



# DARTON COMMODITIES LIMITED



## Cobalt Market Review 2009

In a year that at the outset looked to be catastrophic for the price of cobalt, the blue metal's fortunes closely followed the wider commodity trends commencing with an early first quarter rally, primarily driven by China's voracious appetite for commodities. The combination of an extensive government stimulus package that doubled as a dollar sell and a commodity purchase and a dramatically reduced differential in price between cobalt in concentrates/intermediate form and refined metal resulted in prices moving from below USD 10/lb to USD 15/lb. This movement masked the pain that cobalt demand was actually going through with dramatic reductions in all applications, the worst hit being automotive and electronic related demand as consumer confidence collapsed. This pain eventually resulted in a consolidation in prices as demand from China slowed down and the realities of slack demand from the mature North American and European markets impacted. The rally in prices during the fourth quarter is generally attributed to speculative buying ahead of the LME cobalt contract launch in February, indeed Molybdenum is enjoying a similar rally.

As usual we endeavour to analyse the key factors that have affected the cobalt market during the year over and beyond the pricing movements detailed above. On the supply side the overall economic situation has delayed or indeed resulted in the cancelation of a number of new projects and negatively impacted several existing refined cobalt metal productions. Demand is beginning to show signs of recovery as de-stocking comes to an end and consumer confidence returns.

What to expect in 2010? Fundamentally the market seems well supplied with Chambishi back on stream and a number of other productions ramping up. If the improved demand picture is a dead cat bounce then prices will struggle to continue the current upward momentum. However if some of the more optimistic economic predictions come to pass then higher prices are probable, especially when perhaps as much as 40% of availability is in the hands of one market player. We believe the stock held in China is in relatively 'safe hands' therefore the real joker in the pack will be the launch of cobalt on the LME, a potential rocket or damp squib? Liquidity will always be the key and with only a handful of productions registered as we go to print volatility is certain.

As always we hope you enjoy the contents of this review and would welcome your feedback. Meanwhile all of us at Darton wish you and your families a happy, healthy and prosperous New Year.

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## Executive Summary

### Supply - Refined Cobalt Production

- Refined cobalt supply is estimated to have fallen 4,700 MT to approximately 51,810 MT in 2009, some 8.3% lower than the level seen in 2008. Cobalt metal production is estimated to have been cut by just over 2,000 MT, as significant reductions in output by Chambishi, Vale Inco and Xstrata were offset by substantial increases at Katanga Mining and Minara Resources.

### Supply - Key Developments

- The global financial crisis has had a significant impact on the cobalt supply structure during 2009. The suspension of DRC mining operations led to substantial cutback in the production and exports of cobalt concentrates. While CAMEC operations resumed by end of March, an estimated 3,000 MT of unrefined cobalt production was lost in the DRC during the first quarter of 2009.
- Refined metal output at Chambishi Metals restarted in November 2009 following an 11 month closure of its mining and smelting operations - losing over 2,000 MT of metal output as a result.
- Refined output at non-African producers has been estimated to be down for the year due to a reduction in third party feed supply (Xstrata), the closure of the Ravensthorpe mine (BHP Billiton), a strike at mining and refining operations (Vale Inco) and reduced downstream demand for refined cobalt products (OMG, Umicore).
- Progress in the development of various cobalt projects has been delayed as mining companies focused on liquidity and cash retention and the mining contract revisitation by the DRC government impacted the development of some key mining projects in the country.
- The US Defense Logistical Agency sold 172 MT of metal during the first 10 months of 2009, its lowest sales figure since it commenced selling cobalt from its stockpile in 1992. 256 MT of cobalt remains in stock as per November 30, 2009.

### The China Factor

- During Q1 2009, some 20-30% of Chinese refining capacity was suspended as both domestic demand and export orders collapsed. While downstream demand has gradually recovered in Q2, estimates for 2009 suggest that total refined output fell 5% to 17,400 MT.
- 2009 imports of cobalt increased 34% year-on-year to an estimated 28,000 MT. While the import of ores and concentrates only increased marginally, Chinese customs recorded a dramatic increase in metal imports (4,948 MT /+ 358%) and substantially higher imports of cobalt in intermediate form (3,870 MT /+ 61%).
- The surge in imports has fed speculation on excessive stock building in China. With a net apparent demand of some 23,000 MT and actual estimated demand of 15,500 MT, stocks of cobalt containing materials may indeed have risen above 10,000 MT when taking into account 2008 year-end stocks.

### Demand

- Demand fell some 2,5% in 2008 and estimates suggest that demand dropped a further 9.7% during 2009, falling to 49,300 MT. While practically all consuming sectors were impacted by supply chain destocking and a continued decline in downstream demand, recent market data suggests that some sectors experienced a stronger than expected demand recovery during the second half of 2009 albeit from low levels. The demand for battery materials recovered during the third quarter due to restocking and a recovery in battery sales and super-alloy manufacturers are seeing fragile shoots of recovery in key consuming sectors.

### Prices

- During 2009 cobalt prices averaged \$15.96/lb. and \$17.25/lb. for low and high grade, respectively 56% and 55% down from the averages recorded for 2008. By end February cobalt metal traded at its lowest point for the year, \$10.95/lb and \$12.00/lb. for respectively low and high grade. Following three distinct price cycles, market prices ultimately recovered to annual peak levels of \$20.00 and \$22.00 by mid November.



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### 1.0 Supply

#### 1.1 Global Refined Cobalt Availability in 2009

While global refined cobalt output saw a 5.3% year on year increase during 2008, peaking at just over 56,500 MT, estimates for 2009 suggest that refined cobalt supply fell by 4,700 MT or 8.3% during the year to 51,810 MT. This estimate, based on published first half production data and second half production forecasts, suggests that during 2009 refined cobalt availability has fallen back to a level last seen in 2004.

Total output of CDI member companies is estimated to have fallen by some 5,500 MT or 19% in 2009. Significant reductions in metal production were seen at Chambishi, Vale Inco and Xstrata with a combined loss in output of roughly 4,000 MT. Another 1,000 MT in refined output was lost as a result of production cuts at both Umicore and BHP Billiton. Combined output of non-member companies increased marginally compared to the year before with reductions at various producers being largely offset by the increase in refined metal output at Katanga Mining and Minara Resources. Despite the substantial production increases by the latter two, overall metal production during 2009 is estimated to have dropped by just over 2,000 MT, or 8% of total global metal production.

Refined Cobalt Availability								
CDI Member companies	2004	2005	2006	2007	2008	2009 H1	2009(E)	Difference y.o.y. in %
CTT, <i>Morocco</i>	1,593	1,613	1,405	1,591	1,711	825	1,500	-12%
Xstrata, <i>Norway</i>	4,670	5,021	4,927	3,939	3,719	1,609	3,000	-19%
ICCI / Sherritt, <i>Canada</i>	3,225	3,391	3,312	3,573	3,428	1,876	3,600	5%
Vale Inco, <i>Canada</i>	1,562	1,563	1,711	2,033	2,200	968	1,250	-43%
OMG, <i>Finland</i>	7,893	8,170	8,580	9,100	8,950	4,177	8,100	-9%
BHP Billiton, <i>Australia</i>	1,900	1,400	1,600	1,800	1,600	600	1,200	-25%
Sumitomo, <i>Japan</i>	429	471	920	1,084	1,071	507	1,200	12%
Chambishi, <i>Zambia</i>	3,769	3,648	3,227	2,635	2,591	34	280	-89%
Gecamines, <i>DRC</i>	735	600	550	606	300	204	400	33%
Eramet, <i>France</i>	199	280	256	305	311	198	400	29%
Umicore, <i>Belgium</i> <sup>(1)</sup>	2,947	3,298	2,840	2,825	3,020	1,100	2,300	-24%
<b>Total</b>	<b>28,922</b>	<b>29,455</b>	<b>29,328</b>	<b>29,491</b>	<b>28,901</b>	<b>12,098</b>	<b>23,230</b>	<b>-20%</b>

Non-CDI Member companies	2004	2005	2006	2007	2008	2009 H1	2009(E)	Difference y.o.y. in %
Tocantins, <i>Brazil</i>	1,155	1,136	902	1,148	994	398	800	-20%
Various, <i>China</i> <sup>(2)</sup>	8,000	12,700	12,700	13,245	18,239	6,926	17,400	-5%
Norilsk, <i>Russia</i>	4,524	4,748	4,759	3,587	2,502	1,157	2,300	-8%
Various, <i>India</i>	545	1,220	1,184	980	858	427	700	-18%
Mopani Copper, <i>Zambia</i>	2,022	1,774	1,438	1,700	1,250	693	1,400	12%
South Africa	300	214	257	307	250	120	250	0%
Kasese, <i>Uganda</i>	457	638	674	698	663	339	680	3%
Minara, <i>Australia</i>	1,979	1,750	2,096	1,884	2,018	1,084	2,500	24%
Katanga Mining, <i>DRC</i>	-	-	-	-	630	1,082	2,350	273%
<b>Total</b>	<b>18,982</b>	<b>24,180</b>	<b>24,010</b>	<b>23,549</b>	<b>27,404</b>	<b>12,226</b>	<b>28,380</b>	<b>4%</b>

Other Sources of Supply	2004	2005	2006	2007	2008	2009 H1	2009(E)	Difference y.o.y. in %
DLA Deliveries	1,632	1,199	294	617	203	93	200	-1%
<b>Total Supply</b>	<b>49,536</b>	<b>54,834</b>	<b>53,632</b>	<b>53,657</b>	<b>56,508</b>	<b>24,417</b>	<b>51,810</b>	<b>-8.3%</b>
Change year on year (MT)	4,641	5,298	-686	25	2,851	-	-4,698	-
Change year on year (%)	10.3%	10.7%	-2.2%	0.0%	5.3%	-	-8.3%	-

<sup>1)</sup> Includes / <sup>2)</sup> Excludes Ganzhou Yi Hao Umicore production

Refined Cobalt Availability – Source: '04 – '08 + H1 '09: Cobalt Development Institute / '09 (E) Darton Commodities Ltd.



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### 1.2 Supply 2009 - Key Developments

As the fallout from the global financial crisis began to take hold of the industry in the fourth quarter of 2008, the supply sector was faced with a rapid deterioration in downstream market demand and imploding market prices. In line with general trends seen across the resource sector, the cobalt industry was faced with production cutbacks and the freezing of capital expenditure, forcing it to put operations and projects under care and maintenance. A trend which has not only removed approximately 5,000 MT of output from existing refining operations during the course of 2009 but has also significantly trimmed earlier projections of new supply coming on stream and on to the market in 2009 and beyond. The following summarizes some of the key supply changes seen in the course of 2009;

#### 1.2.1 Africa

Mining operations in the copperbelt region of the Democratic Republic Congo (DRC) and Zambia were severely hit when the meltdown in the financial markets triggered a major global economic crisis, in turn resulting in an unprecedented drop in global demand for natural resources. In the DRC, holding approximately 34% of the global cobalt reserves, over 60% of the copper and cobalt mines were forced to shut their production, leaving over 300,000 people previously involved in industrial and artisanal mining unemployed. Production and exports of cobalt metal and concentrates saw substantial cut backs following the suspension of production at Central African Mining & Exploration Co. (CAMEC), Katanga Mining, Compagnie Minière du Sud Katanga (CSMK) in the DRC and Chambishi Metals PLC in Zambia.

- **Chambishi Metals PLC** in Zambia, Africa's largest cobalt metal producer in 2008, announced suspension of its smelter and mining operations in December 2008 as a result of deteriorating cobalt and copper prices, making operation of the DC furnace unviable. During the course of 2009 Chambishi re-positioned its operations away from the power intensive and relatively expensive DC furnace / slag process to a hydrometallurgical focused process. While initially scheduling a restart of production in May and then September, the initial lack of feed supply prevented operations to commence as scheduled. However, the acquisition of CAMEC in September by ENRC meant that Chambishi would be assured of a constant supply of cobalt / copper concentrates from CAMEC's Mukondo mine (the founding shareholders of ENRC owning International Mineral Resources, owner of the holding company of Chambishi Metals PLC). As a result, metal production recommenced in November with first metal having shipped from Zambia in December. While the company lost some 2,500 MT of cobalt metal production in 2009, it expects to ramp its production back up to 3,500 MT in the course of 2010.
- **Mopani Copper Mines**, majority owned by Glencore International, laid off some 1,700 miners as part of major cost cutting efforts at its Nkana and Mufulira mines. In April Mopani announced that it would stop production at the Mufulira mine and placed Nkana, its concentrator and cobalt plant under care and maintenance. Early May this decision was reversed following a gradual improvement of the copper price and lower production costs. Output is therefore expected to have been largely unaffected and at 1,400 MT slightly up from the level seen in 2008.
- **CAMEC** halted its cobalt and copper operations at its Mukondo mine and Luita plant in November 2008, resuming operations by late March 2009. While mining operations were suspended, production of concentrates continued using stockpiled feed. As a result, CAMEC produced 4,631 MT of cobalt in concentrates for the financial year ending March 2009, up 61% year on year. By October 2009, cobalt production is said to have climbed above 700 MT per month, at a time that CAMEC is completing the construction of its Luita SX/EW facility. Upon commissioning in Q1 2010, this facility is capable of producing some 8,000 MT of cobalt of which 3,200 MT in metal form and the balance in oxide form. During the commissioning period the metal is expected to be of 99.3% purity but the company is targeting to upgrade to four 9's purity once in full production.



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Following the acquisition of CAMEC by ENRC in September 2009, it is expected that CAMEC will supply Chambishi Metals in Zambia with cobalt / copper concentrates from its Mukondo mine and the Kakanda concentrator. In the meantime, supplies will continue to China's Zhejiang Galico Co & Ni Materials Co Ltd., who signed an exclusive off-take arrangement with CAMEC in July 2009.

- **Katanga mining** reported production of 1,710 MT cobalt metal at its Luilu processing plant for the first nine months of 2009. This would suggest that refined cobalt output is likely to reach 2,360 MT for the whole of 2009, significantly up from the 630 MT produced in 2008 but still well below earlier company estimates of 4,000 MT. In September 2009 Katanga announced its intention to accelerate the ramp-up of its project by almost two years to Q2 2011, compared to a previous completion date of Q1 2013. By that time capacity of the project will have increased to 8,000 MT of cobalt, through the refurbishment of existing facilities and infrastructure at the Kamoto Concentrator and the Luilu Refinery. The move to accelerate came after it received a significant cash injection from a share placement earlier in the year. In April, at a time that the cash strapped mining company was at the brink of collapse, Katanga received an additional \$250 million in funding from its main shareholder Glencore. This additional funding, rigorous cost cutting measures and a recovery in copper and cobalt prices resolved the apparent cash flow problem that it was faced with earlier in 2009.
- **Kasese Cobalt Mining Co Ltd** announced in November that it will not be selling any cobalt into the market in 2010, during which it is expecting to produce some 700 MT of cobalt metal. While this is at a similar level to that of 2009, sales of metal through Austrian based MFC Commodities ceased during the second quarter this year, resulting in a metal stock buildup of over 400 MT by the end of this year. The company is in discussion with various parties about the metal according to company officials but is not disclosing any further details. Meanwhile the company is in negotiations to take feed from the tailings at the nearby Kilembe Mines, which would ensure a continuation of future metal production as Kasese's current tailings are due to run out in 2013.

### 1.2.2 Rest of world

- Production estimates for **Umicore** and **OMG**, the world's largest cobalt refiner, suggest that overall refined output at the two companies may have fallen by as much as 10 and 20 percent respectively. A sharp drop in downstream demand from the rechargeable battery, construction and automotive markets has led to an overall reduction in sales volumes and ultimately refined output. The impact on sales volumes was amplified by extensive downstream de-stocking during the first six months. OM Group saw net sales fall 58% in the first nine months of 2009 as a result of lower cobalt prices and end-market demand. The Advanced Materials division still saw a 23% drop in the third quarter compared to the same period last year. While OMG is seeing 'encouraging demand trends in some of its key markets', challenging market conditions remain, especially for the automotive and construction sectors. At Umicore, refining and recycling throughput of cobalt fell by some 50 % during the first half year. The weaker offer of scraps and raw materials and a significant cut in overall industrial activity led the company to idle its refining operations in Olen for several months during the first half of 2009. While it saw an improvement in refining operations during Q3, particularly in China, refined output currently remains well below prior year levels.
- **BHP Billiton** saw some significant changes to its cobalt related operations during 2009;
  - It first announced an indefinite suspension of the Ravensthorpe nickel-cobalt mine in January in an attempt to battle the collapse in commodity metal prices. The mine was scheduled to feed the Yabulu refinery with an additional 1,400 MT of cobalt during 2009 but following the Ravensthorpe closure the refinery resorted to treating third party materials only. While Yabulu has an annual production capacity of some 2,700 MT of cobalt in an oxide / hydroxide form, 2009 production estimates suggest that output has not exceeded 1,200 MT.



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- In July, BHP Billiton announced the sale of its Yabulu nickel and cobalt refinery to Australian mining magnate Clive Palmer who is currently operating the refinery under the name of Queensland Nickel.
- In August, BHP Billiton announced the ending of the tolling arrangement with Xstrata, under which it shipped mixed Ni / Co sulphides from its Kiwana refinery to Xstrata's Nikkelverk refinery for conversion into nickel and Falconbridge grade cobalt metal. As a result, BHP Billiton withdrew itself from the cobalt spot market into which it previously sold some 700-800 MT of Falconbridge cobalt on an annual basis. It is believed that (part of) the mixed Ni / Co sulphides from Kiwana are currently shipped to China to feed Jinchuan refining operations.
- By mid December BHP Billiton announced the sale of its Ravensthorpe mine to Canadian mining company First Quantum Minerals for \$340 million, following an asset sales process which also attracted interest from both Minara Resources and Jinchuan.

- **Xstrata** produced 6% less cobalt in 2008 due to a reduction in cobalt-content feed to its Nikkelverk refinery. During the first 9 months of 2009, the total amount of cobalt derived from Xstrata's own mining operations was 1,051 MT, up marginally from 2008. However, Xstrata is largely dependent on third party feed material for its cobalt refining operation in Norway and during the first 6 months Nikkelverk saw a 16% reduction in the intake of third party feed. This is believed to have fallen further during the second half, primarily due to the ending of the BHP Billiton tolling arrangement. As a result, refined output of cobalt metal by Xstrata is estimated to have fallen to just under 3,000 MT for 2009, approximately 20% lower than in 2008.
- **Sumitomo Metal Mining (SMM)** announced in June that its second nickel / cobalt processing plant at Coral Bay in the Philippines has ramped up to full commercial capacity. This unit joins another plant at the Coral Bay complex, taking total processing capacity to some 22,000 MT of nickel and 1,800 MT of cobalt metal. Total cobalt metal production for 2009 is estimated to be around 1,200 MT.
- **Vale Inco** lost a significant part of its annual cobalt production after about 3,200 workers at its Sudbury operations went on strike in mid-July, followed by the strike in August of a few hundred workers at its Voisey's Bay operations. While discussions between unions and the company are ongoing, there appears to be an impasse on several key issues and no resolution is in sight. The company meanwhile has been training non union workers to restart the Sudbury nickel smelter but there is currently no timeline for when that might happen. It is believed that the company is losing up to 200 MT of cobalt metal production per month as a result of the strike, accumulating to as much as 1,000 MT of lost metal production for 2009.
- **Minara Resources** production dropped 11% during the first quarter to 450 MT compared to the three months before. However, with second quarter output at 634 MT and third quarter output at a record 754 MT, Minara's cobalt metal output is estimated to reach just over 2,500 MT for the year, up 24% from 2008.

### 1.2.3 New projects - progress update

Much of the additional refined cobalt output that was scheduled to come on stream in the course of 2009 has been delayed as producers have cut capital expenditure and are struggling with cost overruns and technical complications related to feed and processing issues. A significant part of the incremental cobalt production that was initially scheduled for 2009 is now being delayed into 2010 and beyond.

- **Tenke Fungurume Mining** is developing the **Tenke Fungurume** project which is believed to hold the largest undeveloped cobalt / copper ore body known today. The project, owned by Freeport-McMoran (operator, 57.75%), Lundin Mining (24.75%) and Gecamines (17.5%) entails an open pit mining operation with expected annual production capacity of 8,000 MT of cobalt in hydroxide form. Production of the first copper cathode was achieved in March 2009 and full commercial production is expected in the second half of 2009.



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The cobalt plant was commissioned in the third quarter and while it had to cope with several start-up issues, production of its first cobalt hydroxide (44% contained cobalt) commenced in the fourth quarter. Deliveries are now being made to Chambishi Metals in Zambia, Jinchuan and a number of other Chinese refiners. Meanwhile discussions are ongoing with the DRC government to address the ongoing mining contract review. The government is revisiting the initial mining agreement in which it is looking to increase its stake and the partners in the Tenke project were given a deadline of October 12 to complete negotiations with the government or risk losing their mining permit. The deadline has passed and negotiations are still said to be ongoing.

- First Quantum Minerals announced in September suspension of construction at its **Kolwezi Tailings Project** in the DRC in which the company has a 65% stake. The suspension followed the issuance of an order by the General Prosecutor of Katanga to seal the Kolwezi facilities. The DRC mining contract revisitation resulted in the cancellation of Kolwezi's exploitation permit. While the company continues to seek a negotiated solution with the DRC government it is currently preparing for international arbitration in an attempt to have the decision revoked. At the time of closure, construction of the project was at an advanced stage (approximately 74% complete) and on schedule to be commissioned in May 2010. Initial production rates are estimated at 7,000 MT per annum of cobalt in hydroxide form, with a planned ramp up to 12,000 MT within 12 months following commissioning.
- **Ruashi Mining**, operated by Metorex has commissioned the Ruashi Phase II cobalt plant in February but ramp up has been slow due to liquidity issues and the company is currently looking for a strategic partner in China to secure the finances to fund the \$100 million higher than expected costs to further develop the DRC Ruashi project. Total Phase II production was 720 MT of cobalt contained in carbonate since the February start up. Upon completion of the Ruashi Phase II plant, annual cobalt output could ultimately grow to 3,500 MT in hydroxide form.
- At the **Ambatovy** project in Madagascar, owned and operated by Sherritt International (40%), Sumitomo Corp., Korea Resources Corp. (both 27.5%) and SNC-Lavalin Group (5%), engineering and construction continued, increasing project expenditures to US\$3.1 billion during the first 9 months of 2009. Mechanical completion of the Ambatovy Project is said to be on schedule for the end of 2010, after which it will ramp up production to 60,000 MT of nickel and 5,600 MT of cobalt in powder and briquette form.
- Vale Inco has commenced mining at its lateritic nickel deposit of the \$4.3 billion **Goro** project, located on the South Pacific island of New Caledonia. However, construction of the processing plant has been delayed and is not expected to be completed until early 2010, after it will have a nominal production capacity of 60,000 MT of nickel and 4,600 MT of cobalt. Production in 2010 is expected to be approximately one third of this capacity, equating to roughly 1,500 MT of cobalt in carbonate form. Vale Inco aims to ramp up to full production by 2013 but there are growing concerns that the technology employed by Vale Inco at Goro (a high-temperature, high-pressure and high-cost acid leaching technology), may lead to difficulties and delays in reaching its production targets.

### 1.3 DLA (US Defense Logistical Agency)

During the first 10 months of 2009 the DLA sold 172 MT of cobalt metal from its strategic stockpile and total sales are therefore not expected to exceed 200 MT for the full calendar year, the lowest sales figure for more than 10 years. As per November 30 2009 the DLA's strategic cobalt stock had dropped to 564,310 lbs or 256 MT of high grade cobalt cathodes, down from nearly 100 million pounds when it first started selling cobalt in 1992. It is expected that the balance stock will be depleted by late 2010 or in the course of 2011.



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### 1.4 Supply - The China Factor

During 2007, the Chinese cobalt industry was faced with a structural tightness in the availability of raw materials to feed its refining operations. This eventually led to record prices for refining grade cobalt, ultimately restricting growth in Chinese refined output to 13,245 MT for the year. The availability and thus imports of refining materials grew dramatically during the course of 2008 and combined with stronger downstream demand, refined cobalt supply in China increased 38% to 18,239 MT in 2008 (CDI estimate). However, by the end of 2008 China had seen a rapid deterioration in downstream demand for cobalt based chemicals and alloys. This slowdown continued well into 2009 as both domestic demand and export orders collapsed, resulting in a suspension of between 20-30% of refining capacity by the end of Q1 according to CRU estimates. While downstream demand showed robust signs of recovery during Q2 resulting in a sharp rise in the import of refining materials, it is estimated that total Chinese refined output dropped almost 5% to approximately 17,400 MT in 2009.

#### Cobalt Imports into China, Jan-Nov 2009

Product	2009											Total Qty YTD	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov		
Cobalt Acetate	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt Carbonate	-	-	2	2	-	2	1	-	-	-	-	-	7
Cobalt Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-
Alliage Blanc*	94	89	208	35	266	36	62	41	137	134	308	1,410	
Cobalt Metal**	41	105	435	512	670	674	480	546	585	319	181	4,548	
Cobalt Nitrate	2	-	-	-	-	-	-	-	-	-	-	-	2
Cobalt Ores	785	638	596	959	1,203	1,316	1,386	1,041	2,561	1,814	2,221	14,520	
Cobalt Oxide & Hydroxide	13	6	31	107	84	141	21	159	90	46	46	744	
Cobalt Sulphate	2	1	4	12	15	5	23	2	19	-	10	93	
Cobalt Waste & Scrap	-	-	-	-	-	-	-	-	-	-	-	-	-
Intermediate Cobalt 1	288	131	248	204	85	288	432	279	503	438	759	3,655	
Intermediate Cobalt 2***	25	53	49	59	233	87	-	168	63	34	73	844	
Other Cobalt	9	7	9	9	7	7	7	8	8	14	8	93	
<b>Total Imports</b>	<b>1,259</b>	<b>1,030</b>	<b>1,582</b>	<b>1,899</b>	<b>2,563</b>	<b>2,556</b>	<b>2,412</b>	<b>2,244</b>	<b>3,966</b>	<b>2,799</b>	<b>3,606</b>	<b>25,916</b>	

#### Cobalt Imports into China, 2007-2009

Product	Jan-Dec 2007		Jan-Dec 2008		Y.o.y. change	Jan - Dec 2009 (Estimate)		Y.o.y. change
	Quantity (KG)	Co cont (MT)	Quantity (KG)	Co cont (MT)		Quantity (KG)	Co cont (MT)	
Cobalt Acetate	-	-	-	-	-	-	-	-
Cobalt Carbonate	456,146	205	32,787	15	-93%	19,207	9	-41%
Cobalt Chloride	-	-	-	-	-	-	-	-
Alliage Blanc *	4,512,444	1,128	7,742,875	1,626	44%	7,123,252	1,496	-8%
Cobalt Metal **	1,550,937	1,543	1,086,613	1,081	-30%	4,972,452	4,948	358%
Cobalt Nitrate	12,830	2	3,902	1	-	5,330	1	37%
Cobalt Ores	118,353,215	7,693	254,735,955	15,284	99%	264,017,890	15,841	4%
Cobalt Oxide & Hydroxide	518,214	337	475,216	285	-15%	1,251,475	751	163%
Cobalt Sulphate	157,836	24	165,254	33	40%	503,789	101	205%
Cobalt Waste & Scrap	-	-	-	-	-	-	-	-
Intermediate Cobalt 1	13,544,576	2,709	14,590,032	2,407	-11%	23,451,857	3,870	61%
Intermediate Cobalt 2 ***	-	-	-	-	-	1,970,000	928	-
Other Cobalt	111,983	105	206,039	200	90%	103,227	100	-50%
<b>Total Imports of Co (MT)</b>		<b>13,746</b>		<b>20,932</b>	<b>52%</b>		<b>28,043</b>	<b>34%</b>

Source: General Administration of Chinese Customs, Co contents estimate Darton Commodities Ltd. -

\* Assumes DRC imports with HS Code 81052090 is primarily in Alliage Blanc form - except for certain tonnage reported as Co metal ex-Katanga

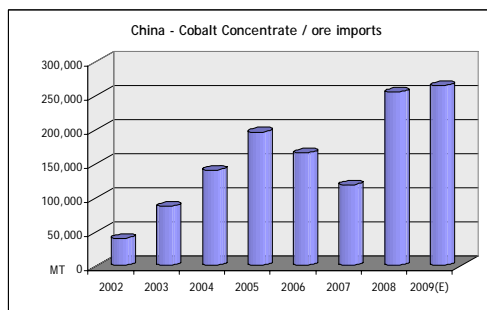
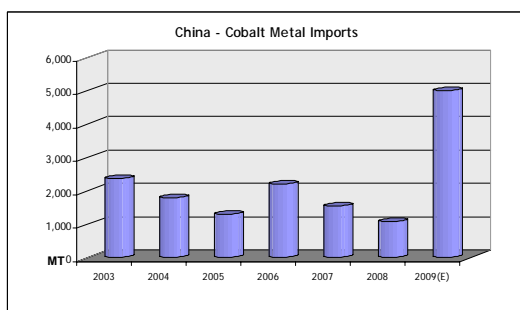
\*\* Assumes non-DRC imports with HS Code 81052090 to be in metal form, except Australian imports by Jinchuan as reported under

\*\*\* Intermediate Cobalt 2' = combined CoHO and mixed Ni/Co sulphide



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- Total cobalt imports increased an estimated 34% during 2009, to approximately 28,000 MT. While imports fell sharply during the first quarter in response to a dramatic cutback in African concentrate production and faltering downstream demand, imports quickly recovered during the second quarter. This trend continued into the third quarter with total cobalt imports already up 123% from the level seen in quarter one. Although the total import of cobalt in concentrates is estimated to have increased marginally in 2009, a massive increase in the imports of metal and intermediates ultimately contributed to an annual increase of 7,100 MT of cobalt contained.



Source: General Administration of China customs / Darton Commodities estimates

- Imports of cobalt in intermediate form grew 61% year on year, of which more than 90% originated from the DRC. The strong growth in DRC exports of cobalt intermediates can be linked to DRC government efforts to force companies to produce value-added processed products inside the country.
- Metal imports will have increased to almost 5,000 MT in 2009, a dramatic increase of 358% compared to the year prior. Various factors have contributed to this surge in metal demand;
  - The reduction in DRC concentrate exports during the first quarter led to relatively high market prices for concentrates, narrowing the price differential with metal. This in turn led various refiners to substitute concentrates with metal as raw material in their production processes.
  - China's RMB 4 trillion (US \$585 billion) stimulus plan, a surge in bank lending (\$1,270 billion over the first 9 months of 2009 - up 149% on the year before), and the government stockpiling program all helped to restore optimism about China's economic recovery and growth rate, leading to an extensive period of commodity restocking. While it is believed that a significant portion of the cobalt metal imported into China has been bought speculatively and has been stockpiled rather than processed, there is no data available to make an accurate estimate of the stocks of metal that have accumulated over the year.
  - Jinchuan Group Ltd, China's largest cobalt metal producer had to significantly reduce its cobalt output due to raw material supply issues. Jinchuan reduced its imports of concentrates earlier in the year in anticipation of supplies commencing from Freeport McMoran's Tenke Fungurume project. However, the company experienced technical problems with adjusting its processing facilities to the hydroxide material and idled some of its production to make some necessary process alterations. Jinchuan's production in 2009 is estimated to have dropped below 4,500 MT, significantly lower than the 6,445 MT it claims to have produced in 2008. To feed its refining operations, Jinchuan consumed an estimated 1,300 MT of domestically mined cobalt ore, imported 1,500 MT of cobalt in concentrates from the DRC and roughly 930 MT in refining material from Australia. In addition to lower metal production Jinchuan chose to export a relatively large share of its metal production (2,200 MT of Co in 2009), leaving the domestic market hungry for Jinchuan cobalt metal, in turn resulting in the re-importing of Jinchuan metal into China (approximately 400 MT).



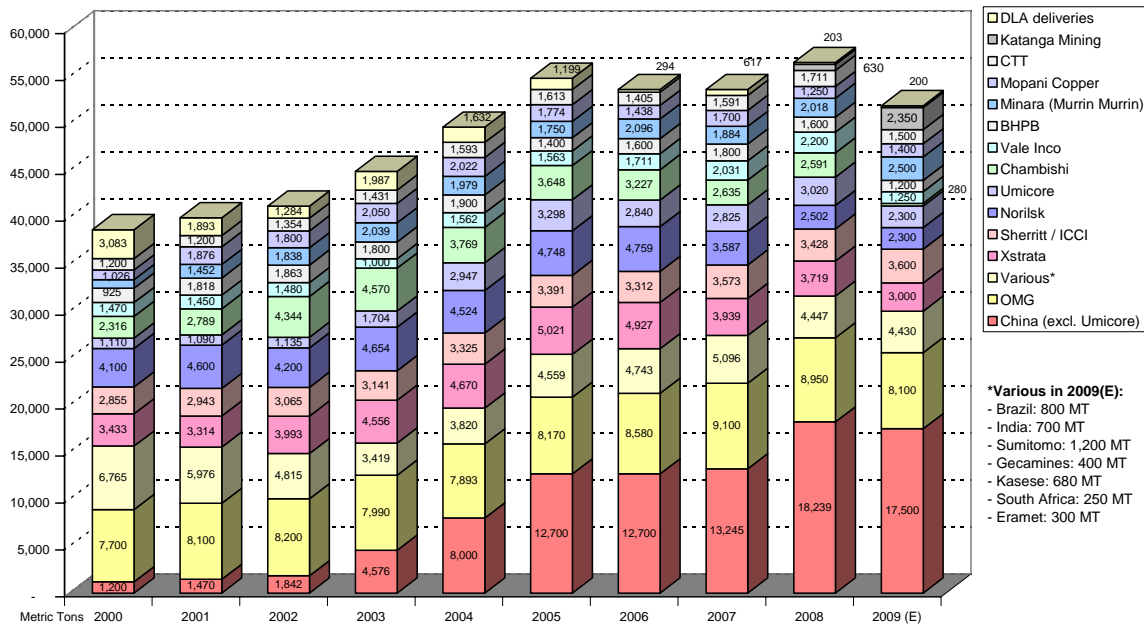
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- The surge in cobalt imports has led to much speculation on the possible build-up of cobalt stocks during the course of 2009. Estimates by various industry sources suggest that China may have accumulated up to 12,000 MT of cobalt containing materials in a mixture of metal, concentrates and intermediates. Calculating net apparent demand basis the available import and export data and offsetting this against an estimated annual Chinese consumption of approximately 15,500 MT, it is evident that stocks may indeed well exceed 10,000 MT, when taking into account 2008 year-end stocks (estimated at 3,000 - 4,000 MT) and the fact that this calculation does not account for secondary cobalt processed in the form of wastes and scraps.

Chinese Apparent Cobalt Demand 2009	
Local mine production	1,300
Imported feed:	
- Co in concentrates	15,840
- Co in alliage blanc	1,496
- Co in (crude) salts	860
Intermediates	3,870
Jinchuan feed (CoHO / Ni/Co sulphides)	928
Less Umicore production	1,200
<b>Available to Chinese producers</b>	<b>23,094</b>
Imports of metal	4,950
Exports of metal	2,600
Exports of cobalt sulphate	2,100
Exports of other refined products	1,650
Plus Umicore production	1,200
<b>Net apparent demand China</b>	<b>22,894</b>

Source: Chinese customs / Darton Commodities Ltd estimates

Global Refined Cobalt Production



Source: Cobalt Development Institute + 2009 (E) Darton Commodities Ltd.

2.0 Demand

2.1 Demand - 2009

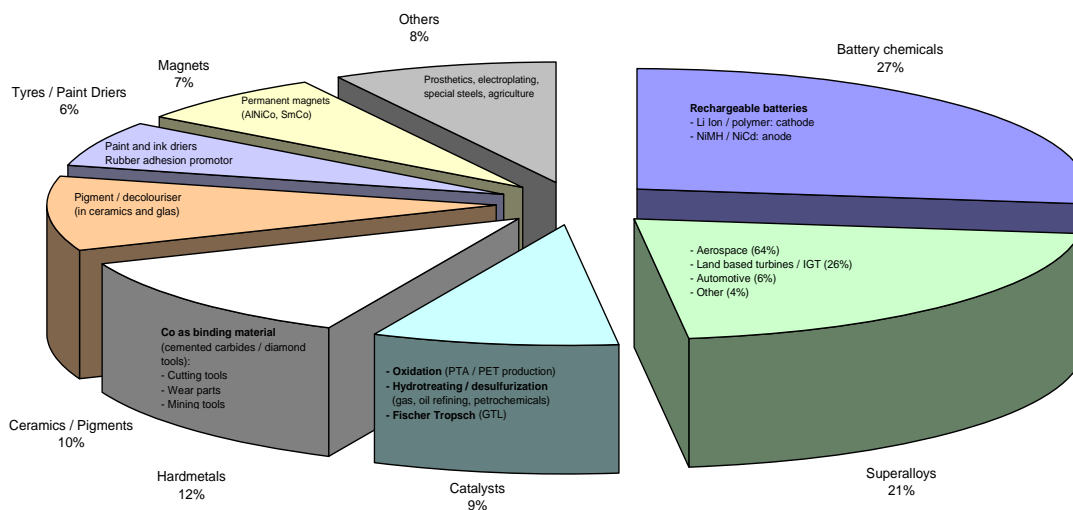
Cobalt demand during 2008 has been estimated at just over 54,600 MT of cobalt, down 2.5% from the estimated 56,300 MT consumed in 2007. Approximately 53% of this was consumed in the chemical sector, the balance in alloys, cemented carbide, diamond tools, magnets and specials steels. While the beginning of 2008 still saw reasonable demand growth in most of the cobalt consuming sectors, downstream demand slowed abruptly during the last few months of the year.



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The financial crisis turned into a full-scale manufacturing crisis with the strongest declines in industrial production occurring in export-based economies. In the three months following November 2008, global trade fell a staggering 17% and a sudden drop in orders from downstream users combined with excessive destocking drastically impacted demand in most key cobalt consuming sectors. For the first quarter of 2009, the annualized rate of decline in GDP was recorded at 14.4% in Germany, 15.2% in Japan, 7.4% in the UK and 9.8% in the Euro area. Japanese exports fell 28.7% during the first quarter, with US and EU exports dropping 12.1% and 10.5% respectively. The dramatic slowdown in end use demand and excessive destocking in the supply chain is thought to have impacted global cobalt demand by as much as 20-25% year-on-year in the first quarter. Second quarter demand gradually improved and economic indicators and trade data suggest that after a trough in May 2009, the majority of the world's economies, albeit still on government life-support, moved back into expansion territory during the second half of 2009. This in turn resulted in a world wide but fragile recovery in industrial production and whilst most sectors are still operating well below the peaks seen in early 2008, the majority of these sectors experienced a meaningful upturn in downstream demand during the second half. Overall, global demand is thought to have fallen by approximately 4,900 MT to 49,300 MT - a 9.7% drop year on year.

**Cobalt Demand by End Use 2008**



Source: Cobalt Development Institute / Darton Commodities Ltd

## 2.2 Demand 2009 - Key Developments by Sector

### 2.2.1 Superalloys

- Initial forecasts suggested demand from the superalloy sector would grow by some 4-5% in 2009, whereby aerospace related demand was to remain the primary growth driver as order backlogs for airplanes and aeroengines reached new record levels by early 2008. However, the commercial aerospace market was soon impacted by pushouts and uncertainties as the supply chain adjusted to revised commercial airplane build schedules and rapidly falling demand from the aeroengine aftermarket, in turn impacting order books in the superalloy sector.



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Producers of high performance alloys reported lower sales volumes across the board, due to reduced demand from most downstream sectors. Carpenter Technologies reported a year on year reduction in overall alloys sales volume of 50% during the April to June 2009 period, with aerospace volumes being 32% lower as a result of lower airplane build levels and excess inventory in the supply chain for jet engine components. Sales to the energy sector dropped 77% compared to the previous year, as a result of declining market demand and high inventory levels in the power generation market and automotive sales dropped 62% as a result of suppressed auto sales. Third quarter aerospace sales improved slightly as the supply chain inventory for jet engine materials became more balanced, resulting in order activity being more closely tied to actual usage. However, the sales volume of alloys to the energy sector dropped further, being 81% lower than in the same period last year.

A majority of superalloy producers believe that the overall decline in alloy sales seen during the first part of the year has bottomed out in the last quarter of 2009 and cautiously optimistic forecasts are made for 2010. Slow but gradual demand recoveries are expected, particularly in aerospace, as customer inventory destocking has slowed and production rates can align themselves again with current aircraft build rates.

- The airplane manufacturers' order backlogs are holding up well despite the dual challenge of a global recession and a weak aircraft financing market. Airlines, hit by weak traffic and low fares, are projected to lose \$11 billion worldwide for 2009. Yet assembly lines in Seattle and in Toulouse, France, have churned out nearly 1,000 new airplanes, a new record. Boeing and Airbus had a combined backlog of 6,849 aircraft at the end of November, equal to more than seven years of production at estimated 2010 rates. Excluding 787 and A350 backlogs, the industry still has almost six years worth of orders. Nevertheless, orders for new airplanes have dropped dramatically during 2009 whereby Boeing recorded net sales of 141 new aircraft by end December, versus net orders of 638 and 1,397 planes during 2008 and 2007 respectively. With a year to date net order book of 194 planes by end November 2009, Airbus orders were higher but still substantially below the 900 and 1,458 net orders recorded in 2008 and 2007. Many financial analysts believe that neither Boeing nor Airbus will be able to maintain current production schedules in 2010 and 2011 given the extent of the airline industry's financial woes. The International Air Transport Association (IATA) predicted in November that the global airline industry will lose another \$5.6 billion in 2010 due to lower passenger traffic and higher fuel prices.
- The power generation market has been experiencing a period of sustained growth, driven by growing demand for additional generating capacity. This in turn has stimulated demand growth for superalloys used in industrial gas turbines. Between 2000 and 2007 the gas fired power generation market more than doubled and while growth slowed significantly in 2008, market analysts suggest that the global market for industrial gas turbines is still anticipated to grow at a compound annual growth rate of 4.7% between 2008 and 2015. Yet superalloy producers have seen sales into this sector being impacted by customer re-scheduling and heavy destocking. Furthermore, a tighter credit market impacted the financing of big industrial turbine projects. However, by the end of 2009, inventory levels have stabilized resulting in a gradually increasing demand for parts and alloys serving the power generation market.

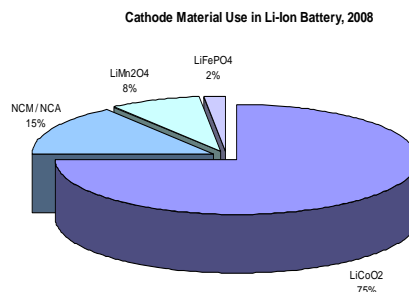
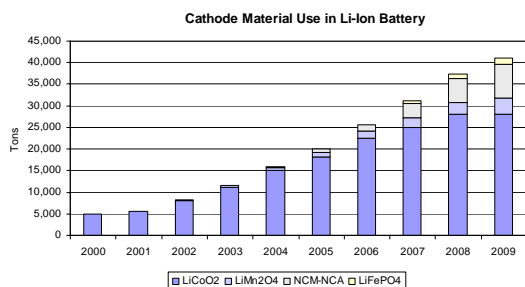
### 2.2.2 Batteries

- Demand for cobalt from the battery sector has been estimated at 14,100 MT during 2009, approximately 6% less than that consumed in 2008. While the market for Li-ion batteries continued to see double digit growth during the first half of 2008, global sales slumped dramatically during the fourth quarter following a sharp decline in consumer electronic sales, compounded by severe destocking throughout the supply chain. Anecdotal evidence suggests that some battery manufacturers cut raw material supplies by as much as 60% during the last quarter of 2008 in a response to deteriorating market conditions, a trend which continued into the first quarter of 2009.



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- Compared to the same periods last year, OMG reported a global drop in end use rechargeable battery demand of approximately 20% and 15% during respectively the first and second quarter of 2009. Third quarter demand saw a significant improvement from the second quarter, although from a low base, and OMG estimates that fourth quarter demand will have exceeded that of Q4 2008, primarily driven by strong demand growth for notebook and netbook computers.
- Over 90% of the cobalt currently consumed in the battery industry is in the production of lithium-ion batteries, with the balance used in NiCd and NiMH batteries. Roskill estimates suggest that the Li-ion battery market grew an average of 22% per year over the 2001-2008 period, contributing up to 60% of the year on year demand growth for cobalt. For the first time since 2001 this trend was reversed and global battery sales fell sharply during the last quarter of 2008 and first few months of 2009. Due to a robust recovery in sales during the second half (Samsung SDI reporting rapidly rising shipments in Q3, estimating a further 12% growth in Q4), it is estimated that overall battery sales will still see positive year on year growth in 2009. However, heavy destocking down the supply chain combined with accelerated substitution efforts have resulted in a year on year decline in demand for cobalt battery materials, subsequently resulting in negative demand growth for cobalt in this sector, the first decline recorded.



Source: Avicenne Developpement

- Substitution of the traditional LiCoO<sub>2</sub> (LCO) cathode material with mixed metal oxide materials continues, decelerating the long-term growth rate for cobalt demand in the battery sector. In 2005 over 90% of the cathode material used in Li-ion batteries was based on LCO (containing up to 60% of cobalt). This has rapidly dropped to 70% in 2008 and is estimated to have fallen further to around 64% in 2009. The replacement materials that are increasingly used are LiNiCoMnO<sub>2</sub> (NCM = 10-20% Co), LiNiCoAlO<sub>2</sub> (NCA = 10% Co), LiMn<sub>2</sub>O<sub>4</sub> (LMO) and LiFePO<sub>4</sub> (LFP), the latter two containing no cobalt. While the rate of substitution is expected to slow over the next few years, it is estimated that the use of LCO as cathode material for Li-ion batteries will drop to approximately 45% by 2013, while use of NCM and NCA will have grown to 34% and 10% respectively. In addition to the shift towards lower or no cobalt cathode materials, increased recycling efforts (EU target = 40% of batteries recycled by 2016) will ultimately reduce the amount of primary cobalt required.
- Whilst the use of rechargeable batteries for automotive applications (HEV, EV and PHEV) remains an important potential growth market, the actual usage of cobalt will strongly depend on the battery technology that will eventually dominate this market. While producers have yet to prove the Li-ion technology for HEV use on a large commercial scale, it is ultimately expected to become the dominant technology for HEV batteries. In December Sanyo Electric, the world's largest rechargeable battery producer announced winning two large contracts for the supply of Li-ion batteries to two large but unnamed automakers for use in HEV vehicles commencing 2011 (Sanyo is expected to use a mixed NCA/LMO cathode material in its batteries). Industry forecasts suggest that by 2015, NiMH batteries will still account for 70% of the battery systems in both mild and full hybrids.



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However, this will then rapidly change in the years following whereby lithium ion batteries should have close to 70% market share in this segment by 2020. Consequently, Sanyo estimates that global sales of hybrid cars using lithium-ion cells, including plug-in models, will grow to 2.3 million units by 2015 and 10.2 million by 2020.

Li-ion batteries are already predominantly used for full electrical vehicles (EV) and plug-in hybrid (PHEV) vehicles due to its superior power density. However, given that LiFePO<sub>4</sub> is expected to be most likely cathode material used in batteries for EV and PHEV applications, this strong growth market may present little or no demand growth for cobalt.

It is impossible to estimate the future use of cobalt in automotive battery applications with a high degree of confidence given the uncertainty surrounding penetration rates of HEV, PHEV and EV vehicles in the global car markets. Furthermore, there appears to be no clear winner in the ultimate choice of cathode type for automotive lithium ion batteries. Deutsche Bank estimated in its 2008 study 'Electric Cars; Plugged-in' that automotive related lithium ion battery demand may require 2,380 MT of cobalt in 2012, growing to 18,900 MT by 2020.

### 2.2.3 Hard Metals

- Approximately 6,500 MT, or 12% of global demand, is estimated to have been consumed in the hard metal sector during 2008, primarily as binder material in cemented carbide and diamond tool applications. It is believed that demand from this particular sector has seen the largest decline during 2009. Global destocking and severe demand cuts coming from the automotive, construction and mining industries hit demand for fine cobalt powders going into wear parts and diamond and cutting tools. During the first half of 2009 large tooling producers saw their orders down by 40-50% compared to 2008. On a year on year basis, OMG, one of the world's largest producers of fine cobalt powders, saw its powder metallurgy sales volumes fall by 72% and 55% in the second and third quarter respectively. Umicore reported a marginal improvement in the sale of fine powders during the third quarter but stated that sales volumes were still 35% below those seen in the same period last year as destocking continues at most major customers. As destocking is expected to have run its course during the fourth quarter, demand in this sector is expected to show further but gradual improvements during the first quarter of 2010. Nevertheless, conservative estimates suggest that overall demand from the hard metals industry for cobalt may have dropped by more than 2,000 MT or 30% compared to 2008.

### 2.2.4 Catalysts

- Just over 5,000 MT of cobalt was consumed by the catalysts industry in 2008, of which the majority was used in the production of polymerization catalyst. The market for purified terephthalic acid (PTA), which in turn is used in polyester fibers and polyethylene terephthalate (PET) packaging materials, saw healthy growth rates of 6-8% per year up until early 2008 when inventory reductions started to impact global sales. Demand continued to deteriorate as it was hit by a severe downturn in polyester fiber and PET resin markets and the collapse in energy and feedstock prices resulted in further inventory reductions. While the market for PTA catalysts started to show careful signs of a recovery during the second half of 2009, a major challenge that will continue to face the PTA industry is the growing threat of overcapacity caused by huge capacity additions of nearly 9 million tpa that are currently under development, mainly in China. More advanced recycling technologies and the increased regeneration of spent catalyst means cobalt consumption in this sector will grow more gradually than global PTA demand.
- The market for cobalt salts used in hydro-desulphurisation catalysts remained reasonably healthy as the oil refining industry intensified maintenance replacements on its installations. In previous years the soaring oil price was seen as a major driver for oil companies to fast-track the development of commercial gas to liquid (GTL) production facilities. However, the sharp fall in oil prices last year put pressure on liquid fuel substitutes, delaying further planning and development of the various scheduled projects.



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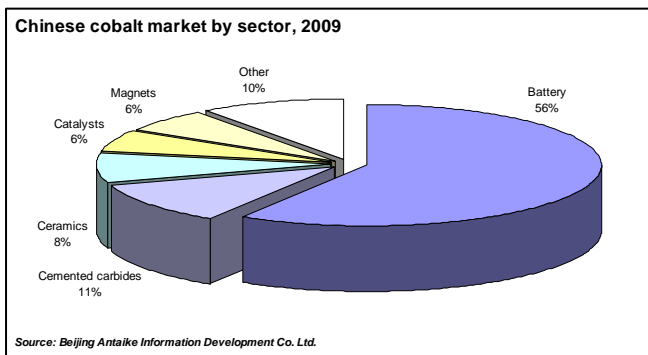
Sasol (Chevron) and Shell are the only two oil companies currently producing GTL products on a commercial scale. Construction of the \$18 billion, 140,000 bpd Shell Pearl Project in Qatar is on track and expected to be operational by end 2010, early 2011. The Sassol Oryx plant in Qatar is now close to producing at its 34,000 bpd capacity. In July of this year Sasol set up a new JV in Uzbekistan to develop a 40,000 bpd GTL production facility in the country.

### 2.2.5 Others

- All other cobalt consuming sectors have been more or less impacted by demand reductions in downstream markets following the outbreak of the worst global economic recession seen since the 1930's. As a result, demand cuts in the first half of 2009 were seen for AlNiCo and SmCo magnets, tire adhesion promoters (both heavily dependent on automotive industry), cobalt oxides for use in the glazing, ceramics and electronics industry, as well as in high speed and tool steels for use in the construction and building sector. One application bucking the trend has been the medical alloy sector. The use of cobalt in this application continued to grow as a result of higher demand for CoCrMo alloys used to form orthopedic implants, in turn driven by the rapid growth in implant procedures in the EU, US and Japan due to the ageing population.

### 2.3 Demand - The China Factor

In November, Beijing Antaika Information Development Co. Ltd, estimated 2009 cobalt demand in China at 15,500 MT, a level similar to that seen in 2008. This represents a significant slowdown from the double digit growth rates seen in previous years (+15.8% during 2006-2007 period).



Consumption of cobalt for the production of battery chemicals is expected to have risen above 9,000 MT in 2009, or 59% of total Chinese demand. While exports of cobalt materials from China suffered from falling global demand, domestic demand kept firm, supported by a \$585 billion dollar stimulus plan from the Chinese government. Announced and quickly implemented late 2008, this was followed up in short order with a loosening of monetary policy and a surge of bank credit.

Nearly a year after announcing its stimulus plan, China seems to have weathered the crisis better than most countries and the governments GDP growth target for 2009 of 8% is expected to be met. In line with the global trend, demand from the cemented carbide sector, after batteries China's second largest consuming sector, dropped substantially. While demand from the ceramics industry is estimated to have increased, demand from the magnet industry and demand for catalysts from the petrochemical industry have both dropped below the level of consumption seen in 2008.

### 3.0 Supply / Demand balance

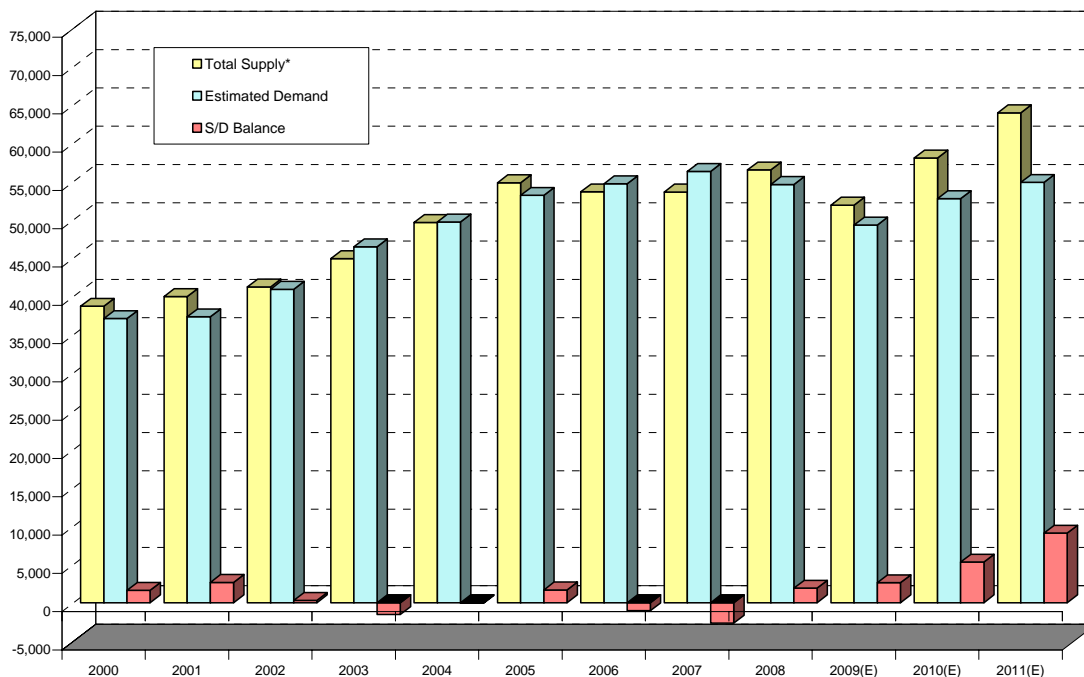
During 2008, refined cobalt production exceeded global demand by approximately 1,900 MT, a sizeable surplus compared to the deficit of 2,675 MT seen in 2007. The forecast for 2009 would suggest a further surplus of approximately 2,600 MT, based on an approximate supply figure of 51,910 MT and global demand of 49,300 MT. If current production forecasts for both existing and new production materialize it is estimated that the cobalt market will be structurally oversupplied from 2010 onwards. Although demand is expected to recover in 2010, even at a healthy 7% growth rate new and additional supply from Katanga, Camec and Tenke Fungurume alone is likely to move the market into surplus by almost 5,000 MT. The commissioning of other projects in 2011 and beyond can contribute to a further increase in the market surplus.



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However, one should bear in mind that since the late 1990's the cobalt market has always been forecasted to see excessive oversupply due to new mining projects coming on stream. Since then we have not seen annual surpluses exceeding 3,000 MT as market forces have continuously adjusted supply closer to actual market demand. Furthermore, with China estimated to have accumulated stocks of up to 10,000 MT which includes a significant volume of metal, the market may continue to see availability constraints during 2010 while these stocks remain in relatively strong hands.

Global Cobalt Supply / Demand Balance



Source: Darton Commodities Ltd.

### 4.0 Market Prices

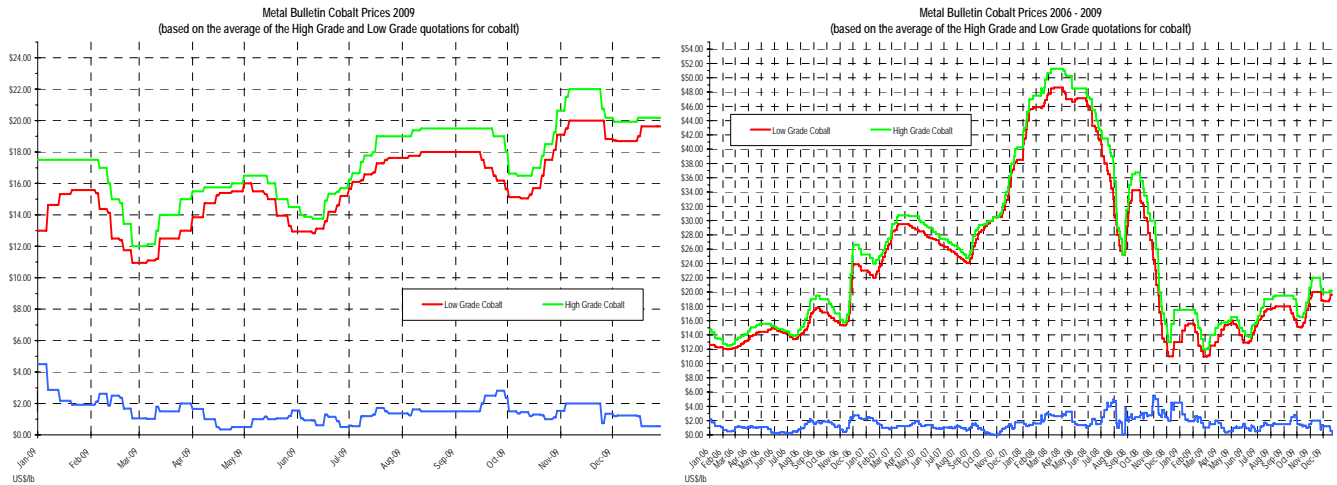
The firmly established bull trend which commenced early September 2007 and lasted a little over seven months pushed prices to a peak of \$51.25/lb. for high grade and \$48.63/lb. for low grade by mid March 2008. Soaring concentrate imports, deteriorating market conditions in China and profit taking pushed prices down to \$24.00/lb. by late August 2008, after which prices quickly gained \$10.00/lb. again on the back of restocking and availability concerns. Market prices briefly consolidated during October but this was soon followed by downward price pressure as growing concerns over the financial system and the global economy kept many consumers out of the market. While consumer demand quickly slowed, traders and producers looked to liquidate stocks with some selling aggressively into a further weakening market. An unprecedented lack of consumer buying, anxious supplier selling and rapidly deteriorating market sentiment drove the cobalt metal price into freefall - in little more than two months the Metal Bulletin Low Grade low cobalt price fell 72%, from \$32.50/lb. to \$9.00/lb. by mid December 2008.

From late December, market prices gradually recovered during January 2009 on the back of renewed consumer and trade buying, in part prompted by supply concerns resulting from the numerous production cutbacks and mine closures. However, industrial buying continued to suffer as a result of poor downstream demand and further destocking throughout the supply chain.



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A severe decline in consumer buying seen in the European, US and Far East markets was to a large extent offset by strong buying interest in China; in part to substitute concentrates as refining material, the balance being bought speculatively as credit became more readily available and metal prices were considered relatively cheap. Chinese buying and trade restocking pushed cobalt metal prices back to a \$15.50 - \$17.00/lb. range by early February, before sliding back to a \$11.00 - \$12.00 range by early March. This was followed by a similar cycle over the March - June period, to be followed by another, yet slightly longer cycle during the third quarter with average prices up approximately \$3.00/lb. from the second quarter as a result of improved buying interest from both consumers and the trade.



	Low Grade Cobalt			High Grade Cobalt		
	Low	High	Average	Low	High	Average
<b>2008</b>						
Jan-08	\$43.22	\$45.08	\$44.15	\$44.50	\$46.75	\$45.63
Feb-08	\$45.67	\$47.24	\$46.46	\$47.33	\$49.89	\$48.61
Mar-08	\$46.62	\$47.94	\$47.28	\$48.83	\$51.06	\$49.94
Apr-08	\$46.62	\$47.94	\$47.28	\$48.83	\$51.06	\$49.94
May-08	\$46.53	\$47.36	\$46.94	\$47.78	\$48.78	\$48.28
Jun-08	\$42.72	\$43.84	\$43.28	\$44.50	\$45.50	\$45.00
Jul-08	\$35.98	\$37.83	\$36.91	\$40.11	\$41.11	\$40.61
Aug-08	\$26.79	\$28.31	\$27.35	\$28.28	\$30.24	\$29.26
Sep-08	\$32.59	\$34.33	\$33.46	\$35.09	\$36.66	\$35.88
Oct-08	\$28.65	\$30.18	\$29.41	\$31.90	\$33.30	\$32.60
Nov-08	\$16.00	\$17.91	\$16.96	\$19.44	\$21.29	\$20.37
Dec-08	\$9.50	\$13.38	\$11.48	\$13.33	\$15.50	\$14.42
<b>Average</b>	<b>\$35.19</b>	<b>\$36.86</b>	<b>\$36.01</b>	<b>\$37.58</b>	<b>\$39.38</b>	<b>\$38.48</b>
<b>2009</b>						
Jan-09	\$13.83	\$16.21	\$15.02	\$16.00	\$19.00	\$17.50
Feb-09	\$11.69	\$13.91	\$12.80	\$13.64	\$15.78	\$14.71
Mar-09	\$10.53	\$13.66	\$12.09	\$12.63	\$14.66	\$13.64
Apr-09	\$14.26	\$15.78	\$15.02	\$15.00	\$16.50	\$15.75
May-09	\$14.15	\$15.07	\$14.61	\$15.17	\$16.17	\$15.67
Jun-09	\$13.26	\$14.11	\$13.68	\$14.20	\$15.00	\$14.60
Jul-09	\$16.44	\$17.34	\$16.89	\$17.63	\$18.59	\$18.11
Aug-09	\$17.38	\$18.50	\$17.94	\$18.76	\$20.09	\$19.42
Sep-09	\$16.67	\$17.73	\$17.20	\$18.59	\$19.86	\$19.22
Oct-09	\$15.88	\$16.89	\$16.38	\$17.14	\$18.25	\$17.69
Nov-09	\$19.26	\$20.21	\$19.73	\$21.11	\$22.00	\$21.55
Dec-09	\$19.76	\$20.50	\$20.13	\$18.71	\$19.59	\$19.15
<b>Average</b>	<b>\$15.26</b>	<b>\$16.66</b>	<b>\$15.96</b>	<b>\$16.55</b>	<b>\$17.96</b>	<b>\$17.25</b>

From mid October onwards prices gained almost \$5.00/lb. over a three week period, peaking at a year high of approximately \$22 for high grade, a move that was supported by tight supply of specific metal grades and a further improvement in overall market sentiment. Following a brief period of decline, prices are firming once again, with low grade prices just short of breaching the November peak of \$20.00/lb. After years of discussion the LME is currently planning to commence trading cobalt on its exchange in February 2010. It is being suggested that this move has brought and may bring significant interest from non-traditional market participants, potentially bringing additional sources of demand to the cobalt market. This, combined with a perceived tightness in metal availability and the potential of

further demand recovery may lead to further price increases in the near term. At the same time it is thought that any upward momentum may be limited by the restart of curtailed and commissioning of new supply.

Source for cobalt price table and charts: Metal Bulletin