



**BUY- \$0.35**

# China Magnesium Corporation Ltd (CMC)

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## *In China, in production, and growing*

### Company Data

ASX Code	CMC
Price	\$0.35
12 month price target	\$0.70
Implied return	100%
Shares on issue	131.02m
Market cap	\$45.9m
12 Month price range	\$0.18/\$0.44
Monthly turnover	5.1m
Listed	09/11/2010
GICS Industry Group	Materials

### Directors & Management

William Bass	Non-Executive Chairman
Tom Blackhurst	Managing Director & CEO
Xinping Liang	COO/Executive Director
Peter Robertson	Non-Executive Director
Garry Edwards	CFO/Company Secretary

### Earnings Summary

Year end	2011A	2012F	2013F	2014F
June				
Lodge adj reported profit	(1.7)	2.5	13.0	26.9
Reported profit (pre abn)	(1.7)	2.8	14.4	29.8
EPS pre goodwill (¢)	(1.8)	2.0	9.9	20.5
<b>EPS growth</b>	<b>-30%</b>	<b>na</b>	<b>405%</b>	<b>107%</b>
<b>P/E ratio</b>	<b>na</b>	<b>17.8 x</b>	<b>3.5 x</b>	<b>1.7 x</b>
EV / EBIT	-19.9 x	12.4 x	2.9 x	1.6 x
EV / EBITDA	-22.1 x	7.0 x	2.4 x	1.4 x
CFPS (¢)	(1.7)	3.9	3.7	10.9
Price / CF	-21.0 x	9.1 x	9.4 x	3.2 x

### Share Price Chart



Source: Iress Market Technology

**We continue coverage on China Magnesium Corporation Limited (“CMC” or “the company”) with a BUY recommendation and a 12 month price target of \$0.70 per share.**

**CMC has a 90.7% interest in a magnesium production facility in China.** China accounts for around 85% of world magnesium production and around 30% of consumption.

**CMC is seeking to position itself amongst the world’s leading and largest magnesium and magnesium alloy producers** and with continued vertical integration and operational efficiencies they will also rank amongst the cheapest.

**Tom Blackhurst the CEO and Xinping Liang the COO** have focused their attention on China for the past seven years. They co-founded CMC 4 years ago and the ownership and management structure reflects the company’s deep China connections.

**CMC’s Phase 1 expansion to 20,000 tpa** remains on time and within budget for completion by December 31, 2011.

**The necessary permits are in place** for Phase 2 and Phase 3 capacity expansion which is planned to reach 105,000 tpa of production by 2014.

**Funding to completion of Phase 3 is in place** and will come from a combination of existing cash, operating cash flow and debt.

**Completion of Phase 1 will include downstream vertical integration** to produce magnesium alloy from magnesium metal.

**The company is planning to exercise an option to purchase a dolomite quarry** to provide upstream integration of refinery feedstock supply.

**Ferrosilicon is the single biggest cost input into the production process** and the company has signed a letter of intent and completed due diligence to acquire an established ferrosilicon producer which will provide further vertical integration and security of raw material supply.

**Our share price outlook** is based on successful completion of the Phase 1 magnesium production expansion by the end of this calendar year and continued progress toward Phases 2 and 3 of the planned magnesium capacity expansion.

**Our financial modelling** assumes energy efficiencies from the coal-to-gas plant, production credits from the sale of tar oil, and vertical integration of dolomite feedstock. We have also assumed the successful acquisition of a stand-alone ferrosilicon producer.

**Further upside** exists in the share price through overall improved operating efficiencies, improvements in the refining process, and a continuing improvement in the magnesium price.

*CMC plans to increase capacity to produce 105,000 tpa of magnesium alloy from its plant in China by CY2014*

**OVERVIEW**

China Magnesium Corporation Limited (ASX code: CMC) holds a 90.7% interest in CMC China which has a 100% interest in the Pingyao Magnesium Project in the Shanxi province of north eastern China.

The existing plant is rated to produce 5,000 tpa of magnesium alloy using the widely accepted Pidgeon process. The company has plans in place to expand the existing production profile under its existing licence to 105,000 tpa by 2013, making Pingyao one of the world's largest producers of magnesium (See Table, Page 13).

The company's expanded magnesium operations will be funded through a combination of existing cash, projected cash flow and debt.

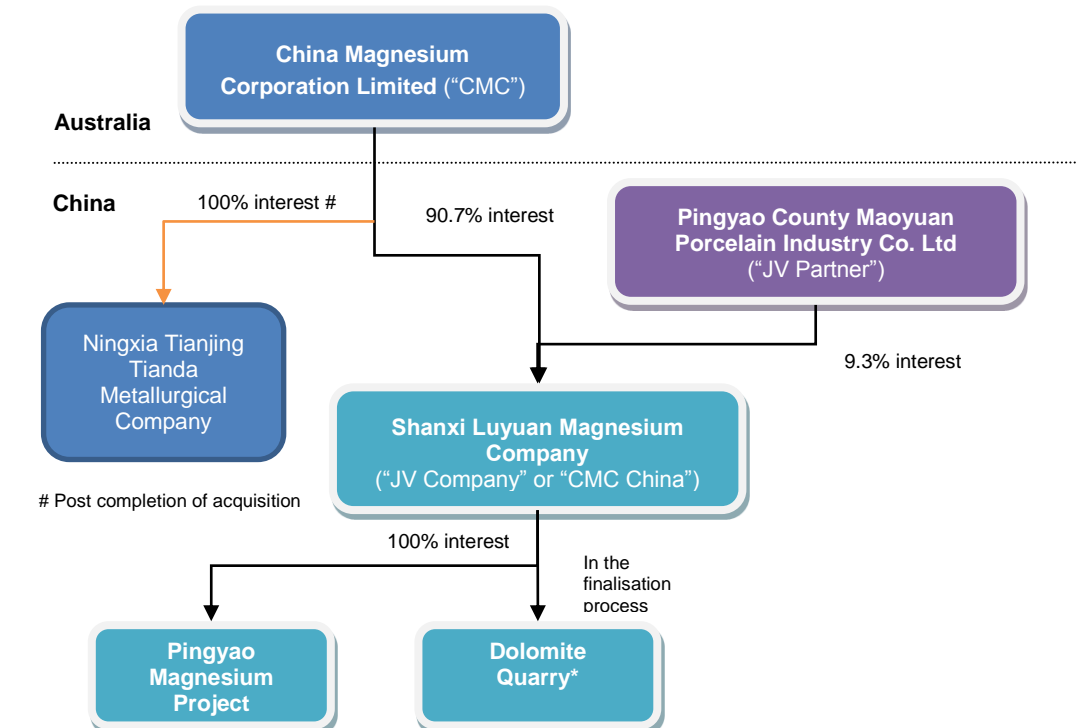
CMC has also completed due diligence to acquire an existing stand-alone ferrosilicon producer. Ferrosilicon is the single largest cost input in the manufacturing process of magnesium.

The terms of settlement are such that this bolt on acquisition will be immediately value and earnings accretive.



Source: China Magnesium Corporation Limited

**ORGANISATIONAL CHART**



*CMC recently increased its interest in the Pingyao Project to 90.7% from 75%*

*CMC recently agreed to purchase NTTMC a ferrosilicon producer*

## PINGYAO MAGNESIUM PROJECT

The Pingyao Project is located in the Shanxi province of north eastern China which is one of the world's largest magnesium producing regions. The provincial and local government has also endowed "Preferred Project" status on the company's operation.

The Plant is well located adjacent to necessary supplies of coal and dolomite in the area. The location also provides access to low-cost additives from nearby provinces, readily accessible transport, competitive operating costs and highly skilled labour.

*Pingyao plant is located adjacent to significant raw material inputs*



Source: China Magnesium Corporation Limited

The plant had been in care and maintenance since October 2008. The company began producing magnesium from the upgraded 5,000 tpa plant in April 2011. Following the upgrade of the plant the First Phase expansion (20,000 tpa) is due for completion by the end of the 2011 calendar year. Like most Chinese magnesium producers the Pingyao plant uses the Pidgeon production process requiring significant proximal feedstocks of dolomite, coal and ferrosilicon. The company recently exercised an option (at a cost of ~A\$700k) to acquire a dolomite quarry as part of its ongoing vertical integration cost improvement program.

CMC already has in place the required environmental permits to facilitate its expansion plans, augmented by an available supply of adjacent and suitable land.

### KEY MILESTONES

<b>2010</b>	
9-Nov	Official Listing on ASX after raising \$12 million (before costs) via IPO
15-Nov	CMC completes minimum 75% joint venture earn-in
7-Dec	Capital works start on China plant upgrade
<b>2011</b>	
5-Jan	CMC increases interest in JV to 90.7%
16-Feb	CMC secures land rights for expansion
10-Mar	Ground-breaking Ceremony for First Phase Expansion
17-Mar	Rationalisation of Chinese magnesium industry to benefit CMC
29-Apr	CMC commences magnesium production at upgraded existing plant
4-May	Baiyuan Dolomite Quarry acquisition (30 km from production plant)
8-Nov	Completion of equity capital raising to help fund purchase of ferrosilicon co.
8-Nov	Phase one expansion progress on schedule and budget

*Magnesium is lighter than, and has the equivalent strength of aluminium*

## MAGNESIUM

Magnesium is the lightest of all the structural metals with a density that is only two-thirds that of aluminium and one-quarter that of steel. This lightness and strength advantage has seen magnesium become the third most commonly used structural metal, behind steel and aluminium.

Its lower density means it is also of greater economic benefit, particularly as the world moves toward greater energy efficiency in end-use manufacturing.

Mg	<b>Magnesium</b>	<b>Characteristics</b>
	Atomic number: 12	<ul style="list-style-type: none"> <li>• Low toxicity</li> </ul>
	Atomic mass: 24	<ul style="list-style-type: none"> <li>• 8th most abundant element in the Earth's crust, (~2% by mass)</li> <li>• 9th in the known universe</li> </ul>
	Alkaline Earth Metal	<ul style="list-style-type: none"> <li>• 3rd most abundant element dissolved in seawater</li> <li>• 11th most abundant element by mass in the human body</li> </ul>

## THE MAGNESIUM INDUSTRY



Source: China Magnesium Corporation Limited

Magnesium metal and magnesium alloys are used across the world in a wide variety of applications. The most common are:

**Magnesium ingots** - mainly used as an alloying element in producing Mg alloy, it has a wide usage in the chemical and military industries.

**Magnesium alloy**—high purity magnesium is combined with other metals and used extensively as an injection mould diecast piece in the aerospace and automobile industries as well as throughout the electronics and information technology manufacturing processes.

**Magnesium granules and powders** – an important raw material in steel and metallurgic casting (desulphurisation)

**Magnesium anodes**—employed as a structural element against corrosion (cathode protection)

There is also a significant market in **Recycled magnesium**, particularly in the USA which is protected from Chinese imports by high anti-dumping duties.

### *The Magnesium industry in China*

China is the world's largest producer of magnesium and magnesium products accounting for approximately 85% of global output (2010) and around 30% of global consumption.

China has also provided most of the growth in the magnesium market now accounting for around 30% of global consumption for magnesium ahead of the USA, Russia, Japan, Germany and Canada.

There are two basic types of primary magnesium production processes in use today: the electrolytic method and the more common Pidgeon process of thermal reduction of magnesium carbonate ores (typically from calcined dolomite) using ferrosilicon.

*China is world's largest producer of magnesium and magnesium alloy*

*CMC has already secured the necessary permitting covering its expansion plans up to 105,000 tpa.*

All Chinese magnesium is produced by the Pidgeon process which is preferred for its lower capital costs, scalability and higher purity product. The Pidgeon process is more labour intensive which is not a logistics issue for the Chinese.

The Chinese government recently outlined significant changes to the domestic magnesium industry with a preference toward fewer but larger processors designed to create greater efficiencies across the supply chain and in particular to employ tighter environmental controls.

The forward blueprint for the industry includes new conditions for existing and future magnesium production facilities as follows:

1. Existing refineries - must have annual production capacity of at least 15,000 tpa. If an existing refinery wishes to apply for renovation or expansion, it will need to have a production capacity of at least 20,000 tpa;
2. New refineries must have a planned capacity of at least 50,000 tpa.

In addition to the above, new magnesium refining projects will be prohibited in areas 1 km from drinking water sources, basic farmland protection areas, natural reserves, scenic spots and other areas that require strict environmental quality.

#### **Global Production - Magnesium**

	2010	2009	2008	2007	2006
China	650,000*	501,000	559,000	625,000	520,000
Russia	40,000	37,000	37,000	37,000	35,000
Israel	30,000	29,000	32,000	29,600	24,600
Kazakhstan	20,000	21,000	21,000	21,000	21,000
Brazil	16,000	16,000	15,000	18,000	6,000
Ukraine	2,000	2,000	2,000	2,500	2,200
Serbia	2,000	2,000	2,000	2,000	1,500
Canada	-	-	2,000	16,300	65,000
<b>TOTAL</b>	<b>760,000</b>	<b>608,000</b>	<b>670,000</b>	<b>751,400</b>	<b>675,300</b>

Source: USGS

\*China has more than 1,000,000 tpa capacity at existing operating plants and those on "standby", however much of the unused capacity will never be restarted under the government mandated industry rationalisation which requires a minimum plant size of 15,000 tpa production capacity.

Growth in world production of magnesium was adversely impacted by the global financial crisis, which had seen strong growth in the years up to 2007 and is only now starting to show signs of upward recovery.

China dominates global production, supplying more than 85% of the world's magnesium with a 30% year-on-year growth across 2009-10.

#### **Global Consumption - Magnesium**

World consumption of magnesium increased sharply between 2002 and 2005 to reach about 800,000 tpa (from about 575,000 tpa in 2002). Consumption of magnesium was affected by the GFC with falling demand in the USA and Europe. This was tempered by a rise in internal demand from Chinese manufacturers buoyed by a better quality product and a more expansive base of production input opportunities for magnesium products.

Independent consultants Roskill have forecast global magnesium consumption to rise by an average overall rate of 6% pa up to 2012 lifting the overall demand to more than 1.1m tpa.

Its single largest use, die-cast alloys for the automotive industry, is expected to show the fastest rate of growth at about 10% pa, underpinned largely by Chinese vehicle production. The use of magnesium cast alloys in computers, communications and consumer electronics, principally for injection moulded housings, and uses for the desulphurisation of

*China is likely to continue as the world's largest manufacturer and consumer of magnesium in the medium-term.*

*Any rationalisation or consolidation of the domestic industry will have positive economic benefits to the dominant players like CMC.*

*2012 forecast for magnesium alloy = ~US\$2,894 per tonne*

steel, is also expected to grow strongly.

### **Chinese production**

China's domination of the world's magnesium industry continues to grow in both supply and demand with this trend likely to continue.

According to the China Nonferrous Metals Industry Association, China accounted for 85% of total global primary output of approximately 650,000 tpa in 2010, 30% more than 2009 production. A significant proportion of new Chinese supply growth has come from the Ningxia, Shanxi and Qinghai provinces.

More than 55% of China's magnesium production in 2010 was exported, most as unwrought magnesium. Magnesium demand was severely impacted by the Global Financial Crisis and underlines a still heavy reliance on the export market as domestic applications still ramp up.



Source: China Magnesium Corporation Limited

### **Pricing Outlook**

Global demand for magnesium was severely impacted following the GFC in 2008. Since then there has been a mild recovery in demand and pricing. Growth remains contingent on strong demand from the primary western markets.

The demand for lighter products prompted by a need for greater energy efficiency is expected to shift global demand for magnesium products higher. This shift is also being driven by the rapid expansion in manufacturing by the Chinese automobile industry. Growth in cast alloy magnesium production is also expected from the information technology, communications and electronics industries.

The magnesium price climbed to more than US\$6,900 per tonne before the Global Financial Crisis brought prices back down to a low of US\$2,300. Since then the price has risen steadily to a current spot price of around US\$3,200 per tonne.

Our financial modelling has assumed direct sales of magnesium alloy to domestic consumers. Our pricing assumption is CNY18,056 (US\$2,894) per tonne of magnesium alloy. With most idle supply likely to come from smaller, inefficient and aging process plants, CMC's expanding production footprint should embed its preferred supplier status amongst downstream customers.

Roskill has also forecast global magnesium consumption to return to its pre-GFC trajectory of one million tonnes by 2013. Growth across all product segments is expected to average around 6% per annum through 2013.

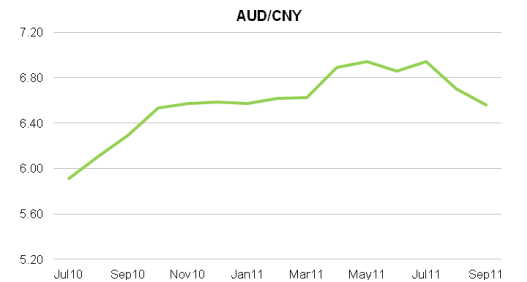
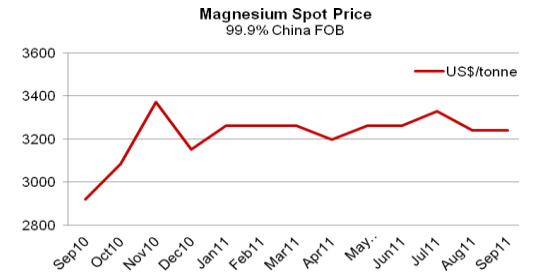
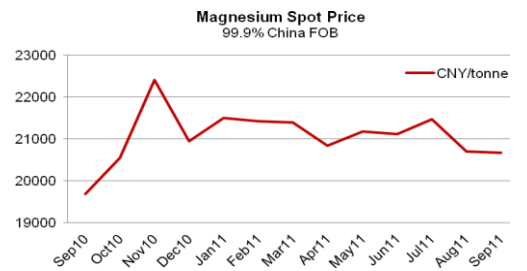
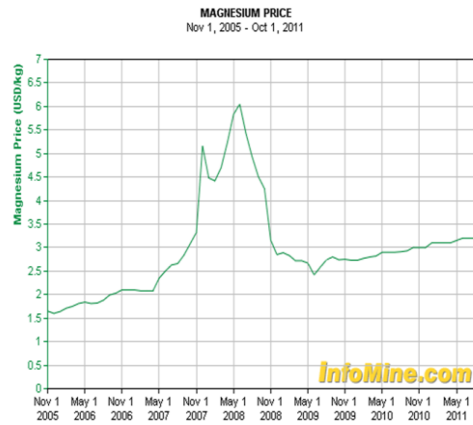
### World Annual Primary Magnesium Production Capacity

as at December 31, 2010

	Capacity (tonnes)
China	1,080,000*
Russia	80,000
United States	52,000
Israel	32,000
Kazakhstan	30,000
Brazil	22,000
Ukraine	15,000
Serbia	5,000
India	900
<b>TOTAL</b>	<b>1,320,000</b>

Source: USGS

\*Includes capacity at existing operating plants and those on standby



Source: Platts, IRESS

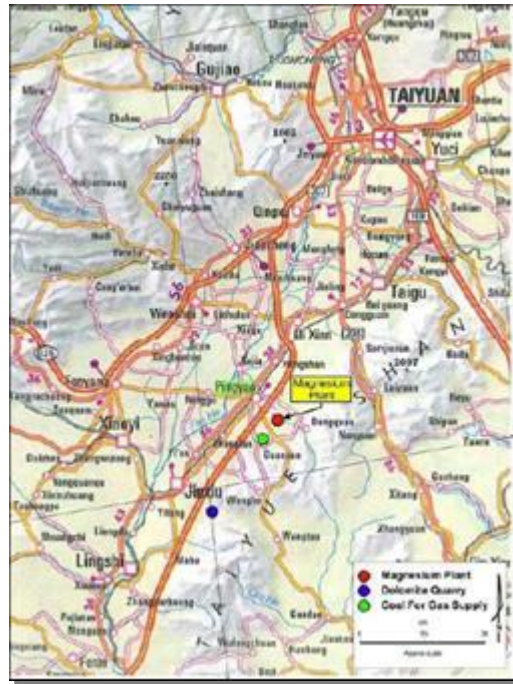
**Soon to be completed rotary kiln and coal-to-gas plant will improve operating efficiencies and deliver cost savings**



Source: China Magnesium Corporation Limited

**THE PROCESS & PLANT**

The manufacturing plant is located in Pingyao County, Shanxi province, approximately 600 kilometres west of Beijing. It is surrounded by easily accessible supplies of dolomite and power to facilitate the production of magnesium.



Additional raw materials (e.g. coal and ferrosilicon), skilled labour and supporting services are all available and being sourced domestically.

Prior to the recent refurbishment by CMC the plant had been on care and maintenance since October 2008. The upgrade completed in April restored the plant to its nameplate capacity current 5,000 tpa of magnesium.

During CY2011, CMC has commenced construction of further critical infrastructure towards meeting its expansion capabilities and objectives.

A rotary kiln is currently being installed on site along with a coal-to-gas plant. Both have the objective to improve operational efficiencies and deliver substantial cost savings.

Source: China Magnesium Corporation Limited

**The Pidgeon Process**

There are two basic types of primary magnesium production processes used today: the electrolytic and the thermal methods of reduction also known as the Pidgeon process. The Pidgeon process is used almost exclusively in China using dolomite as its raw material.

The process has several key advantages:

- Low capital and operating cost
- Modular and scalable
- Energy efficient energy (~35-40 MWh/tonne)
- Higher quality product (99.98% Mg purity)

*Distillation produce high-purity magnesium crowns that are smelted into ingots*



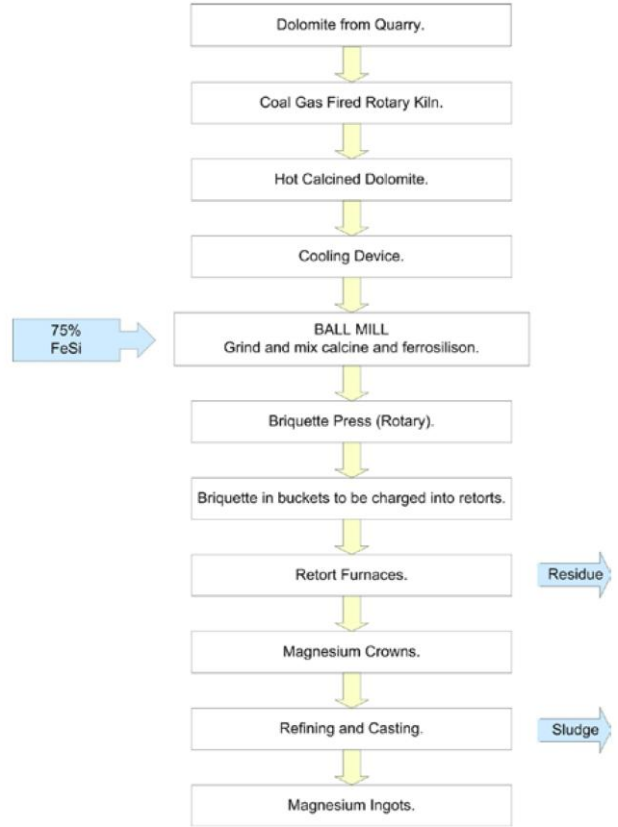
Source: China Magnesium Corporation Limited

**Pidgeon Process Flowsheet**

The Pidgeon process is a batch process that involves calcination of the dolomite by heating to remove the carbon (in the form of carbon dioxide) from the magnesium carbonate molecule within the dolomite, leaving behind oxides of magnesium and calcium.

The calcined dolomite is then mixed with ferrosilicon (the reducing agent), briquetted, and charged in retorts made of nickel-chrome-steel alloy.

The hot reaction zone portion of the retort is either gas fired, coal fired, or electrically heated in a furnace, under a vacuum to the extent that the magnesium oxide is reduced to a magnesium vapour (while the oxygen forms a solid compound with the silicon). On distillation, very high purity magnesium crowns are produced. These are then smelted to produce high purity magnesium ingots.



Source: China Magnesium Corporation

**Feedstock Supply**

Dolomite, a calcium-magnesium carbonate similar to limestone is present in large quantities within China. The quarry that supplies Pingyao is located at the foot of Tianzhong Mountain and approximately 30 kilometres from the existing production plant. The dolomite is transported by truck with two sealed alternative road routes for transport of the dolomite from the Quarry gate to the plant. Additional raw feedstock materials (e.g. coal and ferrosilicon), skilled labour and supporting services are all available and being sourced domestically.

Dolomite is, by volume, the largest raw material component of magnesium production. Approximately 10.5 tonnes of dolomite, 1.08 tonnes of ferrosilicon and less than 5 tonnes of coal (with scope to further reduce coal consumption) are required in order to produce one tonne of magnesium metal.

**Dolomite quarry acquisition funded out of existing cash**



Source: China Magnesium Corporation Limited

In 2011, CMC exercised its option to purchase the quarry for almost A\$700,000, thereby locking in an essential part of the supply chain.

The current extraction permit for the dolomite quarry is limited to a current maximum of 150,000 tonnes per annum. The consumption of dolomite (per tonne) as part of the magnesium production process is on a 10:1 basis.

Whilst this is almost sufficient for the planned magnesium Phase 1 expansion to 20,000 tpa, the existing quarry permit would need to be expanded concurrent with the company's planned Phase 2 and 3 expansions to facilitate the targeted magnesium production capacity of 105,000 tpa by 2014.

**Ferrosilicon is the single highest input cost to the magnesium production business.**

### **The role of Ferrosilicon**

Ferrosilicon is an integral part of the Pidgeon process used to make magnesium from dolomite. In general, thermal processes use a reducing agent, such as ferrosilicon, to reduce magnesium oxides under a vacuum in a furnace. Ferrosilicon is produced by the reduction of silica or sand with coke (coal) in presence of scrap iron, mill scale, or other source of iron. Electric arc furnace production of ferrosilicon is the single highest cost input into the Pingyao magnesium production process.

World ferrosilicon production capacity, nominally about 9.3 mtpa, is very fragmented, with some 80 companies in 27 countries outside China (where as many as 1,000 plants are said to exist) reporting capacities ranging from less than 1,000 tpa to over 5,000 tpa. Rising production costs due to increasing energy prices will see producers attempt to raise market prices, and/or shut down uneconomic capacity.

Sustained demand from the Chinese steel industry has driven the growth in local ferrosilicon production. This is expected to continue in the immediate future. Historically prices have been driven by the steel industry. Whilst that market remains strong the projected growth in magnesium production will tighten supply from amongst China's major ferrosilicon manufacturers.

### **Operating Costs –Pingyao**

In its Prospectus the company outlined its budgeted operating costs under its refurbishment (5,000 tpa) and Phase One (20,000 tpa) expansion plans:

	CNY/tonne	US\$/tonne	US\$/lb
<b>Variable</b>			
Ferrosilicon	5,940	990	0.45
Retort	750	125	0.06
Dolomite	840	140	0.06
Flux	120	20	0.01
Refinery oven	100	17	0.01
Minor consumables	217	36	0.02
Safety equipment	15	2.50	0.00
Coal	3,750	625	0.28
Electricity	650	108	0.05
	<b>12,382</b>	<b>2,064</b>	<b>0.94</b>
<b>Fixed</b>	1,621	270	0.12
<b>TOTAL Operating Cost</b>	<b>14,003</b>	<b>2,334</b>	<b>1.06</b>

Source: China Magnesium Corporation Limited Prospectus

**One tonne of FeSi is consumed per tonne of MagAlloy produced**

**Vertical Integration –Dolomite**

Following the completed purchase of the dolomite quarry in October 2011, the Company will bring a significant percentage of its raw material inputs “in house”.

Initial cost-savings from the purchase of the dolomite quarry are marginal when taken as a percentage of total operating costs, however the security of long-term supply could realise further cost synergies as the planned expansion program proceeds.



Source: China Magnesium Corporation Limited

***New local manufacturing will underpin expansion plans***

**Tar Oil**

We have assumed that sales of tar oil from the coal gasification process at Pingyao will provide by-product credits and further improve Plant economics.

CMC has forecast the potential for tar oil credits to reduce operating costs by a further A\$45 to A\$110 per tonne of magnesium produced with the plant operating at existing nameplate capacity.

**Vertical Integration -Ferrosilicon**

***The purchase of the ferrosilicon circuit makes a compelling investment case toward boosting future revenues***

CMC has taken an opportunity to acquire a ferrosilicon (FeSi) production company, Ningxia Tianjing Tianda Metallurgical Company (NTTMC) in Zhongwei City of Ningxia Province.

This will allow CMC to lock in its supply of FeSi, which is its highest cost input to its Magnesium production process. This very attractive opportunity was brought to the attention of CMC's executive director, Mr Xinping Liang, as a result of his long-term relationships and connections within China.

NTTMC owns and operates four 12,500 KVA electric ferrosilicon furnaces. The four production lines are designed to produce 50,000 tpa of #75 ferrosilicon but actually have a capacity to produce 59,000 tpa. NTTMC has its own independent electricity sub-station linked to the electricity network which allows it to lower its cost of electricity by around CNY0.02/kwh compared to its competitors. NTTMC has more than 10 years of experience in ferrosilicon production and its operational procedures meet the ISO GB/T2272-2009 standard.

CMC is currently a customer of NTTMC. It is planned that NTTMC will be acquired directly by CMC and will continue to be run as a profitable stand-alone FeSi producer. NTTMC will be able to provide all of CMC'S FeSi requirements through to completion of Phase II expansion

CMC believes the acquisition of NTTMC will be immediately value and earnings accretive.

**NTTMC ferrosilicon acquisition**



**Offices and employee accommodation**



**Furnace building**

**One of four electric furnaces**



**Electricity Sub Station**



**Quality control laboratory**



Source: China Magnesium Corporation Limited

**Sensitivities**

Earnings are particularly sensitive to operating costs, with the opportunity to extract further synergies as the plant's modular footprint expands over coming years.

A focus on in-control elements of the production process will deliver a measurably positive result to earnings.

BASE CASE	FY2014	REVENUE	EBITDA	NPV
		A\$m	A\$m	A\$/Share
		<b>177.9</b>	<b>46.3</b>	<b>1.38</b>
		<b>+/-</b>	<b>+/-</b>	<b>+/-</b>
Production	+/-10%	10.0%	12.9%	10.9%
Op Cash Costs	+/-10%	-	36.8%	36.5%
CNYUSD	+/-10%	-9.1%	-11.7%	-10.5%
AUSUSD	+/-10¢	11.1%	14.3%	12.8%
Discount Rate	+/-5%	-	-	97.6%

*Phased magnesium production expansion through to 105,000 tpa by CY2014*

**PRODUCT DEMAND**

CMC has identified several opportunities for its business both in the domestic and international magnesium markets for the reliable long term supply of pure magnesium and magnesium alloys. Strong levels of interest have already been shown from large companies located in the China, Australia and European markets.

Other opportunities include:

- **Short term** – Sale of magnesium at the gate to Chinese companies. Letters of intent from two local companies for the supply of 50,000 tpa of Mg alloy
- **Medium term** – In discussions with a number of international parties. A large car production plant currently being built in the local area. CMC's product has been accredited by a major aluminium producer who is interested in long term supply
- **Long term** – expansion will be increased in order to meet long term demand for magnesium and magnesium alloy

It is CMC's intention to sell 100% of its offtake from the First Phase production capacity increase (20,000 tpa) wholly within China.

In the medium-term scope exists to become a significant supplier within the region to a new automobile production plant which is under construction in the area.

Successful procurement of these contracts will have a measurable impact on the planned expansion timetable of the Second and Third Phase expansions up to 105,000 tpa.

*Recycling of exhaust gases in C2G plant improves environmental efficiencies and costs*

*CMC well positioned for demand growth in magnesium production*

## MAGNESIUM PRODUCTION OUTLOOK

### Capacity

The scalable advantage of the Pidgeon process is that any expansion can be done on a modular basis by replicating the original 5,000 tpa module. CMC already has in place the necessary environmental permits and land use rights to substantially expand output to 105,000 tpa.

### Upgrade & Expansion Strategy

The upgrade and First Phase expansion to 20,000 tpa are being undertaken concurrently and on target for completion by the end of the current calendar year. Capex for this initial growth phase is estimated to be ~CNY52.6 million (A\$8.8 million).

CMC is planning to undertake phased, modular expansions to 105,000 tpa by the end of CY2013 subject to market demand.

Phase	Expansion (tpa)	Aggregate Capacity (tpa)	Target completion date
Upgrade	N/A	5,000	CY2011 <sup>1</sup>
First	15,000	20,000	CY2011
Second	35,000	55,000	CY2012
Third	50,000	105,000	CY2014

Source: China Magnesium Corporation Limited Prospectus

#### Notes:

<sup>1</sup>Assumes the existing plant upgrade to 5,000 tpa is successfully completed concurrent with the First Phase.

Upgrade of the Plant includes upgrade of the coal-to-gas plant, incorporating a gas cooling circuit to increase energy efficiency; construction of two reduction furnaces; refurbishment of the rotary kiln used to calcine dolomite; refurbishment of the briquetting workshop including the ball mill and briquette machinery and refurbishment of the magnesium refinery workshop.

## CONCLUSION

CMC is seeking to position itself amongst the world's leading and largest magnesium and magnesium alloy producers. With a simple flow sheet and planned near-fully vertically integrated cost base they will also rank amongst the cheapest.

There can be no doubt that a global shift toward energy efficiency and lighter products with equivalent durability is underway. Independent forecasts predict between ~6% and ~8%pa growth for Mg alloy consumption.

CMC is well positioned to capitalise on this transition.

### Opportunities

Rationalisation of small, less efficient magnesium producers by Chinese regulators together with projected increases in world magnesium consumption are expected to ensure a strong market for an expanded operation.

The scalable modularity of the Pingyao process plant has significantly de-risked the company's expansion plans. The achievement of significant critical mass by greater vertical integration will challenge the financial viability of smaller plants in the domestic magnesium supply chain with CMC emerging as a dominant supplier to the downstream Chinese manufacturing industry.

CMC intends to expand its magnesium operations to 105,000 tpa over three phases through a combination of operational cash flow and debt, once demand for a planned level of capacity has been confirmed. Several opportunities exist along the cost curve to improve operational efficiencies.

*Global oversupply is a threat to metal prices*

Building on a solid base case, any greater integration of cost inputs into the plant's production process makes sound economic sense. With ferrosilicon included, the revenue and earnings benefits are immediate amplifying the supply security opportunity.

Further positive cost impacts could be realised from:

- Sale of tar oil
- Sale of excess dolomite supply
- Operational efficiencies and technological improvements in the refinery process
- Energy efficiencies through recycling

#### **Advantages**

The proximity in abundance of the key cost inputs creates a distinct and important competitive advantage to the Group's magnesium business. This is amplified by CMC already possessing a licence to substantially expand production capacity beyond its existing footprint.

#### **Challenges**

##### **MARKETS**

- With local US magnesium production 'protected' from dumping of Chinese product, the industry is turning increasingly to its domestic economy as their future primary demand source.
- Whilst the West's demand for finished products at the moment remains buoyant, any repeat of the Global Financial Crisis in 2008 could dramatically alter the supply/demand dynamic and the medium-term price outlook.
- This risk is offset by the manufacture of finished goods increasingly being undertaken in China. This has, in turn, stimulated a strong demand growth in the Chinese domestic manufacturing space for locally produced magnesium and magnesium alloy.

##### **POTENTIAL OVERSUPPLY**

- Global production (2010) for magnesium currently sits at 760,000 tpa. Chinese production counts for more than 85% of this. China also has idle capacity of almost 400,000+ tpa all of which is currently uneconomic and much lower production capacity than the Chinese government's new industry minimum of 15,000 tpa.
- South Korea and Malaysia have plans to increase output of primary magnesium metal which could also impact prices going forward.
- The magnesium scrap market is also active in influencing pricing regimes.

##### **ENVIRONMENT**

- Energy intensive industries such as magnesium and aluminium production could come under scrutiny as China strives to meet its energy efficiency targets.

##### **EXPANSION PLANS**

- CMC's expansion plans to 105,000 tpa are contingent on securing equivalent supply off take and currently budgeted to be funded out of existing cash, future cash flow and debt. This will be driven largely by global demand for magnesium and magnesium alloy products.

*Experienced Board & Management team with deep in-country industry knowledge and networks*

## KEY POINTS

- **Proven production process** – low risk; scalable with advantage of ready infrastructure
- **Vertical integration** – drive to lower cost base and increase margins & profitability
- **Clear expansion strategy** - key land & environmental permits already in place
- **Early cash flows** - from First Phase expansion (CY2011)
- **Experienced team** – Board & Management have deep Chinese business credentials

## DIRECTORS & MANAGEMENT

### Tom Blackhurst

#### Executive Director and Chief Executive Officer

More than 20 years' experience in building new businesses and consulting to various businesses in Australia and Asia. Tom also gained relevant experience through metals trading in Australia, initially with Sims Metal and then via his own company.

### Xinping Liang

#### Executive Director and Chief Operating Officer

Chinese engineer with more than 22 years experience in international project and corporate development. He has extensive senior executive experience in project evaluation, financial analysis and project/business development for numerous private, public and state owned enterprises in Asia.

### William Bass

#### Non-Executive Chairman

Considerable corporate and listed company experience. He brings extensive commercial and financial management experience from a range of leading Australian and international public companies including General Electric, Billabong, 1300SMILES, Country Road and On Card International.

### Peter Robertson

#### Non-Executive Director

Peter is an Australian metallurgist with more than 25 years of experience in mineral processing, smelting and rolling of aluminium and developing new technologies for the recycling of Aluminium waste material.

### Garry Edwards

#### Chief Financial Officer and Company Secretary

Garry has been Company Secretary of a number of ASX listed companies over the past 15 years. His accounting experience includes 8 years managing offices for KPMG in Papua New Guinea and, more recently, 15 years as CFO of entities listed in Australia and Canada, particularly in the resources sector.

## CHINA-BASED DIRECTORS & MANAGEMENT

**Ming Li**

Director of CMC China

**Guicheng Jia**

Director and General Manager of CMC China

**Linchong Sun**

Deputy General Manager of CMC China

**TOP 20 SHAREHOLDERS**

<b>Name</b>	<b>Quoted Ordinary Shares held</b>	<b>Percentage of issued shares</b>
MR THOMAS TROY BLACKHURST	24,240,000	18.50%
MR XINPING LIANG	12,000,000	9.16%
MR GUICHENG JIA	12,000,000	9.16%
MS MING LI	12,000,000	9.16%
JOHN WARDMAN & ASSOCIATES	3,175,000	2.42%
HSBC CUSTODY NOMINEES	3,032,500	2.31%
INTEQ LIMITED	1,920,000	1.47%
HENROTH PTY LIMITED	1,785,750	1.36%
WASHINTON H SOUL PATTINSON	1,714,286	1.31%
MCGEE CONSTRUCTIONS PTY LTD	1,500,000	1.14%
MR JOHN CHARLES PLUMBER	1,400,000	1.07%
MR CLIVE THOMAS	1,390,000	1.06%
EDELLE TWO PTY LTD	1,261,114	0.96%
MR TERRY MCINERNET & ACT2 PTY LTD	1,000,000	0.76%
MR MATTHEW REX PERCY	913,000	0.70%
CUSDODIAL SERVICES LIMITED	888,000	0.68%
JETAN PTY LTD	857,143	0.65%
MFPH SUPERANNUATION MGT	800,000	0.61%
ORGIA PTY LTD	790,000	0.60%
	<b>83,666,793</b>	<b>63.86%</b>

**TOP SHAREHOLDERS\***

Tom Blackhurst	18.50%
Top 20	~63.86%
Directors & Management	~45.98%

\*as at November 8<sup>th</sup> 2011

## China Magnesium Corporation Limited (CMC)

Mkt Cap: \$44.5m

\$0.35



## Valuation data

Year ending Jun	2011A	2012F	2013F	2014F	2015F
Lodge adj profit	(1.7)	2.5	13.0	26.9	42.5
Reported profit (pre WHT)	(1.7)	2.8	14.4	29.8	47.2
<b>EPS<sub>adj</sub> (¢)</b>	<b>(1.5)</b>	<b>2.0</b>	<b>9.9</b>	<b>20.5</b>	<b>32.4</b>
<b>EPS growth</b>	<b>(30.2%)</b>	<b>na</b>	<b>405.4%</b>	<b>106.6%</b>	<b>58.3%</b>
<b>P/E ratio</b>	<b>na</b>	<b>17.8 x</b>	<b>3.5 x</b>	<b>1.7 x</b>	<b>1.1 x</b>
DPS (¢)	0.0	0.0	0.0	9.0	15.0
<b>Yield</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>25.7%</b>	<b>42.9%</b>
Franking	0.0%	0.0%	0.0%	0.0%	0.0%
Payout ratio	0%	0%	0%	44%	46%
EV / EBIT	na	12.4 x	2.9 x	1.6 x	0.9 x
EV / EBITDA	na	7.0 x	2.4 x	1.4 x	0.8 x
NTA per share	\$0.08	\$0.11	\$0.21	\$0.37	\$0.57
Pr / NTA	4.3 x	3.2 x	1.7 x	1.0 x	0.6 x

## Balance sheet (\$M)

Year ending Jun	2011A	2012F	2013F	2014F	2015F
Cash	4.8	2.0	2.6	4.1	15.3
Receivables	0.2	3.2	13.1	28.6	45.8
Inventories	0.6	1.6	6.5	14.3	22.9
Other	0.5	0.5	0.5	0.5	0.5
<b>Current assets</b>	<b>6.0</b>	<b>7.4</b>	<b>22.7</b>	<b>47.4</b>	<b>84.6</b>
Net PPE	5.5	7.8	19.4	35.5	33.7
Investments	0.0	7.0	7.0	7.0	7.0
Goodwill	0.0	0.0	0.0	0.0	0.0
Deferred tax assets	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0
<b>Non-current assets</b>	<b>5.5</b>	<b>14.8</b>	<b>26.4</b>	<b>42.5</b>	<b>40.7</b>
<b>Total assets</b>	<b>11.4</b>	<b>22.2</b>	<b>49.1</b>	<b>89.9</b>	<b>125.2</b>
Debt	0.0	5.5	14.5	26.5	26.5
Provisions	0.0	0.0	0.0	0.0	0.0
Other	0.4	1.6	6.5	14.3	22.9
<b>Total liabilities</b>	<b>0.4</b>	<b>7.1</b>	<b>21.0</b>	<b>40.8</b>	<b>49.4</b>
Equity / reserves	12.5	13.9	13.9	13.9	13.9
Retained profits	(2.1)	0.5	13.5	34.5	61.3
<b>Total s/h funds</b>	<b>11.0</b>	<b>15.1</b>	<b>28.1</b>	<b>49.0</b>	<b>75.8</b>
Minorities	0.7	0.7	0.7	0.7	0.7

## Ratio analysis

Year ending Jun	2011A	2012F	2013F	2014F	2015F
EBITDA / sales	na	34.7%	29.4%	26.6%	25.8%
EBITAg / sales	na	33.6%	28.3%	25.5%	24.6%
<b>EBIT / sales</b>	<b>na</b>	<b>19.8%</b>	<b>24.2%</b>	<b>23.4%</b>	<b>23.2%</b>
Return on assets	na	19.3%	41.3%	47.3%	58.7%
<b>Return on equity</b>	<b>na</b>	<b>18.7%</b>	<b>51.5%</b>	<b>60.9%</b>	<b>62.3%</b>
<b>Return on funds emp.</b>	<b>na</b>	<b>31.3%</b>	<b>65.7%</b>	<b>72.9%</b>	<b>81.5%</b>
Net debt / (cash) (\$M)	(4.8)	3.5	11.9	22.4	11.2
Debt / equity	0.0%	36.5%	51.6%	54.0%	35.0%
<b>Net debt / equity</b>	<b>(43.1%)</b>	<b>23.0%</b>	<b>42.3%</b>	<b>45.7%</b>	<b>14.7%</b>
Interest cover	10.0 x	na	27.1 x	26.7 x	33.3 x

## Profit and loss (\$M)

Year ending Jun	2011A	2012F	2013F	2014F	2015F
Sales revenue	0.3	21.7	83.5	177.9	282.9
EBITDA	(1.8)	6.8	23.4	46.3	71.8
Dep'n and amort'n	(0.2)	(0.2)	(0.9)	(2.0)	(3.2)
<b>EBITAg</b>	<b>(2.0)</b>	<b>6.6</b>	<b>22.5</b>	<b>44.3</b>	<b>68.6</b>
Goodwill amortisation	0.0	0.0	0.0	0.0	0.0
<b>EBIT</b>	<b>(2.0)</b>	<b>3.9</b>	<b>19.2</b>	<b>40.6</b>	<b>64.6</b>
Net interest expense	0.2	(0.2)	(0.7)	(1.5)	(1.9)
Pre-tax profit	(1.8)	3.7	18.5	39.1	62.6
Tax	0.0	(0.8)	(4.1)	(9.3)	(15.4)
<i>Effective tax rate</i>	<i>0.0%</i>	<i>23.0%</i>	<i>21.9%</i>	<i>23.7%</i>	<i>24.6%</i>
Preference dividends	0.0	0.0	0.0	0.0	0.0
Minorities	(0.1)	0.0	0.0	0.0	0.0
Withholding tax	0.0	(0.3)	(1.4)	(3.0)	(4.7)
<b>Lodge adj profit</b>	<b>(1.7)</b>	<b>2.5</b>	<b>13.0</b>	<b>26.9</b>	<b>42.5</b>
Net profit (pre sig & WHT)	(1.7)	2.8	14.4	29.8	47.2
One-off items (post tax)	(0.3)	0.0	0.0	0.0	0.0
Reported net profit	(2.0)	2.5	13.0	26.9	42.5

## Cashflow (\$M)

Year ending Jun	2011A	2012F	2013F	2014F	2015F
EBIT	(2.0)	3.9	19.2	40.6	64.6
Net interest paid	0.2	(0.2)	(0.7)	(1.5)	(1.9)
Dep'n and amort'n	0.2	0.2	0.9	2.0	3.2
Tax paid	0.0	(1.1)	(5.5)	(12.2)	(20.1)
<b>Gross cash from op'ns</b>	<b>(1.6)</b>	<b>2.8</b>	<b>13.9</b>	<b>28.9</b>	<b>45.7</b>
(Inc) / dec in w'k'g cap	0.0	(2.9)	(9.8)	(15.5)	(17.2)
(Inc) / dec in provisions	(0.1)	0.0	0.0	0.0	0.0
Other	(0.2)	5.1	0.8	1.0	(1.5)
<b>Operating cashflow</b>	<b>(1.9)</b>	<b>5.0</b>	<b>4.9</b>	<b>14.3</b>	<b>27.0</b>
<i>growth over pcp</i>					
<b>Investing cashflows</b>					
Capital expenditure	0.0	(7.6)	(13.3)	(19.0)	0.0
Asset sales	0.0	0.0	0.0	0.0	0.0
Investments	0.0	(7.0)	0.0	0.0	0.0
Divestments	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0
<b>Financing cashflows</b>					
Equity raised	0.0	1.4	0.0	0.0	0.0
Dividends paid	0.0	0.0	0.0	(5.9)	(15.7)
<b>Chg in loans</b>	<b>0.0</b>	<b>5.5</b>	<b>9.0</b>	<b>12.0</b>	<b>0.0</b>
Other non-op flows	0.0	0.0	0.0	0.0	0.0
<b>Free cashflow</b>	<b>(1.9)</b>	<b>(2.6)</b>	<b>(8.4)</b>	<b>(4.7)</b>	<b>27.0</b>

## Attrib. Production

	2011A	2012F	2013F	2014F	2015F
MagAlloy (000t)	0.2	6.7	27.1	59.4	95.2
<b>Production Costs A\$t</b>	<b>2258</b>	<b>2258</b>	<b>2258</b>	<b>2258</b>	<b>2258</b>

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Expected total Return is measured as (capital gain (or loss) + dividend)/purchase price

We have divided our recommendations into three main Categories':

**Buy:** Expected Total Return in excess of 15% over a 1 year period.

**Hold:** Expected Total Return between 0% and 15% over a 1 year period.

**Sell:** Expected Total Return less than 0% over a 1 year period.

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I verify that I Stephen Cleugh have prepared this research report accurately and that any financial forecasts and recommendations that are expressed are solely my own personal considered opinions. In addition, I certify that no part of my compensation is or will be directly or indirectly tied to the specific recommendation or financial forecasts expressed in this report.

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