Hindalco HALC.NS HNDL IN

METALS & MINING

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EQUITY RESEARCH

Emerging from dark clouds…

Al prices bottoming, expansion nearing completion & stable Novelis at attractive valuation

September 14, 2012

Rating Starts at	**Buy**
Target price Starts at	INR 143
Closing price September 12, 2012	INR 109
Potential upside	+31.2%

Action: Initiate with Buy for stable Novelis and Indian expansion

We believe Hindalco is in an exciting phase as its expansion plans near completion and volume growth is expected by the end of FY13F with the commissioning of the Mahan smelter. At the same time, Novelis, which Hindalco acquired five years ago, has been a steady performer despite global economic uncertainties and, in our view, should see continued improvement with the focus on recycling and expansion in growth markets of China, Korea and South America.

The stock has corrected by 30% over the past seven months (vs. a 2% correction in SENSEX) on weak aluminium prices and uncertainty of coal block development. However, we believe that even without captive coal, the stock has attractive upside potential. At the same time, a weak INR should mitigate the impact of lower aluminium prices.

Catalyst: Commissioning of the projects at Mahan and Utkal

Commissioning of the Mahan smelter and Utkal alumina over the next 6-12 months would be a key trigger for the stock, in our view.

Valuation: Too much negativity built in

We value Hindalco at INR143/share at 6x FY14F EV/EBITDA with Indian operations contributing INR72/share, Novelis INR54/share and other stakes at INR17/share. HNDL is currently trading at 5.3x FY14F P/E and 0.6x FY13F P/B. We believe that the current share price is not valuing the capex spend, despite the company expecting the expansion project to be commissioned by the year-end.

31 Mar	FY12		FY13F		FY14F		FY15F
Currency (INR)	Actual	Old	New	Old	New	Old	New
Revenue (mn)	808,214		846,213		920,095		1,039,941
Reported net profit (mn)	33,970		34,550		40,921		47,477
Normalised net profit (mn)	36,160		34,550		40,921		47,477
FD normalised EPS	18.88		18.04		20.53		22.99
FD norm. EPS growth (%)	47.2		-4.5		13.8		12.0
FD normalised P/E (x)	5.8	N/A	6.0	N/A	5.3	N/A	4.7
EV/EBITDA (x)	6.5	N/A	6.9	N/A	5.8	N/A	4.6
Price/book (x)	0.7	N/A	0.6	N/A	0.6	N/A	0.5
Dividend yield (%)	1.4	N/A	1.4	N/A	1.4	N/A	1.4
ROE (%)	11.1		10.3		10.8		11.0
Net debt/equity (%)	103.3		115.8		101.8		83.7

Source: Company data, Nomura estimates

Key company data: *See page 2 for company data and detailed price/index chart.*

Anchor themes

Hindalco is in an exciting phase with its Indian expansion nearing completion and Novelis remaining a steady performer despite global uncertainties. We see an EBITDA inflection as Novelis expands recycling capacity and taps growth markets of China, Korea and South America.

Nomura vs consensus

Our FY14-15F EPS est are 5-10% higher than consensus; our TP is 3% higher. 45% of Street analysts have a Buy rating on HNDL.

Research analysts

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See Appendix A-1 for analyst certification, important disclosures and the status of non-US analysts.

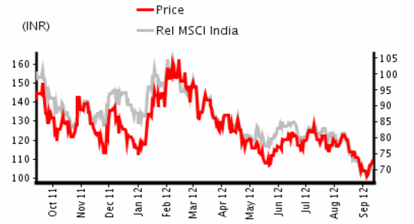
Key data on Hindalco

Income statement (INRmn)

Year-end 31 Mar	FY11	FY12	FY13F	FY14F	FY15F
Revenue	**720,779**	**808,214**	**846,213**	**920,095**	**1,039,941**
Cost of goods sold	-612,329	-690,337	-723,038	-780,327	-878,953
Gross profit	**108,450**	**117,877**	**123,175**	**139,768**	**160,988**
SG&A					
Employee share expense	-55,933	-62,489	-64,692	-69,233	-79,194
Operating profit	**52,517**	**55,389**	**58,483**	**70,534**	**81,794**
EBITDA	**80,017**	**81,894**	**88,726**	**107,313**	**126,345**
Depreciation	-27,500	-26,506	-30,243	-36,779	-44,551
Amortisation					
EBIT	52,517	55,389	58,483	70,534	81,794
Net interest expense	-18,393	-17,580	-19,373	-23,181	-26,181
Associates & JCEs	-571	496	496	496	496
Other income	4,309	7,831	8,173	8,173	9,173
Earnings before tax	**37,861**	**46,135**	**47,779**	**56,022**	**65,281**
Income tax	-9,638	-7,862	-11,115	-12,988	-15,691
Net profit after tax	**28,222**	**38,273**	**36,664**	**43,034**	**49,590**
Minority interests	-3,659	-2,113	-2,113	-2,113	-2,113
Other items					
Preferred dividends					
Normalised NPAT	**24,564**	**36,160**	**34,550**	**40,921**	**47,477**
Extraordinary items	0	-2,190	0	0	0
Reported NPAT	**24,564**	**33,970**	**34,550**	**40,921**	**47,477**
Dividends	-3,338	-3,352	-3,347	-3,609	-3,609
Transfer to reserves	**21,226**	**30,618**	**31,203**	**37,311**	**43,868**
Valuation and ratio analysis					
Reported P/E (x)	8.5	6.2	6.0	5.3	4.7
Normalised P/E (x)	8.5	5.8	6.0	5.3	4.7
FD normalised P/E (x)	8.5	5.8	6.0	5.3	4.7
FD normalised P/E at price target (x)	11.1	7.6	7.9	7.0	6.2
Dividend yield (%)	1.4	1.4	1.4	1.4	1.4
Price/cashflow (x)	4.7	6.9	3.8	2.8	2.6
Price/book (x)	0.7	0.7	0.6	0.6	0.5
EV/EBITDA (x)	5.1	6.5	6.9	5.8	4.6
EV/EBIT (x)	7.9	9.6	10.5	8.8	7.2
Gross margin (%)	15.0	14.6	14.6	15.2	15.5
EBITDA margin (%)	11.1	10.1	10.5	11.7	12.1
EBIT margin (%)	7.3	6.9	6.9	7.7	7.9
Net margin (%)	3.4	4.2	4.1	4.4	4.6
Effective tax rate (%)	25.5	17.0	23.3	23.2	24.0
Dividend payout (%)	13.6	9.9	9.7	8.8	7.6
Capex to sales (%)	12.5	16.5	16.9	10.9	4.9
Capex to depreciation (x)	3.3	5.0	4.7	2.7	1.2
ROE (%)	9.7	11.1	10.3	10.8	11.0
ROA (pretax %)	7.5	6.6	5.9	6.5	7.1
Growth (%)					
Revenue	18.7	12.1	4.7	8.7	13.0
EBITDA	-17.9	2.3	8.3	20.9	17.7
EBIT	-24.6	5.5	5.6	20.6	16.0
Normalised EPS	-37.4	47.2	-4.5	13.8	12.0
Normalised FDEPS	-37.4	47.2	-4.5	13.8	12.0
Per share					
Reported EPS (INR)	12.83	17.74	18.04	20.53	22.99
Norm EPS (INR)	12.83	18.88	18.04	20.53	22.99
Fully diluted norm EPS (INR)	12.83	18.88	18.04	20.53	22.99
Book value per share (INR)	151.56	166.63	184.03	197.62	219.88
DPS (INR)	1.50	1.55	1.55	1.55	1.55

Source: Company data, Nomura estimates

Relative performance chart (one year)



Source: ThomsonReuters, Nomura research

(%)	1M	3M	12M
Absolute (INR)	-11.3	-11.4	-23.7
Absolute (USD)	-11.1	-10.2	-34.7
Relative to index	-13.7	-17.7	-32.3
Market cap (USDmn)	3,786.8		
Estimated free float (%)	65.0		
52-week range (INR)	164.9/100		
3-mth avg daily turnover (USDmn)	13.91		
Major shareholders (%)			
Promoter	35.0		
LIC	10.0		

Source: Thomson Reuters, Nomura research

Notes

While EBITDA should see strong growth during next 2 years, net profit growth to be muted on account of high depreciation and interest expenditure.

Cashflow (INRmn)

Year-end 31 Mar	FY11	FY12	FY13F	FY14F	FY15F
EBITDA	80,017	81,894	88,726	107,313	126,345
Change in working capital	-7,680	-30,133	-9,449	128	-3,902
Other operating cashflow	-27,953	-21,419	-23,932	-29,614	-34,317
Cashflow from operations	**44,384**	**30,342**	**55,344**	**77,828**	**88,126**
Capital expenditure	-90,039	-132,965	-143,131	-99,960	-51,352
Free cashflow	**-45,655**	**-102,622**	**-87,786**	**-22,132**	**36,774**
Reduction in investments	3,907	-5,370	0	0	0
Net acquisitions					
Reduction in other LT assets			0	0	0
Addition in other LT liabilities	-1,786	13,055	0	0	0
Adjustments	5,779	-40,902	9,545	-1,363	-1,363
Cashflow after investing acts	**-37,756**	**-135,840**	**-78,241**	**-23,495**	**35,411**
Cash dividends					
Equity issue	100	5,434	0	16,239	0
Debt issue	36,933	131,666	80,796	20,000	-20,000
Convertible debt issue					
Others					
Cashflow from financial acts	**37,032**	**137,099**	**80,796**	**36,239**	**-20,000**
Net cashflow	**-724**	**1,260**	**2,554**	**12,744**	**15,411**
Beginning cash	78,258	77,534	78,794	81,348	94,093
Ending cash	77,534	78,794	81,348	94,092	109,504
Ending net debt	199,385	329,792	408,033	415,289	379,878

Source: Company data, Nomura estimates

Notes

Cash includes current investments in debentures, bonds and debt funds

Balance sheet (INRmn)

As at 31 Mar	FY11	FY12	FY13F	FY14F	FY15F
Cash & equivalents	77,534	78,794	81,348	94,093	109,503
Marketable securities	0	0	0	0	0
Accounts receivable	79,996	80,172	83,644	90,222	102,884
Inventories	140,956	132,460	140,579	147,006	157,323
Other current assets	33,334	73,529	81,373	82,681	85,794
Total current assets	**331,819**	**364,955**	**386,944**	**414,002**	**455,504**
LT investments	56,578	68,085	68,085	68,085	68,085
Fixed assets	365,947	470,319	574,540	639,702	648,483
Goodwill	89,414	110,665	110,665	110,665	110,665
Other intangible assets	0	0	0	0	0
Other LT assets	0	0	0	0	0
Total assets	**843,758**	**1,014,023**	**1,140,234**	**1,232,453**	**1,282,736**
Short-term debt					
Accounts payable	164,692	151,925	161,911	176,353	198,542
Other current liabilities	52,149	66,659	66,659	66,659	66,659
Total current liabilities	**216,840**	**218,583**	**228,570**	**243,011**	**265,200**
Long-term debt	276,920	408,586	489,381	509,381	489,381
Convertible debt					
Other LT liabilities	37,596	50,650	50,650	50,650	50,650
Total liabilities	**531,356**	**677,819**	**768,601**	**803,043**	**805,232**
Minority interest	22,169	17,091	19,204	21,317	23,430
Preferred stock	0	0	0	0	0
Common stock	1,915	1,915	1,915	2,065	2,065
Retained earnings	21,226	30,618	31,203	37,311	43,868
Proposed dividends	3,338	3,352	3,347	3,609	3,609
Other equity and reserves	263,755	283,229	315,964	365,108	404,532
Total shareholders' equity	**290,233**	**319,113**	**352,430**	**408,093**	**454,074**
Total equity & liabilities	**843,758**	**1,014,023**	**1,140,235**	**1,232,453**	**1,282,736**
Liquidity (x)					
Current ratio	1.53	1.67	1.69	1.70	1.72
Interest cover	2.9	3.2	3.0	3.0	3.1
Leverage					
Net debt/EBITDA (x)	2.49	4.03	4.60	3.87	3.01
Net debt/equity (%)	68.7	103.3	115.8	101.8	83.7
Activity (days)					
Days receivable	36.8	36.3	35.3	34.5	33.9
Days inventory	75.6	72.5	68.9	67.3	63.2
Days payable	88.1	83.9	79.2	79.1	77.8
Cash cycle	24.3	24.8	25.0	22.6	19.2

Source: Company data, Nomura estimates

Notes

Debt should peak in FY14F and D/E ratio should remain under control at close to 1

Contents

Executive summary

Hindalco is the largest aluminium company in India with a capacity of 0.5mtpa and has a worldwide presence through Novelis (which it acquired in May 2007). Hindalco is also present in the copper smelting business with a capacity of 0.5mtpa.

Hindalco has large expansion plans to triple its capacity from the current level and is at an exciting phase with its expansion plans nearing completion and volume growth expected to start by the end of FY13 with the commissioning of the 0.36mtpa Mahan smelter. At the same time, Novelis has been a steady performer despite global economic uncertainties and should see continued improvement with focus on recycling and expansion in growth markets of China, Korea and South America.

Initiate coverage with BUY rating and target price of INR143

We initiate coverage of Hindalco with a BUY rating and target price of INR143.

- We expect Novelis to continue to record robust performance driven by efficient operations and judicious capex plans. The company is investing in growing markets of Asia and South America and is focusing on expanding recycling capacity across the regions. These two factors should lead to another inflection in Novelis EBITDA by FY15, we believe.
- Its Indian expansion is nearing completion and even without captive coal blocks, the projects would be profitable, in our view. With a captive bauxite mine, Hindalco will have an advantage of USD200/tonne in cost of production which should keep it in a much better shape than peers such as Vedanta Aluminium (not listed), which is a loss-making entity.

Recent stock price correction provides attractive opportunity

Hindalco's stock price has corrected by 30% over the last seven months (vs 2% correction in SENSEX and 18% correction in the BSE metals index) primarily on account of: 1) weak global macroeconomic conditions; 2) concerns about coal block development – development of coal blocks had been stuck for various government approvals, and now with the CAG report questioning the methodology of allocating coal blocks, there are concerns that it might be delayed further; and 3) temporary power-related issues –the power plant had to be shut down temporarily, which affected aluminium production in Q1FY13.

We believe the recent correction provides an attractive entry point given our view that: 1) Novelis remains a pillar of strength and should see continued strong profitability with higher recycling and strategic investment; and 2) Indian operations should see strong EBITDA growth despite a delay in coal block development as we expect Hindalco's cost of production to remain less than USD1,700/tonne despite external coal usage.

Aluminium prices bottoming, weak INR a tailwind

Aluminium prices on the London Metal Exchange are down sharply to USD1,900/tone, (down 20% over last six months) primarily on weaker European outlook and fears of slowdown in China. While we believe aluminium prices have bottomed out, we don't expect significant recovery in aluminium prices as 1) aluminium remains in surplus despite production cuts in effect; and 2) global macro conditions remain sluggish.

At the same time, we believe close to 50% of global aluminium smelters have turned unprofitable at current aluminium prices. This should provide a floor to aluminium prices. However realizations in terms of rupees have been helped by weak currency (INR has depreciated by 12% over last six months), and blended realizations for HNDL should remain flat to marginally positive YoY. Since most of the costs are in INR, we expect profitability to remain intact for Hindalco.

Novelis has been a successful acquisition…

Novelis has been a remarkable success for Hindalco as EBITDA has doubled to USD1bn in FY10 and has maintained an annual run rate of USD0.9-1bn consistently for the past 2-3 years. At the same time, Novelis has paid back cash of USD1.7bn to Hindalco in FY11. Novelis is largely a converter with very stable margins (as its margins are not impacted by the volatility of aluminium prices). The company has also been able to operate at full capacity despite the weak economic environment as 60% of its deliveries are in beverage cans for which there is very stable demand.

Focus on recycling, growth projects: expect 2nd EBITDA inflection in FY15-16F

Novelis experienced an inflection in its EBITDA in FY10, when EBITDA doubled to around the USD1bn level. We expect another inflection in EBITDA from FY15F as the company is investing heavily in: 1) expansion in Asian and South American markets; and 2) expanding its recycling capacity at most of its facilities which should improve the use of recycled aluminium by Novelis to 50% in FY16F from the current rate of 37.5%.

The FY10 inflection in EBITDA was on account of: 1) an increased focus on profitable business segments – ie, beverage cans; 2) higher conversion margin; and 3) restructuring of operations. We believe the inflection in FY15F will be more internally driven by judicious and focused capex.

Indian operations: expansion nearing completion

Hindalco plans to increase aluminium smelting capacity to 1.64mn tonnes (from 0.5mn tonnes currently) and alumina refining capacity to 4.5mn tonnes (from 1.5mn tonnes currently) by FY15-16F. This would make Hindalco amongst the largest integrated aluminium companies in the world. Hindalco is also expanding captive power capacity to 4000MW from close to 1100MW currently, which would be sufficient to meet its 100% energy requirement.

While Indian companies in general have faced major hindrances in their expansion plans, with Hindalco also having its shares of problems, we believe the projects now have improved visibility of getting commissioned.

Hindalco's projects are viable even without captive coal...

All of Hindalco's expansion plans have been allocated bauxite mines as well as coal blocks by the government. While development of coal blocks has been lagging due to various approval issues, bauxite mine development is going on as per schedule.

While coal block would boost the profitability of the Mahan smelter, we believe that even without it, the cost of aluminium production would be ~USD1,650/tonne. Balco (not listed) and Vedanta Alumina (not listed) have aluminium cost of production of USD1,900-1,950/tonne. Hindalco, owing to its captive bauxite mine, should have an advantage of USD200-250/tonne. Therefore, we estimate the Mahan smelter can generate EBITDA/tonne of USD600- USD650, which would be enough to meet the interest/debt obligation.

Phase wise commissioning to keep leverage under control

Hindalco has a capex plan of USD3.5bn over the next 3 years in India and close to USD1.5bn at Novelis. As a result, we expect standalone net debt to increase to USD3bn in FY14F from USD1.7bn in FY12, and on a consolidated basis, net debt should be close to USD7.5bn in FY14F from USD6bn in FY12.

However, we believe D/E should remain at around 1:1 on a consolidated basis and interest coverage ratio should be at a healthy 4.5-5x. Novelis has debt of USD4bn (out of total consolidated net debt of USD7bn), and it should have sufficient cash flows to meet all its capex and interest servicing needs.

We capture recent challenges in our estimates…

As discussed above there has been a series of challenging developments affecting the sector and stock performance. We also acknowledge that coal block development will take time and don't expect it to be operational for another two years. At the same time we have built in benchmark aluminium prices at USD1950/t in FY13F and USD2000/t from FY14F onwards, largely in line with current prices.

Despite improved visibility, we are not going overboard on expansion…

While we believe the visibility on the commissioning of projects has improved, we have not assumed aggressive production from new plants in our forecasts. We expect the Mahan aluminium smelter to gradually ramp up production over the next two years. The table below shows our production forecasts.

We have built in higher costs in the initial phase, and we do not assume any benefit from the Mahan coal block built until FY15.

Fig. 1: Production estimates at Indian operations

	FY12	FY13F	FY14F	FY15F	FY16F
Alumina					
Utkal alumina			400,000	1,050,000	1,350,000
Aditya Aluminium					750,000
Total alumina	**1,354,970**	**1,422,719**	**1,822,719**	**2,472,719**	**3,522,719**
Aluminium					
Hirakud			35,700	35,879	36,058
Mahan Smelter			143,600	251,300	287,200
Aditya Aluminium				35,900	251,300
Total Aluminium	**573,935**	**573,935**	**753,235**	**897,014**	**1,148,493**

Source: Company data, Nomura estimates

Still expect strong EBITDA growth over FY12-16F

We expect Hindalco to record 15% consolidated EBITDA CAGR over FY12-FY14F and 22% CAGR over FY14F-16F on the back of expansion in India and investments in Novelis. Forecast EBITDA growth during FY12-14F is primarily on account of the Mahan smelter coming on line (without coal block development and running on external coal).

We expect the Mahan coal block to be operational by FY15 and hence the EBITDA CAGR post FY14F should be driven by: 1) coal block development; and 2) inflection in Novelis' profitability driven by expansion and higher recycling. We expect consolidated EBITDA of USD1.96bn in FY14F, up from USD1.5bn in FY12.

Fig. 2: EBITDA growth driven by stable Novelis and expanding Indian ops

	FY10	FY11	FY12	FY13E	FY14E	FY15E
Indian operations (INRmn)	29,499	31,854	31,048	33,356	46,971	54,488
% contribution	*30.3%*	*39.8%*	*37.9%*	*37.6%*	*43.8%*	*43.1%*
Novelis (USDmn)	1,071	971	932	895	985	1,194
% contribution	*52.1%*	*55.3%*	*54.6%*	*55.5%*	*50.5%*	*52.0%*
Others (INRmn)	17,193	3,914	6,167	6,167	6,167	6,167
Total EBITDA (INRmn)	97,458	80,017	81,894	88,726	107,313	126,345

Source: Company data, Nomura estimates

The stock has significant option value not built in our TP

We have valued Hindalco at 6x FY14F EBITDA. This means we have not factored in benefits of either the Mahan coal block or the inflection in Novelis EBITDA which we expect from FY15.

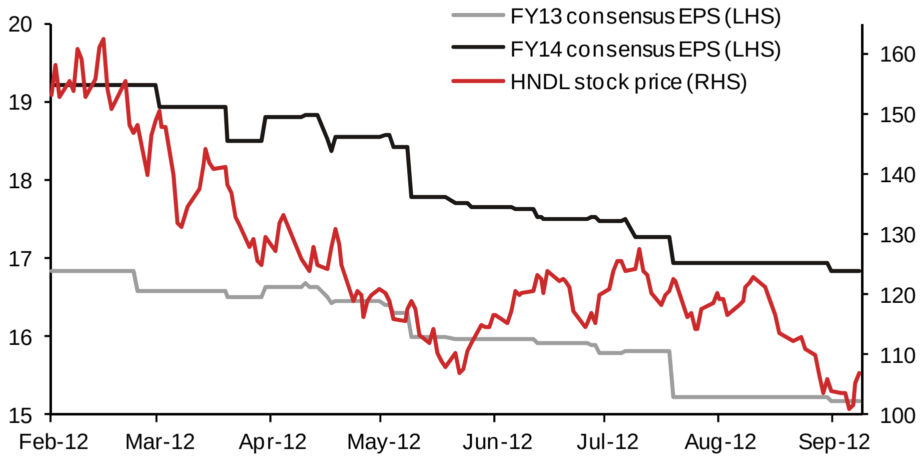
The stock has significantly higher intrinsic value as exemplified by the fact that it can have consolidated EBITDA of USD2.9bn in FY16F, up from USD1.96bn in FY14F and USD1.5bn in FY12. On FY16x estimates the stock will have a value of INR240/share (at 6x EV/EBITDA).

Therefore the stock has option value of close to INR100/share which is not yet built in our forecasts. This would be driven by 1) inflection of Novelis EBITDA from USD1bn to USD1.4bn and 2) Indian operations' EBITDA to USD1.4bn in FY16F from USD650mn in FY12.

Consensus estimates are incorporating most of the recent negatives...

In our view, consensus earnings forecasts are incorporating most of evolving challenges related to coal block issues as well as near-term operational issues. FY13-14 consensus earnings estimates have been revised downwards 10-12% over past six months. We believe current consensus estimates are now in a range easily achievable by the company and can actually have some upside.

Fig. 3: Stock performance vs consensus earnings revision



Source: Bloomberg, Nomura research

The recent stock price correction (30% since February 15, 2012) looks disproportionate to us relative to the 10-12% cut in consensus earnings forecasts. We attribute this de-rating of the stock to sector-related developments over the last few months.

Novelis should generate surplus cash flows despite continuing capex

Novelis has plans to spend USD400mn/year on capex for the next 2-3 years, which would take care of most of the expansion plans discussed above.

We forecast Novelis will generate USD550-600mn of operating cash during FY13F-15F. With capex of USD600mn in FY13F and USD400-500mn thereafter, Novelis should have surplus cash of USD200mn in FY14F-15F and increasing thereafter.

Novelis should generate free cash flow of USD600mn from FY16F, once the majority of its capex plans are completed.

Hindalco: A brief introduction

Part of Aditya Birla group, amongst the largest business groups in India

Hindalco is part of the Aditya Birla group, which is amongst the oldest and most prestigious business groups in India. The Aditya Birla group has a presence in a wide range of businesses such as telecom, cement, insurance and finance, fertilisers, retail and metals.

The Aditya Birla group is amongst the largest corporates of India and is part of the Fortune 500 companies with a total size of USD40bn. The leadership of the company has consistently figured amongst the best as per Fortune magazine.

Experienced management team

Hindalco has an experienced management team which in our view has a good track record of focusing on shareholder value.

The Novelis acquisition was generally expected to be a bad business move, but the company has been able to stage a remarkable turnaround at Novelis, in our view, doubling its EBITDA within 3 years of acquiring it. Likewise, its approach towards expansion in India has also turned out to be sensible. Earlier the company was perceived to be too slow and passive compared with peers like Vedanta Group. However, Hindalco’s approach of first getting all necessary approvals and committing big money only after satisfactory progress on all aspects of expansion has helped the company avoid situations of stuck capex like Vedanta Alumina (which has close to USD3bn of capex stuck for want of bauxite mines and necessary approvals).

Key management profile

Mr Kumar Mangalam Birla, Chairman
Mr Kumar Mangalam Birla became the chairman of Aditya Birla Group in 1995 and has overseen the group’s growth from USD2bn turnover in 1995 to USD40bn at present.

He has focused on making all the group companies more professional and aggressive, which has resulted in the company attaining a leadership position in its various businesses. Mr Birla has also been instrumental in simplifying the group structure by reducing crossholding (like merging all cement businesses in Ultratech and focused on growth both through the organic route (expansion at aluminium and cement business) and inorganic route (acquisitions of Novelis, Columbian Chemicals, etc).

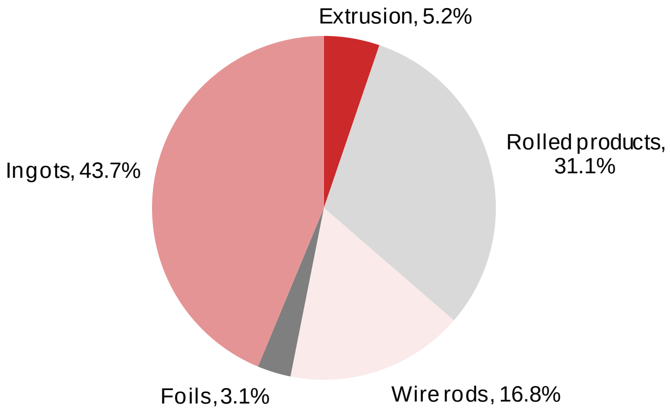
Mr Debu Bhattacharya, Managing Director
Mr Bhattacharya joined Aditya Birla Group in 1998 and has been the Managing Director of Hindalco and on its board since 2003. Prior to joining Aditya Birla Group, Mr Bhattacharya worked for various subsidiaries of Unilever Ltd and was inducted on the board of directors for Hindustan Unilever (HUVR IN, Reduce) in 1991.

Largest aluminium and copper producer in India

Hindalco is the largest aluminium and copper producer in India and has the largest aluminium rolling operations globally through its fully owned subsidiary Novelis, which it acquired in May 2007.

Hindalco’s total aluminium capacity is 0.5mn tonnes currently, which it plans to raise to 1.6mn tonnes by FY15-16F. It has a copper smelting capacity of 0.5mn tonnes as well. At the same time, Hindalco has 3mtpa of rolling capacity through Novelis and also holds copper mines in Australia (though not significant).

Fig. 4: Hindalco product mix – Indian aluminium (FY12)



Source: Company data

Around 60% of the company's total aluminium production is sold in value-added form.

Novelis provides HNDL with global footprint

With the acquisition of Novelis, the largest aluminium-rolling company in the world, Hindalco extended its presence in 11 countries across North America, Europe, Asia and South America. At the same time, the company is now present in downstream facilities with high value-added products.

Hindalco acquired Novelis in May 2007 for a total enterprise value of USD6.2bn and equity value of USD3.4bn. We believe this has been a successful acquisition for Hindalco, given that Novelis has already paid back half the equity invested in cash and has been able to double its EBITDA over the past 4-5 years.

Hindalco has access to captive bauxite and cheaper power

Hindalco has alumina capacity of 1.5mn tonnes and sources all of its bauxite requirement from captive mines. While it operates most of the mines itself, it also operates some mines on a contract basis. Possessing bauxite gives Hindalco an advantage by saving USD200-250/tonne in aluminium production costs.

At the same time, all its current power plants operate either on captive coal or linkage coal; hence it can produce power at INR1.6/kWh. This too gives Hindalco an advantage in terms of saving USD300/tonne in power costs.

Large aluminium expansion plans in India

Hindalco plans to increase its aluminium smelting capacity to 1.64mn tonnes (from 0.5mn tonnes currently) and alumina refining capacity to 4.5mn tonnes (from 1.5mn tonnes currently) by FY15-16F. This would place Hindalco amongst the largest integrated aluminium companies in the world. Hindalco is also expanding captive power capacity to 4,000MW from close to 1,100MW currently, which would be sufficient to meet its full energy requirement, we estimate.

While Indian metal companies, in general, have faced major hindrances in their expansion plans, with Hindalco also having its share of problems, we believe there is improved visibility now on the projects being commissioned.

Fig. 5: Schedule of projects being commissioned

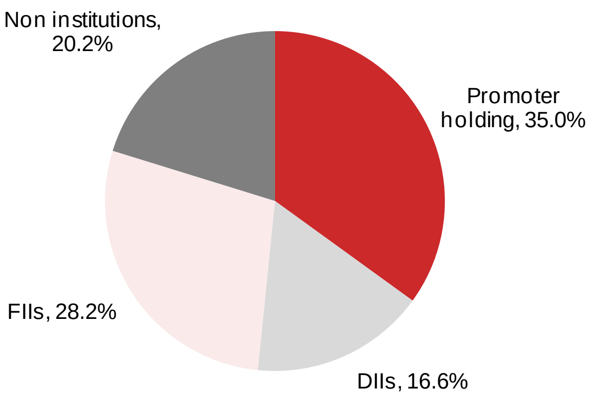
Location	Alumina (ktpa)	Aluminium (ktpa)	Power plant (MW)	Total capex (INRbn)	Capex spent (INRbn)	Start date
Hirakud expansion		51	100	10	7	Q4FY13
Mahan smelter (MP)		325	900	105	80	Q4FY13
Utkal Alumina (Orissa)	1,500			73	40	mid FY14
Aditya Aluminium (Orissa)	1,500	325	900	152	40	H2FY15
Latehar (Jharkhand)		325	900	100	-	FY16

Source: Company data, Nomura estimates

Shareholding pattern: Well-distributed holdings

The Aditya Birla Group holds a 35% stake in Hindalco and the remaining 65% is held by a mix of institutional and individual investors. 45% of the shares are held by institutional investors, of which 28% are held by FIIs (Foreign Institutional Investors).

Fig. 6: Hindalco – shareholding pattern



Source: Company data (as of June 2012)

Valuation methodology

We value Hindalco at 6x FY14F EV/EBITDA – its Indian operations at INR72/share, Novelis at INR54/share and INR17 from its holdings in non-core listed companies. Our TP for Hindalco is INR143. Hindalco's Indian operations are valued at an EV of INR281.4bn (USD5.2bn) – at 6x FY14F EBITDA of INR47.2bn (USD860mn). We value Novelis at an EV of USD5.9bn – 6x FY14F EBITDA of USD985mn.

Hindalco's peers are trading in the range of 4.5-6.2x EV/EBITDA; we believe HNDL has better earnings growth potential on account of its expansion plans in India and hence ascribe a multiple of 6x. This is also in line with Hindalco's average historic trading multiple.

We value Hindalco at a discount to the average multiple of 6.8x at which global peers are currently trading.

Since we value the stock on FY14F EBITDA not including the benefits of either its coal blocks or inflection in Novelis' EBITDA, we have not ascribed any value to these in our TP calculation.

Fig. 7: Hindalco – consolidated valuation

Entity	EV (INRmn)	Equity value (INRmn)	Per share (INR)	Valuation methodology
Indian operations	281,358	138,191	72	6x FY14F EBITDA
Novelis	325,050	103,176	54	6x FY14F EBITDA
Other stakes		40,068	17	17% holding co discount
Target price			**143**	

Source: Company data, Nomura estimates

We are ascribing just about INR39bn (14% of total India EV) to the new Mahan smelter, as we have assumed INR6.5bn of EBITDA from the new smelter in FY14. This is against the asset size of INR100bn. Therefore, we value just the Mahan smelter in our estimates and that, too, at 40% of the total value. We have not built in any value from other expansions where it has already spent close to INR80bn.

Fig. 8: Valuation of stakes in listed non-core assets

	Ticker	No of shares	CMP (INR)	Stake value (INRmn)
Aditya Birla Chemicals	ABCH IN	12,004,987	81	972
Nalco	NACL IN	28,667,404	52	1,491
Aditya Birla Nuvo	ABNL IN	8,650,412	771	6,669
Grasim	GRASIM IN	2,299,059	2,650	6,093
Ultratech	UTCEM IN	1,313,748	1,762	2,314
ABML	ABY AU	159,820,001	27	4,261
IDEA	IDEA IN	228,340,226	80	18,267
Total value				**40,068**

Source: Company data, Bloomberg

Fig. 9: Relative valuation

		Price	Mkt cap (USDmn)	Rating	P/E (CY13F/FY14F)	EV/EBITDA (CY13F/FY14F)	P/B (CY12F/FY13F)	ROE (CY12F/FY13F)	EBITDA margin (CY12F/FY13F)
Rio Tinto	RIO AU	55.1	81,495	BUY	7.9	4.5	1.42	17.8%	40.7%
United Co Rusal	486 HK	4.1	8,032	Not rated	61.2	15.7	5.00	8.2%	13.8%
Norsk Hydro	NHY NO	27.3	9,816	NEUTRAL	18.5	5.4	0.70	3.8%	10.9%
Alcoa	AA US	9.3	9,954	NEUTRAL	12.2	6.2	0.69	5.6%	13.2%
Nalco	NACL IN	52.3	2,440	Not rated	13.1	5.5	1.04	7.9%	18.4%
Hindalco Industries	HNDL IN	109.1	3,782	BUY	5.3	5.7	0.59	11.1%	11.6%
Sterlite Industries	STLT IN	95.1	5,786	BUY	4.8	3.8	0.63	13.2%	26.1%
Hindustan zinc	HZ IN	132.4	10,128	BUY	9.4	5.5	1.74	18.6%	50.5%
Average					**17.8**	**6.8**	**1.5**	**9.8%**	

Bloomberg consensus estimates for Not rated stocks. Pricing as of 12 September. Prices are in local currency.

Source: Bloomberg, Nomura estimates

Sensitivity analysis

The profitability of Hindalco's Indian aluminium operations largely depends on aluminium realizations, which are a factor of LME aluminium prices and the USDINR exchange rate.

On our estimates, Hindalco's FY14F EBITDA would increase by INR4.0-4.5bn (8-10%) for every USD100/tonne increase in aluminium prices. At the same time, with a depreciation of INR1 to the USD, EBITDA would increase by INR1.8-2.1bn (4-5%).

Fig. 10: FY14F standalone EBITDA sensitivity to LME aluminium prices

		LME aluminium prices (USD/t)					
	(INRmn)	1,700	1,800	1,900	2,000	2,100	2,200
USD/INR exchnage rate	50	24,834	28,822	32,810	36,799	40,787	44,775
	52	28,425	32,572	36,720	40,868	45,015	49,163
	54	32,015	36,322	40,630	44,937	49,244	53,551
	56	35,606	40,072	44,539	49,006	53,473	57,939
	58	39,196	43,823	48,449	53,075	57,701	62,328
	60	42,787	47,573	52,358	57,144	61,930	66,716

Source: Company data, Nomura estimates

On our estimates, Hindalco's FY14F EPS would increase by INR1.6-1.8 (12-15%) for every USD100/tonne increase in aluminium prices. At the same time, with a depreciation of INR1 to the USD, EBITDA would increase by INR0.7-0.8 (5-6%).

Fig. 11: FY14F standalone EPS sensitivity to LME aluminium prices

		LME aluminium prices (USD/t)					
	(INR)	1,700	1,800	1,900	2,000	2,100	2,200
USDINR exchnage rate	50	4.6	6.1	7.7	9.3	10.8	12.4
	52	6.0	7.6	9.2	10.9	12.5	14.1
	54	7.4	9.1	10.8	12.5	14.1	15.8
	56	8.8	10.6	12.3	14.1	15.8	17.6
	58	10.2	12.0	13.8	15.7	17.5	19.3
	60	11.6	13.5	15.4	17.2	19.1	21.0

Source: Company data, Nomura estimates

Novelis: A steady performer

Novelis (not listed) is amongst the largest aluminium rolling company in the world and produces sheets which are used in the beverages/food cans, automotive, construction and packaging sectors. It has a rolling capacity of 3.3mt in 11 countries across the world. Hindalco acquired Novelis in May 2007 for an EV of USD6.2bn.

Novelis has been a consistent performer for Hindalco over the past 2-3 years despite a challenging operating environment in western countries. Although 65-70% of Novelis' deliveries are in North America and Europe (economies with the most challenging outlook as per the company), Novelis has seen stable EBITDA performance.

Novelis currently generates EBITDA of close to USD1bn and we expect EBITDA to remain at the same level in FY13-FY14F. With the benefits of new capex starting, we estimate strong EBITDA growth over FY15-16F to USD1.2-1.4bn.

Novelis has been a successful acquisition for Hindalco

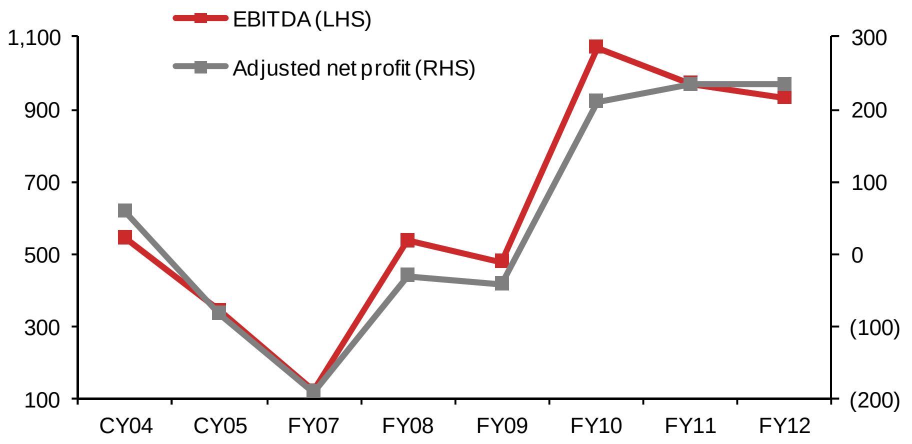
We believe Novelis has proved to be a commendable success for Hindalco both operationally as well as financially.

Hindalco paid a total EV of USD6.2bn and equity value of USD3.4bn to acquire Novelis. Novelis has already paid USD1.7bn of equity to Hindalco. At the same time, even operationally, Novelis has been able to register significant improvement, with EBITDA doubling to USD1bn in FY10, within three years of Hindalco acquisition. We attribute the EBITDA improvement to: 1) the company's focus on profitable products such as beverage and food cans; 2) higher recycling which has helped lower costs; and 3) industry-wide improvement in conversion margins.

A remarkable turnaround in FY10…

Novelis staged a remarkable turnaround in FY10, when it reported EBITDA/tonne of USD375/tonne and total EBITDA of more than USD1bn for the first time. This, we note, was a sharp jump from EBITDA of nearly USD0.5bn which Novelis had been generating over the previous 7-8 years. This turnaround was driven by a combination of factors such as: 1) increased focus on profitable products – ie, beverage cans; 2) increased focus on recycling; 3) higher conversion margins; and 4) restructuring of non-core assets.

Fig. 12: Novelis – remarkable turnaround from FY10
(USDmn)

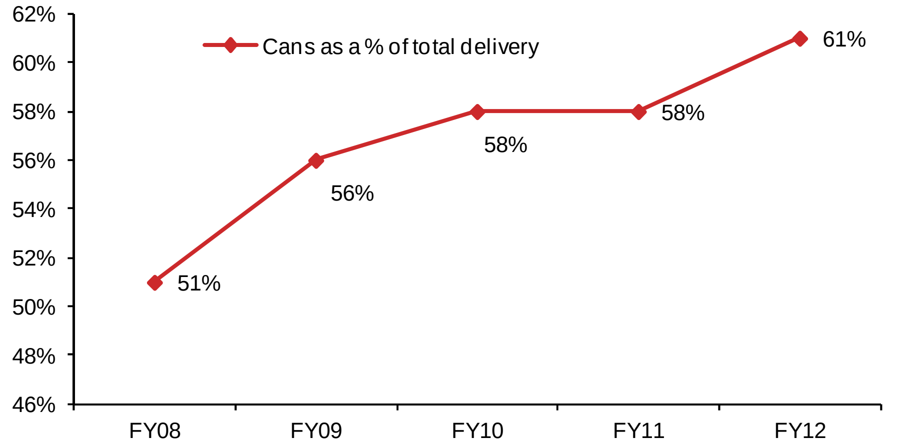


Source: Company data

The company has concentrated on the profitable can segment

Novelis has increased its focus on high-margin products such as beverage cans, with the share of beverage cans in the total product mix having increased to 61% in FY12 from 51% in FY08. Demand for beverage cans is much more stable than demand in the construction sector, which has been weak due to slower economic growth and fixed asset investments. At the same time, the possibility of recycling leads to potential higher margins in the beverage can business.

Fig. 13: % of cans in the product mix has steadily increased



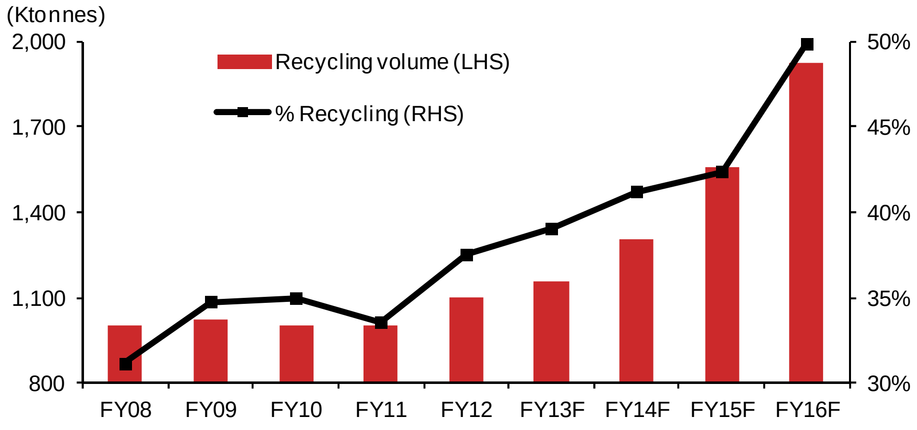
Source: Company data

Recycling has been another focus area

Novelis is focusing on the higher usage of recycled metal which, in our view, should be a key driver of profitability going forward. We believe the use of recycled aluminium gives an advantage of USD150/tonne (over new aluminium). Please see our calculation in the table below (Fig. 15):

At the current LME aluminium price of USD1,950/ tonne, Novelis pays close to USD2,100/tonne for new aluminium slabs, while the current price of used beverage cans (UBC) is close to USD1,500/ tonne. With a yield of close to 85%, the effective cost of recycled metal would be close to USD1950/tonne, we estimate. Novelis has a capital cost of close to USD650/tonne to set up a recycling plant, which can generate a ROIC of close to 18.1%, on our reading.

Fig. 14: Usage of recycled metal… on a steady increase



Source: Company data, Nomura estimates

Novelis is expanding its recycling capacity in all the regions it operates in, with a: 1) 400ktpa expansion in Germany; 2) 500ktpa expansion in Korea including recycling capacity; 3) 200ktpa expansion in North America along with recycling expansion, and; 4) 220ktpa expansion in SA with recycling expansion.

With all its expansions, we estimate Novelis would use nearly 50% of recycled metal by FY16F from the current level of 37.5%.

Fig. 15: Dynamics of recycling
(USD/t)

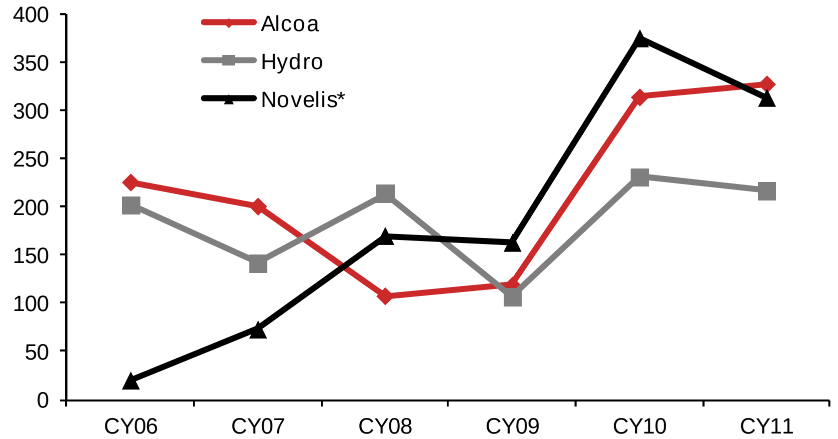
Dynamics of recycling	
Purchase price of Aluminium Scrap	1,500
Energy cost of melting & conversion	57
Other conversion costs	100
Total cost of recycled Aluminium	1,657
Yield	0.85
Recycled aluminium cost	1,950
Cost of new Aluminium	
LME Al price	1,950
Physical premium	150
Per tonne cost	2,100
Additional margin	150
Capex required for recycling plant	650
ROIC (%)	18.1%

Source: Industry data, Nomura estimates

Novelis also benefitted from improvement in industry dynamics

While its improving product mix and increased recycling have helped improve conversion margins, we believe Novelis has also benefitted from an increase in the conversion premium witnessed by the industry. Apart from Novelis, even Hydro and Alcoa witnessed a sharp increase in EBITDA/tonne in FY10.

Fig. 16: The aluminium rolling industry has seen margin improvement in FY10
(USD/t)



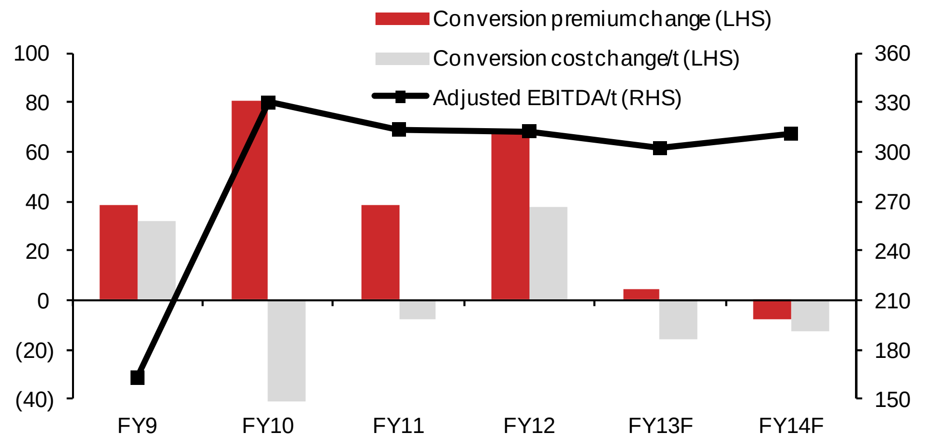
Source: Company data, * Novelis year end is March from CY08 – others Dec end

While costs have also increased on account of a hike in fuel prices and higher value added products, the increase in conversion premium has been higher for the aluminium rolling industry.

Novelis was able to bring down costs in FY10 with a fall in energy costs; however, post FY10 there has been a steady increase in conversion costs. However, as shown in the figure below, the increase in costs has been lower than the increase in conversion premium.

This has been a key driver of Novelis' steady EBITDA. Going forward, we expect production costs to decline marginally primarily owing to operating leverage resulting from its expansion plans.

Fig. 17: Change in conversion premiums and cost of conversion for Novelis
(USD/t)



Source: Company data, Nomura estimates

Fig. 18: Novelis: key financials

	FY10	FY11	FY12	FY13F	FY14F	FY15F	FY16F
Total deliveries (ktonnes)	2,854	3,097	2,982	2,958	3,167	3,669	3,861
% of recycled materials	35.0%	33.6%	37.5%	39.0%	41.2%	42.4%	49.9%
EBITDA (USDmn)	1,071	971	932	895	985	1,194	1,418
EBITDA/t	375	314	313	302	311	326	367
Interest cost (USDmn)	175	207	305	291	291	291	291
Net profit (USDmn)	405	116	63	201	236	346	491
Gross debt (USDmn)	2,586	4,105	4,362	4,362	4,362	4,362	4,340
Net debt (USDmn)	2,149	3,794	4,045	4,034	3,846	3,550	2,801
Capex (USDmn)	206	274	413	600	372	361	161

Source: Company data, Nomura estimates

A strategic capex plan – centred around recycling and expansion in growth markets

We believe Novelis has adopted a very calculated expansion plan which focuses on its growth markets of Asia and South America. At the same time, the company is also focusing on expanding its recycling capacity across all its regions of operation. The following figure shows key details of its expansion projects.

Fig. 19: Novelis – Major capacity expansion plans

Entity	Expansion (ktpa)	Timeline	Details
Brazil	220	end 2012	Includes 190ktpa recycling
North America	200	Mid 2013	Largely for auto sheets
South Korea	350	end 2013	Includes 220ktpa recycling
China	120	end 2014	Automotive sheeet heat treatment
Germany	400	early CY15	Integrated recycling

Source: Company data, Nomura research

Novelis may see another EBITDA inflection from FY15F on completion of capex plans

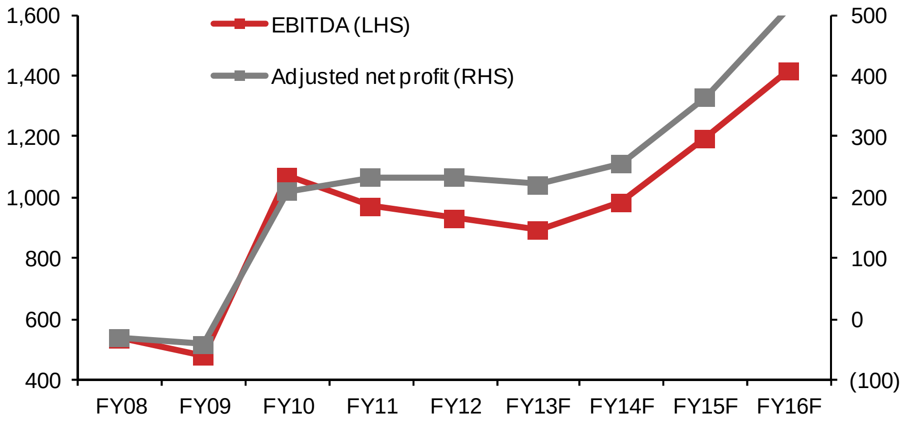
While Novelis saw its first EBITDA inflection in FY10, when EBITDA grew from close to USD500mn in FY08-09 to USD1bn, we expect another inflection in EBITDA from FY15F as the company is investing heavily in: 1) expansion in Asian and South American markets; and 2) expanding its recycling capacity across the regions which would increase Novelis' usage of recycled aluminium to 50% in FY16F from the current 37.5%.

As a result of the above two factors, we estimate EBITDA to increase to USD1.2bn in FY15F and USD1.4bn in FY16F. However, since we value the stock at FY14F EV/EBITDA, these forecast upsides have not been captured in our valuations.

We estimate a flattish conversion premium going forward.

Fig. 20: Novelis should see another inflection in FY15F

(USDmn)



Source: Company data, Nomura estimates

Novelis should continue to generate surplus cash despite significant capex plans

Novelis plans to spend USD400mn/year on capex over the next 2-3 years, as per management, which we estimate should take care of most of its expansion plans discussed above. On our estimates, Novelis would generate USD550-600mn of operating cash during FY13-15F. With capex of USD400mn per year, Novelis should have surplus cash of USD150-200mn over the next two years, increasing thereafter. On our reading, Novelis should generate free cash flow of USD600mn from FY16F, once majority of its capex plans are completed.

Financial performance–Indian operations

Hindalco plans to increase its aluminium smelting capacity to 1.64mn tonnes (from 0.5mn tonnes currently) and alumina refining capacity to 4.5mn tonnes (from 1.5mn tonnes currently) by FY15-16F. This would place Hindalco amongst the largest integrated aluminium companies in the world. Hindalco would also have power capacity of close to 4,000MW from nearly 1,100MW currently, which we estimate would be sufficient to meet its full energy requirements.

While Indian metal companies, in general, have faced major hindrances in their expansion plans, with Hindalco also having its share of problems, we believe there is improved visibility now on the projects being commissioned.

The company has indicated that the Mahan smelter, with a capacity of 359ktpa and the Hirakud expansion of 52ktpa, would be commissioned by December 2012. However, we have built in a gradual ramp-up in production from the two plants and expect only trial production in FY13 and 40% utilisation at the Mahan smelter in FY14.

At the same time, for the Utkal alumina expansion of 1.5mtpa, which the company expects to be commissioned by mid-FY14, we have built in 25% utilisation for FY14F. Please see Fig. 22 for our production estimates:

Fig. 21: Schedule of projects being commissioned

Location	Alumina (ktpa)	Aluminium (ktpa)	Power plant (MW)	Total capex (INRbn)	Capex spent (INRbn)	Start date
Hirakud expansion		51	100	10	7	Q4FY13
Mahan smelter (MP)		325	900	105	80	Q4FY13
Utkal Alumina (Orissa)	1,500			73	40	mid FY14
Aditya Aluminium (Orissa)	1,500	325	900	152	40	H2FY15
Latehar (Jharkhand)		325	900	100	-	FY16

Source: Company data, Nomura estimates

Despite improved visibility, we are not going overboard on expansion

While we believe the visibility on the commissioning of projects has improved, we have not assumed any aggressive production from the new plants in our forecasts. We believe the Mahan aluminium smelter would commence production and gradually ramp up production over the next two years. The table below shows our production forecasts.

Fig. 22: Production estimates at Indian operations

	FY12	FY13F	FY14F	FY15F	FY16F
Alumina					
Utkal alumina			400,000	1,050,000	1,350,000
Aditya Aluminium					750,000
Total alumina	**1,354,970**	**1,422,719**	**1,822,719**	**2,472,719**	**3,522,719**
Aluminium					
Hirakud			35,700	35,879	36,058
Mahan Smelter			143,600	251,300	287,200
Aditya Aluminium				35,900	251,300
Total Aluminium	**573,935**	**573,935**	**753,235**	**897,014**	**1,148,493**

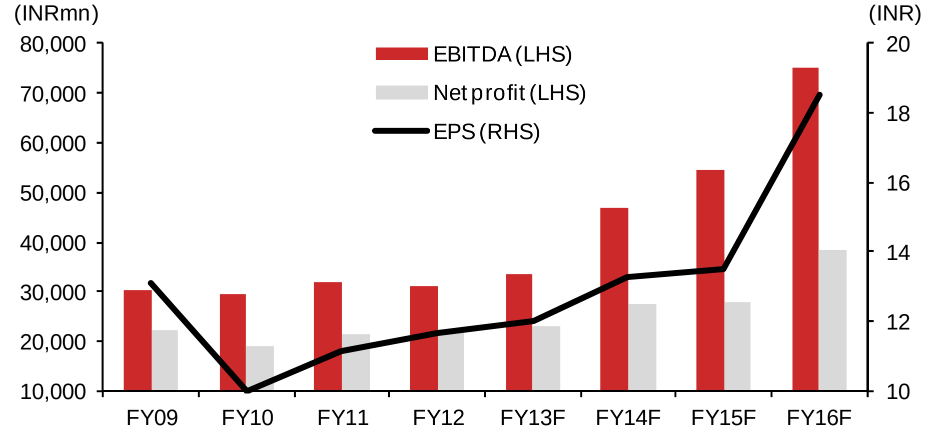
Source: Company data, Nomura estimates

Strong EBITDA growth despite assuming high cost of production in initial phase

We expect Hindalco to see standalone EBITDA growth of 7.4% in FY13F and 40.8% in FY14F primarily on account of Mahan and Utkal alumina expansion coming on line in FY14.

We estimate cash cost of production from the new smelter to remain close to USD1650/tonne in FY14F as Hindalco will be using external coal (through a mix of e-auction and imports). We expect the cash cost should come down to USD1200/tonne by FY16F, when the coal block allotted to them is operational.

Fig. 23: Standalone EBITDA should be strong, but net profit growth muted



Source: Company data, Nomura estimates

However EPS growth should remain muted on higher depreciation and interest cost

Despite expecting strong EBITDA growth in FY12-14F, we believe net profits will see only muted growth as depreciation and interest costs are likely to rise. We expect interest cost to increase from INR2.9bn in FY12 to INR7.1bn in FY14F and INR13.8bn in FY16F. Hindalco capitalized INR7.2bn of interest accrued on expansion projects in FY12, and this number should increase as the company goes for more capex.

Interest expense is recognised in the P&L account only when the capex is commissioned and during the development phase the interest on the CWIP (capital work in progress) is capitalised.

Fig. 24: Standalone interest cost calculation
(INR mn)

	FY10	FY11	FY12	FY13E	FY14E	FY15E
Total ineterst cost	6,138	6,103	10,185	15,835	18,643	18,643
Interest capitalized	3,358	3,903	7,249	12,500	11,500	8,500
CWIP	37,028	94,641	162,569	140,069	116,569	45,069
Transferred to P&L	2,780	2,200	2,936	3,335	7,143	10,143

Source: Company data, Nomura estimates

We expect flat net profit y-y in FY13F followed by a 10.6% increase in FY14F. This is primarily because in the initial phase of project commissioning, projects should be just about profitable given 1) lower capacity utilization; and 2) the high cost of production in the initial stage.

Fig. 25: Indian operations: Key financial details

Production volume (ktonnes)	FY11	FY12	FY13F	FY14F	FY15F	FY16F
Alumina	1,353	1,355	1,423	1,823	2,473	3,523
Aluminium	538	574	574	753	897	1,148
Copper cathode	336	331	335	350	360	370
Sales volume (ktonnes)						
Alumina	310	319	309	361	733	1,295
Aluminium (total)	534	574	574	753	897	1,148
Copper cathode	208	189	191	206	215	225
CC Copper rods	142	143	146	146	146	146
LME aluminium price (USD/t)	**2,250**	**2,200**	**1,950**	**2,000**	**2,000**	**2,000**
Exchange rate	**45.0**	**47.7**	**55.0**	**55.0**	**55.0**	**55.0**
Actual Al realization* (INR/t)	128,533	154,693	153,266	155,361	152,720	149,207
Net sales (INRmn)	**238,592**	**265,968**	**286,879**	**323,842**	**355,845**	**407,514**
EBITDA (INRmn)	**31,854**	**31,048**	**33,356**	**46,971**	**54,488**	**75,158**
Interest cost (INRmn)	2,200	2,936	3,335	7,143	10,143	13,843
Depreciation (INRmn)	6,875	6,900	8,181	12,530	17,370	21,365
Net profit (INRmn)	**21,369**	**22,372**	**22,956**	**27,376**	**27,924**	**38,275**
EPS (INR)	**11.2**	**11.7**	**12.0**	**13.3**	**13.5**	**18.5**
Gross debt (INRmn)	72,715	145,719	195,719	215,719	195,719	175,719
Net debt (INRmn)	18,411	92,662	143,168	163,946	147,390	109,069
Capex (INRmn)	58,649	69,834	77,500	76,500	28,500	23,000

Source: Company data, Nomura estimates *blended realizations including excise

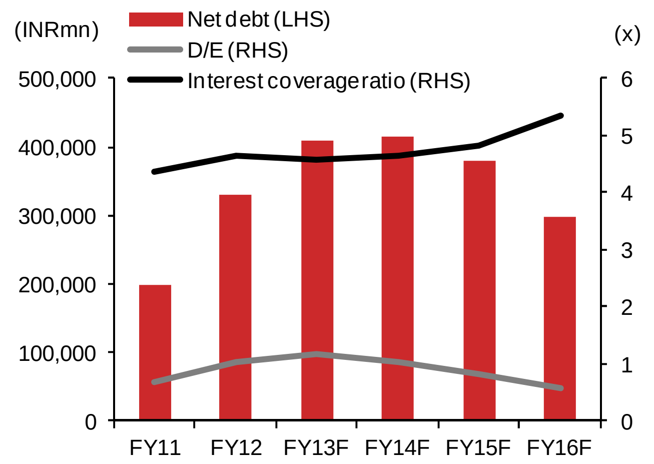
The aluminium realizations in the table above are higher than base aluminium prices as 60% of Hindalco's deliveries are in value-added segments. Gradually the proportion of valued-added products is coming down, and hence realizations going forward are softening.

Leverage ratio not concerning to us – phase-wise commissioning of projects should keep it under control

According to management, Hindalco has planned capex of USD3.5bn over next 3 years in India and close to USD1.5bn at Novelis. We expect Hindalco to generate operating cash of USD2.2bn over next 3 years – USD560mn in FY13F, USD770mn in FY14F and USD885mn in FY15F. Thus, we expect standalone net debt to increase to USD3bn in FY14F from USD1.7bn in FY12, and on a consolidated basis, we look for net debt close to USD7.5bn in FY14F from USD6bn in FY12.

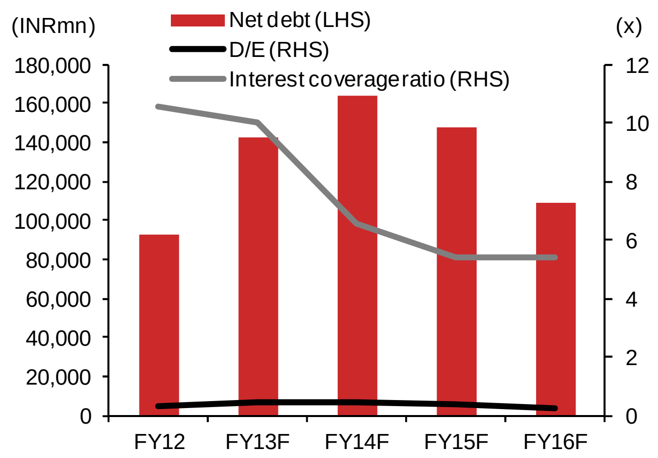
We expect D/E to remain around 1:1 on a consolidated basis, and even interest coverage ratio should be at a healthy 4.5-5x. Note that Novelis has debt of USD4bn (out of total consolidated net debt of USD7bn), and it should have sufficient cash flows to meet all its capex and interest servicing needs, in our view.

Fig. 26: Consolidated Hindalco leverage ratio



Source: Company data, Nomura estimates (interest on CWIP projects is capitalized)

Fig. 27: Standalone Hindalco leverage ratio



Source: Company data, Nomura estimates (interest on CWIP projects is capitalized)

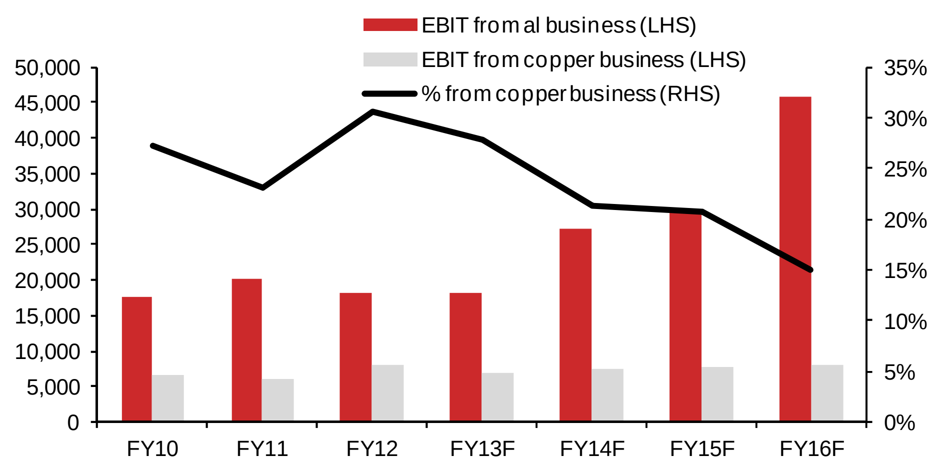
Most of the debt in India is through project financing for expansion and is secured by the cash flows of the respective projects. Since we expect these projects to generate enough cash flow (even without coal blocks) to service debt, we do not expect cash flow pressure on Hindalco.

The company capitalizes interest costs on projects yet to be commissioned, and payments start only after commercial production starts.

Copper business contribution likely to shrink further

Hindalco also has copper smelting business with total capacity of 0.5mtpa. However, given that it is a custom smelter, the copper business contribution to Hindalco's overall profit is low. Copper contributed close to 30% of total EBIT in FY12, and we expect it to gradually shrink to 15% by FY16F as incremental production from new aluminium projects start.

Fig. 28: Copper business contribution should shrink gradually



Source: Company data, Nomura estimates

Access to captive bauxite keeps projects viable even without coal block…

Hindalco plans to increase its refining capacity by 3mtpa – 1.5mtpa each at Utkal Alumina and Aditya Aluminium. According to management, Utkal Alumina should be ready for commissioning by FY14 and Aditya Aluminium should start production by FY15-16.

Hindalco has been allocated the Baphlimali bauxite mine in Orissa (by the government) and has plans for production capacity of 8.5mtpa. We believe this should be sufficient to meet 100% of Hindalco's bauxite needs for its refineries by the time refinery production starts.

Having access to a bauxite mine gives the company an advantage of close to USD15-20/tonne, as per management. The company can get captive bauxite at USD13-15/t, as against current market price in excess of USD35-40/t. Since 3 tonnes of bauxite is required per tonne of alumina, we calculate that it straightway gives Hindalco an advantage of USD60/tonne in cost of production.

Please see the table for cost of production expected at Utkal Alumina. Even for upcoming capacity at Aditya, we expect alumina costs should be around USD220/tonne.

Fig. 29: Contribution of new projects

	FY14F	FY15F	FY16F
LME aluminium price (USD/t)	2,000	2,000	2,000
Freight + premium (USD/t)	200	200	200
Import duty (USD/t)	110	110	110
Total Al realization (USD/t)	2,310	2,310	2,310
Cost of production/t (USD/t)	1,648	1,534	1,193
EBITDA/t of AL (USD/t)	662	776	1,117
Total AL production (tonnes)	179,300	323,079	574,558
EBITDA from aluminium (USDmn)	119	251	642
Alumina realization (USD/t)		350	350
Alumina cost of production (USD/t)	245	238	217
Alumina - EBITDA/t (USD/t)		112	133
Total alumina produced (tonnes)	400,000	1,050,000	2,100,000
Excess Alumina (tonnes)	0	429,689	996,849
EBITDA from alumina (USDmn)	0	48	132
EBITDA (INRmn)	6,531	16,433	42,573
Depreciation (INRmn)	2,761	5,779	10,712
Interest cost (INRmn)	4,832	6,809	10,509
PBT (INRmn)	-1,062	3,845	21,352
PAT (INRmn)	-850	3,076	17,082

Source: Company data, Nomura estimates

Fig. 30: Alumina cost of production at Utkal

(USD/t)	Units/t	Unit	Captive coal	External coal
Coal cost	**650**	**Kg/t**	**12**	**35**
Fuel oil	85	Lit/t	46	46
Power cost	500	KWH/t	10	23
Total power and fuel cost			68	105
Bauxite	3	Tonnes/t	39	39
Caustic soda	135	Kg/t	74	74
Total RM cost			113	113
Employee cost			27	27
Other overheads			9	9
Total cost/t (USD)			217	254

Source: Company data, Nomura estimates

Mahan coal block on the fast track, however, progress may be hampered by recent controversy

Mahan coal block development has been the key roadblock for Hindalco's first expansion project of 325ktpa in Madhya Pradesh. With increased focus on improving coal availability in India, Mahan coal block has seen increased attention from the government of India, and the EGOM (Empowered Group of Ministers) has expedited the process of approving this project. While final approvals are still pending, there is an improved visibility of the coal block starting in the near term, in our view.

The EGOM has approved Mahan coal block with the following conditions (as per management):

1) Hindalco needs to conduct reforestation on a land parcel equivalent to that used for mining
2) 5% of total mining profit must be used for local area development
3) The company must monitor the impact on the Rehan water reservoir
4) The mining plan has been revised to reduce the permitted mining area

However, with the recent roadblock on account of CAG reporting corruption issues related to the allotment of coal mines, the start-up of the block might be hampered, in our view. Though Hindalco has not been accused of any wrongdoing, often in such cases, the whole sector suffers from slow decision-making by the government.

Mahan smelter should start production from FY14 – initial production driven by E-Auction coal

Hindalco has indicated that it will start production at the Mahan smelter by the end of FY13. It plans just trial production in FY13, with commercial production starting from FY14. In the initial period (before coal block starts production i.e. late FY15), Hindalco would procure coal from E-Auction and imports to run its power plants to meet the energy requirements for aluminium production.

A power plant running on a mix of E-Auction and imported coal should produce power at the rate of INR2.5/kWh (as is the case for Sterlite Energy), as per our estimates – while with captive coal power generation cost would be close to INR1.1/kWh.

We expect 143,600 tonnes of aluminium production in FY14F – which would be totally dependent on power generated from external coal. Therefore, the cost of production during FY14F would be close to USD1700/tonne, based on our calculations.

In FY15F, we have built in costs improving to USD1,578/tonne with the stabilization of operations. We have built in the benefits of captive coal starting from late FY15F. Cost of production can come down to USD1,200/tonne by FY16 when coal block is fully operational.

Fig. 31: Cost of production expected at Mahan smelter in different scenarios
(expect captive coal to start by end FY15F)

	Without captive coal	With captive coal	Consumption/t (Kg)
Alumina cost (USD/t)	490	434	2,000
CT Pitch (USD/t)	47	47	100
CP coke (USD/t)	160	160	350
Aluminium Floride (USD/t)	27	27	25
Raw material cost (USD/t)	**725**	**669**	
Power & fuel cost (USD/t)	732	333	15,000
Staff cost (USD/t)	100	100	
Overheads (USD/t)	91	91	
Total cash cost (USD/t)	**1,648**	**1,193**	

Source: Company data, Nomura estimates

Utkal Alumina to provide alumina for aluminium production at Mahan

Since Hindalco already has access to a captive bauxite mine which the company indicated would be operational from FY14, we expect initial production of 350,000 tonnes (close to 23% utilization) in FY14F from Utkal Alumina, which would be sufficient to meet requirements at the Mahan smelter. We expect alumina cost of production at USD240/tonne in the initial year, which we estimate should come down to USD215/t gradually with ramp up of production and access to captive coal.

Expect similar costs for future expansion of Hindalco

Given that even other expansions at Hindalco such as Aditya Aluminium will have access to both captive bauxite and coal block (as and when they become operational), we expect the cost of production to be around the same level as that of Utkal Alumina (USD215/tonne in FY16) and the Mahan smelter (USD1,200/tonne in FY16). We have not built these expansions into our forecasts until FY15F.

Aluminium – prices bottoming out

Aluminium prices have come down sharply to USD1,900/tonne on LME (down 20% over last six months), primarily on the weaker European economic outlook and fears of slowdown in China. We had expected aluminium prices to be under continued pressure (see "Initiating Coverage of Americas Metals/Mining: Proceed with Caution", by Nomura analysts Curt Woodworth and Tom Qiu, published 1 March 2012). However, the scale of the correction has been sharper than we expected.

We don't expect significant recovery in aluminium prices in the near term as: 1) the aluminium market remains in surplus despite production cuts in effect; and 2) global macro conditions remain sluggish. However, we also don't expect prices to fall significantly as we believe the cost of production remains elevated with close to 50% of global aluminium smelters unprofitable at current prices, which should support the downside. We are assuming aluminium prices of USD1,950/tonne in FY13F and USD2,000/tonne in FY14F for Hindalco.

Aluminium demand has slowed; production cuts announced

We expect global aluminium demand growth of 4% in 2012F and 7% in 2013F, down from 16% in 2010 and 7% in 2011. We see a sharp slowdown in European demand (-12% in 2012F from 11.5% growth in 2010 and 18.3% growth in 2011) and moderation in China (9% growth in 2012F from 22% in 2010 and 13.5% in 2011).

On the supply side, we expect production growth to moderate to 1.5% in 2012F and 8% in 2013F. Companies such as Alcoa and Rio Tinto have announced shutdowns of high-cost capacity which should reduce operational capacity by close to 0.8mn tonnes.

Fig. 32: Announced aluminium capacity cuts

('000 tonnes per annum)

Company	Smelter	Oct 2011 rate	Reduced rate	Effective date	Current rate
Aluar	Puerto Madryn, Arg.	460	375	Nov-11	420
Rio Tinto	Alma, Canada	438	145	Dec-11	145
Rio Tinto	Shawinigan, Canada	100	50	Jan-12	100
BHP Billiton	Hillside, South Africa	715	465	Mar-12	525
CVG	Alcasa, Venezuela	328	172	Jun-12	165
Sohar Aluminium	Sohar, Oman	370	300	Jul-12	300
Total		**2,411**	**1,507**		**1,655**

Source: Brookhunt, Nomura research

Inventories remain high, though surplus is narrowing

With the production cuts announced by major smelters in light of lower aluminium prices and the weaker demand outlook, aluminium surplus has started to narrow. We expect aluminium production to outpace demand by 428kt in 2012F and 780kt in 2013F. There was surplus production of 7.2mn tonnes over 2008-11, or an average surplus of 1.8mn tonnes per year.

With narrowing surplus, global aluminium inventory has started to stabilize, and we expect it to peak near the current level around 110 days of consumption.

Widespread production cuts globally, but higher Chinese production undermines the effort

During the first half of 2012, aluminium production in the world excluding China declined by 2% YoY. However, global production was still 3% higher YoY due to 11% production growth in China. Some of the above production cuts have been on account of forced outages and these are expected to be back in production by the year-end. As a result, unless Chinese production comes down or global demand improves, we should start seeing production surplus increasing. As can be seen in table below, we expect production surplus of 780kt in 2013F after surplus falls to 428kt in 2012F.

Fig. 33: Global aluminium demand supply scenario

('000 tonnes)

Refined Consumption	2,008	2,009	2,010	2,011	2012F	2013F	2014F
Emerging Economies							
China	12,560	13,879	16,932	19,222	20,957	23,202	25,657
y-o-y %	*1.7%*	*10.5%*	*22.0%*	*13.5%*	*9.0%*	*10.7%*	*10.6%*
India	1,284	1,478	1,715	1,869	2,052	2,252	2,340
y-o-y %	*6.4%*	*15.1%*	*16.0%*	*9.0%*	*9.8%*	*9.7%*	*3.9%*
Russia	1,020	884	975	1,089	1,164	1,261	1,343
y-o-y %	*0.0%*	*-13.3%*	*10.3%*	*11.7%*	*6.9%*	*8.3%*	*6.5%*
Brazil	860	799	1,026	1,109	1,157	1,218	1,390
y-o-y %	*8.2%*	*-7.1%*	*28.4%*	*8.1%*	*4.3%*	*5.3%*	*14.1%*
Developed Economies							
United States	5,364	4,141	4,627	4,803	5,044	5,266	5,468
y-o-y %	*-9.5%*	*-22.8%*	*11.7%*	*3.8%*	*5.0%*	*4.4%*	*3.8%*
Japan	2,250	1,711	1,793	1,704	1,905	1,874	1,821
y-o-y %	*2.4%*	*-24.0%*	*4.8%*	*-5.0%*	*11.8%*	*-1.6%*	*-2.8%*
Other Regions							
Asia (ex-China, India, Japan)	4,014	3,992	4,559	3,311	3,468	3,698	5,751
y-o-y %	*-2.4%*	*-0.5%*	*14.2%*	*-27.4%*	*4.7%*	*6.6%*	*55.5%*
North America (ex-US)	709	583	658	696	755	772	807
y-o-y %	*-10.6%*	*-17.8%*	*12.9%*	*5.8%*	*8.5%*	*2.3%*	*4.5%*
Latin America (ex-Brazil)	749	777	843	882	936	983	1,051
y-o-y %	*15.6%*	*3.7%*	*8.5%*	*4.6%*	*6.1%*	*5.0%*	*6.9%*
Europe (ex-Russia)	7,828	6,315	7,039	8,330	7,336	7,530	7,947
y-o-y %	*-3.2%*	*-19.3%*	*11.5%*	*18.3%*	*-11.9%*	*2.6%*	*5.5%*
Oceania	462	438	468	464	496	511	521
y-o-y %	*4.1%*	*-5.2%*	*6.8%*	*-0.9%*	*6.9%*	*3.0%*	*2.0%*
Africa	468	424	531	548	573	604	637
y-o-y %	*-4.9%*	*-9.4%*	*25.2%*	*3.2%*	*4.6%*	*5.4%*	*5.5%*
Total Global Demand	37,568	35,421	41,166	44,027	45,843	49,171	54,733
		-6%	16%	7%	4%	7%	7%
Estimated Global Supply	40,039	37,504	42,285	45,593	46,271	49,954	56,178
			12.7%	7.8%	1.5%	8.0%	12.5%
Supply/Demand Surplus	2,471	2,083	1,119	1,566	428	783	1,445
Total inventory	7,718	10,208	12,041	13,372	13,800	14,584	16,029
Inventory (no of days)	75	105	107	111	110	108	107

Source: Brookhunt, Nomura estimates

Higher physical premium has helped aluminium smelters…

While aluminium prices have come down sharply and costs remain elevated, there has been a respite for smelters' profitability on account of increase in physical premium. Physical premium has increased due to restrained supply caused by various forced production cuts as well as continued high primary aluminium sourcing by China.

As a result, physical premium in the Asia Pacific region has increased to USD175/tonne primarily on account of force majeure declared by Rio Tinto at its Sohar smelter in Oman which had production capacity of 375ktpa. Current premiums for Q42012 aluminium supply are being negotiated at close to USD250/tonne.

Physical premium may moderate once smelters that had been forced to close start production again, in our view. We have assumed USD150/tonne of premium going forward.

Cost of production remains elevated…

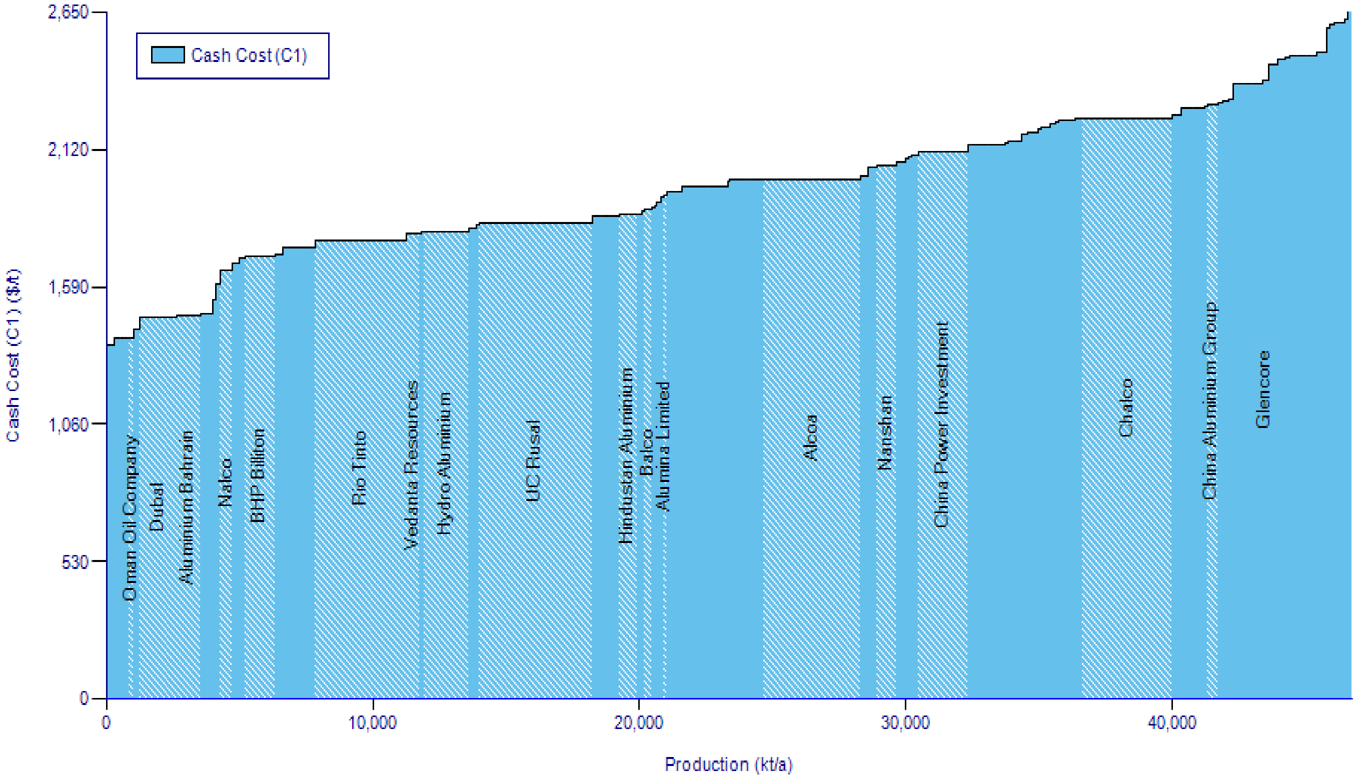
While there has been a drop in coal and alumina prices, the cost of aluminium production remains high. According to Brookhunt, 55% of smelters have cash cost of production in excess of USD1,950/tonne and 40% of smelters have cash cost of production in excess of USD2,000/tonne.

This is primarily because alumina costs are still high at USD300-325/tonne (despite falling from USD350/tonne earlier this year - 2 tonnes of alumina required per tonne of aluminium) and high power costs. Most of the high cost smelters globally (close to 20% of the capacities with high costs) are located in China and have cost of production in excess of USD2,000/tonne – driven by high power cost which is in the range of USD1,100-USD1,400/tonne.

The lowest-cost producers of aluminium are located in Middle East owing to access to cheap power. Indian smelters also have low cost of production on account of captive alumina and relatively low power cost due to self-generated power using cheap coal.

Fig. 34: Global aluminium cost curve

As per 2012 data



Source: Brookhunt, Nomura research

At current aluminium prices of USD1,900/tonne and physical premium of USD200/tonne, close to 35% of total aluminium capacity would be making cash losses as per Brookhunt.

Alumina market is balanced – helped keep prices high

Spot alumina prices have remained in excess of USD300/tonne despite the sharp fall in aluminium prices. Alumina prices, which used to comprise 12-13% of aluminium prices until 2008-09, have gradually increased to 15-17% of aluminium prices on the back of strong aluminium production and balanced alumina market.

Though close to 90% of the global alumina refineries would be making cash profit at current prices, as per Brookhunt, we believe balanced supply should keep prices at current level.

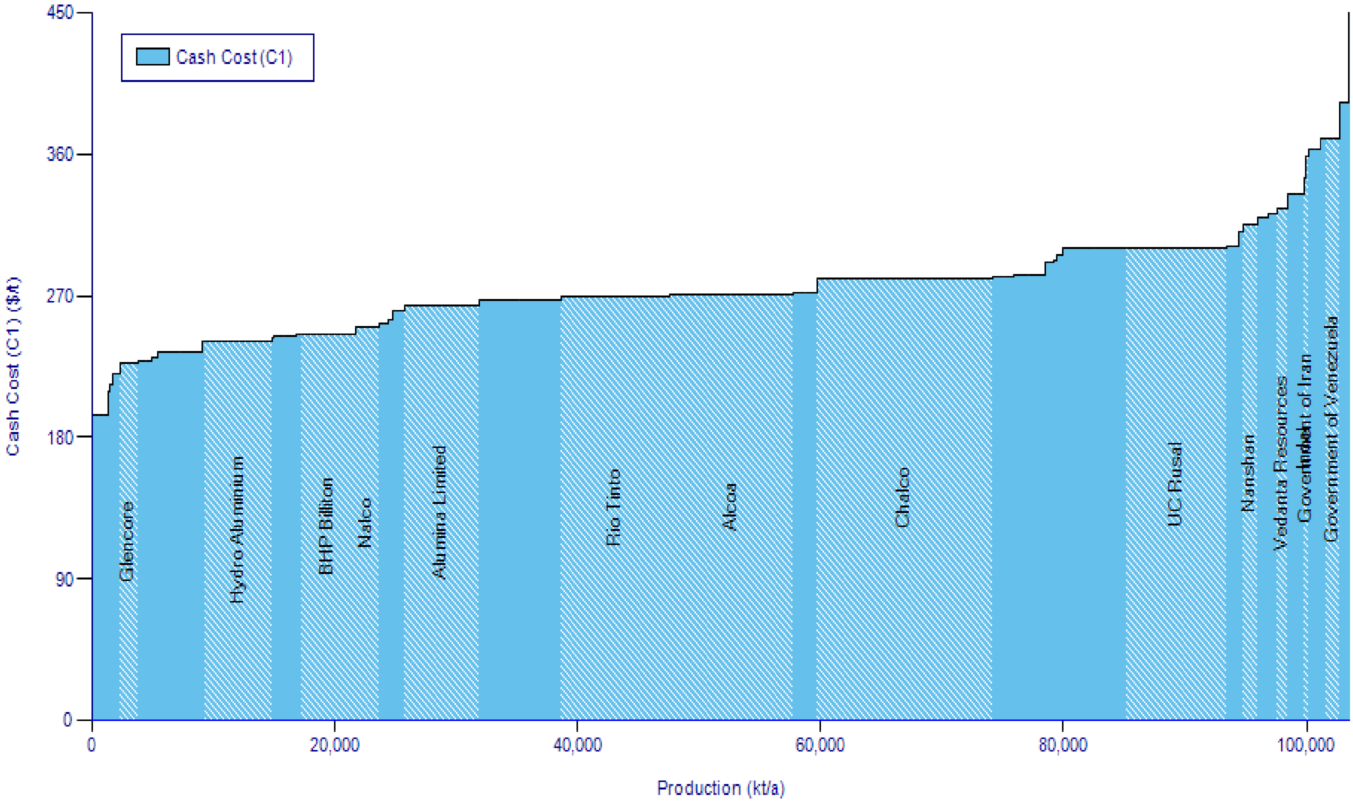
While aluminium inventory has increased from 50 days of consumption in 2008 to 110 days of consumption now, alumina inventory has actually come down from 48 days of consumption to 45 days of consumption. Brookhunt expects alumina inventory to gradually increase and should stabilize at close to 55 days of consumption in 2014.

Alumina cost supported by high bauxite and raw material cost

Bauxite and caustic soda are key raw materials for making alumina and account for close to 45-50% of total cost of production. Power cost is close to USD60-100/tonne and accounts for 30% of total cost.

The average cost of producing alumina globally is around USD275/tonne according to Brookhunt, with most efficient capacities at USD190-195/tonne. At current alumina prices close to 90% of global capacity would be profitable, as per Brookhunt.

Fig. 35: Alumina cost curve
As per 2012 data



Source: Brookhunt, Nomura research

India: one of the best locations globally for aluminium production

India should be one of the best locations in the world for making aluminium given its: 1) low cost of production owing to captive bauxite and coal; 2) availability of labour at relatively low cost; and 3) shortage of aluminium relative to local demand.

Despite these advantages, the industry has not seen the desired growth, as all the announced projects have seen delays associated with: 1) land acquisition; 2) mine development; and 3) various regulatory approvals. However, we expect the situation to improve, as there are signs of improved decision-making as reflected in the case of Hindalco's Mahan block.

Coal and bauxite key to aluminium profitability

Alumina and power costs typically comprise 60-70% of total aluminium production cost, according to Brookhunt. To produce one tonne of aluminium, two tonnes of alumina and 15,000kWh of power are needed. Each tonne of alumina in turn requires 3 tonnes of bauxite. Therefore, the key raw materials for aluminium production are: 1) bauxite; and 2) power.

In India, since most of the aluminium smelters use power from coal-based captive power plants, coal becomes an important raw material for them. Therefore coal and bauxite are key raw materials for aluminium producers in India.

Typically smelting and refining capacities are in different locations…

Alumina refining and aluminium smelting are two key stages of production. Alumina refineries are located closer to bauxite mines, meaning that countries such as Australia, China, and Brazil which have large bauxite reserves are among the largest alumina producers.

Meanwhile, smelters are typically located in the regions with low cost of power, so countries in the Middle East, Russia and Canada, which have lower power cost owing to cheaper oil and hydro power respectively, are fast developing as major smelting hubs.

Indian has abundance of both – tapping the resources the key

India has the 6th largest bauxite reserves in the world of 1.1bn tonnes (including operational reserves of 400mn tonnes), and it has 267bn tonnes of coal reserves. India is among the few countries that both has these resources and enjoys a growing market for aluminium. However, despite possessing these huge reserves, actually tapping them has been a herculean task.

Indian companies with access to both captive coal and captive bauxite mines can produce aluminium at cash cost of USD1,200/tonne – among the lowest-cost globally.

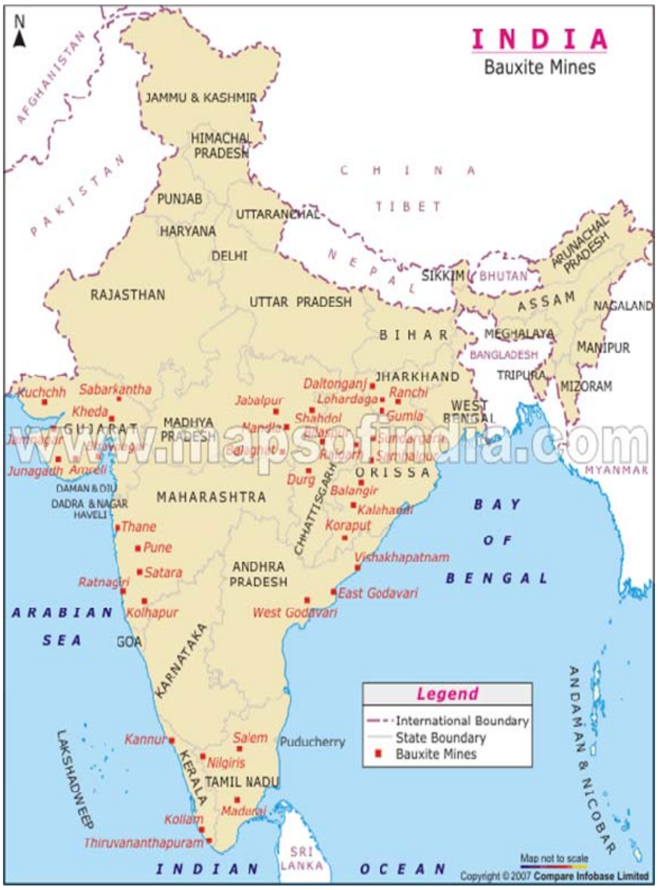
Fig. 36: India has abundant bauxite reserves

(mn tonnes)

Country	Total reserve	Potential reserve	Production
Australia	9500	5900	70
Brazil	8200	2000	32
China	2100	900	40
Guinea	14900	400	17
India	1600	400	18
Jamaica	1100	500	9

Source: USGS, Nomura research

Fig. 37: India: bauxite reserves



Source: www.mapsofindia.com

Fig. 38: India: Coal reserves

Source: www.mapsofindia.com

Eastern India the key area seeing aluminium investments

Most of India's bauxite and coal reserves are in the states of Orissa, Jharkhand, Madhya Pradesh and Chhattisgarh in eastern India. As a result, most of the capacity expansions that have been announced are in these regions.

Orissa has seen the most progress, with Vedanta Group setting up a ~1mtpa alumina refinery (with plans to expand capacity to 5mtpa) and a 1.75mtpa aluminium smelter and Hindalco setting up a 1.5mtpa alumina refinery at Utkal. Hindalco is also setting up a plant at Mahan in Madhya Pradesh and one at Latehar in Jharkhand.

Major expansion plans announced – Actual capacity addition may be lower

India has current aluminium capacity of 1.8mn tonnes, and companies like Vedanta Group and Hindalco have announced plans to take this capacity to 4.4mn tonnes by FY15-16.

In contrast to Hindalco's good progress on its expansion plans, Vedanta Group is still struggling with how it will obtain access to bauxite. Vedanta Group also faces delays in getting approval for its alumina refinery expansion. As a result, we expect most of the additional aluminium production in next 1-2 years to come from Hindalco.

However, once all the announced capacity expansions are on line, India should be among the world's top producers of aluminium after China and Russia.

Fig. 39: Indian aluminium capacity expansion plans

Capacity by company

(KTPA)	FY11	FY12	FY13E	FY14E	FY15E	FY16E
Hindalco	506	506	506	917	1,276	1,635
Nalco	460	460	460	460	460	460
Balco	245	245	245	570	570	570
Vedanta Aluminium	500	500	500	500	1,125	1,750
Al smelter capacity	**1,711**	**1,711**	**1,711**	**2,447**	**3,431**	**4,415**

Source: Company data, Nomura research

Fig. 40: Indian aluminium demand/supply scenario

(kilotonnes)

	FY10	FY11	FY12	FY13E	FY14E	FY15E	FY16E
Production	1,525	1,619	1,700	1,734	1,908	2,289	3,091
Imports	407	577	577	577	577	577	577
Exports	400	577	528	423	426	602	1,177
Consumption	1,532	1,619	1,749	1,889	2,059	2,265	2,491

Source: Crisinfac, Nomura research

Robust demand growth driven by auto and power sector

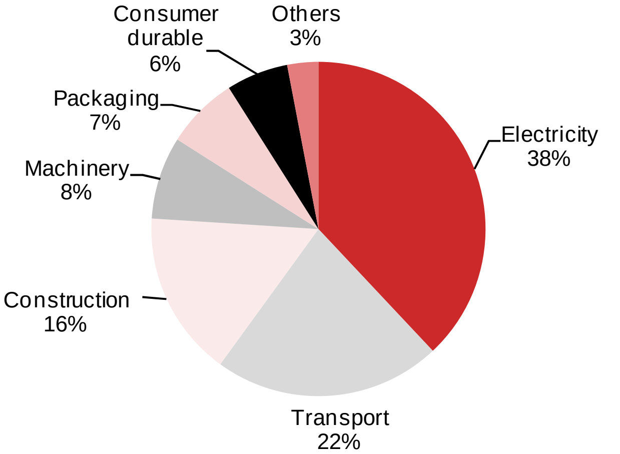
Indian aluminium demand has been growing at 8.8% a year during FY07-12 driven primarily by growth in auto, power and construction segments. We expect Indian aluminium demand to grow at a CAGR of 8-10% over next 5 years as explained below.

Auto segment: India becoming an export hub should boost aluminium demand

The auto sector has been a key contributor to aluminium demand growth in India and we expect the trend to continue despite short-term hiccups. We expect Indian auto demand growth to remain robust with CAGR of 8-10% for two-wheelers and commercial vehicles and 12-15% CAGR for passenger cars over FY13-17F.

Fig. 41: Aluminium consumption pattern in India

(FY11)



Source: Crisinfac, Nomura research

Fig. 42: Demand growth by segment

	FY07-12 CAGR	FY13-17F CAGR
Power sector	8-9%	8-10%
Automotive sector	13-14%	10-12%
Construction demand	4-5%	4-5%
Consumer durables	12-13%	10-12%
Total Aluminium demand	**8-9%**	**8-10%**

Source: Industry data, Nomura estimates

India is fast developing as an export hub for various global car companies such as Suzuki, Nissan and Renault, and this should contribute to Indian aluminium demand growth as well, in our view.

Power segment: T&D is the key area of usage

The power segment has been a key driver of aluminium demand in India. The main area of usage is in the transmission lines. During last five years, total investment in transmission lines was USD25bn, as per data from Ministry of Power, while we expect around USD35bn investments in coming five years as per 12th Five-Year Plan.

We expect demand for aluminium from the power segment to grow at a CAGR of 8-10% over FY12-17F. Since the power sector has been a focus area for the government, we believe it will be a key growth segment going forward.

India to turn net exporter: cost benefits keep Indian smelters competitive

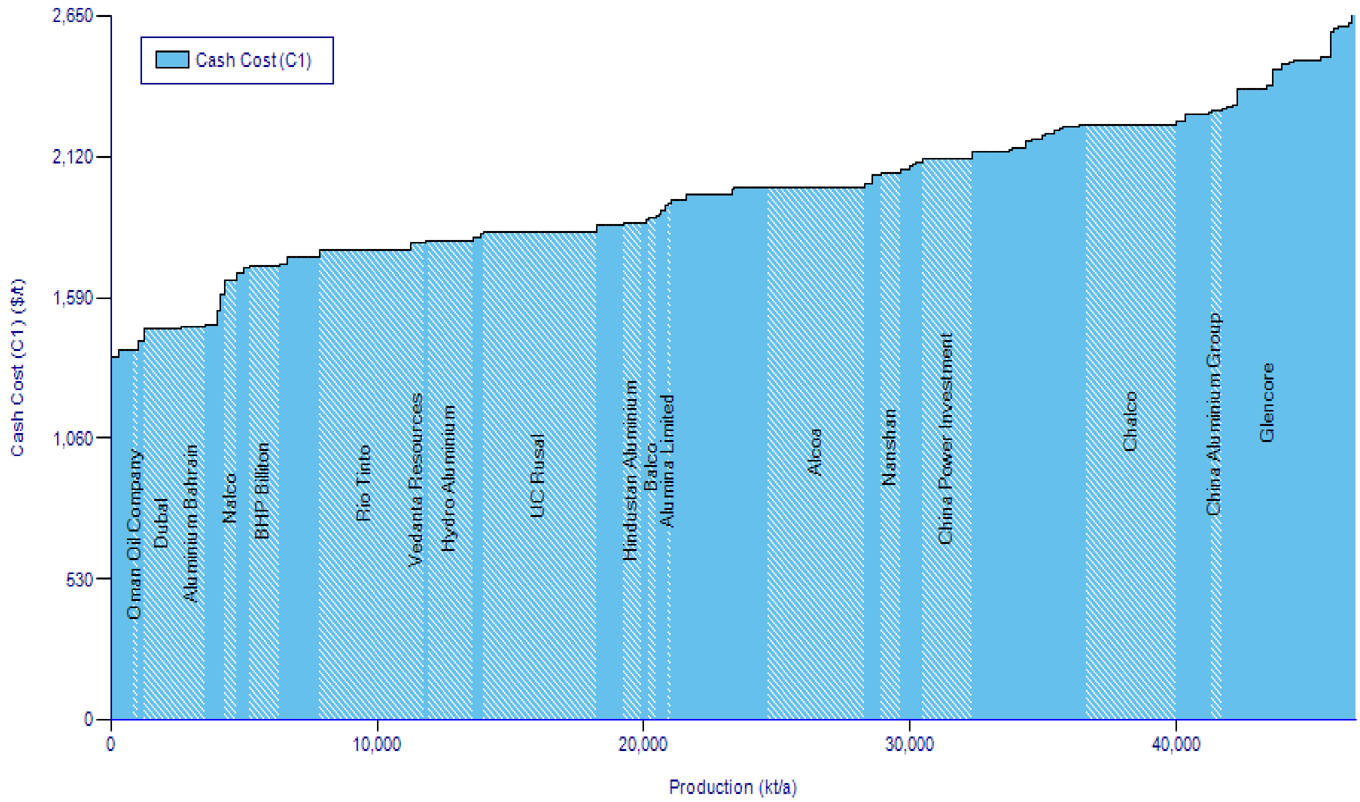
While we expect robust demand growth, we believe India still will have surplus capacity over the next 2-3 years given the significant capacity additions expected. Based on the planned addition of 2.7mn tonnes of aluminium smelting capacity by FY16, India's aluminium production should exceed demand in FY16F by around 1.0-1.5mn tonnes, we expect.

However, we believe Indian companies should be able to export any surplus production as all the new capacity will be among the lowest-cost globally. As shown in chart below, Hindalco's production using captive alumina is in the lowest-cost quartile, while even Vedanta, which lacks captive bauxite, is in the first half of the cost curve. On a steady state, when new capacities by Hindalco are operating with captive bauxite and coal, they would be amongst the 10% of the lowest cost producers globally, we believe.

On account of the lower cost of production, these capacities should be able to compete with major players globally, in our view.

Fig. 43: Global aluminium cost curve

As per 2012 data



Source: Brookhunt, Nomura research

Regulatory hurdles improving but gradually

Regulatory hurdles have been a key factor behind the slower growth of the aluminium industry in India. While all the expansion plans announced by Vedanta Group and Hindalco have seen progress, they have been impacted by: 1) land acquisition issues; and 2) delay in getting approvals for bauxite/coal mines.

However, things are gradually improving, in our view. Hindalco's projects are now in the last stage of completion, and its new capacity should start coming on line gradually from later this year. However, Vedanta Group has not been able to acquire the approvals to develop bauxite mines, nor have the approvals to expand alumina refinery capacity been coming through. The company is looking for alternate sources of bauxite, but it will likely need time before it can benefit from these initiatives, in our view.

Cost dynamics of aluminium production in India

Indian smelters are among the lowest-cost producers globally

We note two reasons why Indian smelters are among the lowest-cost producers in the world:

1) Most of the Indian smelters have captive bauxite. With captive bauxite, cost of alumina is close to USD210/tonne, compared with the current market price of alumina around USD300-325/tonne. Since 2 tonnes of alumina are required per tonne of aluminium, captive bauxite gives a cost advantage of USD200-250/tonne to Indian aluminium smelters.

2) Access to captive coal or coal sourced from Coal India at administered price is another advantage. With coal sourced more cheaply, Indian smelters can produce power at the rate of INR2/kWh, i.e. US cents 3.5/kWh, as against INR3/kWh or US cents 5-6/kWh for plants dependent upon external coal. So companies with cheaper coal have a cost advantage of USD300/tonne.

There are typically four types of smelters in India:

- **Smelters with captive bauxite and coal**: These are among the lowest-cost producers, able to make aluminium at USD1,300-1,400/tonne.
- **Smelters with captive bauxite and able to source coal from Coal India at administered prices**: Most Indian smelters are in this category. Their cost of production is around USD1,400-1,500/tonne.
- **Smelters with captive bauxite that source coal from E-Auction/imports**: Such smelters have aluminium cost of production around USD1,600-1,700/tonne.
- **Smelters without captive bauxite or coal**: Vedanta group falls in this category, with cost of production around USD1,800-1,900/tonne. They would be amongst the 3rd quartile costs globally.

Captive bauxite allows availability of cheap alumina

Most of the Indian aluminium companies have their own alumina refineries, along with captive bauxite, which allows them to produce alumina more cheaply. Indian producers with captive mines can get bauxite at USD10-15/tonne, compared with external bauxite costing USD40-45/tonne.

The companies which own bauxite mines and do the mining themselves have production cost of USD10-15/tonne. Hindalco will have bauxite cost of USD13/tonne for its mines in development. Some producers have outsourced mining operations to a 3rd party. For such mines cost of production is close to USD15-20/tonne.

Details on cost of production of alumina

The key costs for alumina production are: 1) bauxite; 2) caustic soda; and 3) fuel costs. For companies such as Nalco and Hindalco, which own captive bauxite mines, cost of producing alumina is close to USD225/tonne.

The following table shows cost of production for alumina:

Fig. 44: Alumina cost of production

	Quantity* (Kg/t of alumina)	Per unit cost (USD)	Cost/t of alumina	Cost with captive coal
Bauxite	3,000	15	45	45
Caustic soda	135	455	61	61
Thermal coal	650	55	35	20
Fuel oil for calcination	80	500	40	40
Oil for steam	5	500	3	3
Power cost (US cents/KWH)	500	5.1	25	18
Staff cost			36	36
Other overheads			9	9
Total Alumina cost per ton			**255**	**233**

Source: Company data, Nomura estimates *power requirement is in KWH/kg of alumina

The table shows the difference in cost between the two scenarios: 1) using captive bauxite and captive coal; and 2) using captive bauxite and external coal. In the first case, cost of production is close to USD230/tonne, while in the second case it is USD250/tonne. As power is not a significant cost during alumina production, there is not much of a difference between the two scenarios.

Power is another major cost in aluminium production: power costs too ultimately depend on sourcing of coal

15,000kWh of electricity is required to produce one tonne of aluminium. Therefore power is amongst the biggest costs of aluminium production. Power reliability is very important for aluminium smelters. If there is a power failure, it is very difficult to restart aluminium smelters, and can take 2-3 months to clean the frozen material in the pots, incurring production losses as well as significant maintenance costs. As a result, all the smelters in India have captive power plants.

Power plants based on captive coal can produce electricity at around INR1.0-INR1.1/kWh, while plants with linkage coal can produce power at around INR1.6/kWh. In comparison, plants dependent upon external coal (through a mix of E-Auction/ imports) have cost of production in the range of INR2.5-INR3.0/kWh.

Sterlite Energy, which uses a mix of imported and E-Auction coal, has cost of production of INR2.3-INR2.5/kWh. JSW Energy, which is dependent entirely on imported coal, has cost of production of INR3.0-INR3.2/kWh, according to the company.

Fig. 45: Details on cost of power production in India

	Captive coal	Linkage coal	Mix of Auction & imports	100% import
Coal cost (INR/t)	750	1,200	2,700	6,325
Fuel cost (INR/KWH)	0.6	0.9	2.0	2.5
Other costs (INR/KWH)	0.5	0.5	0.5	0.5
Total power cost (INR/KWH)	1.1	1.4	2.5	3.0

Source: Industry data, Nomura estimates

Therefore, we find power costs for aluminium smelters can vary between USD300/tonne and USD825/tonne, depending on the coal sources.

Fig. 46: Aluminium cost of production in different scenarios

(USD/t)	Units (Kg/t)*	Own bauxite & coal	Own bauxite, linkage coal	Own bauxite, E-Auction coal	Own bauxite, imported coal
Alumina - 2 tonnes/t of Al	2,000	434	471	490	507
Other raw materials					
CT pitch (Kg/ton)	100	47	47	47	47
CP coke (Kg/ton)	400	160	160	160	160
Cryolite+Aluminium floride	25	27	27	27	27
Total raw material cost		669	705	725	742
Electricity charges	15,000	290	382	689	826
Other fuel charges		44	44	44	44
Total power & fuel costs		333	425	732	870
Employee cost		100	100	100	100
Other overheads		91	91	91	91
Total cost/t (USD)		**1,193**	**1,322**	**1,648**	**1,803**

Source: Company data, Nomura estimates

We assume Hindalco will use coal from E-Auction/imports in the initial stages

We assume Hindalco will be in the 3rd scenario (captive bauxite, E-Auction coal) for the first two years, after which it may move to a combination of 1st and 2nd scenarios. Accordingly, we estimate cost of production at the Mahan smelter at USD1,650/tonne until FY15F. In effect, we estimate that the Mahan coal block won't be operational until about FY15; i.e. two and half years from now. Since we are valuing the stock at 6x FY14F EV/EBITDA, in effect we are not valuing benefits of the Mahan coal block.

Appendix A-1

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Issuer name	Ticker	Price	Price date	Stock rating	Sector rating	Disclosures
Hindalco	HNDL IN	INR 109	12-Sep-2012	Buy	Not rated	

Previous Rating

Issuer name	Previous Rating	Date of change
Hindalco	Not rated	13-Sep-2012

Hindalco (HNDL IN) **INR 109 (12-Sep-2012)** Buy (Sector rating: Not rated)

Chart Not Available

Valuation Methodology We value Hindalco at 6x FY14F EV/EBITDA – Indian operations are valued at INR72/share, Novelis at INR54/share and INR17 from its holdings in non-core listed companies. Our target price for Hindalco is INR143.

Risks that may impede the achievement of the target price • Further fall in aluminium prices • Coal costs are higher than our estimates • Macro conditions worsen from here

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