



McKinsey & Company

# China Steel Industry Perspectives

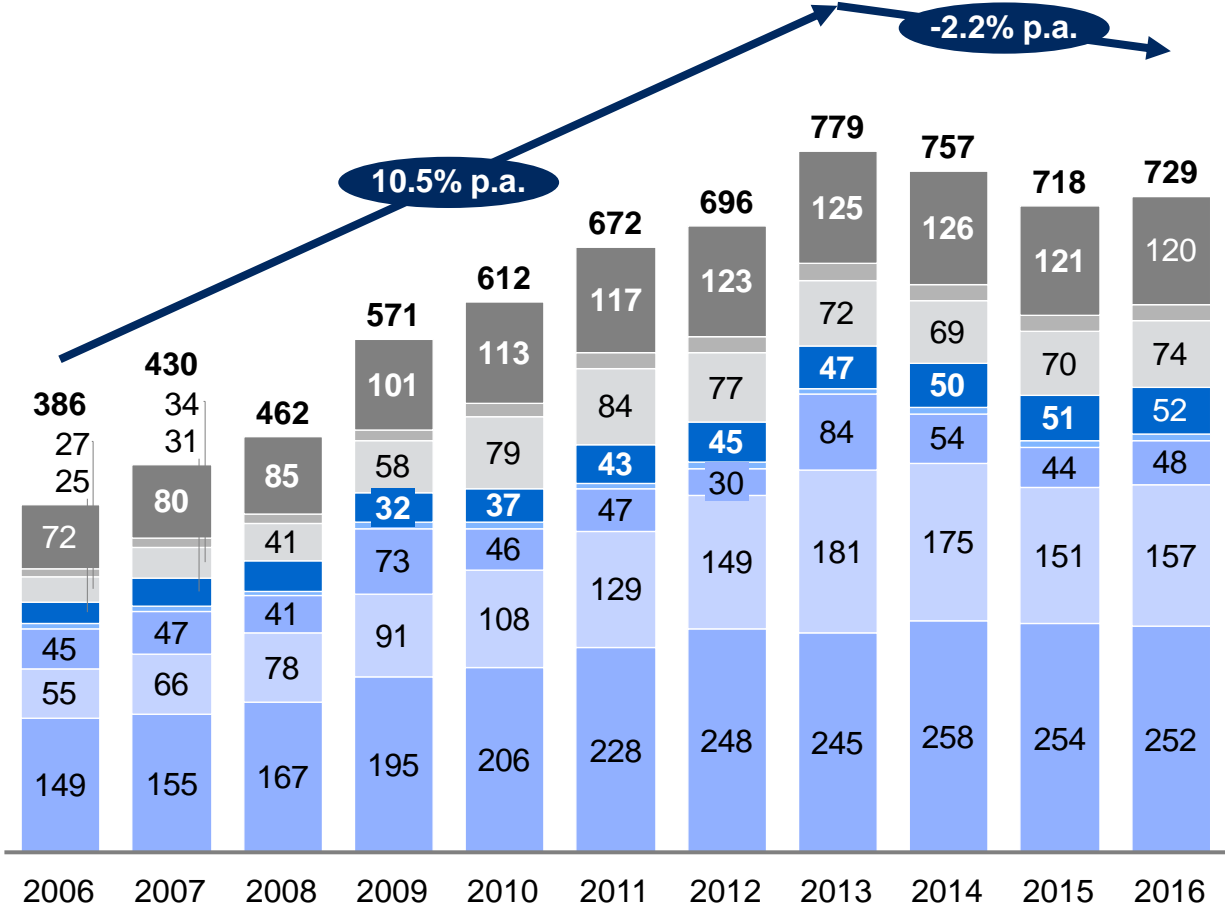
November 2017

Yuanpeng Li

# China's finished steel demand has already peaked out at 779mtpa in 2013, then declined gradually to 729mtpa in 2016

China<sup>1</sup> apparent finished steel demand by sector 2006-2016  
Million metric tonne

CAGR, Percent	
06-13	13-16



06-13	13-16	Sector
8.3	-1.3	Machinery
12.5	-1.2	Consumable durables
14.7	0.9	Transportation
9.6	3.3	Metal goods
5.4	2.0	Oil & gas
9.2	-10.6	Others <sup>2</sup>
18.5	-4.5	Urban residential construction
7.3	0.9	Comm./ind./inf. construction <sup>3</sup>

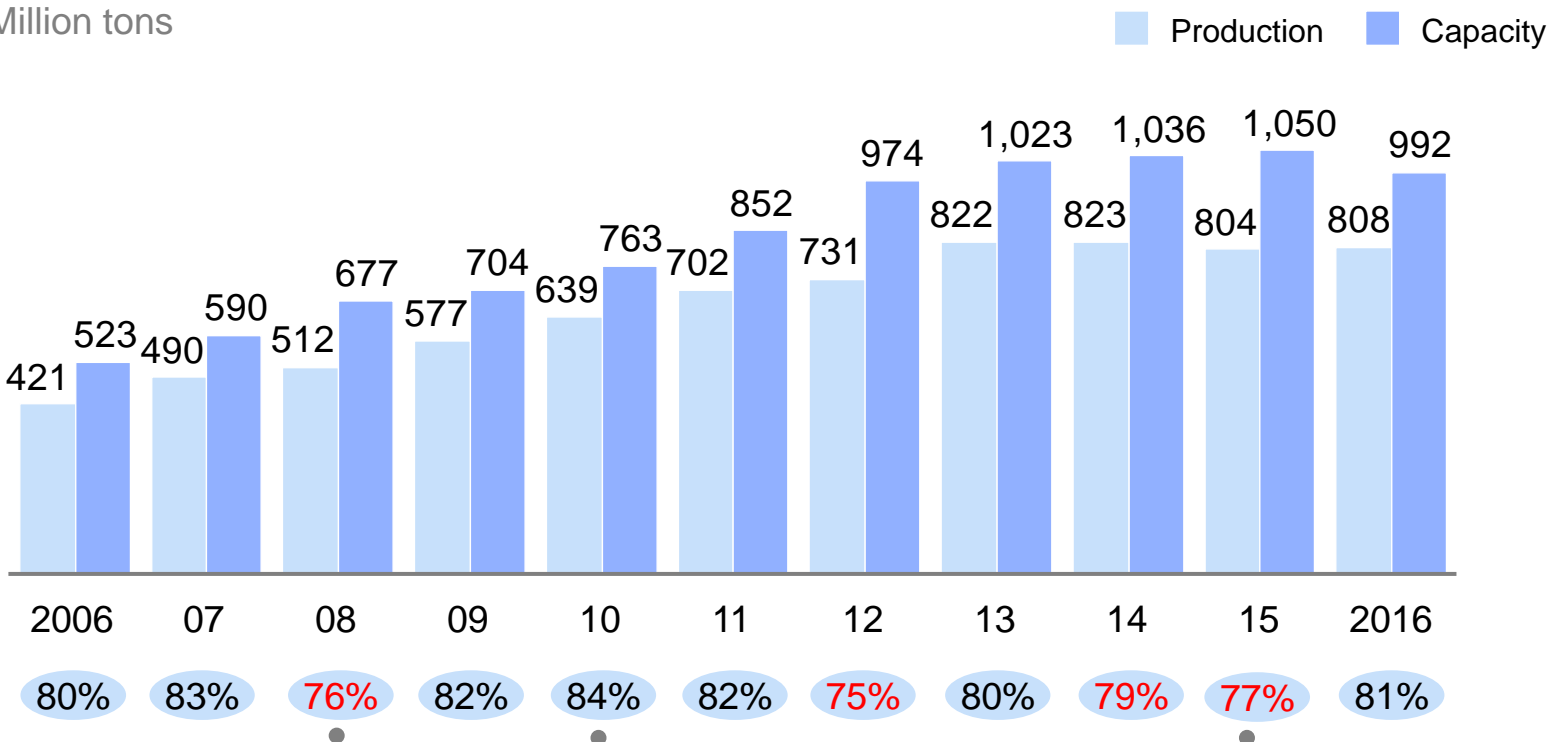
1 Mainland China      2 Unclassified construction, stock change, and others  
3 Commercial, industrial, infrastructure, and rural residential construction

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# China's crude steel capacity has increased to ~1 bn tonne since 2013; production slowdown results in ~180mt capacity idling

Chinese crude steel capacity<sup>1</sup> and production<sup>2</sup> evolution

Million tons



**CAGR 2006-16**

6.7%

6.6%

**Capacity Utilization**

Aggressive and intensive capacity expansion

China's stimulus package effect

Slow-down of China demand

1 Nameplate capacity, with corresponding utilization rate referred here  
 2 Excluding IF capacity and production

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# Several approaches being adopted to remove outdated and inefficient capacity

## Bankruptcy

- Sep 2015 – **Songting steel, private** steel mill in Hebei Province, officially bankrupted
- Mar 2016 - **Shandong Huayuan** Steel Co. bankrupted and auctioned its asset

“To actively and steadily **promote the survival of the fittest**, we will clear the **market through mergers and acquisitions, bankruptcy and liquidation.**”

– Xi Jinping, president of China, Dec 2015

## Forced closures

- **Local government** announced targeted **151mt** steel capacity reduction by 2020
- **Leveraging rigid environmental and legal compliances**, government shut down **~110mt IF capacity** by the end of June 2017

“**Reduction of outdated and inefficient steel capacity** is the **prerequisite of industry restructuring** and normalizing.”

– The State Council, May 2017

## Environmental Compliance

- 28 cities in North China (e.g. Hebei, Shandong, provinces) are requested **to cut steel operations by 50%** during Nov 15, 2017 – Mar 15, 2018

“Capacity elimination in tandem with **tightening environment regulations**, help to facilitate restructuring of local steel industry.”

– CISA, July 2017

## Funds for re-education

- Laid-off employees will be re-educated and re-deployed...
- Central Govt set up **Industrial Enterprises Structure Adjustment Special Funds** (~Rmb 100bn)

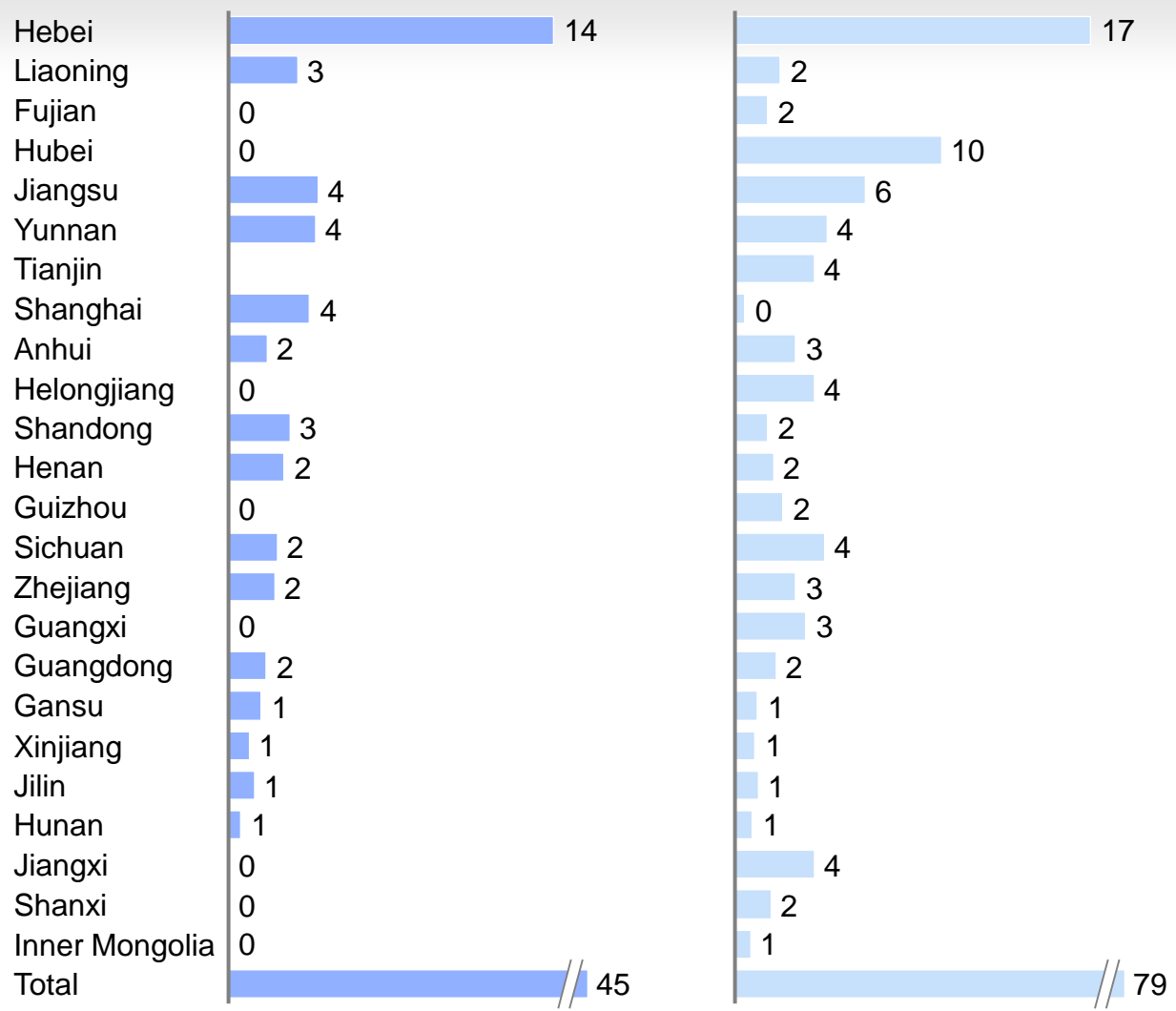
“...for young, who have learning ability and are trainable, they could **learn new technics and skills**, and transfer to **service industry**, eg. express delivery.”

– Ministry of Finance, Mar 2016

# Elimination volume in 2016 out-performed government target

2016 elimination target<sup>1</sup>, mt

2016 real elimination<sup>1</sup>, mt



- Elimination volume in 2016 out-performed the government target
- Government plans to shut down ~50mtpy outdated steel capacity in 2017
- By the end of Sep 2017, capacity reduction reached to ~35mtpy capacity

1 BOF+EAF capacity

# Complete elimination of 110mtpy IF capacity has been creating substantial impact on the industry climate

2016 IF capacity in China, mt



Capacity: ~110mt  
Production: ~70mt

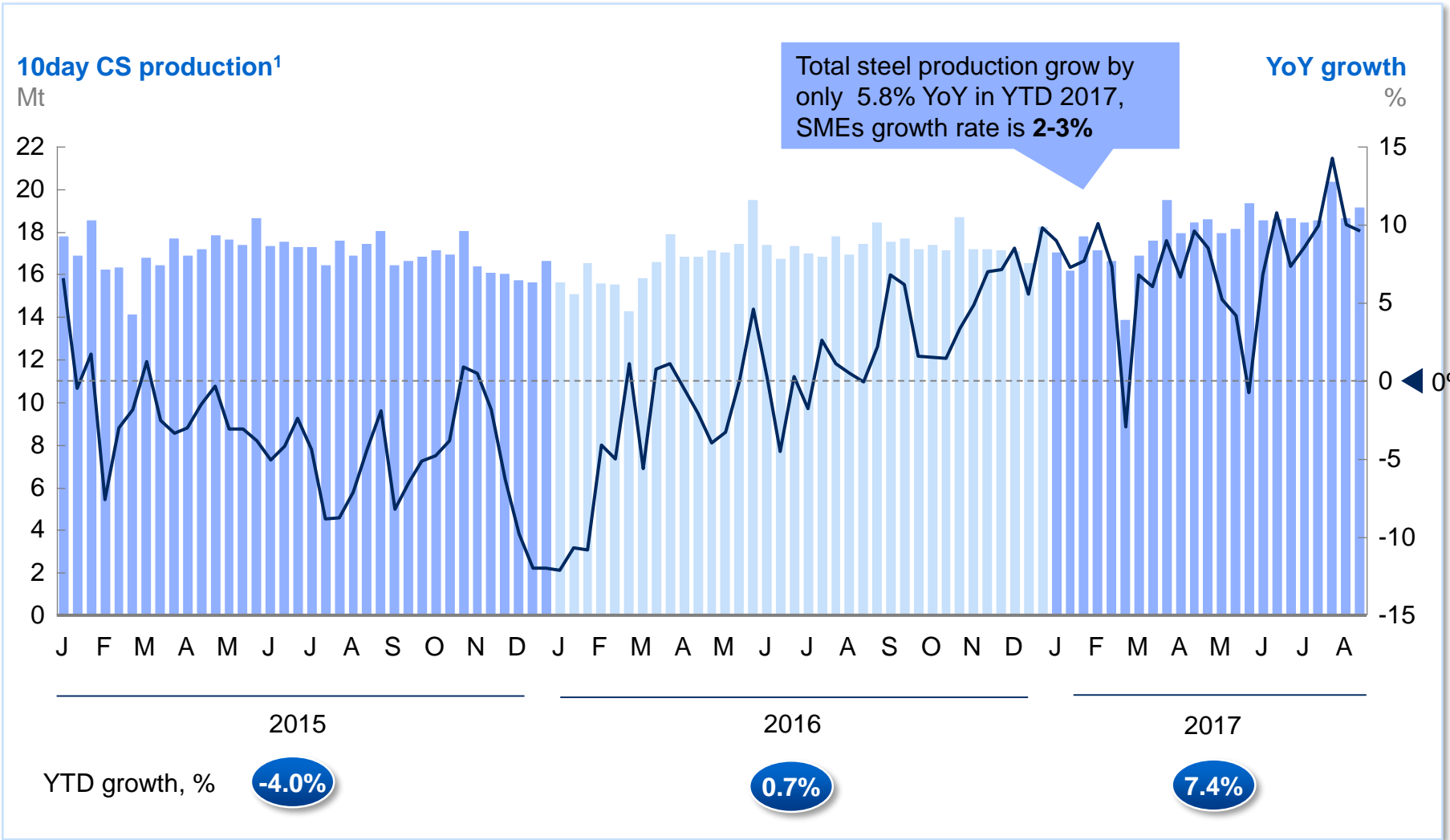


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# Due to IF closures, 2017 production of “CISA member mills” has grown faster than small private mills

— YoY,%  
 ■ 10day CS production



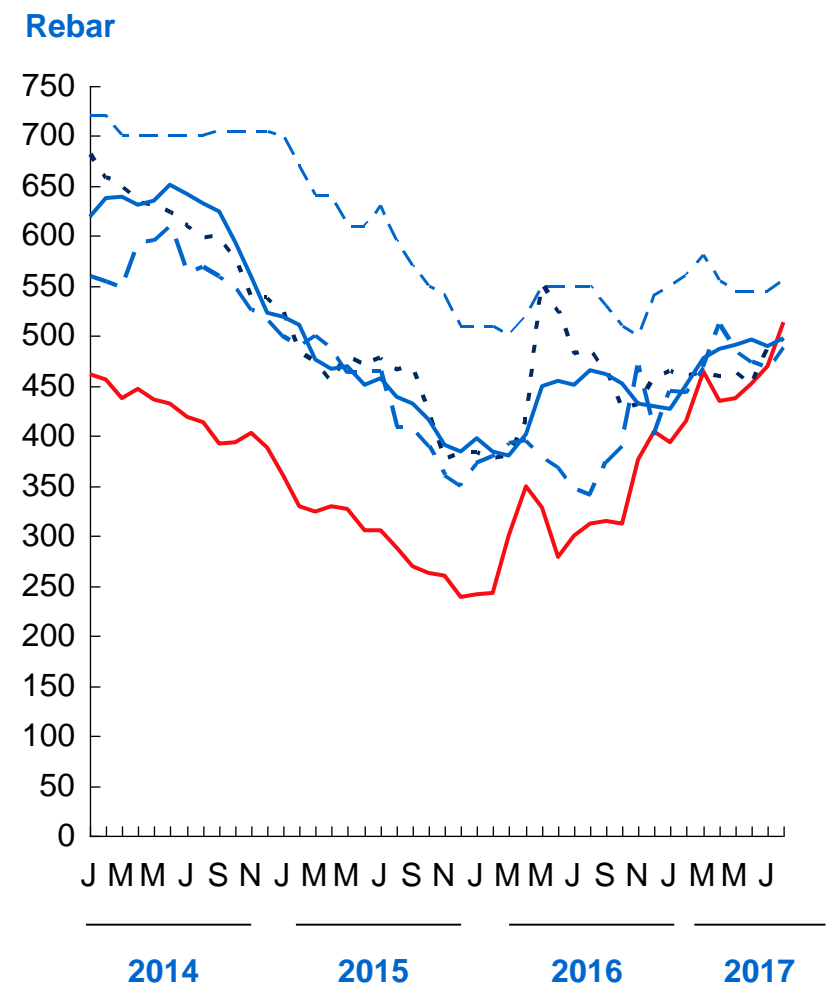
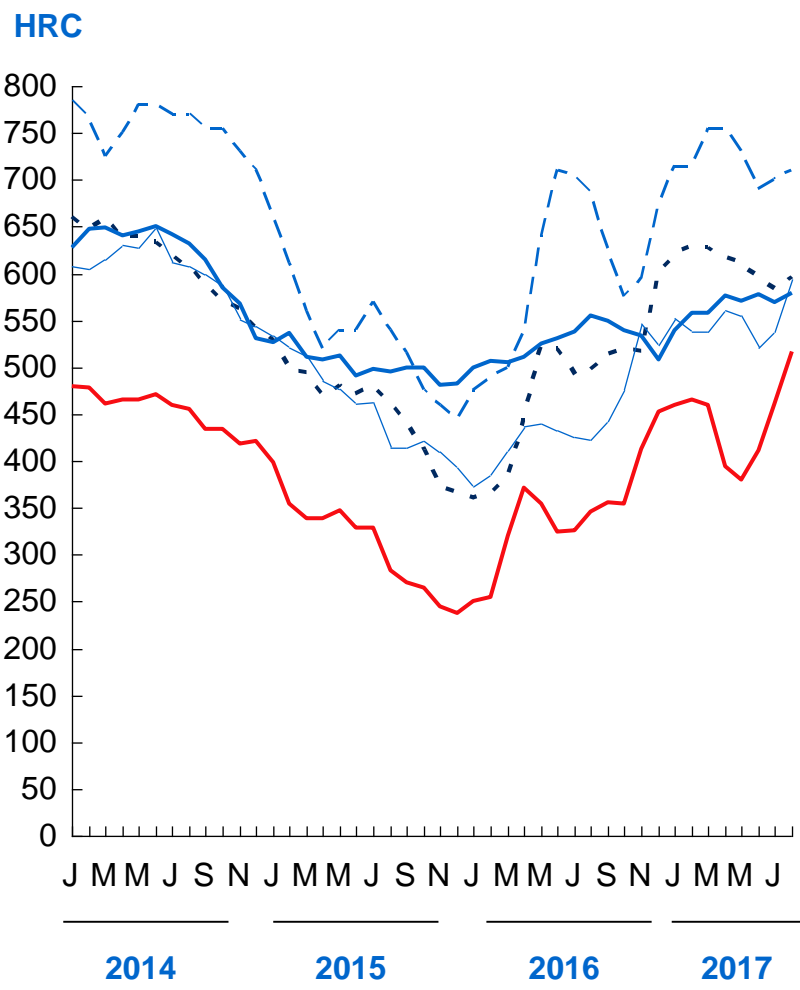
<sup>1</sup> CISA member mills

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# Rebar prices have closed the gap with international prices due to IF closures creating tightness in the market

- US
- Japan
- China
- India
- EU

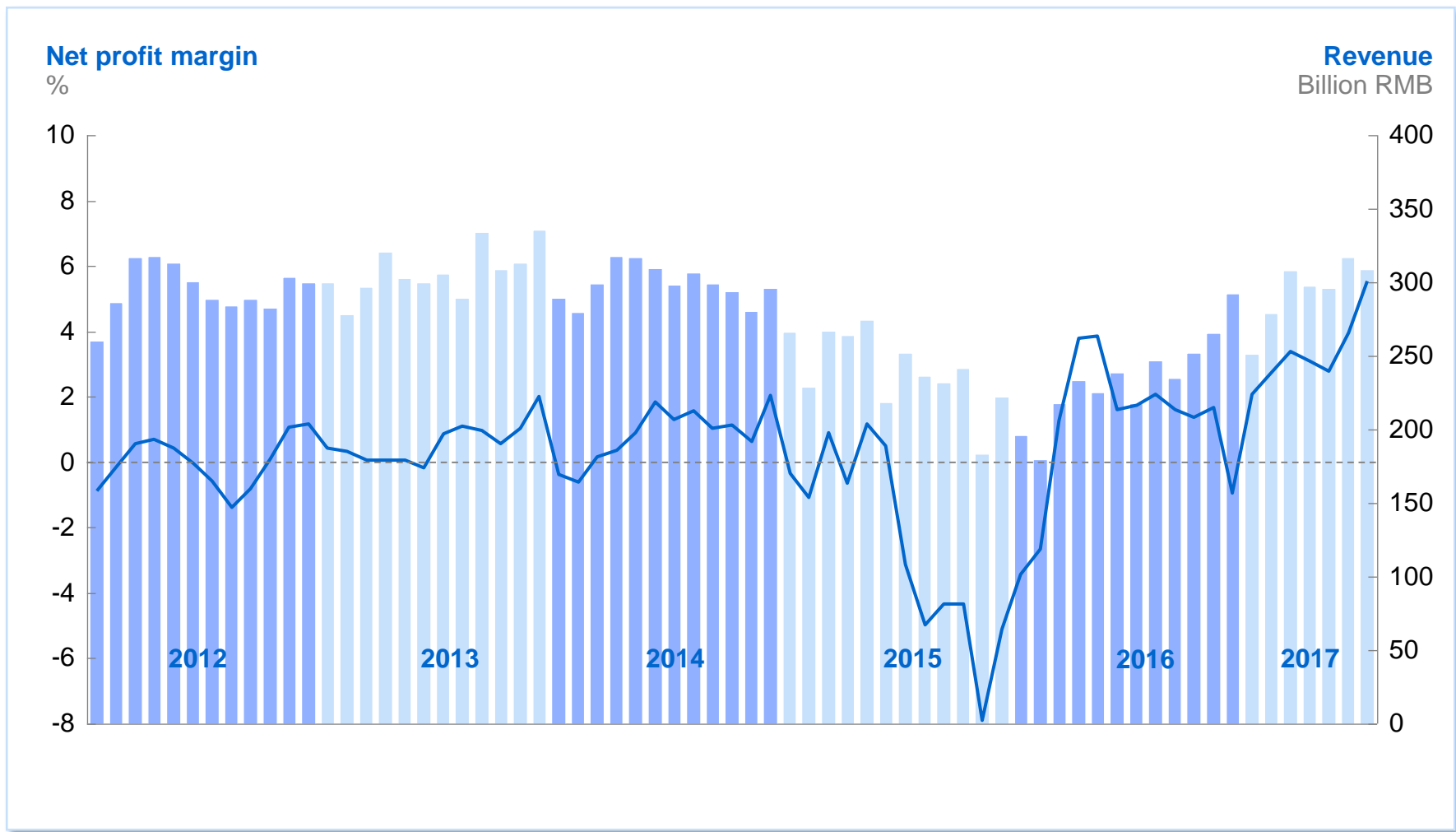
Chinese price vs. global prices (USD/tonne, local VAT excluded)





# Profitability improved significantly in 2017 as net margin increased from 1.1% in 2016 to 5.5% in July 2017

— Net profit margin  
■ Revenue



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1 Profit data for 77 large & medium CISA member steel mills

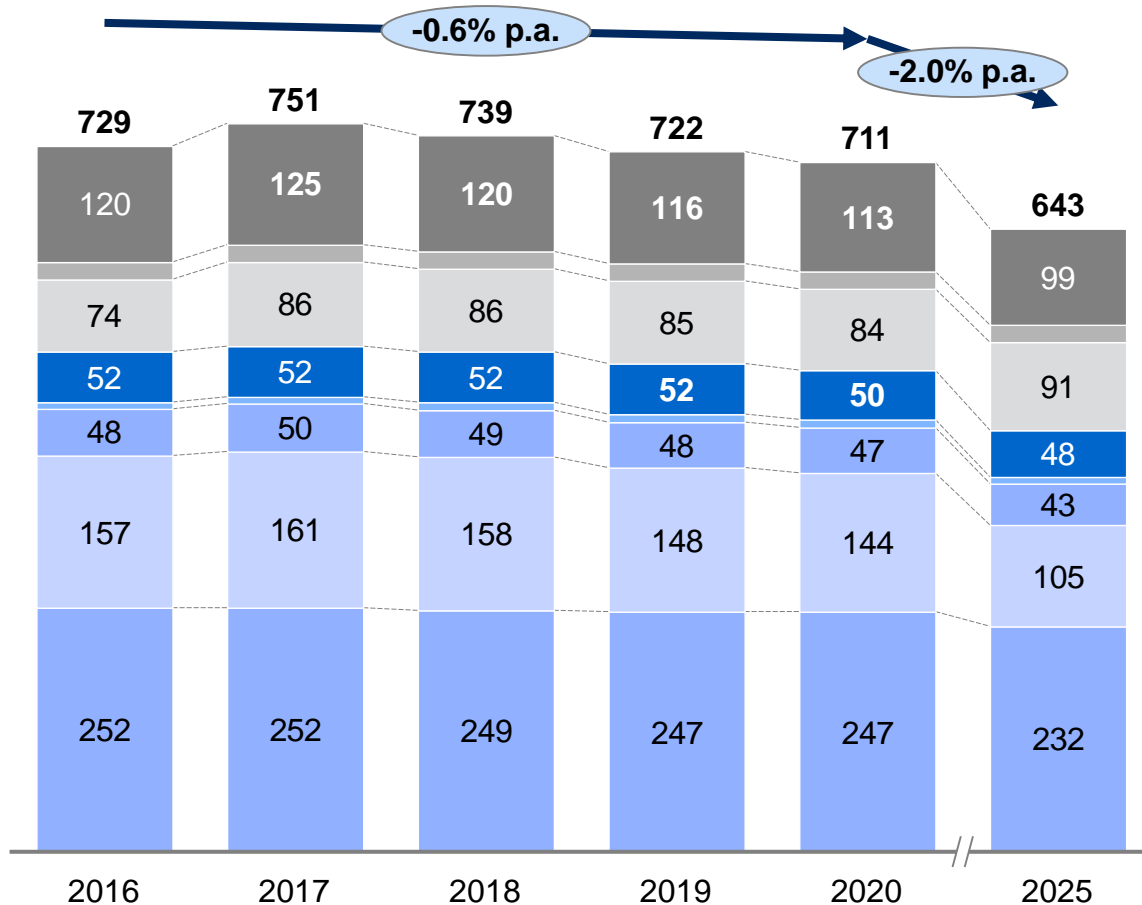
# We expect the industry to be a bit balanced but with continues structural changes for upgrading



- A** Supply reform will continue, yet market tightness being offset by demand slowdown
- B** Industry consolidation likely to improve for more cross region M&A
- C** EAF could go at higher growth due to scrap availability
- D** Export unlikely to grow but outbound investment could grow

# A Going forward, China steel demand is expected to decline to 711mt in 2020 and 643mt in 2025

China<sup>1</sup> apparent finished steel demand by sector 2011-2025



CAGR, Percent	
16-20	20-25
-1.5	-2.6
-0.2	-0.3
3.2	1.7
-0.8	-0.9
2.2	-3.0
-0.6	-2.0
-2.2	-1.1
-0.5	-1.2

- 1.5   -2.6   Machinery
- 0.2   -0.3   Consumable durables
- 3.2   1.7   Transportation
- 0.8   -0.9   Metal goods
- 2.2   -3.0   Oil & gas
- 0.6   -2.0   Others<sup>2</sup>
- 2.2   -1.1   Urban residential construction
- 0.5   -1.2   Comm./ind./inf. construction<sup>3</sup>

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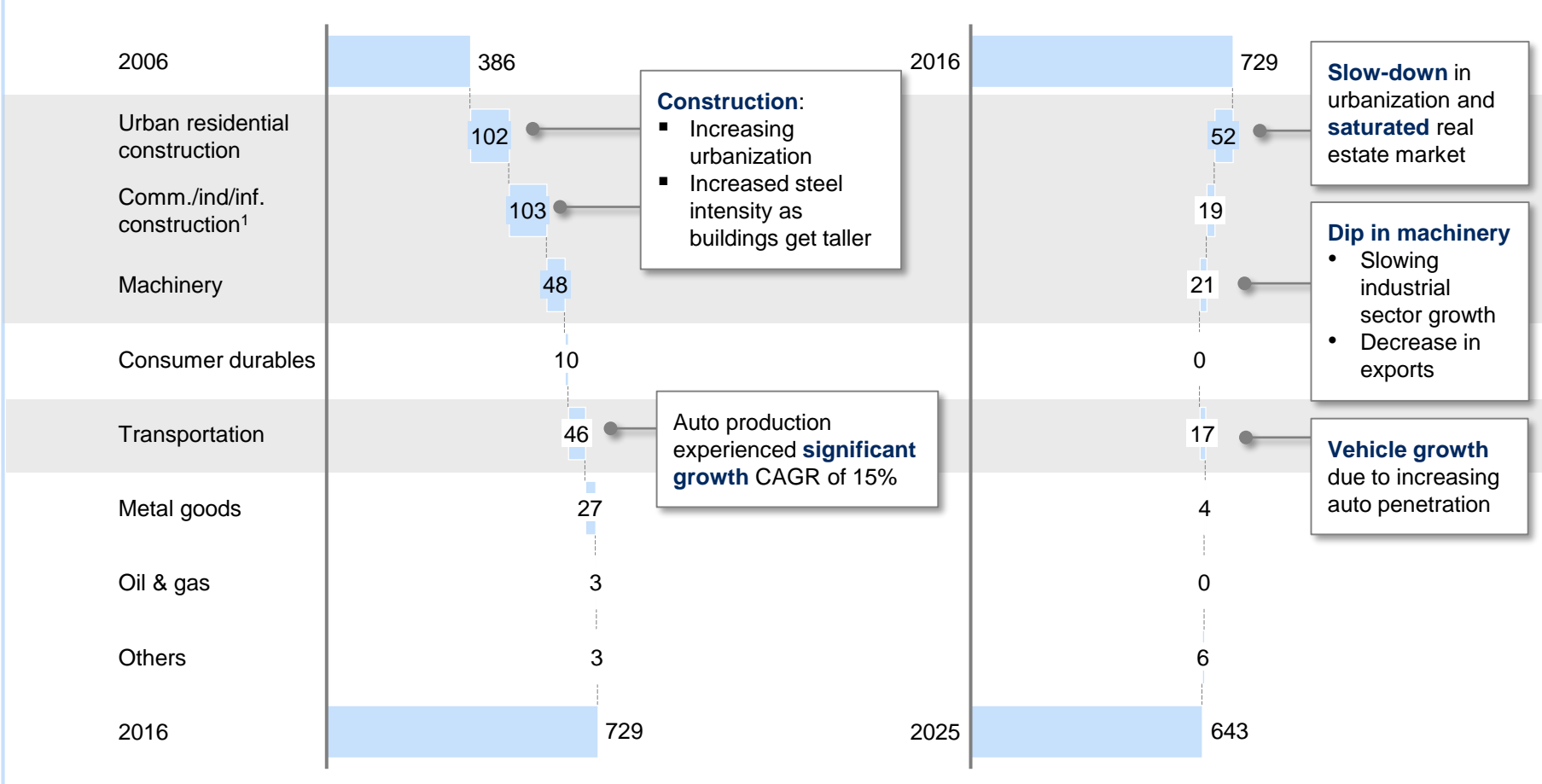
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# A Continuous decline in steel consumption is driven by decreasing demand in construction and machinery segments

China apparent finished steel demand sources of growth, 2006 - 2025

BASE CASE

Million metric tonne



**Construction:**

- Increasing urbanization
- Increased steel intensity as buildings get taller

Auto production experienced **significant growth** CAGR of 15%

**Slow-down** in urbanization and **saturated** real estate market

**Dip in machinery**

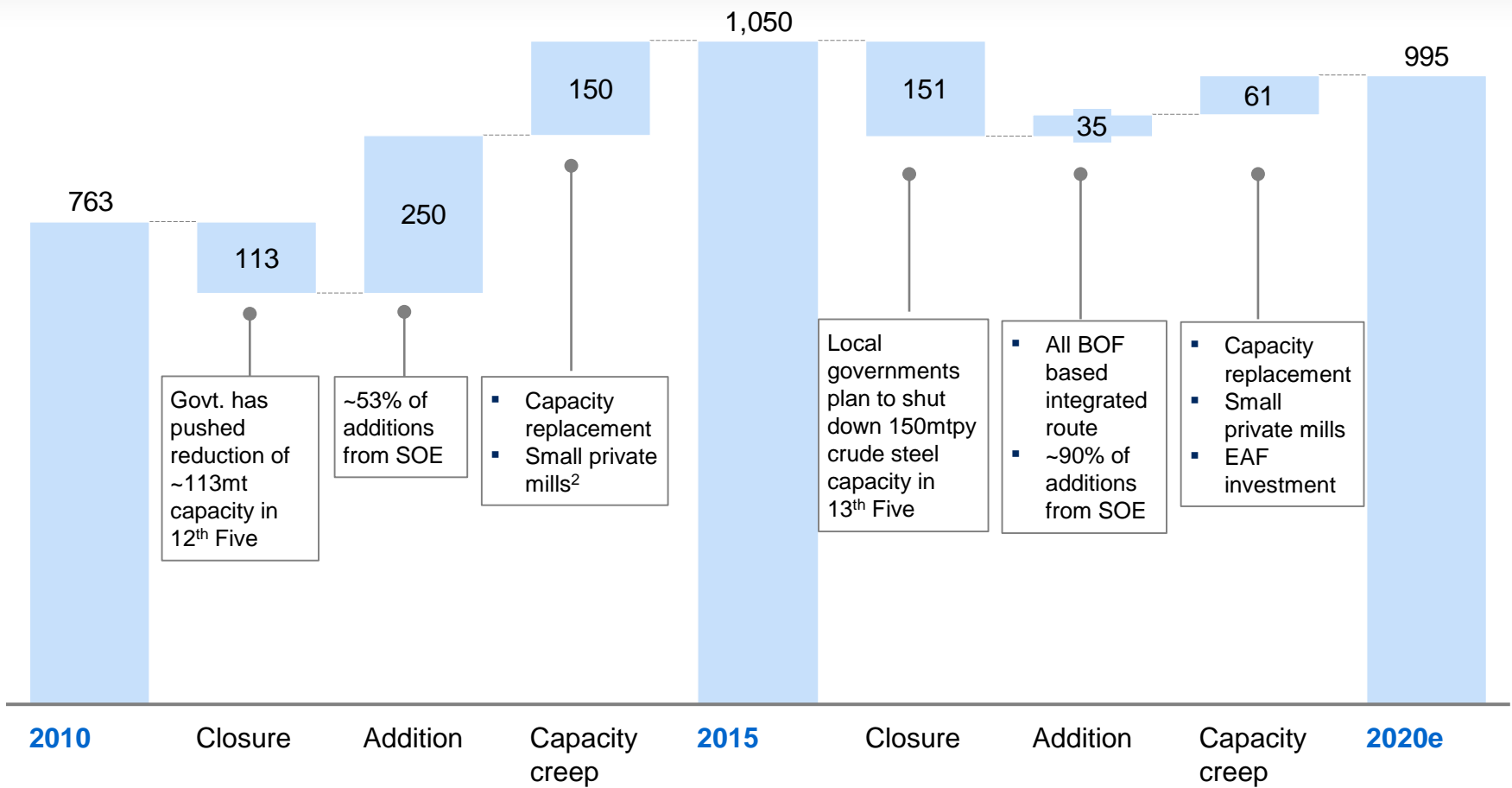
- Slowing industrial sector growth
- Decrease in exports

**Vehicle growth** due to increasing auto penetration

<sup>1</sup> Commercial, industrial, infrastructure, and rural residential construction

# A Chinese government continues to push restructuring and capacity elimination of 150mt in 2016-2020

China crude steel capacity<sup>1</sup>, 2010-2020, Million tons

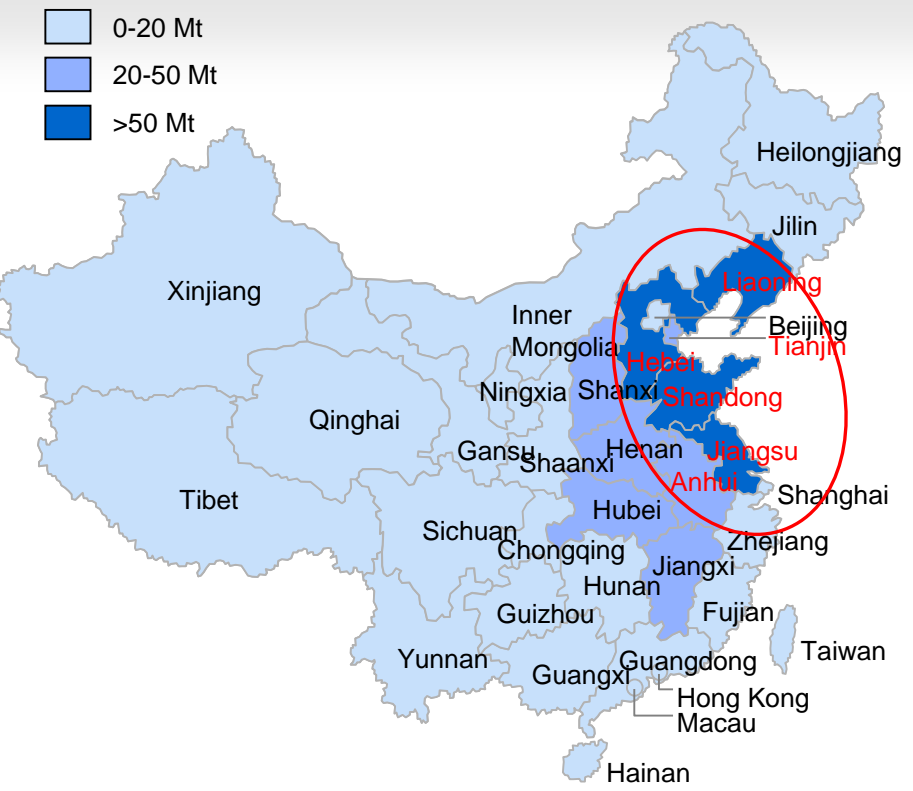


1 Excluding IF capacity  
2 Other small mill: crude steel production < 3.0mt

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# A Capacity elimination will be highly concentrated on Eastern and Coastal regions, especially Hebei province

China steel production by province, 2015



- Eliminations will concentrate on **Eastern and Coastal** regions
- **Hebei province** accounts for ~33% of the shutdown
- **Small and private mills** are the key regulation targets, e.g. Qingquan Steel, Zongheng Steel in Hebei
- While elimination from SOE mills is driven by replacement, e.g. Shandong Steel, Baowu Steel

Province	Capacity <sup>1</sup> , 2015, mt	Over supply 2015, mt	Shutdown plan, in 2016-20, mt
Hebei	257	69	49
Jiangsu	124	14	18
Shandong	76	10	15
Liaoning	73	12	6
Shanxi	64	20	NA
Henan	34	5	2
Hubei	33	3	6
Anhui	33	8	6
Xinjiang	32	20	1
Inner Mongolia	32	13	NA
Sichuan	31	10	4
Guangdong	29	11	3
Jiangxi	26	4	4
Tianjin	26	5	9
Shanghai	26	8	4
Hunan	24	5	1
Guangxi	23	2	2
Yunnan	22	8	5
Zhejiang	22	6	2
Jilin	20	6	1
Fujian	20	4	5
Heilongjiang	13	7	3
Gansu	12	4	3
Guizhou	6	1	2
Qinghai	3	2	1
<b>Total</b>	<b>475</b> / 1,050	<b>243</b> /	<b>151</b> /

1 BOF+EAF capacity

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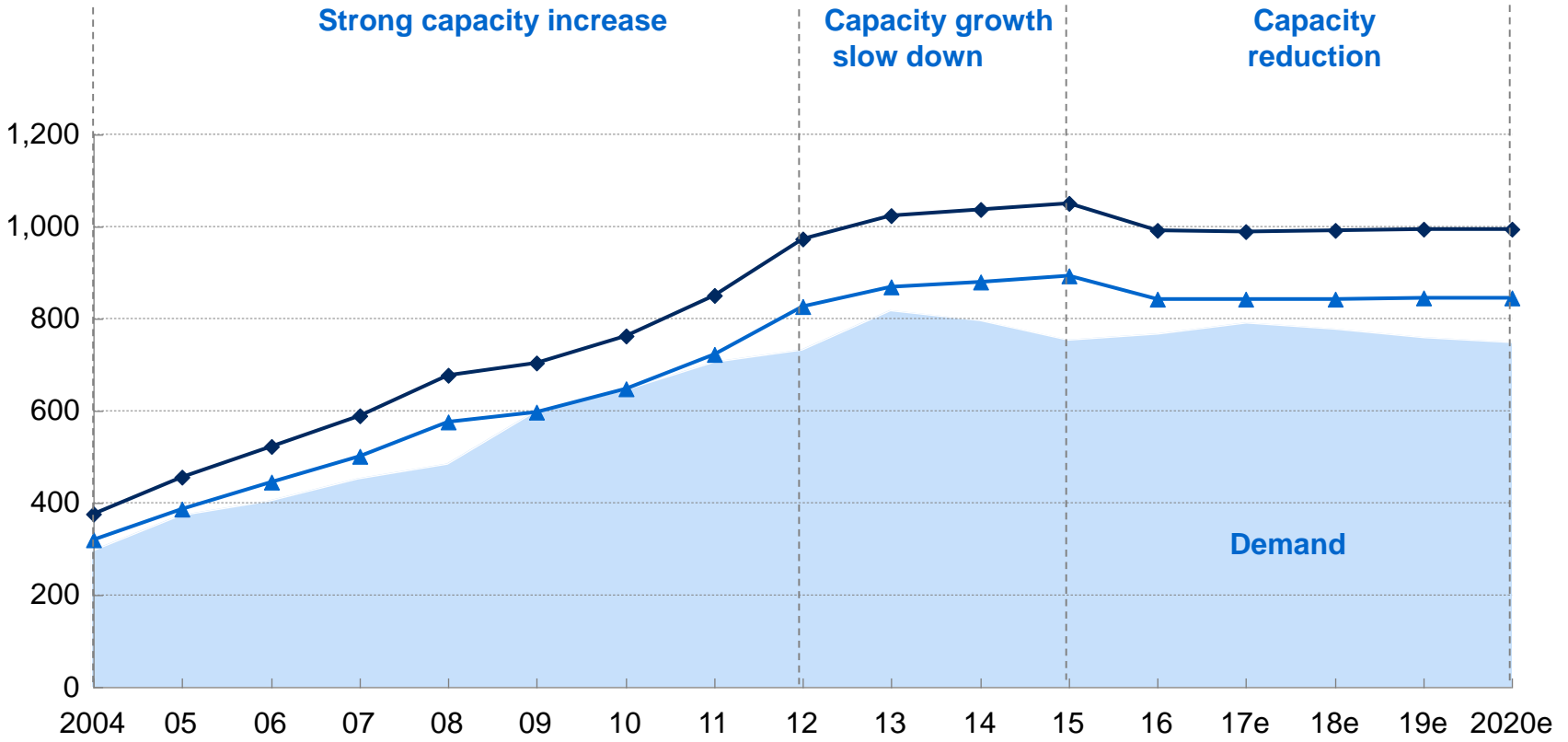
# A Overcapacity is likely to hang over China steel industry due to continuous decline in steel demand

BASE CASE

## China demand/capacity

Million metric ton, crude steel

Nominal capacity    Production @ 85% capacity utilization



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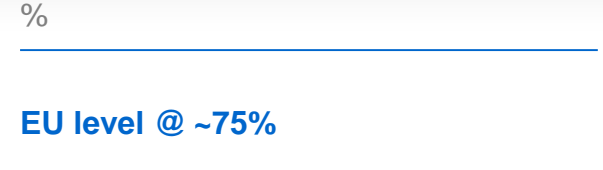
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# B To meet central government expectation on 60% of consolidation, strong support from local government on M&A is needed

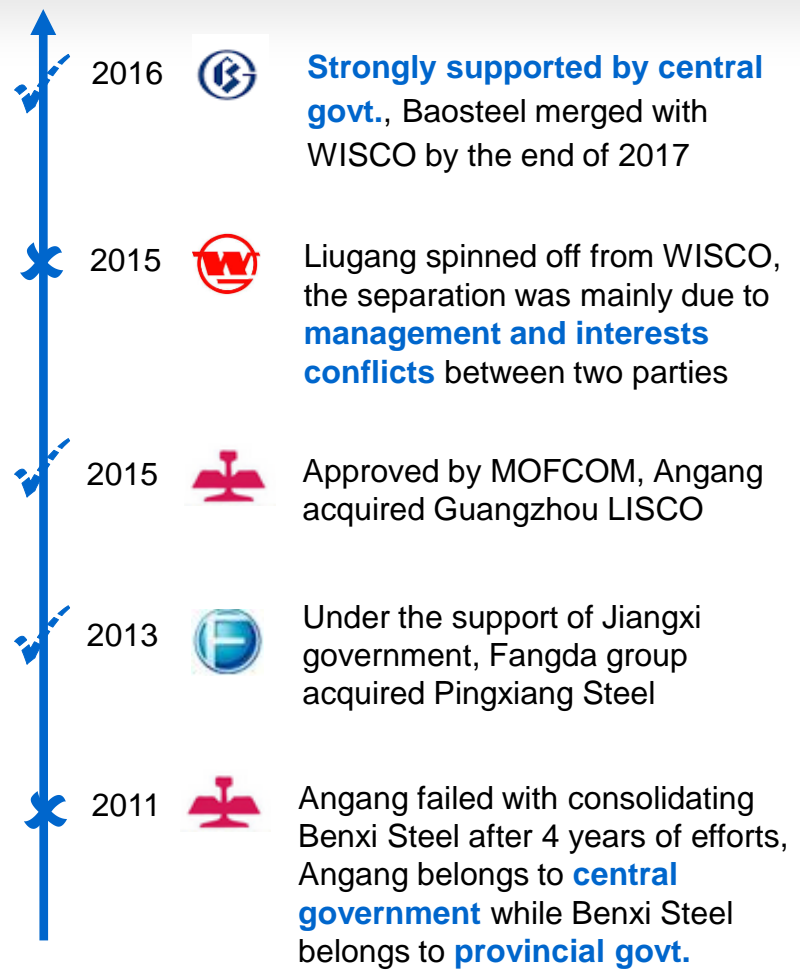
## Government plan for top 10 concentration

China Top 10 crude steel player share %



EU level @ ~75%

## Recent M&A activities



- Government postponed the concentration target by five years
- Local gov. interference is the key barrier for cross regional M&A



# B The prevalence of regional and cross-regional consolidation can be expected in the medium to long term

**Government consolidation plan<sup>1</sup> for 2025**

- To foster 3-4 steel groups with capacity of ~80mtpy and 6-8 steel group with capacity of 40mtpy

**3-steps approach will be adopted to realize the 2025 plan, :**

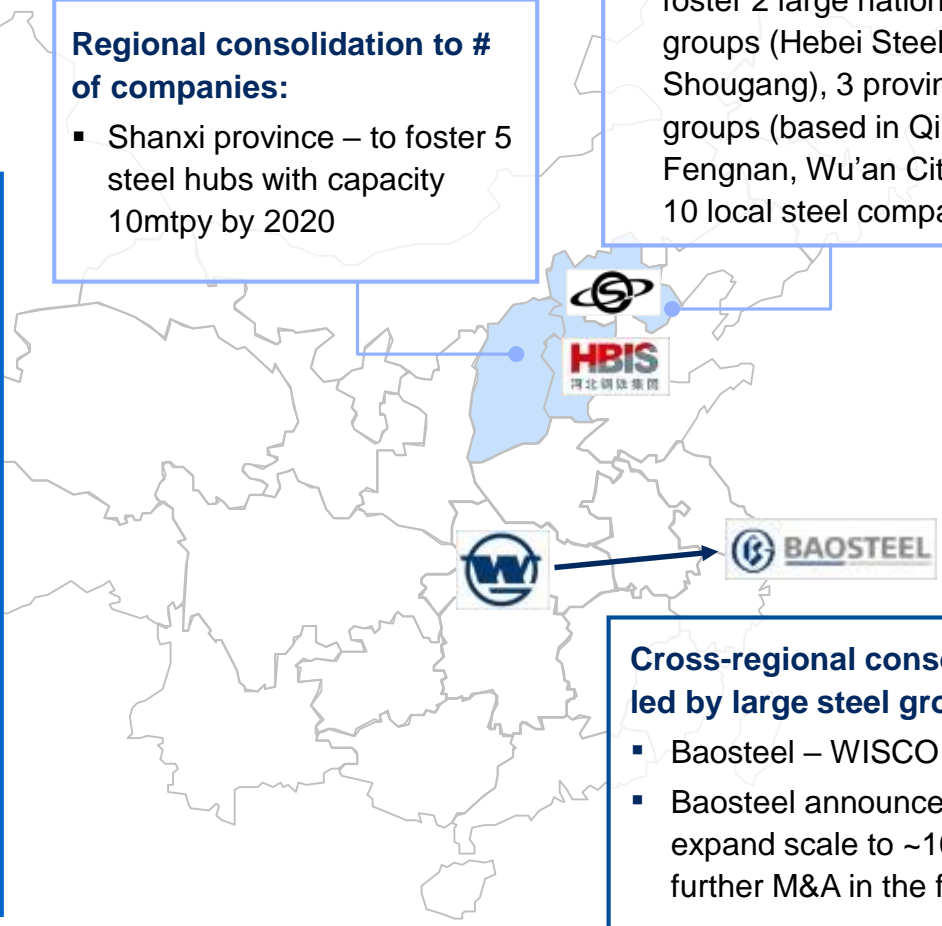
- Step 1 (2016-2018):** Shutdown obsolete steel capacity and develop model example for consolidation (Baosteel – WISCO)
- Step 2 (2018-2020):** Optimize consolidation policy and compliances
- Step 3 (2020-2025):** Facilitate consolidation progress to a grander level

**Regional consolidation to # of companies:**

- Shanxi province – to foster 5 steel hubs with capacity 10mtpy by 2020

**Regional consolidation to reduce # of companies:**

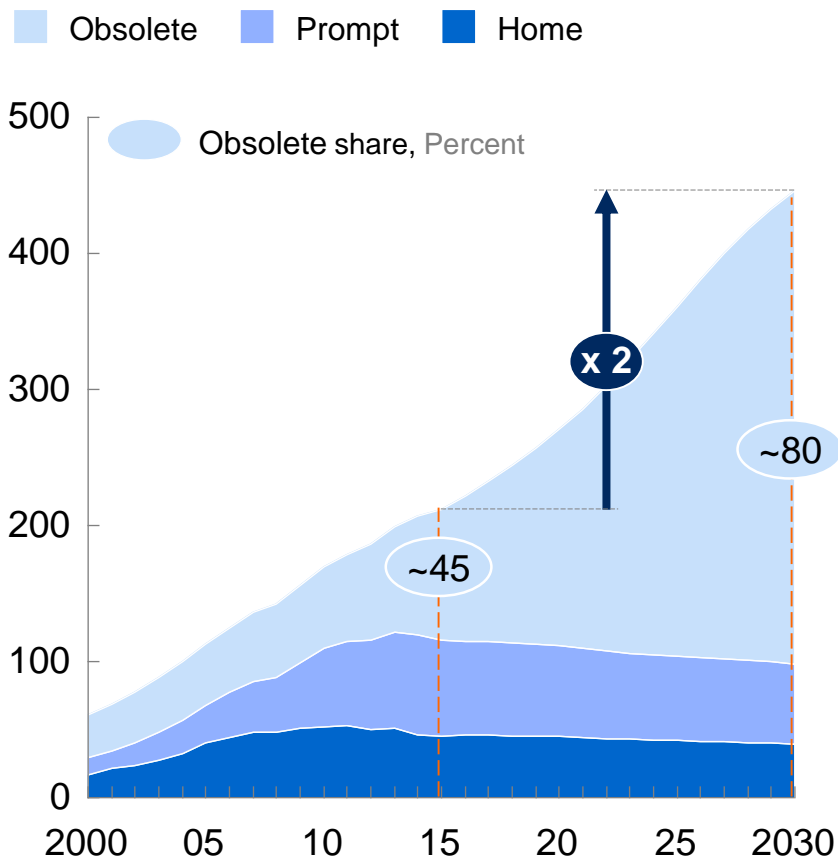
- Hebei province – by 2020 to foster 2 large national steel groups (Hebei Steel and Shougang), 3 provincial steel groups (based in Qian’an, Fengnan, Wu’an Cities) and 10 local steel companies



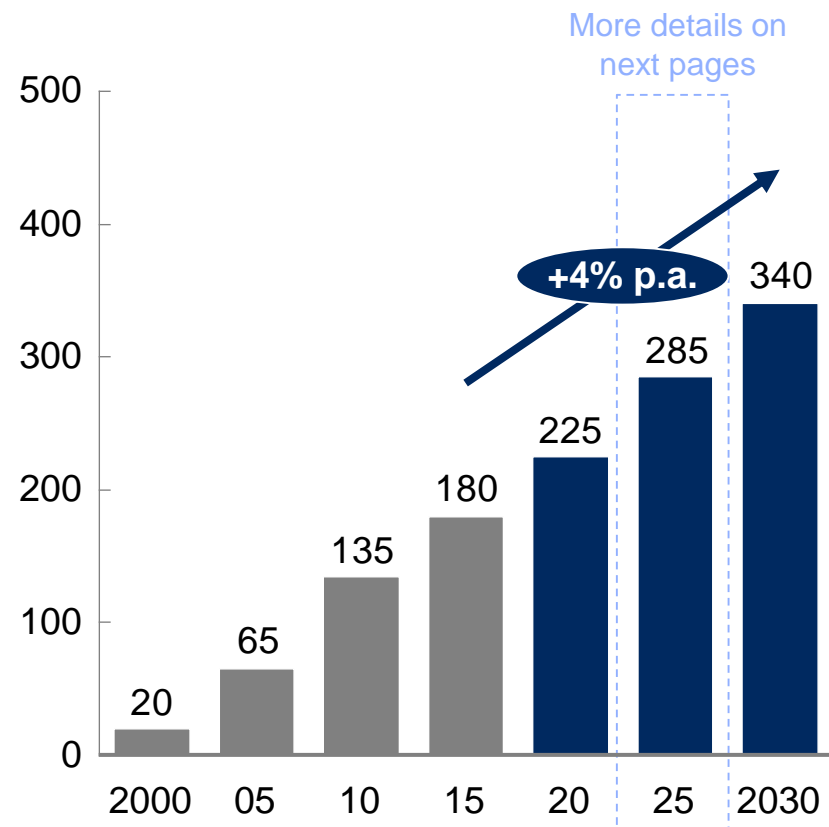
1 Central government guideline for consolidation and disposal of mothballed capacity

# China scrap will grow stably over next decade, driven by strong generation in obsolete scrap

China scrap availability  
mmt



China scrap supply – 70% recycling<sup>1</sup>  
mmt



<sup>1</sup> For the future 70% of available obsolete scrap is assumed to be recycled, For home and prompt scrap a 100% recycling efficiency is assumed

# C Surplus of scrap in China is likely to occur as scrap supply will exceed the demand even while assuming high usage rates in EAF and BOF

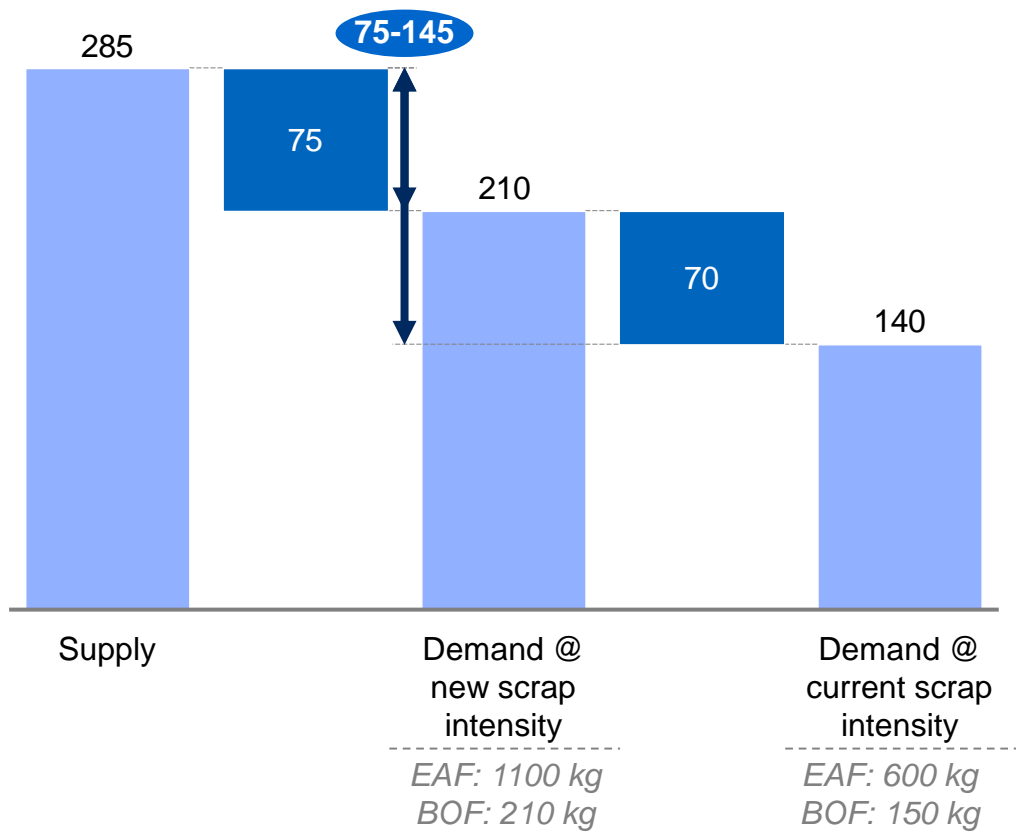
ROUNDED NUMBERS

China scrap supply demand balance 2025E – base case assumptions

mmt



- **Crude production** (as a result of steel demand and net trades) to decline by ~70 mmt in next 10 years
- Typical **life cycles and collection rates** for different end use sectors of steel
- Obsolete scrap **recycling efficiency of ~70%**



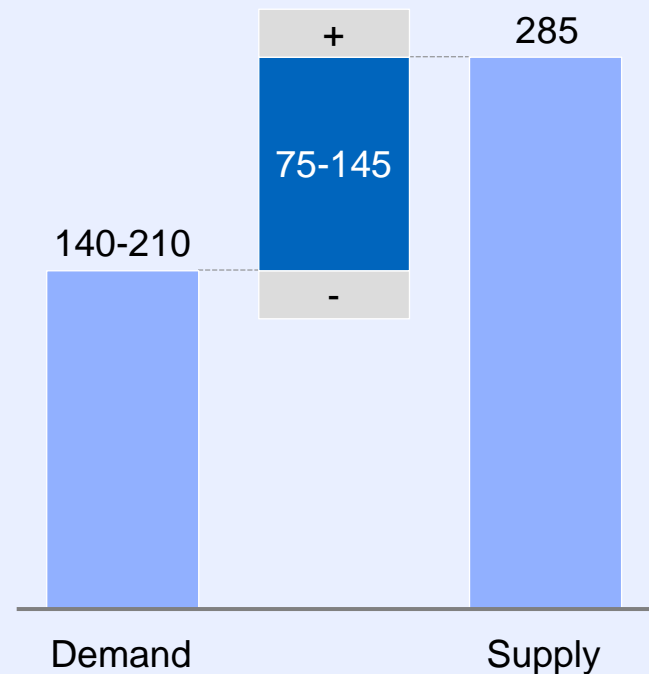
- **Steel demand** to decline by ~80 mmt in next 10 years
- **Net exports** to decline to ~70mmt in 2025 from ~100mmt in 2015
- **Maximized EAF crude steel production** ~70 mmt (capacity ~75 mmt in 2016)

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# C Different scenarios could be considered by which China's future scrap supply demand mismatch gets balanced

China scrap supply demand balance 2025E

mmt



1

Will there be **as much obsolete scrap available** and **enough incentives** in China to collect and recycle the scrap? How will scrap **recycling industry** evolve and what prices are needed to make the industry **profitable**?

2

Will **current BOF and EAF players** be able to **use more scrap** up to the standards typically observed in developed regions or above by applying new technologies?

3

To what extent is the country ready to allow the steel industry to make the **switch from BOF to EAF** and hence closing more BF-BOF capacity while investing in new EAF facilities?

4

If not all collected scrap can be consumed locally, **what measures** will be put in place to **support or discourage the exports** of scrap from China? Will it **distort global trade of scrap, and iron ore market**?



# Beyond the current capacity closure plans a significant switch from BOF to EAF is needed to accumulate the scrap

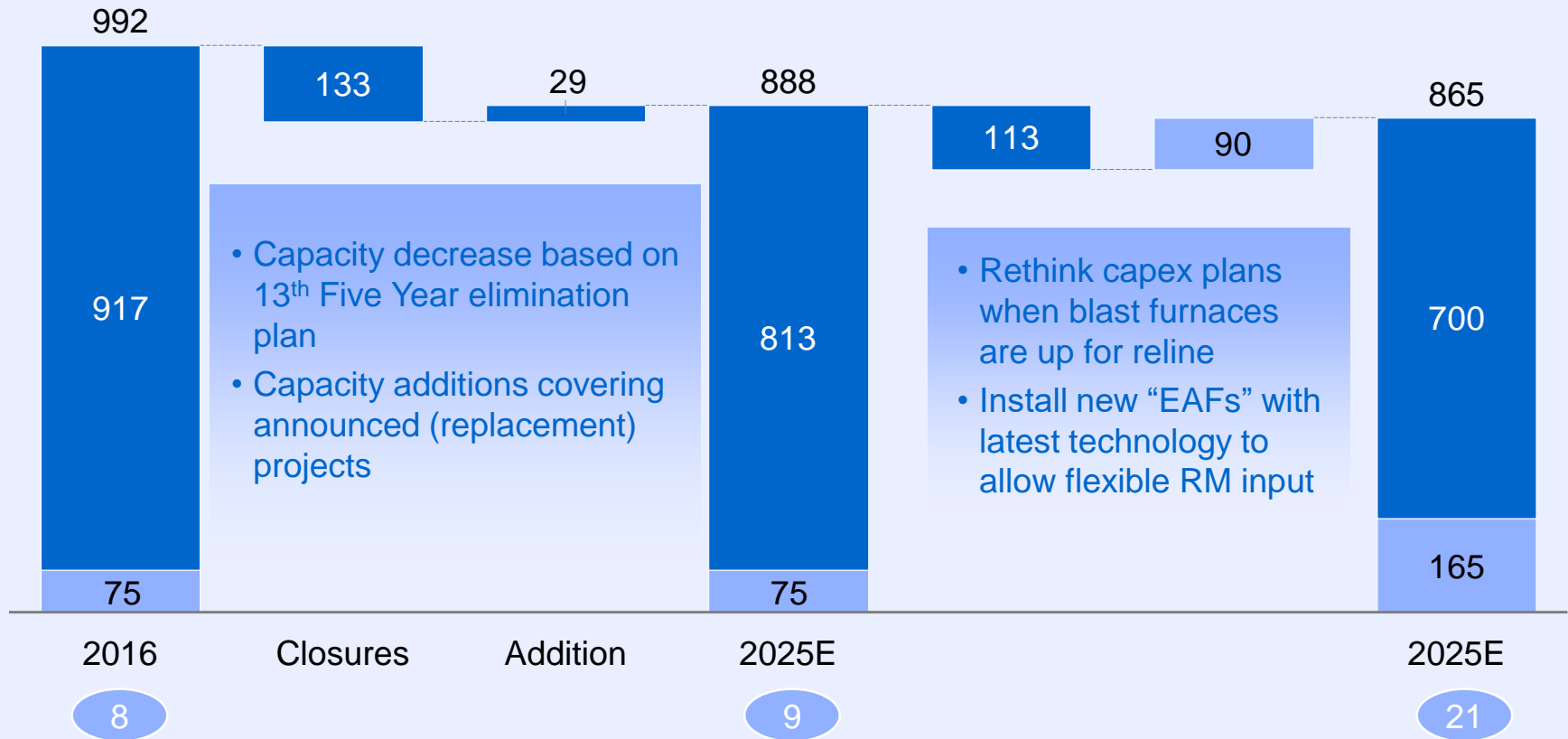
ROUNDED NUMBERS

China crude steel capacity assessment  
mmt

■ BOF ■ EAF ○ EAF share, Percent

➤ Current estimates

➤ Additional needs



5

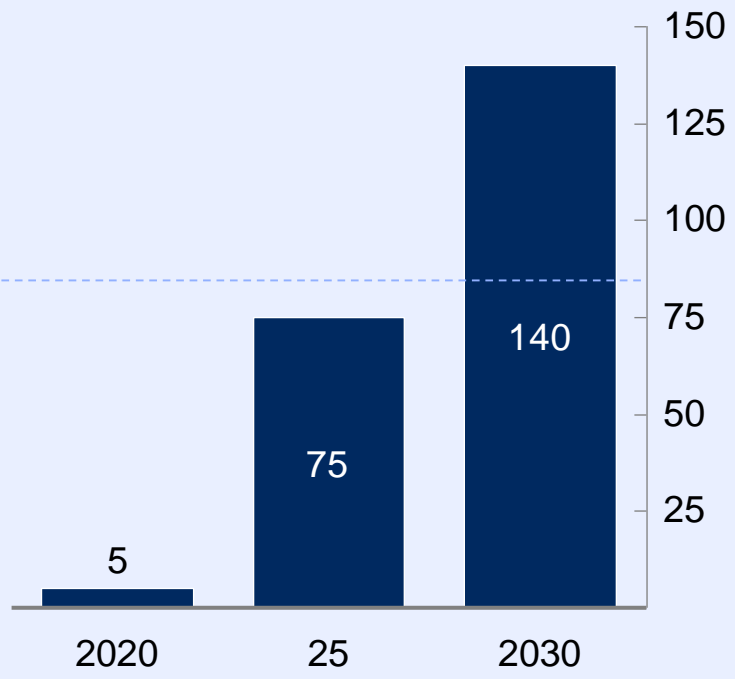
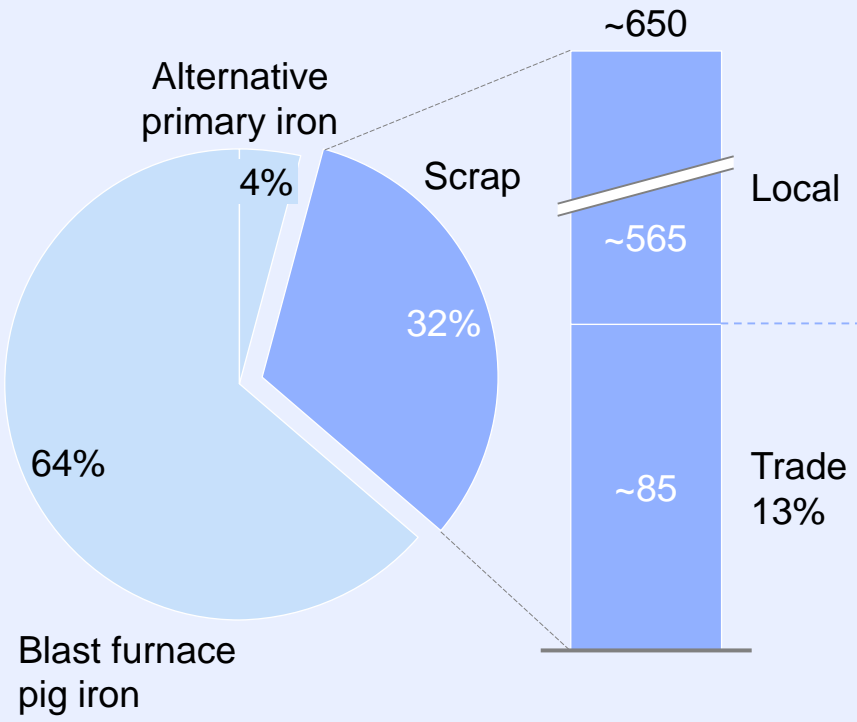
# C4 Increasing surplus due to lacking the ability to absorb collected scrap could distort global scrap trade and iron ore market

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**Global share of metallics 2015**  
Percent

**Total scrap consumption**  
mmt

**China scrap supply surplus based on base case assumptions**  
mmt

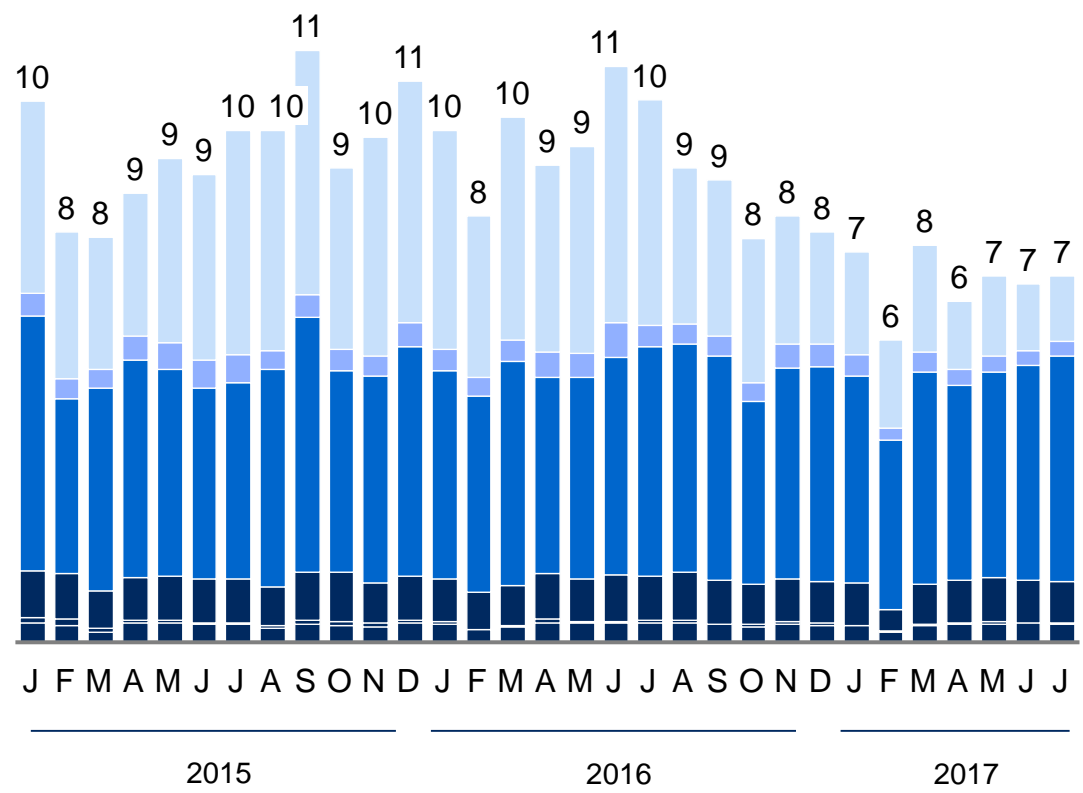


# D Export of Rod & bar products reduced significantly in 2017 due to IF elimination, Asia markets still the biggest destination for China steels

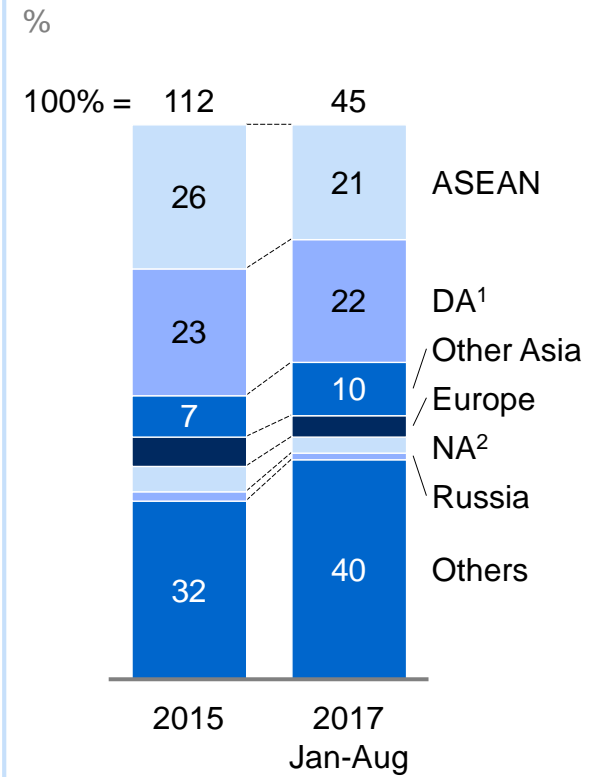
## Chinese steel products export

Million tons

- Rod & Bar
- Angle, Shape, Section
- Sheet & Plate
- Tube & Pipe
- Railway Use
- Other



## Export by destination



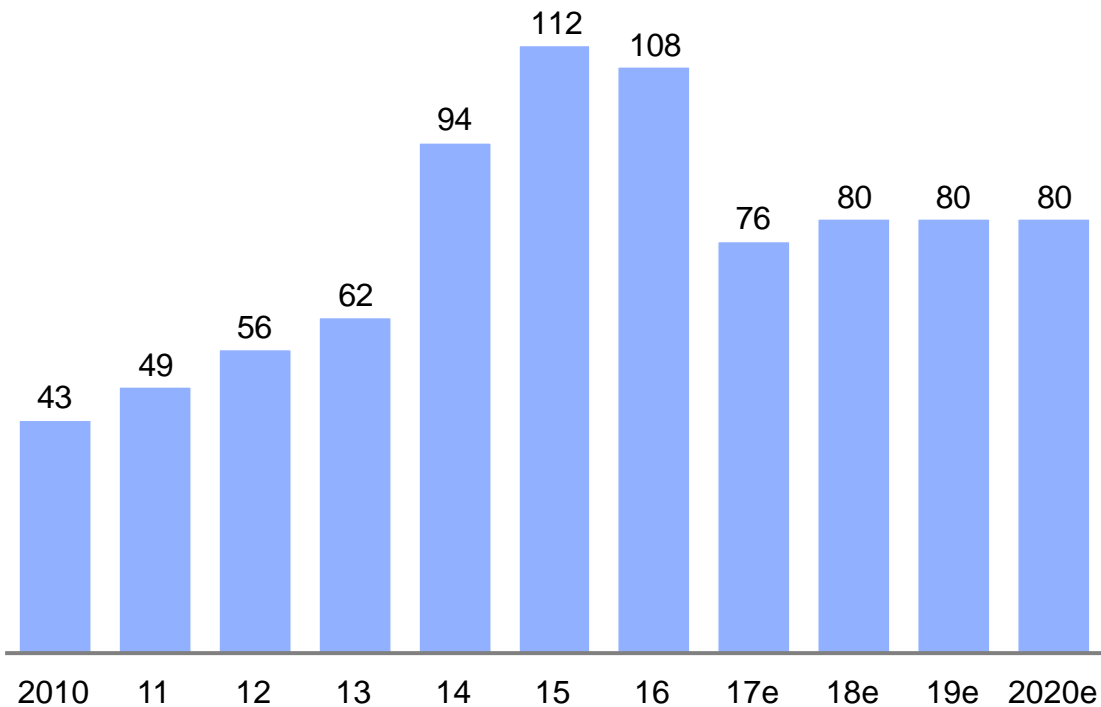
1 Developed Asia 2 North America

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# D Strong exports are not expected to be sustainable over the long term

China finished steel export, 2010-2020

Million metric tons



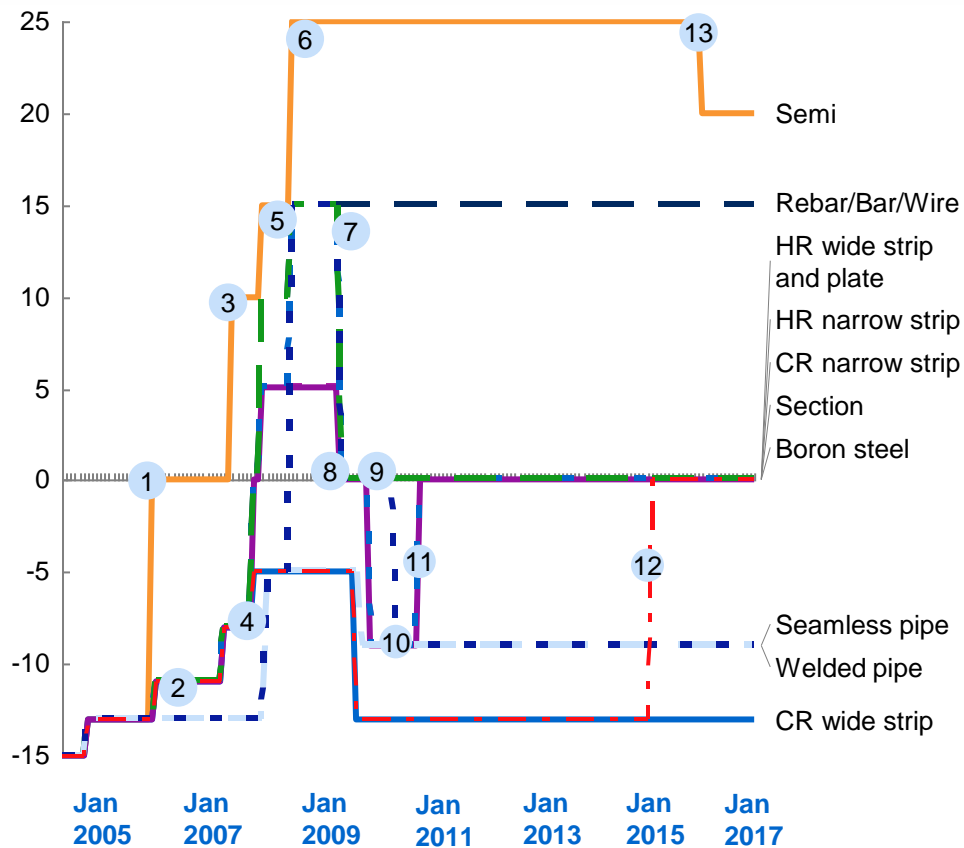
“China steel exports are facing with increasing **pressure of protections** such as anti-dumping, regarding current huge export volume and **slowdown of global demand**, the export **growth potential will be limited** in the future”  
- *Mysteel*

“Government **doesn't encourage** steel exports, the export volume is mainly **decided by global demand**. China steel exports will **remain ~ 80-90mtpy** in the long term”  
- *Steel Home*



# D Government's long-term policy goal to restrict the export of low value-added steel products

China steel products export tariff, 2005 - 2017  
Percentage



- 1 May 2005: cut tax rebate from 13 - 11% for rolled steel and to 0% for semi-steel
- 2 September 2006: cut tax rebate from 11 - 8% for rolled steel
- 3 November 2006: imposed 10% export tax for semi- steel
- 4 April 2007: cut tax rebate from 8 - 5% for 73 high-end rolled steel products (i.e., stainless); for the remaining 83 rolled steel products, tax rebate was removed
- 5 June 2007: further added 5 - 10% export tax for most rolled steel products and increased semi-steel export tax to 15%
- 6 January 2008: increased semi-steel export tax to 25%, most long products and narrow strip to 15%, wide flat and seamless pipe remain 5%; some high-value-added cold rolled flat products (i.e., coated) still enjoy 5% tax rebate
- 7 December 2008: temporary export duty removed for 102 categories of finished steel products from Dec 2008 to Dec 2009
- 8 April 2009: VAT rebate for high-value-added products (i.e., CR wide strip, stainless, electronic sheets, alloyed steel, stainless seamless pipe) increased from 5 - 13%
- 9 June 2009: VAT rebate was raised again for steel products (i.e. HR strip, plate, part of seamless pipe and welded pipe)
- 10 January 2010: VAT rebate was raised for welded pipe to 9%
- 11 July 2010: VAT rebate was canceled for 48 steel products, mostly plate and strip (i.e. HR wide / narrow strip, CR narrow strip)
- 12 January 2015: VAT rebate of boron containing steel was canceled
- 13 January 2016: Export tax for semi reduced from 25% to 20%

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# D Increasing global investments from Chinese top steel players as they expand market footprints, seek new growth, and acquire technology

“More and more Chinese steel mills explore oversea markets to **achieve new growth and acquire technology**. For some companies such as WISCO and Baosteel, the acquisition is shifting from **resource driven to technology driven**”  
 – *YiCai Financial, Jun 2015*

“Steel companies could invest production hubs of steelmaking and distribution in **ASEAN and Africa** countries to **extend value chain and expand sales**, and take advantage of local raw material resources ideally”  
 – *Hebei Government, Nov 2014*

Chinese steel players	Investment details	Value creation levers
<b>Apr 2013</b>  WISCO	<ul style="list-style-type: none"> <li>Announcement for JV with TBEA for silicon steel distribution center (20 ktpy) in India</li> </ul>	<ul style="list-style-type: none"> <li>New growth market</li> </ul>
<b>Jun 2013</b>  WISCO	<ul style="list-style-type: none"> <li>Acquired laser welding dept. of ThyssenKrupp</li> </ul>	<ul style="list-style-type: none"> <li>Extend value chain</li> <li>Acquire technology</li> </ul>
<b>Sep 2013</b>  Baosteel	<ul style="list-style-type: none"> <li>New Five-Year plan: Develop distribution networks and JV in ASEAN markets for CR and coating products</li> </ul>	<ul style="list-style-type: none"> <li>New growth market</li> </ul>
<b>May 2014</b>  Maanshan Steel	<ul style="list-style-type: none"> <li>Applied to French govt. for acquisition of wheel producer Sasvaldunes</li> </ul>	<ul style="list-style-type: none"> <li>Acquire technology</li> <li>Extend footprints</li> </ul>
<b>May 2014</b>  Kunming Steel	<ul style="list-style-type: none"> <li>Commissioned JV in Vietnam for 1.0 mtpy integrated steel mill</li> </ul>	<ul style="list-style-type: none"> <li>New growth market</li> </ul>
<b>Sep 2014</b>  Hebei Steel	<ul style="list-style-type: none"> <li>Started investment in South Africa for 5.0 mtpy integrated steel mill</li> </ul>	<ul style="list-style-type: none"> <li>New growth market</li> </ul>
<b>Sep 2015</b>  Hebei Steel	<ul style="list-style-type: none"> <li>Acquired European steel trader Duferco (annual trading volume ~20 mt)</li> </ul>	<ul style="list-style-type: none"> <li>Extend footprints</li> <li>Avoid anti-dumping</li> </ul>
<b>Jul 2015</b>  Delong Steel	<ul style="list-style-type: none"> <li>Commission of JV in Thailand for 0.6 mtpy steel sheet distribution center</li> </ul>	<ul style="list-style-type: none"> <li>New growth market</li> </ul>
<b>Apr 2016</b>  Hebei Steel	<ul style="list-style-type: none"> <li>Acquired Zelezara Steel (~1.0 mtpy) in Serbia</li> </ul>	<ul style="list-style-type: none"> <li>Extend footprints</li> </ul>

- Chinese top steel players have been increasing investment for globalization, ~4.0 bn USD in 2013-2016
- They target ASEAN countries and South Africa for new growth engine via JV of integrated steel mill and distribution centers
- While investments in European market mainly to acquire technology as well as extend value chain and market footprints

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