



## China's 12th Five-Year Plan: Iron and Steel

May 2011

KPMG CHINA



China's 12th Five-Year Plan (5YP) emphasises environmental issues and clean technology. The 5YP's environmental targets pose a challenge to the iron and steel sector regarding energy usage and pollution, however this is counterbalanced by China's need to continue building infrastructure and manufacture high-end equipment.

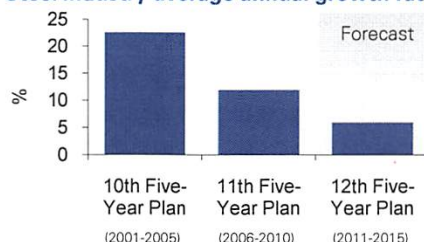
### Environmental targets in the 5YP place pressure on China's steel industry

- Reduction of energy use per unit of GDP: 16%
- Reduction of CO<sub>2</sub> emissions per unit of GDP: 17%
- Reduction of water use per unit of industrial value added: 30%

### China intends to restructure the iron and steel sector under the 5YP

- Over the next five years (2011 to 2015), the sector is expected to see the following changes:
  - Increased M&A activity as the government seeks to create larger, more efficient steel companies
  - Restrictions on steel capacity expansion
  - Upgrading of steel industry technology
  - Greater emphasis on high-end steel products
  - Relocation of iron and steel companies to coastal areas.
- The steel sector's growth rate is set to slow during the 5YP period, with forecasts ranging from 5 percent to 6 percent. This contrasts with double-digit growth rates seen during the 10th and 11th Five-Year Plans.<sup>(1)</sup>

Steel industry average annual growth rate (%)

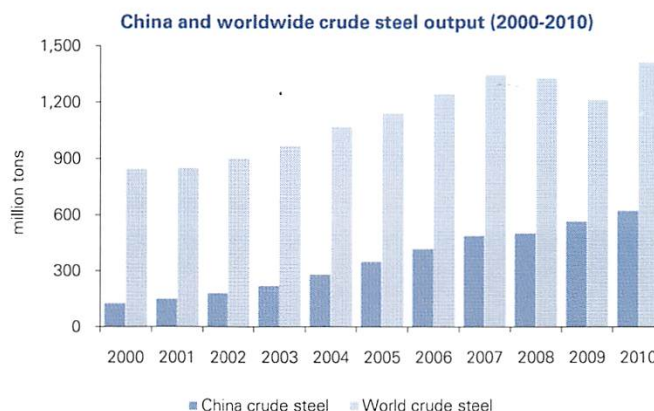


Note: Annual growth projections for the 12th 5YP period range from 5% to 6%  
Source: (1) China Iron and Steel Association



#### The steel sector is facing problems created by rapid expansion

- Rapid growth of China's steel sector in the past 10 years has led to overcapacity, heavy pollution, and a fragmented industry structure. In the last decade, the steel industry grew at an average annual rate of 17 percent, reaching around 600 million tons of crude steel output in 2010.<sup>(2)(3)(a)</sup>
- Total steel capacity in China is estimated at 720-750 million tons per year.<sup>(4)</sup> According to one estimate, around 100 million tons of steel capacity is unnecessary.<sup>(5)</sup>



#### Reducing capacity expansion is one of the goals of the 5YP

- China will primarily target low-end steel manufacturers, which have contributed to declining industry profit margins and undermined the government's goal of more orderly industry development. Small steel players will be forced to close or agree to M&A.
- Smaller players also impede progress on 5YP environmental targets. According to industry analysts, small steel mills are less energy-efficient and cause more pollution (per unit of production) than larger companies.<sup>(6)</sup>

#### The targets below are intended to eliminate smaller steel players

##### Steel production below these cut-off points will be eliminated

<b>Blast furnace</b>	Less than 400 cubic meters
<b>Converters</b>	Less than 30 tons
<b>Electric arc furnace</b>	Less than 30 tons
<b>Hot-rolled strip</b>	Width below 1,450mm <sup>(a)</sup>
<b>Hot-dipped galvanized coil</b>	Annual capacity below 300,000 tons per year
<b>Colour-coated sheet</b>	Annual capacity below 200,000 tons per year

Note: (a) Excluding specialty steel

Source: (1) Reuters, China restructuring plan: what's hot and what's not in metals, 29 April 2011



World's top steel producers ranked  
by crude steel output (2010)

Rank	Company	Crude steel output (mil ton)
1	ArcelorMittal	90.6
2	Hebei Steel	52.9
3	Baosteel	44.5
4	Anben Steel	40.3
5	Wuhan Steel	36.5
6	POSCO	35.4
7	Nippon Steel	34.5
8	JFE	31.1
9	Jiangsu Shagang	30.1
10	Shougang	25.8
11	Tata Steel	23.5
12	Shandong Steel	23.2
13	U.S. Steel	22.2
14	Hebei New Wu'an Steel	18.6
15	Nucor	18.2
16	Gerdau	17.8
17	Bohai Steel	17.4
18	Severstal	17.0
19	ThyssenKrupp	16.7
20	Evrz	16.3

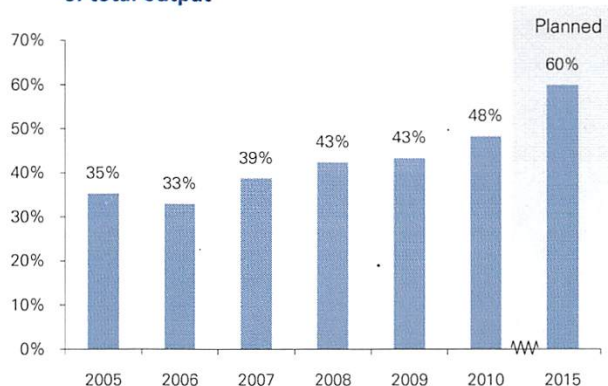
Note: Companies highlighted in blue are based in China

Sources: (1) World Metal News; "9 Chinese firms listed in world's top 20 steel makers in 2010", 13 March 2011  
(2) China Mining (<http://www.chinamining.org>)

#### Steel industry consolidation is a key initiative in the 5YP

- China's top 10 steel producers are expected to expand through M&A, and will represent 60 percent of the country's total steel output by 2015, up from 48 percent in 2010.<sup>(7)</sup> A higher industry concentration is expected to
  - Reduce overcapacity
  - Decrease pollution
  - Strengthen bargaining position of Chinese steel companies in price negotiations for iron ore.
- The government's 5YP initiatives are consistent with the *Development Policies for the Iron and Steel Industry* released in 2005. This law already set in motion a wave of M&A, and aims to increase the output of the top 10 steel groups to 70 percent of the nation's total by 2020.

Output of the top 10 steel groups as a percentage of total output



Sources: (1) China InfoBank  
(2) China Iron and Steel Industry Statistics, 2005-2009

#### China plans to relocate steel companies to coastal regions, motivated largely by logistics costs

- In the 5YP, the government intends to move its steel production to the coast and interior waterways; production based in these areas will represent 40 percent of the total output by 2015.<sup>(7)</sup> Such regions include:
  - Caofeidian Port in Hebei province
  - Zhanjiang in Guangdong province
  - Fangcheng Port in the Guangxi Zhuang autonomous region.<sup>(8)</sup>
- Cited reasons for altering the geographic distribution include:
  - Reducing logistics costs. Steel mills located near water and ports can use cheaper seaborne transport for raw material (e.g. - iron ore). Producing one ton of steel requires 1.6 tons of iron ore and 0.6 tons of coking coal, imposing high logistics costs on steel companies.<sup>(9)</sup> The logistics cost differential between coastal and interior areas can be as high as RMB 100 per ton of iron ore.<sup>(10)</sup>
  - Environmental reasons. Current steel producing areas are under environmental strain, due to the steel industry's heavy emissions and high demand for water. Relocating companies will redistribute the environmental burden.

**What will drive steel demand during the 5YP?**

**Clean energy steel demand**

- Nuclear power plants
- Wind farms
- Energy-saving automobiles
- Hydropower facilities

**Other steel demand**

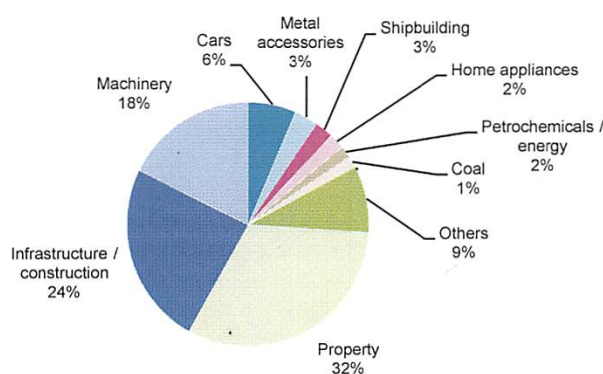
- Ports
- Ships
- High-speed railways
- Metro systems
- Coal mining machinery
- Medical equipment
- Construction machinery
- New housing

Sources: (1) China's 12th Five-Year Plan  
(2) Deutsche Bank, China Steel Sector, 20 Jan 2011

**Steel demand during the 5YP will be supported by housing construction and high-end equipment manufacturing**

- Steel sector growth is expected to slow to 5 percent to 6 percent annual growth, but steel is still an important part of the 5YP.
- The government's 5YP target of building 36 million units of affordable housing will help contribute to steel demand.
- Property and infrastructure are China's dominant steel users, accounting for over 50 percent of steel use; this pattern will likely remain in place.
- Specialty steel could see increased adoption during the 5YP:<sup>(1)</sup>
  - Railways and machinery will require springs, fasteners and bearings
  - Nuclear power plants and wind farms will need heavy plates and high-strength stainless steel.

**Breakdown of steel use in China (2010 estimate)**



Note: Rounding may lead to slight discrepancies  
Sources: (1) Deutsche Bank, China Steel Sector, 20 Jan 2011  
(2) My Steel  
(3) China Iron and Steel Association  
(4) CEIC

**Steel development areas in the 5YP**

**Development of key categories**

- Steel designed for high-speed railways
- High-grade non-oriented silicon steel (used in high-end equipment such as electric motors)
- High magnetic induction grain-oriented silicon steel (used in high-end equipment such as transformers)
- High-strength mechanical steel

**Key technology development**

- Non-blast furnace technology
- Clean steel production

**Carbon reduction technology**

- Development of energy management systems
- Use of afterheat
- Sintering flue gas desulfurization

**Access to raw materials**

- Develop a resource base for key supplies (e.g. – iron ore)

Source: China's 12th Five-Year Plan, Chapter 9



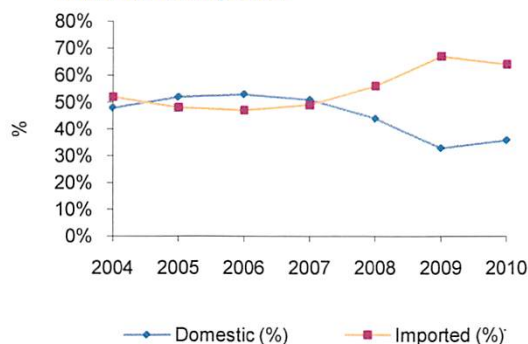
*China's steel industry is big but not strong*

- Luo Bingsheng, vice chairman of the China Iron and Steel Association, 9 December 2010

**Pricing of iron ore, a key steel input, has been a contentious issue between China's steelmakers and the world's big three miners**

- China is increasingly reliant on imported iron ore for its steel production. From 2005 to 2010, China's imported iron ore has been steadily increasing (over 60 percent of the total in 2010). A key goal in the 5YP is increasing the proportion of domestic iron ore to 45 percent by 2015.<sup>(12)</sup>
- China's steel industry is the largest in the world, but has been frustrated by its inability to win price concessions for iron ore with the world's big three miners - Vale, BHP Billiton, and Rio Tinto. Small steel mills were viewed as not fully cooperating in the Chinese steel industry's efforts to present a unified front in the negotiations.<sup>(4)</sup>
- Rising iron ore prices have placed pressure on steel company margins. The average profit margin of China's 77 largest steel companies slipped below 3 percent in 2010, a sharp decline from the 8 percent profit margins seen during the 2001 to 2005 period.<sup>(13)</sup>
- Two solutions will be implemented to deal with rising raw material costs
  - Expand domestic iron ore production
  - Purchase equity in overseas companies. China's target is purchasing 40-50 percent of iron ore from its own overseas assets, up from the current 15 percent.<sup>(14)(15)(b)</sup>

**Source of iron ore used in Chinese steel production: domestic vs. imported**



Note: Figures for 2010 represent data from January to November  
Source: (1) Deutsche Bank, China Steel Sector, 20 Jan 2011



Sector Leader

**David Ko**  
Partner  
david.ko@kpmg.com



Business opportunities

- Overseas acquisitions present an opportunity for larger players to gain access to key steelmaking technologies (e.g. – specialty steel) and input materials (e.g. – iron ore and coking coal).
- The 5YP's emphasis on high-end manufacturing provides impetus for companies to diversify into specialty or high-end steel.
- Steel companies will see higher cost structures during the 5YP as workers' wages rise, and therefore offshoring production (i.e. – building steel mills in other countries) will increasingly become a viable alternative to domestic steel production.

Challenges and risks

- In the event of energy shortages, heavily polluting and energy-intensive industries such as steel will be the first targets of energy rationing and shutdowns.
- Steel company profit margins could remain under pressure, especially in the low-end steel segment.
- Annual growth forecasts ranging from 5 percent to 6 percent indicate a more challenging business environment for steel companies.
- Chinese companies seeking overseas acquisitions potentially face a politicised environment, underscoring the need to seek help from skilled advisers who can offer guidance concerning acquisitions.
- Government-imposed mergers may result in M&A on paper, as companies try to appease government officials; but the lack of true consolidation means that planned efficiencies do not arise.<sup>(4)</sup>
- Local governments may resist shutting down smaller steel companies as a means of eliminating overcapacity, especially since such companies are a source of tax revenue.

CEO checklist

- If your company is exploring acquisitions outside China in relation to accessing iron ore or coking coal, are you confident about being able to overcome cultural or political barriers to M&A?
- Do you have a strategy to deal with slowing growth in the steel industry?
- If your business is likely to be adversely affected by measures in the 5YP, have you explored diversification, exit, or restructuring options?
- Does your company have the manufacturing technology to produce speciality or high-end steel called for in the 5YP?
- Do you have any contingency plans in the event of energy rationing and shutdowns?

DISCLAIMER: The information herein has been obtained from public sources believed to be reliable. The views and opinions in this report are those of the authors. KPMG makes no representation as to the accuracy or completeness of such information.



## Sources

Notes: (a) Some steel industry analysts believe China's production numbers are actually higher, but under-reporting from steel companies prevents capturing the full data set (The Wall Street Journal Asia, China Keeps Steel Guessing--Tracking Country's Supply and Demand Becomes Difficult Amid Lack of Accurate Data, 25 May 2011)

(b) Different sources give slightly different numbers, which range from 40 percent to 50 percent

- Sources: (1) China Daily, China's steel output growth to slow, 18 April 2011
- (2) China Steel Statistics Yearbook 2009
- (3) World Metal News
- (4) Reuters, China's plan to create steel super firms seen floundering, 16 Feb 2011
- (5) Xinhua, China 2010 crude steel output to hit 620 mln t, 9 Dec 2010
- (6) Cui Jingyi, senior steel analyst, Guotai Junan Securities
- (7) China Daily, Steel industry plan forged, 27 Jan 2011
- (8) Reuters, China to tackle steel overcapacity in new plan-report, 26 Jan 2011
- (9) Reuters, China steel demand to face headwinds in 2011, 9 Nov 2010
- (10) KPMG, China's Iron and Steel Industry amid the Financial Crisis, 2009
- (11) Xu Xiangchun, chief analyst, Mysteel: China Daily, Rolling out a higher grade of product, 4 March 2011
- (12) Deng Qilin, chairman of China Iron and Steel Association, 21 Feb 2011
- (13) China Iron and Steel Association
- (14) Dow Jones Business News, China Plans To Expand Overseas Iron Ore Mine Purchases, 23 Feb 2011
- (15) Reuters, China steel has last chance to restructure, 5 March 2011

DISCLAIMER: The information herein has been obtained from public sources believed to be reliable. The views and opinions in this report are those of the authors. KPMG makes no representation as to the accuracy or completeness of such information.

© 2011 KPMG Advisory (China) Limited, a wholly foreign owned enterprise in China and a member firm of the KPMG network of independent member firms affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity. All rights reserved. Printed in China.

7