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Industry View
In-Line

Nonferrous Metals & Mining

Aluminum: Evolving to a Two-Tier Structure Driven by Large Global Players

Conclusion: We believe the industry is evolving towards a two-tier structure dominated by a few large integrated producers. This is in part the result of persistent cost pressures accelerating the global supply migration away from high power cost regions.

In the short term, we project a rapid increase in Chinese smelting production should drive the commodity price lower over the next 6 to 12 months.

What's New: The potential Rusal-Sual merger (reported by the *Financial Times* on August 29, 2006) is a clear example of the consolidation process we believe will shape the industry going forward. We have no knowledge whether any such transaction might occur, but the rumored $30 billion deal would create the world's largest integrated aluminum company. (See page 4 for details.)

In 2005, the US and Western Europe represented 23% of the global aluminum supply, down from 43% in 1985. By 2010, we project their share of world production will further decline to approximately 17%.

Implications: The rise of large aluminum producers in low cost power regions is likely to transform the structure of the industry and enhance supply discipline. It also increases the pressure on US producers to diversify the geography of its smelting base, which could constrain managements' ability to return cash to shareholders during the current period of well above trend aluminum prices.

GICS Sector: Materials

Strategist's Recommended Weight	1.1%
S&P 500 Weight	2.9%

Investment Case

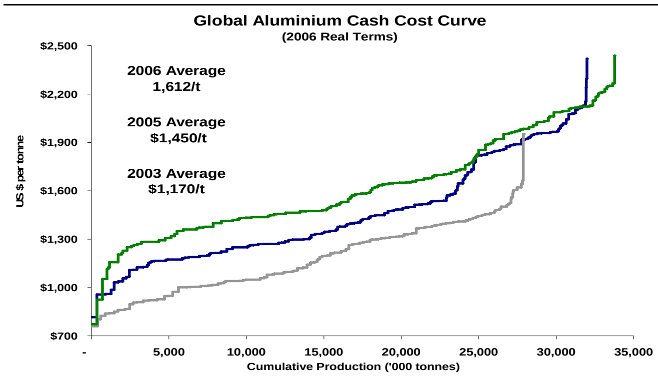
Summary & Conclusions

We maintain our Cautious view on the aluminum industry over the next 6–12 months, as we project a rapid increase in Chinese smelting production. Beyond this, we believe the industry is evolving towards a two-tier structure dominated by a few large integrated producers, which should result in further supply consolidation. This is in part the result of persistent cost pressures accelerating the global supply migration away from high power cost regions. In addition, the process is also likely to force some US and European producers to relocate their asset base to avoid becoming uncompetitive in the long-term.

Persistent cost pressures have shifted the industry's cost curve up over the past few years... According to our calculations, world average smelting costs have climbed by 14% in 2006 to $1,612/tonne. This follows a 13% rise in 2005 and a 15% increase in 2004. Higher alumina, power and carbon prices are the main factors behind the recent annual cost increases.

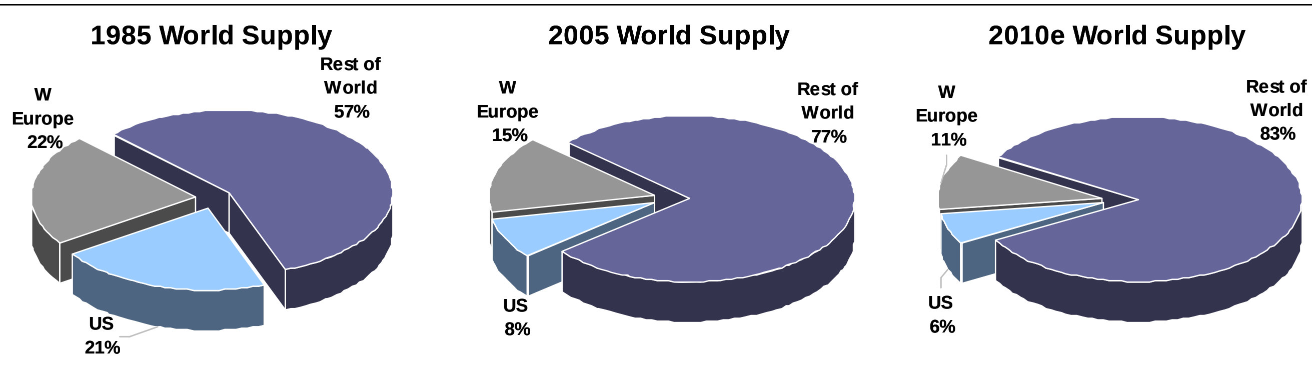
… which should accelerate the global supply migration away from high power costs regions. In 2005, the US and Western Europe accounted for 23% of the global aluminum output, significantly down from 43% in 1985. We project that this trend is likely to accelerate in the coming years, as aluminum makers seek to improve their competitive advantages by reducing power costs. As a result, we estimate the US and Western Europe will comprise only about 17% of the world supply by 2010. This assumes global capacity changes presented in Exhibit 8.

Exhibit 1
Global Average Smelting Cost Has Climbed by 13% per Year Since 2003



Source: CRU, Morgan Stanley Research

Exhibit 2
Continuous Cost Pressures are Likely to Accelerate the Supply Migration into Low Power Costs Regions

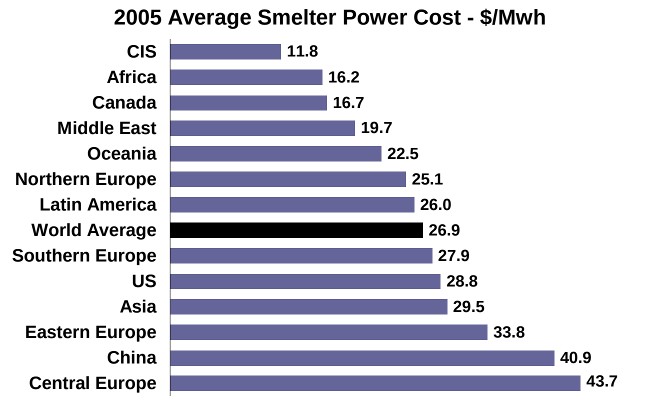


Source: CRU, Morgan Stanley Research e = Morgan Stanley Research estimates

Power costs are a significant driver of smelter cost competitiveness. Based on Exhibit 3, we estimate that the average smelter located in the CIS enjoys a cost advantage of $227/tonne compared to the average world smelter and of $255/tonne relative to the average US smelter. Our analysis assumes similar energy efficiencies across regions. Aluminum is the most energy intensive metal to produce with the average smelter requiring approximately 15 megawatt-hours (MWh) to produce one metric tonne of aluminum. As a result, power accounts for close to 30% of the average smelter cost structure.

Exhibit 3

Attractive Power Costs Are Likely to Steer Aluminum Makers Away from the US and W Europe

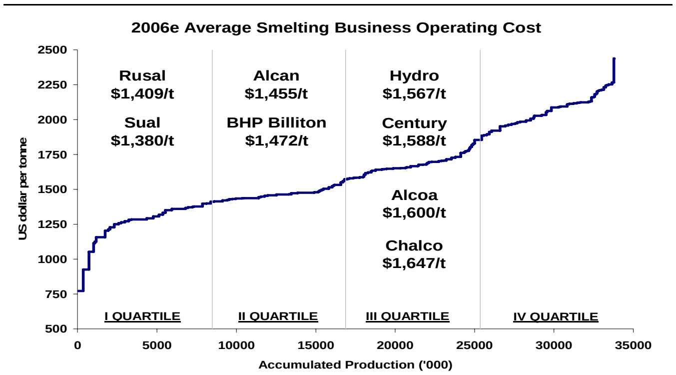


Source: Alcoa, The Wall Street Journal

Aluminum producers with a large majority of their smelting capacity in low power cost regions enjoy a clear competitive advantage (Exhibit 4). According to CRU estimates, Rusal and Sual have average smelting costs in the first quartile of the industry cost curve with all of their primary aluminum facilities located in the CIS. BHP-Billiton's exposure to Africa and Alcan's presence in Canada positions them in the second quartile of the cost curve. On the other hand, producers with a majority of their output coming from the US (Century Aluminum and Alcoa), China (Chalco) and Western Europe (Hydro) have smelting costs above the industry average.

Exhibit 4

Relative Position Along the Industry Cost Curve is Largely Driven by Power Cost



Source: CRU, Morgan Stanley Research

Relatively high power cost in the US is forcing aluminum makers to relocate their asset base. In recent years, Alcoa and Century Aluminum have been trying to diversify the location of their aluminum production away from the US. We are constructive on their efforts, as we believe this is the best way to enhance their long-term competitiveness. However, the relocation process will require significant capital investments and should take several years to complete, therefore limiting managements' ability to return cash to shareholders during the current period of well above trend aluminum prices.

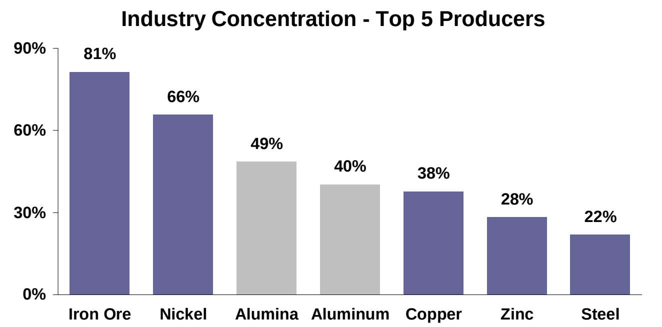
Alcoa is currently building a low-cost hydro powered 350,000 tonne smelter in Iceland with the first metal expected in 1H07. The company is also conducting feasibility studies for a natural gas powered 340,000 tonne facility in Trinidad and Tobago. Finally, it is considering 300,000 tonne plant in Russia. Meanwhile, Century Aluminum acquired the 90,000 tonne Nordural smelter in Iceland in April 2004, and it has embarked on a series of expansions that are likely to bring total capacity to 260,000 tonnes by 2H07. Nordural uses LME-linked hydro and geothermal power. In addition, the company is evaluating the construction of a second smelter in Iceland. Management has tentatively secured its energy requirements for a 250,000 tonnes plant, which would run with geothermal power.

Power costs are likely to constrain Chinese aluminum production growth in the long-term. We believe the ongoing aluminum output expansion in China is a typical supply response to increasing domestic demand, combined with earlier tax incentives by the Chinese Government and low capital intensity requirements for new smelting projects (60% less than in the Western World). Therefore, the impressive rise in Chinese aluminum production should be unsustainable in the long-term. High power costs and limited proven bauxite reserves are likely to restrict supply growth beyond 2008 – 09, in our view.

However, we expect the recent output expansion to continue in the near future and project double-digit production growth over the next three years. Chinese aluminum production increased 18% in August to 808,000 tonnes from 687,000 tonnes a year ago, according to the International Aluminum Institute. On YTD basis through August, China produced 5.9 million tonnes of primary aluminum, up more than 17% from 5.0 million tonnes in they year ago period. These short-term developments underpin our cautious near-term view on the aluminum industry.

Two-tier industry structure emerging as producers pursue cost advantages. We believe the industry is evolving towards a two-tier structure dominated by a few large integrated producers with more than 3.5 million tonnes of primary metal capacity and 7 million tonnes of alumina. In our view, higher industry concentration offers at least three clear advantages to producers: 1) a faster – and probably less expensive – way to gain access to low cost regions; 2) improved industry discipline and pricing power; and 3) enhanced operating flexibility and economies of scale.

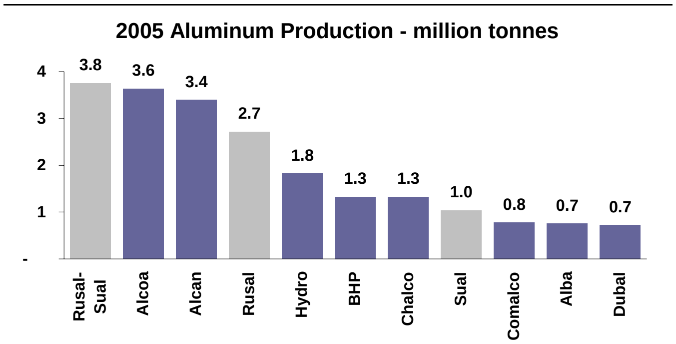
Exhibit 5
Aluminum Industry Poised for Further Consolidation



Source: CRU, Morgan Stanley Research

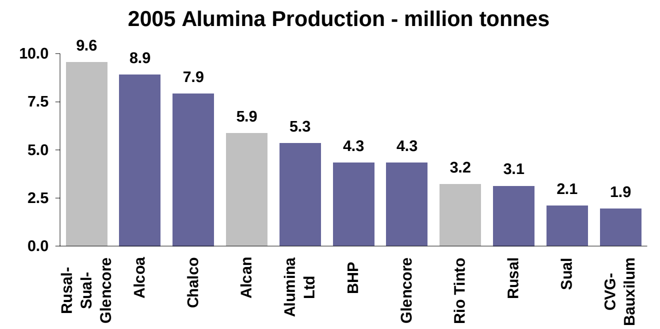
The potential Rusal-Sual merger is a clear example of the consolidation process we believe will shape the industry going forward. The *Financial Times* reported on August 29, 2006, that the two largest Russian aluminum producers were holding discussions related a possible marriage and the purchase of Glencore's alumina assets. We have no knowledge whether any such transaction might occur, but the rumored $30 billion deal would create the world's largest integrated aluminum company with the capacity to produce approximately 10 million tonnes of alumina and 4.2 million tonnes of primary metal per year.

Exhibit 6
New Rusal Would Become the Largest Smelting Company in the World…



Source: CRU, Morgan Stanley Research

Exhibit 7
… and Self-Sufficient in Alumina Requirements



Source: CRU, Morgan Stanley Research

We can see clear strategic advantages in such a deal, given that the companies complement each other well. Rusal currently mines more bauxite than it can refine into alumina, which the company purchases from third-party suppliers. On the other hand, Sual and Glencore have excess refining capacity, and they would in turn benefit from Rusal's bauxite surplus. The hypothetical new company will carry some diversification risk, however, as a significant portion of its production capacity will be located in Russia.

If completed, the deal would reflect the growing presence of Russian metals companies in the international markets, as the country's president Vladimir Putin pushes for national champions. According to the *Financial Times* report, the transaction is believed to have been cleared by the Kremlin, and it will be officially announced by the end of September. The companies have not commented on the transaction, although both Rusal and Sual recently announced that they are exploring different strategic alternatives.

Exhibit 8

Estimated Changes to World Aluminum Capacity

Location	Plant/Operator	Expansion Type	Change 2006e	2007e	2008e	2009e	2010e	Cumulative 2006e -10e
Argentina	Puerto Madryn/Aluar	Brown/Creep	-	80	42	-	-	123
Bahrain	Alba/Alba	Brown/creep	105	-	-	263	87	455
Brazil	Aluminio(Sorocaba)/CBA	Brown	31	42	28	-	-	101
Brazil	Sao Luis/Alcoa	Brown/creep	60	25	7	-	-	92
Cameroon	Edea/Alcan	Creep	-	2	16	11	130	159
Canada	Alouette	Green	87	5	-	-	-	92
Canada	Kitimat	Brown	-	-	-	31	62	93
China	Dengfeng	Brown	-	35	55	-	-	90
China	Guizhou (Chalco)	Brown	135	-	-	-	-	135
China	Huaxin	Brown	168	117	-	-	-	285
China	Lanzhou	Brown	19	119	12	-	-	150
China	Liancheng	Brown	45	30	-	-	-	75
China	Pingguo (Chalco)	Brown	-	15	220	15	-	250
China	Qiatou	Green	117	-	-	-	-	117
China	Qingtonxia	Brown	178	-	-	-	-	178
China	Qingyang	Brown	(72)	-	-	-	-	(72)
China	Shanxi (Chalco)	Green	165	(1)	-	140	-	304
China	Shanxi Guanlu	Brown	91	108	-	-	-	199
China	Tongchuan	Brown	45	75	-	-	-	120
China	Various		649	(152)	(271)	630	760	1,616
China	Weiqiao	Brown	56	62	-	-	-	118
China	Yichang	Green	-	-	125	-	-	125
China	Zouping		-	-	-	-	74	74
Dubai	Dubal/Dubal	Brown/creep	37	105	45	-	-	187
Europe	Various	Closures	-	-	(100)	(100)	(300)	(500)
Iceland	Fjardaal/Alcoa	Green	-	86	257	-	-	343
Iceland	Nordural/Nordural	Brown	69	71	30	-	-	170
Iceland	Isal/Alcan	Brown	-	-	-	-	140	140
India	Angul/Nalco	Brown	-	-	87	28	-	115
India	Hirakud/Indal	Brown/creep	20	15	16	16	14	81
India	Jharsuguda/Vedanta	Brown	-	-	-	20	180	200
India	Korba/Balco	Brown/creep	161	55	-	-	-	216
Iran	Bandar Abbas/State	Green	-	-	7	96	7	110
Kazakhstan	Pavlodar	Green	-	-	60	60	-	120
Mongolia	Greenfield	Green	-	-	-	-	300	300
Mongolia	Tongshun	Brown	63	11	-	-	-	74
Mozambique	Mozal/BHP Billiton	Brown	14	-	-	-	153	167
Norway	Karmoy/Hydro	Closure	-	-	(61)	(61)	-	(122)
Oman	Sohar/OOC	Green	-	-	175	175	-	350
Qatar	Mesaieed/Hydro	Green	-	-	-	86	204	290
Romania	Slatina	Brown	20	-	-	160	-	180
Russia	Irkutsk (IrkAZ)	Brown/creep	-	86	109	-	-	195
Russia	Kandalaksha (KAZ)	Brown/creep	-	-	103	-	-	103
Russia	Krasnoyarsk (KAZ)	Creep	19	14	15	47	-	95
Russia	Sayansk	Brown/creep	20	242	44	-	63	370
Trinidad	Alcoa T&T	Green	-	-	-	341	-	341
Trinidad	Alutrint	Green	-	-	-	-	94	94
USA	Vancouver	Closure	(58)	(57)	-	-	-	(115)
USA	Frederick/Alcoa	Closure	(172)	-	-	-	-	(172)
Venezuela	Venalum	Brown/creep	-	-	-	214	71	285
Other			165	2	32	(319)	289	169
Total World			**2,238**	**1,194**	**1,053**	**1,853**	**2,328**	**8,666**

Source: CRU, Morgan Stanley Research   e = Morgan Stanley estimates

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The following analysts hereby certify that their views about the companies and their securities discussed in this report are accurately expressed and that they have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report: Mark Liinamaa.

Unless otherwise stated, the individuals listed on the cover page of this report are research analysts.

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Within the last 12 months, Morgan Stanley has either provided or is providing non-investment banking, securities-related services to and/or in the past has entered into an agreement to provide services or has a client relationship with the following companies covered in this report: Alcan Inc., Alcoa Inc., Cleveland-Cliffs Inc., Freeport-McMoRan, Inco Ltd., Phelps Dodge.

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(as of August 31, 2006)

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	Coverage Universe		Investment Banking Clients (IBC)		
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category
Overweight/Buy	**784**	**39%**	**294**	**44%**	**38%**
Equal-weight/Hold	**888**	**44%**	**297**	**45%**	**33%**
Underweight/Sell	**332**	**17%**	**74**	**11%**	**22%**
Total	**2,004**		**665**		

Data include common stock and ADRs currently assigned ratings. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations. Investment Banking Clients are companies from whom Morgan Stanley or an affiliate received investment banking compensation in the last 12 months.

Analyst Stock Ratings

Overweight (O). The stock's total return is expected to exceed the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Equal-weight (E). The stock's total return is expected to be in line with the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

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More volatile (V). We estimate that this stock has more than a 25% chance of a price move (up or down) of more than 25% in a month, based on a quantitative assessment of historical data, or in the analyst's view, it is likely to become materially more volatile over the next 1-12 months compared with the past three years. Stocks with less than one year of trading history are automatically rated as more volatile (unless otherwise noted). We note that securities that we do not currently consider "more volatile" can still perform in that manner.

Unless otherwise specified, the time frame for price targets included in this report is 12 to 18 months.

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In-Line (I): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below.

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Industry Coverage:Nonferrous Metals & Mining

Company (Ticker)	Rating (as of)	Price (09/22/2006)
Mark Liinamaa		
Alcan Inc. (AL.N)	E (05/02/2006)	$38.93
Alcoa Inc. (AA.N)	E (05/02/2006)	$27.49
Century Aluminum (CENX.O)	U (07/31/2006)	$32.55
Cleveland-Cliffs Inc. (CLF.N)	O (05/02/2006)	$37.68
Freeport-McMoRan (FCX.N)	E (05/02/2006)	$50.79
Inco Ltd. (N.N)	++	$76.17
Phelps Dodge (PD.N)	NA (08/17/2006)	$82.70

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