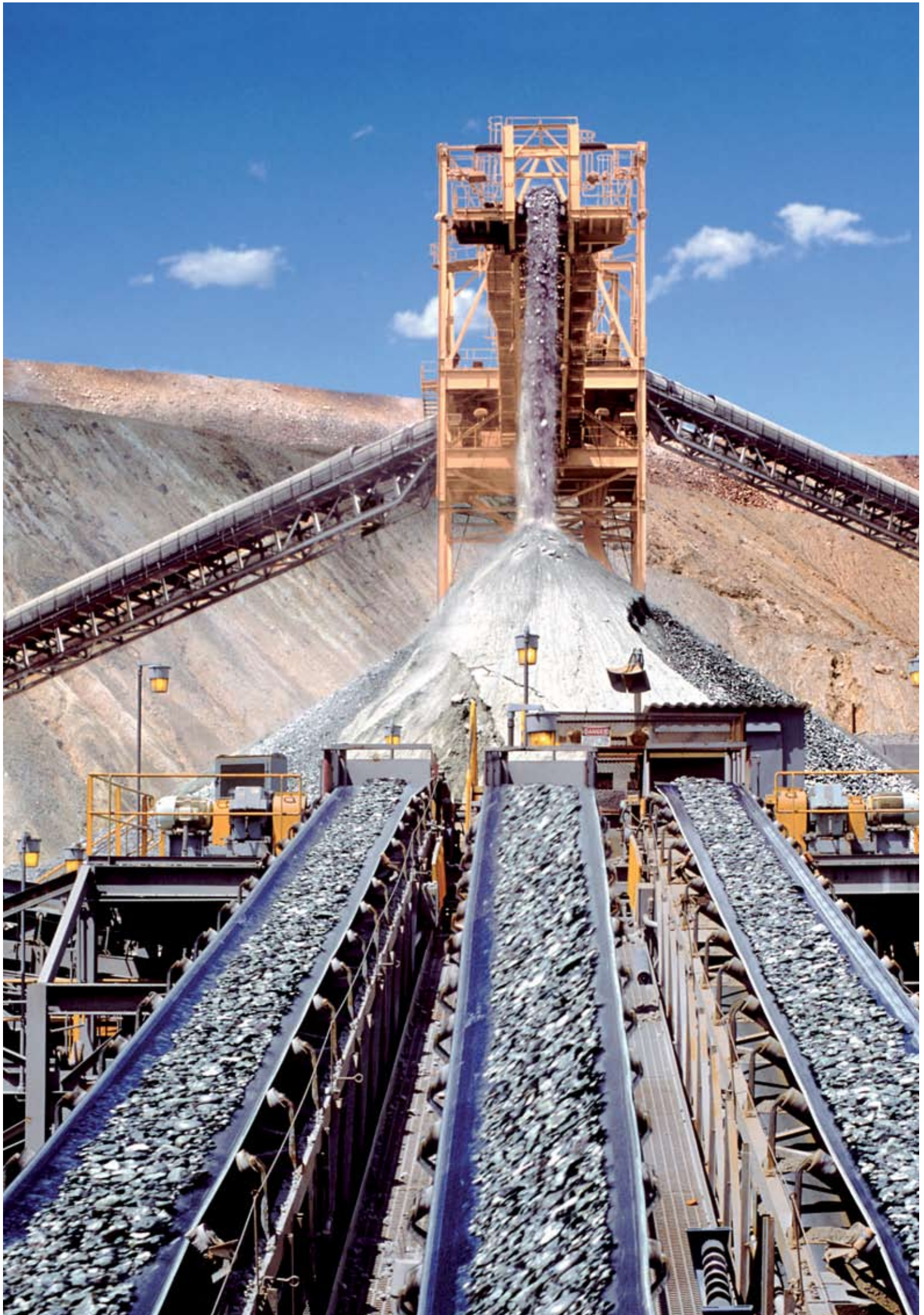


Forging ahead*

Mergers and acquisitions activity in the global metals industry, 2007





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Methodology

Our report provides an analysis of domestic and cross-border deal activity in the global metals industry (with the exception of mining transactions unrelated to the production of steel and aluminium). It is based on data from Thomson Financial (supplemented by company reports and websites, where necessary), and covers all mergers and acquisitions completed in 2006 and 2007. Any minor discrepancies between the figures published here and those recorded in last year's edition of *Forging ahead* are attributable to the difference in the data sources we have used or to variations between the preliminary and final value of certain deals, where due diligence or other circumstances have provided grounds for changing the price.

Introduction

Welcome to the fourth edition of *Forging ahead*, covering mergers and acquisitions (M&As) in the global metals industry in 2007¹. Our report shows that deal-making in the industry has soared to unprecedented levels, but the focus of interest has shifted from steel to aluminium and from Western Europe to North America.

We have analysed the key trends driving this activity and discussed the largest individual deals in more detail. We have also considered the impact of the credit crunch which began in mid-2007, and assessed the outlook for the next few years. We believe that, despite the turbulence in the capital markets and downturn in the world's leading economies, the scope for deal-making is still huge. Indeed, in the current climate, some corporate buyers could well enjoy a stronger hand than ever before.

This year's issue also includes a discussion of the key differences in the opinions of chief executives in the metals industry and those in all industries, based on data drawn from PricewaterhouseCoopers' *11th Annual Global CEO Survey*; and an analysis of how the regulation of carbon emissions is likely to affect metals companies. As our survey findings indicate, rising energy prices and the cost of meeting the growing body of regulations on carbon emissions are among the industry's main concerns.

We hope that you enjoy the latest edition of *Forging ahead*. If you have any queries about our findings, please contact us. The fifth issue, covering deal activity in 2008, will be released in April 2009. The four issues that have been published to date are available at www.pwc.com/metals.



Jim Forbes

Global Metals Leader

¹ For the purposes of this document we have defined the metals industry as steel, aluminium and other base metals (including non-integrated iron ore, tungsten, molybdenum, copper, metal powder, zinc, lead and nickel) which are used in the production of steel and/or aluminium.

Highlights

Consolidation high on the agenda

The rate at which the metals industry – and the aluminium sector, in particular – is consolidating increased dramatically in 2007. There were 411 disclosed deals, marginally more than the 385 that took place in 2006. But the aggregate value of those deals was a massive US\$ 144.7 billion, 67% more than the \$86.4 billion that was traded the previous year². The aluminium sector accounted for much of this activity, with 56 transactions collectively worth \$77.3 billion, over three-and-a-half times more than the \$21.3 billion it generated *in total* between 2003 and 2006.

The era of the mega-merger

Anglo-Australian mining giant Rio Tinto set a new record in the aluminium sector, with the \$38.1 billion acquisition of Alcan. Russian aluminium producer RUSAL followed hard on its heels, when it joined forces with SUAL and Swiss commodities group Glencore International, creating a company with a market capitalisation of \$30 billion. But this may be a prelude to even bigger things. In early 2008, BHP Billiton put in a \$147.4 billion bid for Rio Tinto – and though Rio Tinto's board rejected the proposal, it has signalled that it may be prepared to talk at a higher price. If BHP Billiton succeeds in its ambitions, the deal would be the biggest in the industry's history.

Incremental expansion in steel sector

Conversely, deal-making in the steel sector was largely incremental, with the notable exception of Tata Steel's acquisition of the Anglo-Dutch Corus. ArcelorMittal made various small acquisitions in emerging markets. Several North American producers also bought smaller competitors in order to reduce overcapacity or expand their product offerings.

North America the location of choice

North America was the undisputed M&A hotspot, with 115 deals worth \$77 billion. Rio Tinto's acquisition of Alcan accounted for nearly half this sum, but a number of steelmakers based in emerging economies also purchased North American producers as a means both of moving up the value chain and of getting access to the US market, where steel consumption is forecast to outstrip production for the next few years.

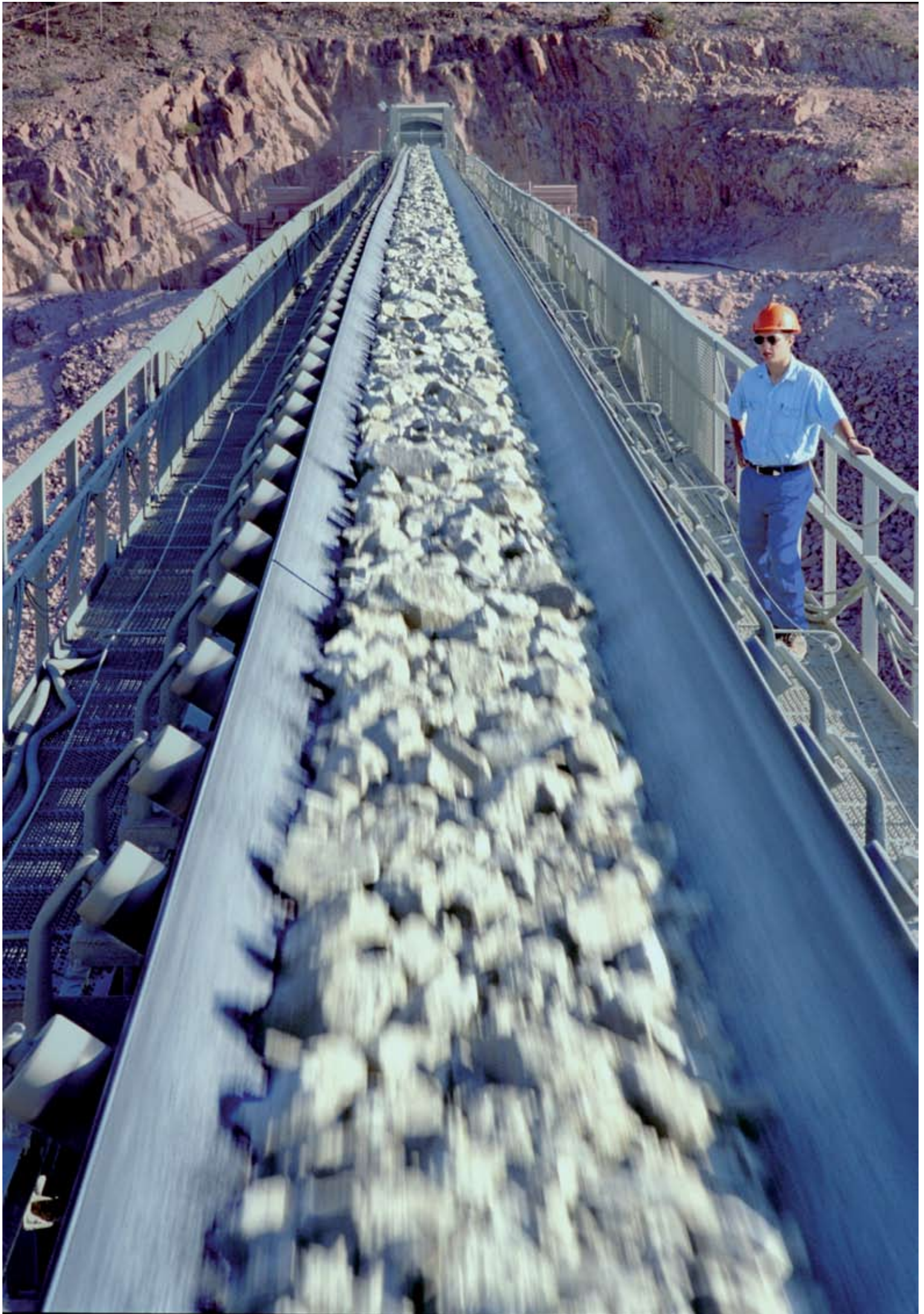
Concern over the long-term outlook

According to our *11th Annual Global CEO Survey*, metals executives are reasonably confident about their business prospects for the next 12 months. However, they are more pessimistic about the long-term outlook, citing government intervention, low-cost competition, energy security and lack of key skills as major concerns. More surprisingly, metals executives seem relatively untroubled about climate change. But they are more worried about rising energy costs and supply-chain disruptions than executives in other industries, and a significant percentage are "extremely" concerned about the cost of regulating carbon emissions.

The growing carbon emissions regulatory burden

The US, Japan and Australia are now exploring various options for reducing carbon emissions, and forward carbon prices suggest that Phase 2 of the European Union Emissions Trading Scheme will be more demanding than Phase 1. So it is clear that the regulatory burden will increase. The carbon-offsetting markets are also growing rapidly and a number of metals companies are beginning to capitalise on the opportunities they present. Nevertheless, regional variations in the regulation of carbon emissions could seriously disadvantage metals companies based in industrialised countries. Both the EU and US are considering how best to address this problem, without causing major trading disputes.

² All subsequent references are to US dollars.



Deal numbers: new highs

M&A activity in the metals industry has risen steadily since we produced our first edition of *Forging ahead* four years ago, with a record amount of money changing hands in 2007. There were 411 deals for which values were disclosed, compared with 385 the previous year. And the aggregate value of those deals soared to \$144.7 billion, a 67% increase on the \$86.4 billion that was traded in 2006. (see Figure 1).

Domestic deals accounted for most of the activity that occurred, as they have in preceding years. But cross-border deals accounted for the lion's share of the value, with 143 transactions collectively worth \$98.3 billion – 68% of the industry's aggregate expenditure on M&As.

The steel sector

The steel sector normally dominates the deal-making scene, but in 2007 it was relegated to second place. There were 249 deals collectively worth \$60.9 billion – \$16.4 billion less than the value that changed hands in the aluminium sector and an overall drop of 23% from the previous year's high.

ArcelorMittal also seems to have altered its M&A strategy. In 2006, there was considerable speculation that the company would buy a large steelmaker, such as Russia's Magnitogorsk Iron and Steel Works (MMK) or South Korea's POSCO, to reach its stated goal of becoming a 160 million tonnes per year (Mtpy) producer within five years. But ArcelorMittal spent most of 2007 focusing on small manufacturers in emerging markets and driving increased value from within – a change of approach that may well stem from concerns about potential government intervention.

Figure 1: Cross-border and domestic deals in the metals industry

	2007				2006			
	Number	Value (US\$ billions)	% of total number	% of total value	Number	Value (US\$ billions)	% of total number	% of total value
Cross-border	143	98,303	35	68	110	63,016	29	73
Domestic	268	46,391	65	32	275	23,403	71	27
Total	411	144,694	100	100	385	86,419	100	100

Source: Thomson Financial data and PricewaterhouseCoopers analysis

Note: Values of cross-border deals are assigned to companies acquired

Conversely, a number of global producers based in emerging economies purchased North American and European steelmakers as a means of moving up the value chain and earning higher margins. Tata Steel's acquisition of Corus is one such instance; the deal gives the Indian steelmaker much better access to the markets of Europe and North America, where its presence was previously limited. Fellow Indian manufacturer Essar Steel also bought two North American steel producers, Algoma Steel and Minnesota Steel, and the Russian Evraz Group acquired Oregon Steel Mills.

Meanwhile, several North American steelmakers acquired smaller competitors in the hope of consolidating and reducing overcapacity, as US steel consumption slowed down in mid-2007, with the weakening of the economy on the back of the sub-prime mortgage crisis. US Steel bought Stelco and Lone Star Technologies, bringing its total production capacity to 25 Mtpy. Similarly, Nucor purchased a 96% stake in Harris Steel, making it North America's largest rebar producer. Swedish steelmaker SSAB Svenskt Stål AB (SSAB) also capitalised on the consolidation of the sector, with the acquisition of Canadian steel products maker IPSCO for \$7.6 billion in the year's second-biggest steel deal.

Yet, despite all the M&A activity of the past few years, the top five steelmakers still command only 18% of the world's overall steel supplies – substantially less than the market share their peers in the iron ore and aluminium sectors enjoy (see Figure 3). We therefore believe that the largest steel producers will continue to consolidate and expand, both upstream and down, to control a bigger share of the steel value chain.

But if recent trends are any indication, they will have to pay higher acquisition multiples. In 2007, transaction values per tonne of production capacity ranged from \$533 to \$2,313, an average of \$1,404 per tonne – up from \$1,035 in 2006 (see Figure 4). Values were generally higher in North America than they were in Western Europe or Central and South America (with the notable exception of the remaining stake in Arcelor Brasil, which Mittal Steel was required to buy on the same terms as its bid for the parent company), and we anticipate that this pattern will continue in the short term.

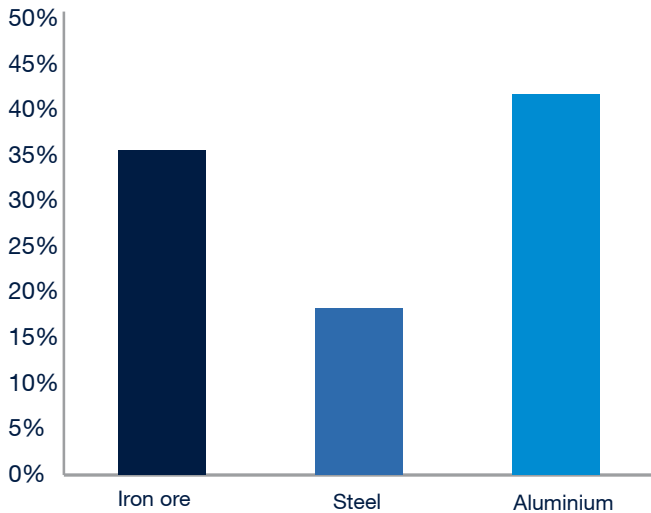
Figure 2: Deals by industry sector

	2007			2006		
	Steel	Aluminium	Other metals	Steel	Aluminium	Other metals
Domestic						
Number	162	38	68	161	48	66
Value (US\$ millions)	12,689	32,424	1,278	18,704	2,567	2,131
Cross-border						
Number	87	18	38	75	13	22
Value (US\$ millions)	48,216	44,891	5,196	59,962	1,458	1,597
Total						
Number	249	56	106	236	61	88
Value (US\$ millions)	60,905	77,315	6,474	78,666	4,025	3,728

Source: Thomson Financial data and PricewaterhouseCoopers analysis

Note: Values of cross-border deals are assigned to companies acquired

Figure 3: The market share of the top five companies in the steel sector and related industries



Source: AME Mineral Economics

Note: Market shares are based on total global production

Figure 4: Transaction values per tonne in a selection of recent steel acquisitions

Value of transaction (US\$ millions)	% share of ownership	Value of transaction if 100% stake (US\$ millions)	Crude steel capacity (net tonnes)	Crude steel or conversion capacity (Mtpy)	Value per tonne (US\$)	Date deal completed	Target name	Acquirer name
Completed in 2006:								
2,960	49.3	6,005		5.2	1,166	7 Mar 06	Eregli Demir Celik Fabrikalar	Ataer Holding
5,217	100.0	5,217	5.51	5.0	1,043	7 Mar 06	Dofasco	Arcelor
422	92.3	457		4.6	99	3 Apr 06	Stelco	Multiple acquirers
46,048	100.0	46,048		51.6	892	8 Aug 06	Arcelor	Mittal Steel
2,807	100.0	2,807	2.0	1.8	1,547	5 Oct 06	Maverick Tube	Tenaris
1,324	100.0	1,324	1.0	0.9	1,459	1 Dec 06	NS Group	IPSCO
Average					1,035			
Completed in 2007:								
2,300	100.0	2,300	2.3	2.1	1,102	12 Jan 07	Oregon Steel Mills	Evrax Group
1,070	96.0	1,114	1.0	0.7	1,595	13 Mar 07	Harris Steel Group	Nucor
12,100	100.0	12,100	19.0	17.2	702	2 Apr 07	Corus Group	Tata Steel
1,439	100.0	1,439		2.7	533	20 Apr 07	Sicartsa	ArcelorMittal
2,099	100.0	2,099	1.0	0.9	2,313	14 Jun 07	Lone Star Technologies	US Steel
5,627	34.0	16,549		11.0	1,504	19 Jun 07	Arcelor Brasil	Mittal Steel
7,572	100.0	7,572	5.0	4.1	1,855	18 Jul 07	IPSCO	SSAB
4,138	100.0	4,138	3.0	2.5	1,629	14 Sep 07	Chaparral Steel	Gerdau Ameristeel
Average					1,404			

Sources: Bloomberg, Thomson Financial, AME Mineral Economics, company data and PricewaterhouseCoopers analysis

Note: Transaction values per tonne are for illustrative purposes, since estimates of capacity vary from one source to another

The aluminium sector

The aluminium sector has traditionally experienced much less M&A activity than the steel sector, but mining giant Rio Tinto's \$38.1 billion purchase of Alcan and RUSAL's \$30 billion, three-way merger with SUAL and Glencore International catapulted it into the big time in 2007, with total deal values soaring to \$77.3 billion, more than 19 times the amount that was traded in 2006. These two transactions have concentrated aluminium supplies even further; the top five aluminium manufacturers now control 41% of global production, up from 38% in 2006.

India's Hindalco Industries also expanded its global footprint, with the \$5.8 billion purchase of Canadian aluminium flat-rolling and recycling giant Novelis. The deal makes Hindalco the world's largest aluminium flat-rolling company and one of the biggest producers of primary aluminium in Asia.

Other metals

The base metals sector experienced a somewhat smaller surge in activity. There were 106 transactions collectively worth \$6.5 billion in 2007, compared with 88 deals worth a total \$3.7 billion in 2006.

Two deals accounted for more than half this sum. British mining company Anglo American acquired a 49% stake in Sistema Minas-Rio from the Brazilian iron and steel company MMX Mineracao e Metalicos for a total consideration of almost \$2.5 billion. A \$1.3 billion joint venture between the Australian Zinifex and Belgian Umicore also saw the creation of Nyrstar, now the world's largest zinc smelting producer with a capacity of 1.2 Mtpy and operations in seven countries.



Deal makers: big is beautiful

The value of the top 10 deals that took place in 2007 was a massive \$113 billion – almost 73% more than the \$65.5 billion that was exchanged in the top 10 deals of the previous year (see Figure 5). The role the aluminium sector played is particularly noteworthy. An aluminium producer topped the mega-merger chart for the first time since the inaugural edition of *Forging ahead* in 2004, and aluminium companies collectively accounted for 65% of the total value the top 10 deals represented, up from just 4% in

Figure 5: The top 10 deals in the global metals industry in 2007

No.	Value of transaction (US\$ millions)	Date completed	% of ownership	Target name	Target nation	Acquirer name	Acquirer nation	Sector
1	38,100.00	14 Nov 07	100	Alcan	Canada	Rio Tinto	UK	Aluminium
2	30,000.00	27 Mar 07	100	SUAL & Glencore International	Russia & Switzerland	RUSAL	Russia	Aluminium
3	14,748.80	2 Apr 07	100	Corus	UK	Tata Steel	India	Steel
4	7,571.76	18 Jul 07	100	IPSCO	Canada	SSAB	Sweden	Steel
5	5,788.60	15 May 07	100	Novelis	Canada	Hindalco Industries	India	Aluminium
6	5,626.58	19 Jun 07	34	Arcelor Brasil	Brazil	Arcelor-Mittal	Netherlands	Steel
7	4,138.33	14 Sep 07	100	Chaparral Steel	US	Gerdau Ameristeel	Canada	Steel
8	2,500.00	24 Jan 07	N/A	Handan Iron & Steel	China	Baosteel	China	Steel
9	2,451.00	16 Jul 07	49	Sistema Minas-Rio	Brazil	Anglo American	UK	Other Metals
10	2,098.63	14 Jun 07	100	Lone Star Technologies	US	US Steel	US	Steel

Source: Thomson Financial data and PricewaterhouseCoopers analysis

Rio Tinto took pole position with its \$38.1 billion all-cash offer for Alcan, trumping a hostile cash-and-stock bid worth \$28.8 billion from US aluminium company Alcoa. The mining giant paid for the deal with a syndicated loan of \$40 billion – the largest-ever loan facility raised by a British enterprise and the fourth-largest worldwide. But since completing the acquisition, Rio Tinto has itself become the target of unwelcome attention. In early 2008, rival iron ore giant BHP Billiton made a \$147.4 billion bid for the group, which the board and shareholders unanimously rejected on the grounds that it was too low.

A number of steelmakers have also been quick to criticise the proposed deal. They point to the fact that BHP Billiton, Rio Tinto and Vale (formerly CVRD) jointly account for 80% of seaborne iron ore exports, and argue that a merger between BHP Billiton and Rio Tinto would create a duopoly, driving prices even higher. Iron ore prices have already risen by about 180% since the start of the decade and are expected to increase by another 65% this year³.

In February 2008, Alcoa and Chinalco responded by joining forces to purchase 12% of Rio Tinto's shares for an estimated \$14 billion, in a move that is clearly intended to obstruct BHP Billiton. And though the two companies have said that they do not currently plan to bid for Rio Tinto, they have reserved the right to do so if a third party puts an offer on the table.

Meanwhile, Russian aluminium producers RUSAL and SUAL merged with Swiss commodities trader Glencore International to create United Company RUSAL, leapfrogging over Alcoa in the process. The deal was backed by former president Vladimir Putin, who is keen to make Russia's metals industry more competitive. But United Company RUSAL's ambitions obviously go much further; in November 2007, it announced plans to buy 25% of Norilsk Nickel, the world's largest producer of palladium and nickel. Hindalco Industries also acquired Novelis, a step that should propel the company into the Fortune 500 list of the world's largest enterprises, measured by sales, this year.

Another Indian company accounted for the biggest transaction in the steel sector. Tata Steel started life as a low-cost manufacturer – and fellow subsidiary Tata Motors recently unveiled a mini-car with a \$2,500 price tag for Indian consumers. But Tata Steel itself has been steadily moving up the value

chain, a strategy which culminated in the \$14.7 billion acquisition of Corus in April 2007. Almost 60% of Tata Steel's revenues now come from Europe.

Chinese steelmaker Baosteel likewise furthered its stated aim of becoming the world's second-leading steel producer, via a 19.4 billion yuan (\$2.5 billion) joint venture with Handan Iron & Steel Group to build a plant in Northern China. Baosteel still has a long way to go before it can realise its goal – which requires that it raise its production capacity from 22.5 Mtpy to 80 Mtpy by 2012. But, if it can do so, it will account for 10% of China's entire steel output.

And Brazil saw two multi-billion-dollar deals. In June 2007, ArcelorMittal completed the undertaking it made as part of the original merger between Arcelor and Mittal Steel to acquire the remaining 29.5% of Arcelor Brasil and delist the company from the São Paulo Stock Exchange. A month later, Anglo American bought into Sistema Minas-Rio, Brazilian producer MMX's most ambitious mining project to date. The mine is expected to produce 26.6m tonnes of iron ore when it reaches full capacity in 2011.

The steel markets of North America also attracted considerable interest. In June 2007, US Steel bought Lone Star Technologies for \$2.1 billion, a move that has made it North America's largest fully integrated seamless and welded tubular producer. In July 2007, SSAB spent \$7.6 billion on the purchase of IPSCO. And in September 2007, Gerdau Ameristeel acquired Chaparral Steel for \$4.1 billion, reinforcing its position in the non-residential construction sector.

In all, North American targets accounted for three of the six top deals in the steel sector and 38% of the \$36.7 billion they were collectively worth. Three factors help to explain this increase in M&A activity in the region. First, steel consumption is forecast to grow more rapidly than production capacity in the US, and acquiring a US company gives the purchaser legitimate access to the US market for the steel it makes in other regions. Second, the weakening of the dollar has boosted the purchasing power of overseas buyers. And, lastly, many mid-sized steelmakers recognise that, if they are to compete with mega-producers like ArcelorMittal, they will need both to widen their product range and to improve their access to raw materials.

³ Associated Press, "China's Baosteel agrees to 65 percent increase in iron ore price with Brazil's Vale", *International Herald Tribune* (February 22, 2008). Available at <http://www.ihf.com/articles/ap/2008/02/22/business/AS-FIN-China-Brazil-Iron-Ore-Prices.php> (accessed April 1, 2008).

Deal spread: geographical snapshot

There were 308 regional deals collectively worth \$57.1 billion in 2007 – 165% more than the \$21.6 billion that was generated in 2006 (see Figure 6). The value of the cross-continental deals that took place also soared to \$87.6 billion, although the year-on-year rise was a much smaller 35%.

Figure 6: Regional versus cross-continental M&As

	2007				2006			
	Steel	Aluminium	Other metals	Total	Steel	Aluminium	Other metals	Total
Regional								
Number	188	41	79	308	148	38	68	254
Value (US\$ millions)	22,728	33,086	1,325	57,139	15,284	2,491	3,278	21,593
Cross-Continental								
Number	61	15	27	103	88	23	20	131
Value (US\$ millions)	38,176	44,229	5,149	87,554	62,842	1,534	450	64,826

Source: Thomson Financial data and PricewaterhouseCoopers analysis
Note: Values of cross-continental deals are assigned to companies acquired

The steel sector accounted for 188 regional deals with a combined value of \$22.7 billion, up 49% from 2006. It also accounted for 61 cross-continental deals with an aggregate value of \$38.2 billion. But in the absence of a mega-deal like the merger of Arcelor and Mittal Steel, the total value that was traded across continents was 39% less than in 2006.

Conversely, the aluminium sector enjoyed record regional and cross-continental values. There were 41 regional deals jointly worth \$33.1 billion and 15 cross-continental deals jointly worth \$44.2 billion. Cross-continental activity in the base metals sector also increased by \$4.7 billion in 2007, as a result of Anglo American's acquisition of a stake in the Sistema Minas-Rio iron ore mine and the joint venture between Zinifex and Umicore.

However, the focus of attention has switched quite dramatically. In 2006, it was Western Europe that garnered much of the interest, as Arcelor and Mittal joined forces. In 2007, by contrast, North America was the world's M&A hotspot – with 115 deals worth a huge \$77 billion, 89% of the value that was traded in the entire metals industry the previous year (see Figure 7).

The value of the deals that took place in Central and Eastern Europe also surged, as it did in Central and South America – albeit that the latter was starting from a very much smaller base. Conversely, deal-making in Asia-Pacific declined.

Figure 7: M&A activity by continent

	2007				2006			
	Number	% of total number	Value (US\$ m)	% of total value	Number	% of total number	Value (US\$ m)	% of total value
North America	115	28	76,987	53	106	38	17,833	21
Central and Eastern Europe	23	6	30,848	21	42	15	3,326	4
Western Europe	104	25	20,052	14	69	25	49,259	57
Central and South America	21	5	9,620	7	14	5	892	1
Asia-Pacific	148	36	7,187	5	154	55	15,110	17

Source: Thomson Financial data and PricewaterhouseCoopers analysis

Note: Values of cross-continental deals are assigned to companies acquired. All companies acquired in Africa are included in the numbers for Asia-Pacific

North America

North America's aluminium producers accounted for 18 deals worth \$46.7 billion in 2007, thanks to the acquisition of Alcan and Novelis. These two deals jointly represented 94% of the value that was traded in the sector (see Figure 8). The 71 transactions that took place in the steel industry generated only \$30 billion, by contrast, although this was more than double the \$14.2 billion that was generated in 2006.

The deal-making was particularly hectic in Canada. We noted in last year's issue of *Forging ahead* that more than 40% of the country's 15 Mtpy of steel production capacity was heading for new ownership. By the end of 2007, the three key companies that remained independent at the close of 2006 – Algoma, IPSCO and Stelco – had also been sold. Moreover, two of the three new owners come from other regions – clear evidence that the Canadian government believes it is better to have strong local operations in foreign control than it is to have locally owned companies that are struggling to compete.

Meanwhile, US steelmaker Nucor bought a majority stake in Harris Steel, which should enable the company to expand its downstream rebar fabrication business. Fabricated rebar is a vital building component and Nucor hopes to capitalise on a massive spending

Nucor hopes to capitalise on a massive spending programme to support Canadian oil sands production and improve the region's infrastructure, with projects like the rebuilding of the US highways and the Gulf Coast. ArcelorMittal also strengthened its position in the North American marketplace, with the \$1.4 billion acquisition of Sicartsa, an integrated Mexican steel producer with a capacity of 2.7 Mtpy. Sicartsa has estimated iron ore reserves of 160m tonnes, providing 30 years of reserves at current production rates.

We anticipate that steelmakers from the emerging and industrialised markets alike will continue to show considerable interest in North America for some time to come. Although AME Mineral Economics reports that US steel consumption dropped by 5% in 2007, in reaction to fears of a recession, the weak US dollar has reduced acquisition costs for overseas buyers. Moreover, in the longer term, the North American market looks attractive, with US consumption forecast to grow by 3% a year for the next two years.

Figure 8: M&A activity in North America

	2007			2006		
	Steel	Aluminium	Other metals	Steel	Aluminium	Other metals
Domestic						
Number	49	14	20	53	12	21
Value (US\$ millions)	5,475	2,317	126	5,469	1,160	1,115
Cross-Border						
Number	22	4	6	12	2	6
Value (US\$ millions)	24,519	44,376	174	8,686	423	980

Source: Thomson Financial data and PricewaterhouseCoopers analysis
 Note: Values of cross-border deals are assigned to companies acquired

Central and Eastern Europe

M&A activity in Central and Eastern Europe's metals industry soared in 2007 – with 23 deals worth a total \$30.8 billion, more than nine times the \$3.3 billion that was traded the previous year (see Figure 9). A single transaction – the creation of United Company RUSAL – accounted for 97% of this value.

Russian steelmaker Novolipetsk Steel (NLMK) also acquired a controlling stake in fellow Russian steel producer OAO Maxi for \$600m. Although the transaction subsequently fell foul of Russia's Federal Antimonopoly Service (FAS) for technical reasons, NLMK re-submitted the filing in late February 2008 and representatives of the FAS have indicated that they see no reason for further denials of the deal.

However, the Central and Eastern European steelmaking sector is already consolidated; the top 10 manufacturers control 85% of crude production and many of the larger steelmakers are also self-sufficient in iron ore and coal. Some of the region's steelmakers have therefore been looking elsewhere. One such example of this strategy occurred in early 2008, when Russian steelmaker Evraz announced plans to buy 51% of Chinese steel producer Delong Holdings, thereby increasing its exposure to the rapidly growing Chinese marketplace.

Figure 9: M&A activity in Central and Eastern Europe

	2007			2006		
	Steel	Aluminium	Other metals	Steel	Aluminium	Other metals
Domestic						
Number	8	5	1	18	5	1
Value (US\$ millions)	728	30,063	0	1,840	7	16
Cross-Border						
Number	8	1	0	13	3	2
Value (US\$ millions)	45	12	0	414	1,035	14

Source: Thomson Financial data and PricewaterhouseCoopers analysis
 Note: Values of cross-border deals are assigned to companies acquired, with the exception of the merger that created United Company RUSAL, which we have attributed solely to Central and Eastern Europe for the purposes of regional analysis

Western Europe

There were 104 deals collectively worth \$20 billion in Western Europe in 2007, compared with 69 deals worth \$49.3 billion the previous year (see Figure 10). The steel sector was the source of most of this activity, as it has been for a number of years.

The biggest transaction by far was Tata Steel's \$14.7 billion acquisition of Corus. Competition concerns as a result of the creation of ArcelorMittal generated another \$1 billion-worth of sales. In early 2007, the steel giant sold German section manufacturer Stahlwerk Thüringen to Grupo Alfonso Gallardo for \$785.4m. It also disposed of a rolling mill in Northern Italy for \$155m and Polish steel mill Huta Bankowa for \$84m. Meanwhile, Celsa Group, Spain's leading long rolled products manufacturer, bought the Spanish Siderúrgica Añón for \$562m, increasing its capacity to 9 Mtpy.

The aluminium sector accounted for another 18 deals collectively worth \$129m, marginally more than the \$76m that was traded in 2006. The largest of these deals saw Honsel International Technologies, a subsidiary of RHJ International, acquire Tafime's aluminium die-casting manufacturing facilities in Madrid, Spain, and Queretaro, Mexico, for \$129m.

However, deal-making in the other metals sector was significantly higher than in 2006, with 27 deals worth a total \$3.2 billion. The \$1.3 billion joint venture to create zinc producer Nyrstar accounted for the biggest chunk of this money. Kazakhmys, the biggest copper producer in Kazakhstan, also exercised an option to acquire an 18.8% stake in the UK's Eurasian Natural Resources Corporation, a large diversified mining and natural resources group with significant chrome, iron ore, alumina and coal assets in Kazakhstan, for \$806.5m.

Figure 10: M&A activity in Western Europe

	2007			2006		
	Steel	Aluminium	Other metals	Steel	Aluminium	Other metals
Domestic						
Number	40	10	12	25	10	6
Value (US\$ millions)	861	0	904	947	76	11
Cross-Border						
Number	19	8	15	17	6	5
Value (US\$ millions)	15,844	129	2,314	48,087	0	138

Source: Thomson Financial data and PricewaterhouseCoopers analysis
 Note: Values of cross-border deals are assigned to companies acquired

Central and South America

Twenty-one deals collectively worth \$9.6 billion took place in the metals industry in Central and South America in 2007 (see Figure 11). Anglo American's acquisition of a minority stake in the Sistema Minas-Rio iron ore mine accounted for more than a quarter of this sum. The steel sector accounted for the rest.

The single biggest deal in the steel sector was the \$448m acquisition of a 52% stake in Colombian miner Acerias Paz del Rio by Brazilian industrial conglomerate Votorantim Participacoes at public auction. The transaction has increased Votorantim's captive iron ore and coal deposits, as well as giving it access to other minerals such as nickel and zinc (which is thought to be why Votorantim paid 150% more than the initial auction price). But the domestic Colombian steel market is also growing rapidly, with 50% of domestic consumption

supplied by imports – and Votorantim is keen to expand its presence in the country. It has offered to purchase Gerdau's 9.9% stake in Paz del Rio and the 5.1% of the shares held by other minority investors, although neither transaction has yet gone through.

Brazilian steelmaker Companhia Siderúrgica Nacional (CSN), which lost a bid for Corus in early 2007, also acquired fellow Brazilian iron ore producer Companhia de Fomento Mineral for \$440m, through its wholly-owned subsidiary Nacional Minerios. The transaction consolidates CSN's position in the iron ore marketplace, giving it a total capacity of 30 Mtpy and projected sales of up to 15m tonnes a year by 2009. And ArcelorMittal expanded its presence in the emerging markets of Latin America with the purchase of the 35% of the shares of Argentine steelmaker Acindar which it did not already own.

Figure 11: M&A activity in Central and South America

	2007			2006		
	Steel	Aluminium	Other metals	Steel	Aluminium	Other metals
Domestic						
Number	5	0	0	4	1	0
Value (US\$ millions)	664	0	0	160	28	0
Cross-Border						
Number	14	0	2	8	0	1
Value (US\$ millions)	6,467	0	2,489	704	0	0

Source: Thomson Financial data and PricewaterhouseCoopers analysis
 Note: Values of cross-border deals are assigned to companies acquired

Asia Pacific

There were 148 deals with an aggregate value of \$7.2 billion in the Asia-Pacific metals industry in 2007, a substantial drop on the 154 deals collectively worth \$15.1 billion that occurred in 2006 (see Figure 12). The 52% decline in the value of the transactions that took place is largely attributable to the lull in the Chinese steelmaking sector, which remains very fragmented, despite the central government's Steel Industry Development Policy to promote the consolidation of the sector and development of several major domestic steel producers.

AME Mineral Economics reports that Chinese demand rose 11.4% in 2007. However, raw steel supplies increased by 16.7% over the same period, even though some 30 Mtpy of iron and 35 Mtpy of steel production capacity was closed down and another 20% of Chinese steel capacity is so old that it is extremely inefficient. The Chinese Ministry of Finance has therefore introduced additional regulations to squeeze out marginal producers using old technology, with effect from 1 January 2008, as part of a wider programme to reduce pollution by 10%, and per capita energy consumption by 20%, over the next three years.

Baosteel was one of the few domestic companies to participate in any deals. In January 2007, it paid \$128.5m for a 70% stake in Bayi Iron & Steel, the biggest steelmaker in Northwest China's Xinjiang Uygur Autonomous Region. Four months later, it formed a \$2.5 billion joint venture with Handan Iron & Steel Group.

Meanwhile, ArcelorMittal bought a 28% stake in China Oriental Group, which specialises in the production of steel H-sections, cold rolled and galvanized sheets,

and the processing of billets and strips for use in the construction and machinery manufacturing segment, for \$647m. It also acquired 90% of the shares in Rongcheng Chengshan Steel Cord, which makes steel tyre cord and bead wire, for \$27m. However, ArcelorMittal was forced to terminate its plans for buying a stake in Laiwu Steel, first announced in February 2006, when the Chinese National Development and Reform Commission refused to approve the deal, citing price and technology transfer concerns.

There was slightly more activity in Japan and Australia, although even here things were relatively quiet. The largest deal in the region saw Japan's JFE Holdings repurchase \$1 billion-worth of stock on the open market. Fellow Japanese steelmaker Nippon Steel also acquired a nearly 35.6% stake in rival Oji Steel for \$135m, while Australia's BlueScope Steel and OneSteel finalised a deal, first mooted in mid-2006, to divide smaller peer Smorgon Steel between them. Under the terms of the transaction, BlueScope bought Smorgon's steel and metal merchandising arm for \$562m and sold its 19.9% stake in the remaining business to OneSteel.

But BlueScope was on the move yet again in December 2007, when it announced plans to buy US steelmaker IMSA Steel from Ternium, a Latin American steel conglomerate listed on the New York Stock Exchange, for \$730m. It expects the deal (which is due to be completed in the first half of 2008) to generate savings of some \$40m a year from the expansion of its distribution network, manufacturing improvements and economies of scale in procurement.

Figure 12: M&A activity in Asia-Pacific

	2007			2006		
	Steel	Aluminium	Other metals	Steel	Aluminium	Other metals
Domestic						
Number	60	9	35	61	20	38
Value (US\$ millions)	4,961	44	247	10,288	1,297	989
Cross-Border						
Number	24	5	15	25	2	8
Value (US\$ millions)	1,341	375	219	2,071	0	465

Source: Thomson Financial data and PricewaterhouseCoopers analysis

Note: Values of cross-border deals are assigned to companies acquired. All companies acquired in Africa are included in the numbers for Asia-Pacific

The impact of the global credit crunch

Of course the slowdown in M&A activity in several regions was more than offset by the frenetic pace in other regions; as we indicated earlier, the total value that was traded in the global metals industry in 2007 was higher than in any of the previous four years. At first glance, this might suggest that the industry was completely unscathed by the credit crisis which has crippled the financial markets in recent months, but closer examination reveals a different story.

In 2006, financial buyers (including private equity firms, management buyouts and so forth) accounted for 20% of the total value that changed hands. In 2007, by contrast, they accounted for only 4% (see Figure 13). The fallout from the credit crunch has been particularly pronounced in the steel sector, where financial buyers accounted for only \$3.9 billion, compared with \$14.2 billion the previous year (see Figure 14).

Figure 13: Strategic versus financial buyers

	2007				2006			
	Number	Value (US\$ billions)	% of total number	% of total value	Number	Value (US\$ billions)	% of total number	% of total value
Financial	101	5,282	25	4	102	17,027	26	20
Strategic	310	139,412	75	96	283	69,392	74	80

Source: Thomson Financial data and PricewaterhouseCoopers analysis

Figure 14: Strategic versus financial buyers by sector

	2007			2006		
	Steel	Aluminium	Other metals	Steel	Aluminium	Other metals
Financial						
Number	58	12	31	61	20	21
Value (US\$ millions)	3,906	1,156	219	14,224	2,330	473
Strategic						
Number	191	44	75	175	41	67
Value (US\$ millions)	56,998	76,159	6,255	64,442	1,694	3,255

Source: Thomson Financial data and PricewaterhouseCoopers analysis

This marked decline in the presence of financial buyers reflects the uncertainty in the broad debt markets. With the re-pricing of risk, debt has become more expensive, borrowing covenants have become stricter and syndication has become more difficult because it is necessary to line up more banks, many of which are wary of being over-exposed. As a result, funding has shrunk and some private equity groups have been unable to raise the money they need to finance deals that were already on the table.

However, three particular transactions are worth noting. In May 2007, Apollo Management completed the purchase of Xstrata's aluminium business for just over \$1.1 billion. In October 2007, Platinum Equity acquired Ryerson for \$2 billion, after one of the US metals processor's institutional shareholders launched a battle for control of the company, alleging that the management was inexperienced and incompetent; and, in November 2007, Onex Corporation, Canada's biggest leveraged buyout firm, bought Tube City IMS, which provides raw materials procurement, scrap and materials management, and slag processing services, for \$638.6m.

Nevertheless, Gerald Schwartz, chief executive of Onex, recently warned investors that there would be fewer private equity transactions in 2008 than in 2007: "There is no doubt that the current state of the credit market makes funding large-scale private-equity transactions more difficult and has also discouraged owners of many businesses from considering a sale at this time," he observed⁴. In the current environment, then, it seems likely that corporate buyers will drive the global M&A metals market – and, with easier access to equity funding and greater opportunities for exploiting potential synergies, they could well enjoy a stronger hand than private equity firms.

⁴ David Paddon, "Onex sees opportunity in distressed credit market, Schwartz says", *Canadian Business Online* (February 28, 2008). Available at http://www.canadianbusiness.com/markets/headline_news/article.jsp?content=b0228137A (accessed March 8, 2008).

Future outlook

So what will 2008 bring? Despite the downturn in the world's leading economies, a number of metals companies still have plenty of liquidity and some private equity firms also have unspent capital.

Moreover, the steel sector is still very fragmented – and if BHP Billiton succeeds in winning Rio Tinto, further consolidation will be vital. A duopoly in the iron ore seaborne market would put particular pressure on non-integrated steelmakers. In the short term, they might be able to pass any increase in raw materials costs on to their customers, but in the longer term such an approach would be unsustainable. Many non-integrated suppliers would be forced to acquire iron ore and coal assets in order to remain competitive. Alternatively, if rising raw materials costs continued to boost finished prices, the industry sectors that are most reliant on steel might start using other materials. That, in turn, might force some steelmakers to diversify.

In either case, the volume of deal-making would increase, although whether the aggregate value of those deals would be greater than in 2007 is another matter. If valuations fall sufficiently, even a considerable surge in M&A activity might not be enough to offset the impact. However, at \$147.4 billion, BHP Billiton's latest offer for Rio Tinto is already more than the combined value of all the transactions that occurred in 2007, and Rio Tinto has indicated that it is still not enough. A deal of such magnitude – both political and financial – would almost certainly attract considerable scrutiny from competition authorities around the world. But should BHP Billiton fulfil its ambitions, it would single-handedly break all previous records.

Cautious optimism? The view from the top

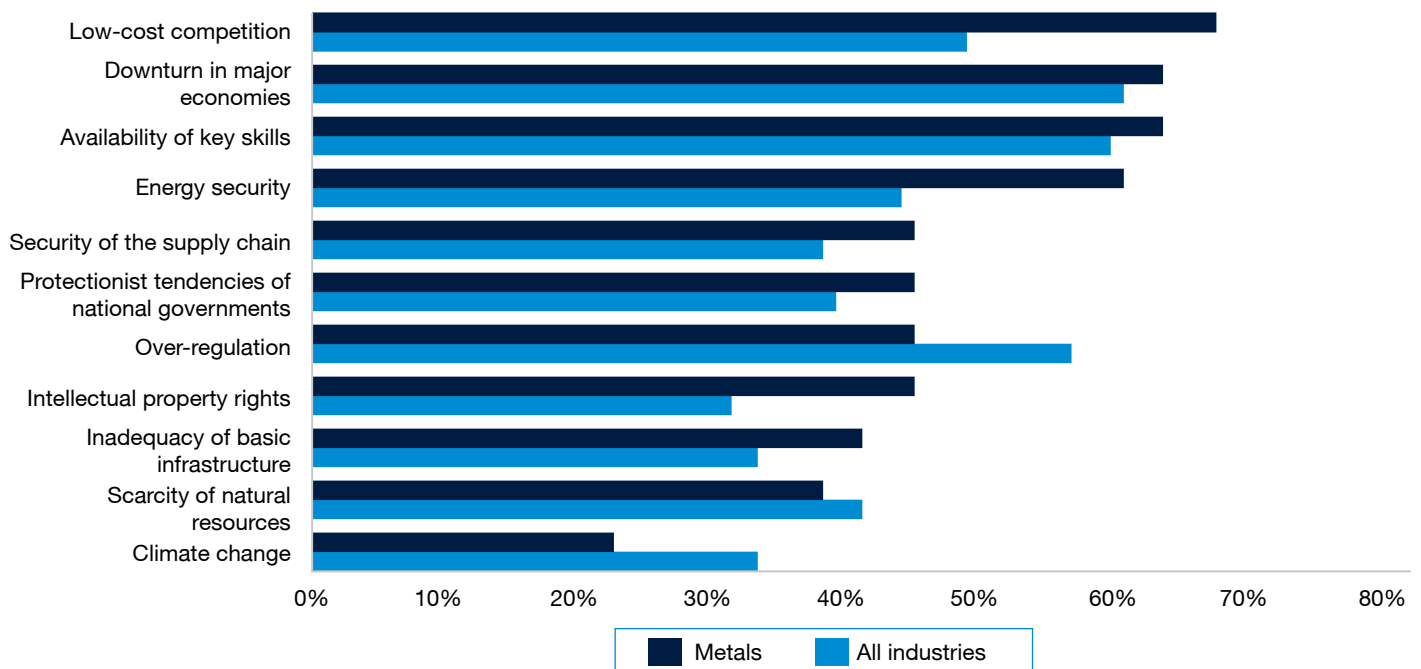
In late 2007, we interviewed 26 CEOs from the metals industry to see how they are addressing the opportunities and challenges associated with an increasingly connected world. We have compared their opinions with those of CEOs in a wide range of industry sectors to see how they differ¹.

In this year's survey metals CEOs report roughly the same level of confidence about their business prospects over the next 12 months as do their peers in other industries – in marked contrast with last year, when metals respondents were noticeably less confident than those in other areas of business. This optimism probably stems from greater pricing stability, as a result of the last three years of industry consolidation. Steelmakers, particularly those that are not self-sufficient in iron ore, are now more confident that they can pass raw materials price increases on to their customers.

However, metals CEOs are rather more pessimistic about the long-term outlook than executives in other industries – and some of this anxiety can probably be laid at the feet of iron ore producers. Free trade iron production is in the hands of a small group of producers, who are lifting their prices significantly each year. So some steelmakers may fear that, if they continue to increase their prices in line with costs, their customers will seek alternative products.

Similarly, metals CEOs are more concerned about the risk of government protectionism and low-cost competition than CEOs in other industries, reflecting past controversies over tariffs and dumping in a number of key sectors. They are also more concerned about energy security and lack of key skills, a trend we have noted in a number of sectors involved in heavy industry, which are often viewed as less desirable employers by the best and brightest new graduates. Conversely, metals CEOs are less concerned about over-regulation (see Figure 1).

Figure 1: Metals executives are somewhat or very concerned about a number of threats to their prospects for business growth



Source: PricewaterhouseCoopers 11th Annual Global CEO Survey

¹ Between September and November 2007, we interviewed 1,150 CEOs in 43 industry sectors around the world – including 26 CEOs from the metals sector – for PricewaterhouseCoopers' 11th Annual Global CEO Survey. Our survey explores the impact of global connectivity on the sources of growth and risk, the way in which companies work and their relations with their stakeholders. It shows that achieving the correct balance between collaboration and traditional management discipline is vital for succeeding in a connected world. The full results are available at <http://www.pwc.com/ceosurvey>

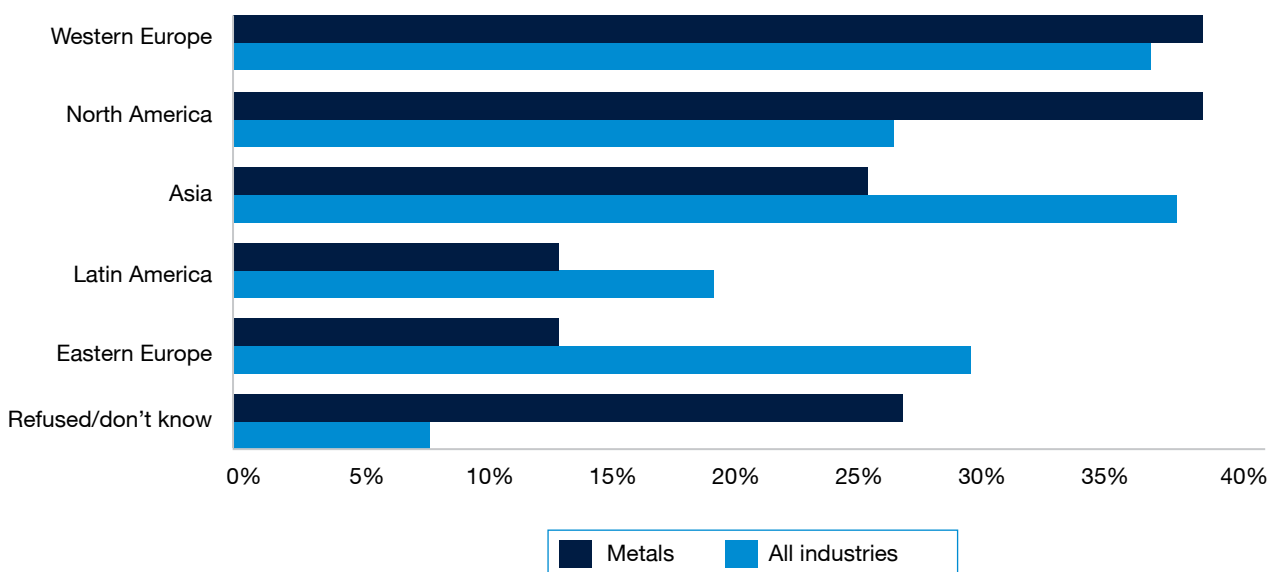
Many metals CEOs continue to recognise the importance of deal-making; 24% of respondents report that M&As have had a bigger impact on their business than any other changes over the past 12 months. And 27% of those who think this believe that M&As represent the biggest opportunity for growth over the next 12 months (compared with just 15% of all CEOs). They also believe that M&As will play a much greater role than joint ventures and strategic alliances – a clear sign that the metals industry is playing M&A catch-up with other industries.

Thirty-five percent of metals CEOs say that they have completed a cross-border transaction within the past 12 months, compared with only 24% of the survey population as a whole. Our analysis of the M&As that took place in 2007 bears this out;

the number of cross-border deals increased by 33, while their total value increased by \$35.3 billion, year on year. Slightly fewer CEOs – 31% – anticipate consummating a deal in the next 12 months, a figure in line with the results across all industries.

However, most of those metals executives with deal-making in mind have their sights on North America or Western Europe (as Indian steelmaker Tata Steel did, when it purchased Corus), rather than on Eastern Europe or Asia (see Figure 2). This regional bias reflects the fact that steel giants like ArcelorMittal have already acquired a number of formerly state-owned steel mills in Eastern Europe and are now looking elsewhere. Last year, by contrast, Eastern Europe was still high on the list of areas into which metals CEOs were keen to expand.

Figure 2: Metals executives are predominantly interested in completing deals in Western Europe and North America over the next 12 months



Source: PricewaterhouseCoopers 11th Annual Global CEO Survey

So what are the industry’s core concerns when going overseas? Our survey shows that metals CEOs are particularly concerned about the potential impact of cultural differences – a problem that is often severe in formerly state-owned companies without a history of commercial competitiveness – and, given the usual emphasis on managerial control from the “home office”, they are right to worry.

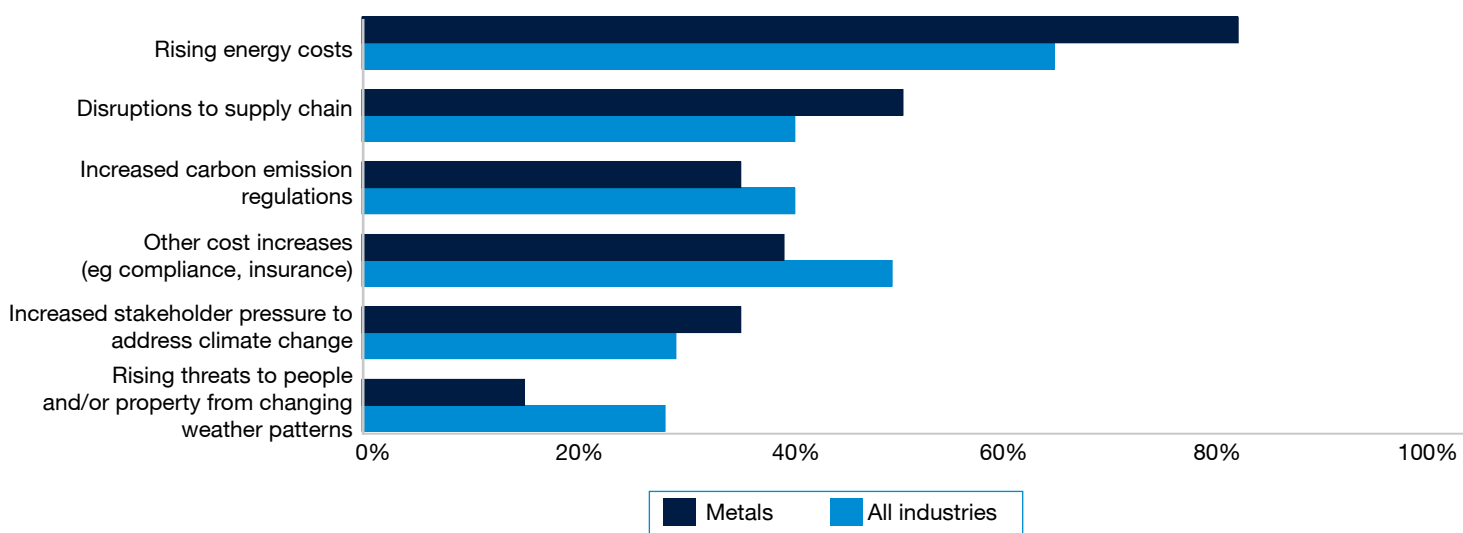
They are also concerned about inadequate management and unexpected costs. But they are more sanguine than their peers in other industries about political opposition, conflicting workforce expectations and their ability to capture the full value of the transactions they undertake. Many metals CEOs have already successfully completed foreign acquisitions and are justifiably confident that they can draw on prior experience to realise the benefits of further deal-making.

More surprisingly, perhaps, many metals CEOs seem relatively untroubled about the potential commercial consequences of climate change. A huge 65% of respondents do not worry at all on this score, compared with just 38% of our global sample – even though

climate change could have a major bearing on their companies, as our next article shows. However, analysis of the individual risks arising from climate change reveals a somewhat more varied picture.

Metals executives are less concerned than their peers in other industries about increasing insurance and compliance costs or damage from changing weather patterns. But they are more concerned about rising energy costs and supply-chain disruptions, a fact that reflects the importance of energy and commodities in the metals production process (see Figure 3). Moreover, although only 12% are “somewhat” concerned about the costs of regulating carbon emissions, compared with 25% of our global sample, a substantially higher percentage are “extremely” concerned. Twenty-three percent of metals CEOs express great anxiety about the impact of carbon regulation, versus only 14% of respondents as a whole. This dichotomy may reflect a regional split between metals executives running European companies that are subject to the EU Emissions Trading Scheme (EU-ETS) and those in companies based in other parts of the world.

Figure 3: Metals executives are particularly concerned about rising energy costs and supply-chain disruptions



Source: PricewaterhouseCoopers 11th Annual Global CEO Survey

Metals CEOs differ from those in other industries – and, indeed, from the prevailing public view – in another key respect: their confidence in their companies’ technological prowess. The general public may perceive the metals industry as traditional; those in the business see things very differently. Thirty-five percent of metals executives believe that technological innovation is their main source of competitive advantage, compared with just 22% of CEOs as a whole. Improved customer service likewise receives high marks, but metals respondents are much less confident about their ability to access and retain key talent (see Figure 4).

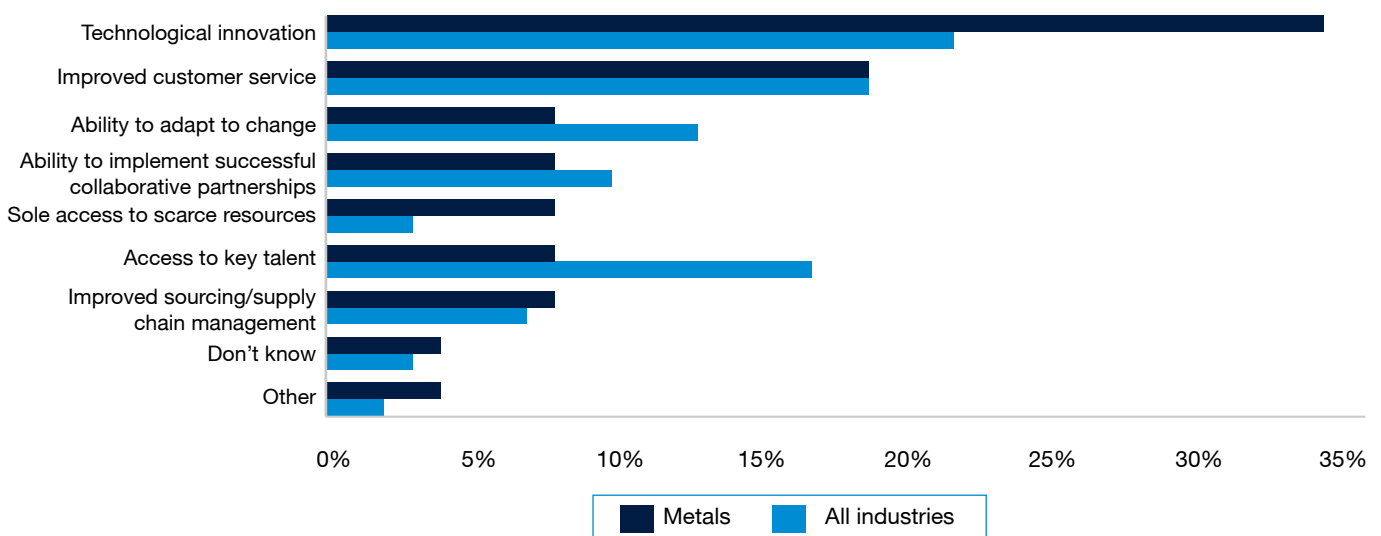
Further evidence of the extent to which the industry is changing its traditional modus operandi comes from the high percentage of metals CEOs who report that the implementation of new business models has had a major impact on their companies over the past three years. This is not surprising, given the amount of industry consolidation that has taken place, since the integration of new acquisitions often results in new ways of working. It may also account for some of the reservations metals CEOs clearly feel about how agile their organisations are. Only 69% of those surveyed are confident that their leadership teams have the ability to lead significant change initiatives, compared with 84% of our global sample. And only

58% believe that their HR functions are equipped to handle any changes required to compete for talent, compared with 72% of respondents as a whole.

Finding people with multinational know-how is a particular problem. Seventy-four percent of metals CEOs place a high priority on global experience, compared with just 55% of their peers in other industries. But 79% of those who believe global experience is critical say that it is hard to hire people with the necessary qualifications, compared with 65% of respondents in other sectors. Metals executives also find it more difficult to recruit people with combined technical and business expertise and the courage to challenge the status quo.

In short, the results of our survey suggest that metals executives are acutely aware of the degree to which the business world is changing, as globalisation and connectivity transform the way we work. But they are cautiously optimistic about the prospects for growth in the short term and actively preparing to capitalise on any opportunities that emerge – be it through technological advances or international expansion.

Figure 4: Metals executives think technological innovation is their main source of competitive advantage



Source: PricewaterhouseCoopers 11th Annual Global CEO Survey

Carbon constraints slowly biting on the metals industry

Metals executives may worry less about climate change than their peers in other industries, but many of those who are concerned about the cost of meeting the regulations on carbon emissions are very concerned indeed (as our previous article shows). With climate change now high on the international agenda, more than 170 countries have signed up to the Kyoto Protocol, global carbon credit trading has reached \$60 billion¹ and the stock markets have started following the “carbon story”. So what is the regulatory outlook for the industry and the likely impact over the longer term?

Recent developments in carbon policy around the world

The regulation of carbon emissions is rapidly gathering pace. In December 2007, delegates from nearly 190 nations met in Bali to launch negotiations for a new pact to replace the Kyoto Protocol, when it expires in 2012. Developments have been taking place in other parts of the world as well.

The election of Kevin Rudd as Australia’s new premier has changed the direction of the country’s climate policy, and work on a multi-sector national emissions trading scheme is already underway. The Japanese government is also considering the creation of a carbon trading market, and Prime Minister Yasuo Fukuda is reportedly keen to implement a new climate-change policy before hosting a meeting of the G8 industrialised nations in July 2008.

There has been progress in the US, too. Several bipartisan bills to cut greenhouse emissions have been launched at federal level; Senators Jeff Bingaman and Arlen Specter introduced one such bill in July 2007, while Senators Joseph Lieberman and John Warner introduced another in October 2007. These are still a long way from passing into law but, with the election of a new US president in November 2008, climate change is likely to feature more prominently on the federal programme.

Eighteen US states have also set mandatory targets for cutting greenhouse gases and some have banded together to tackle the challenge, with cooperative efforts like the Regional Greenhouse Gas Initiative (RGGI). The seven North Eastern and Mid-Atlantic states involved in the RGGI will introduce a cap-and-trade scheme in 2009 (although it will only apply to power generation at first), and other regional organisations are planning to follow suit.

Meanwhile, the European Commission has released its proposals for updating the European Union Emissions Trading Scheme (EU-ETS) after 2012, together with various policies for promoting renewable energy and carbon capture and storage. In Europe, at least, the regulatory horizon for managing carbon emissions has thus become a little more visible. This is crucial in encouraging companies to invest in cleaner technologies and products, as carbon prices can affect both operational and infrastructure investment decisions.

¹ Reuters, “Global carbon trade rose 80 pct last year” (January 18, 2008). Available at <http://uk.reuters.com/article/environmentNews/UKN1832831820080118> (accessed March 14, 2008).

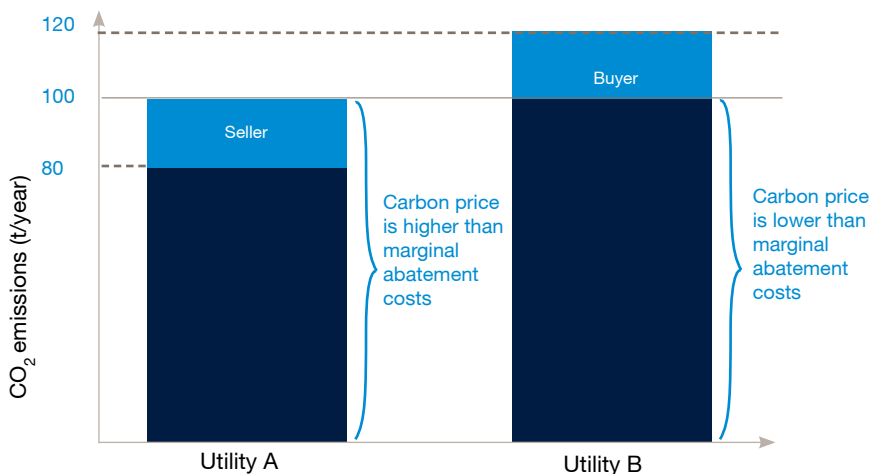
How the EU-ETS works

The EU-ETS, a mandatory cap-and-trade scheme introduced in 2005, remains the cornerstone of European policy efforts to regulate carbon. The scheme works by setting a cap on the emissions each country can produce, splitting these allocations into individual permits and enabling companies that reduce their emissions to sell their surplus allowances to other organisations (see Figure 1). It covers about 40% of the EU 27's emissions and applies to over 11,000 industrial installations. Iron and steel facilities account for an estimated 11% of the total volume of allowances in the system (which is equivalent to about 220m tonnes a year).

The EU-ETS has been divided into three distinct phases. Phase 1 covered the period 2005-2007; Phase 2 will run from 2008 to 2012; and Phase 3 is expected to cover the years 2013 to 2020, at which point the European Commission proposes to include carbon dioxide (CO₂) and perfluorocarbon emissions from aluminium producers.

However, Phase 1 was not entirely successful. The principal method of allocation used by the European Commission involves granting allowances for free, typically on the basis of historical emissions data (an approach known as “grandfathering”). But a combination of poor data and lack of transparency meant that some countries secured such generous caps in the first phase that they did not need to reduce their emissions. Once the extent of the over-allocation was clear, spot prices for surplus emissions allowances plummeted (see Figure 2).

Figure 1: Cap-and-trade systems establish the total number of permits and let the market determine the price



Source: PricewaterhouseCoopers

Figure 2: EU-ETS allowance prices during Phase 1



Source: Bloomberg

Many analysts therefore denounced the EU-ETS as a failure, although this seems somewhat harsh. One of the main aims of Phase 1 was to establish a functioning market – and it has certainly succeeded in that respect. Traded volumes have grown strongly each year; in 2007, the market traded an estimated 1.6 billion tonnes – 80% more than in 2006. The participation of financial institutions such as investment banks and hedge funds has bolstered liquidity, and speculative trading far exceeds the compliance needs of the natural players.

The European Commission has also recognised that, if carbon trading is to work, emissions allowances must be fundamentally scarce. So it has been much more stringent in approving the national allocation plans submitted by all the member states to determine their overall emissions caps in Phase 2. Forward carbon prices have risen accordingly; as Figure 2 shows, the cost of carbon in Europe currently ranges between €21 and €24 per tonne of CO₂.

The impact of the EU-ETS on iron and steel producers

So how have iron and steel producers fared under the EU-ETS to date? In Phase 1, many companies received generous allocations and were able to realise significant value from selling their surplus allowances before the price crash. But they have also had to absorb higher wholesale energy prices, because the energy generators have passed through their carbon costs. In addition, a number of energy-intensive industries have begun to feel the competitive effects of a global marketplace with an uneven playing field in respect of carbon regulation.

During consultations over the future design of the EU-ETS, the European Federation of Iron and Steel Industries (Eurofer) and other associations representing energy-intensive industries highlighted some of the side-effects arising from emissions trading in industries heavily exposed to international competition.

In particular, they argued that the scope for achieving significant abatement was limited, given the prevailing steelmaking technologies, as was the ability to pass on carbon costs – either direct or indirect – to consumers. They also claimed that higher costs could affect the industry’s investment choices and decisions about where to locate new plant over the longer term. This is known as the risk of “carbon leakage”.

Many European steelmakers favour greater use of benchmarking as an allocation tool within the EU-ETS, and a more global and sector-based approach to carbon regulation. This was the position articulated by the International Iron and Steel Institute (IISI) at the Bali Conference. The IISI has already consulted its members, including those in developing countries, and begun to formulate a common framework for centralised collection of CO₂ performance data to benchmark plant performance and develop intensity-based targets. But it remains to be seen how successful such sector-based approaches will be.

The European Commission is also exploring a “carbon equalisation system”, under which importers of energy-intensive products into the EU would be required to pay a form of border tax to put them on an equal footing with European producers. However, any such proposal is likely to face significant obstacles under the rules of the World Trade Organisation.

In the longer term, though, technological advances could ameliorate the situation – and there has already been progress in this area. The Ultra Low CO₂ Steelmaking initiative (ULCOS), a five-year European R&D programme established in 2005, is analysing new solutions to achieve a 50% reduction in emissions from primary iron production. Key areas of research include new blast furnace designs that will recycle and capture the CO₂ from the furnace top gas and the substitution of natural gas or hydrogen for coal in the reduction process.

The ULCOS initiative will also consider the possibility of retrofitting different carbon capture and storage (CCS) options to existing iron and steelmaking installations. But there are many challenges, both technological and commercial – in particular, those regarding the wider future of CCS within the European energy policy framework and the applicability of ULCOS technologies to the developing world.

The position of US steelmakers

European steelmakers are not alone in pushing for a global approach to regulation. The US House of Representatives Subcommittee on Energy and Air Quality is currently evaluating the implications of introducing a federal climate change programme, and US steel producers argue that any such programme should take account of manufacturing practices in developing economies like China and India.

At a meeting of the House subcommittee in March 2008, for example, a spokesperson for the American Iron and Steel Institute and the Steel Manufacturers Association advocated the use of “carbon intensity standards”, which would set an upper limit on the greenhouse gases that could be emitted for every tonne of steel consumed in the US, whether domestically produced or imported. However, critics claim that such a system could lead to international trade tensions because foreign steel producers might see it as protectionism masquerading under the guise of environmentalism².

Realising carbon value in emerging markets

Yet, despite the difficulties in developing an equitable system for regulating carbon emissions, there has been considerable progress in project-based “carbon offsetting” over the past year. The Kyoto Protocol resulted in the development of a regulated market, under which governments or companies that are required to meet emissions reductions targets can offset their obligations by funding “clean” projects. But there are also a number of voluntary markets, such as the Chicago Climate Exchange, which are generally more flexible; they include reforestation, energy conservation and renewable energy programmes within their scope.

² Rory Carroll, “Steel industry offers climate change plan”, *Metal Bulletin*

In essence, “carbon offsetting” involves developing a robust hypothetical estimate of the emissions that would have been produced had a particular project not been completed and comparing that figure with the emissions attributable to the project itself. If abatement is deemed to have occurred, the result is the creation of a tradable commodity denoted by one tonne of CO₂.

But the value attributed to carbon credits varies hugely. The markets are highly diverse in terms of product characteristics, and quality can be difficult to determine. Over the last two years, the key growth area has been the Clean Development Mechanism (CDM) introduced under the Kyoto Protocol, since CDM credits have full “fungibility” (equivalence) with EU allowances and can be used for compliance or as risk-hedging instruments. Their value is also enhanced by relatively clear governance structures for project approval, verification of abatement activities and tracking of issued units.

The iron and steel sector is already beginning to capitalise on these opportunities. In February 2008, for example, Chinese steelmaker Anshan Iron & Steel announced a deal to sell 13m tonnes of carbon credits generated from various energy-efficiency improvements to the European Carbon Fund and Camco International³. Abatement activities involving the capture and conversion of blast furnace gas and coke oven gas are eligible, in principle, to receive carbon credits, and many other large Chinese and Indian steel producers are undertaking similar projects.

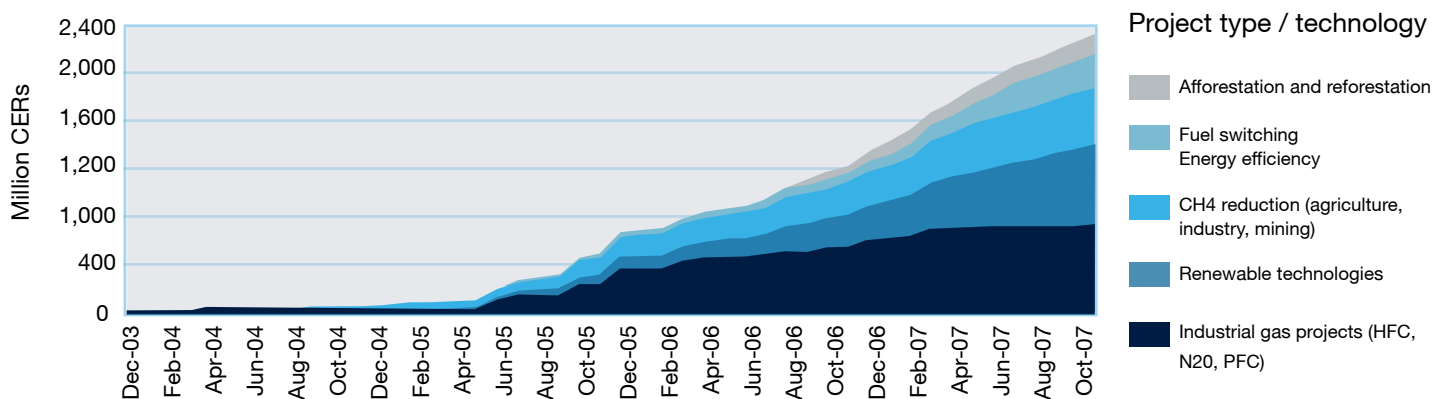
In spite of the significant risks involved in developing such projects and uncertainty over the final value that will be realised, the market is growing rapidly and has attracted a wide range of speculative financial investors, including investment banks, hedge funds and private specialist investors. Indeed, the secondary market for CDM credits was worth about €5.7 billion in 2007.

Figure 3 shows the growth in CDM projects since 2004 by technology group. At the time of writing, there are over 2,700 projects in the pipeline with a projected output of 2.35 billion tonnes of CO₂-equivalent up to 2012, although how much of this carbon credit volume will actually materialise and be transacted is subject to much speculation.

Conclusion

Executives in the metals industry are not blind to the implications of climate change, even if they worry less than executives in other industries about some of the commercial risks. A growing number of metals executives are now considering carbon regulation when they review their capital allocation plans and long-term corporate strategies. They are also beginning to take carbon assets and liabilities into account when engaging in M&A activity – recognising that the investor community may well require greater (and more comparable) disclosure on such issues in the future.

Figure 3: Growth of forecast certified emission reduction project pipeline by technology



Source: UNEP Risoe CDM/JI Pipeline Analysis and Database, March 1, 2008

³ “Anshan Steel sells greenhouse gas credits abroad”, *China Daily* (February 9, 2008). Available at http://www.chinadaily.com.cn/bizchina/2008-02/09/content_6446941.htm (accessed February 28, 2008).

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