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Improving Energy Productivity: The Policy Practice of China

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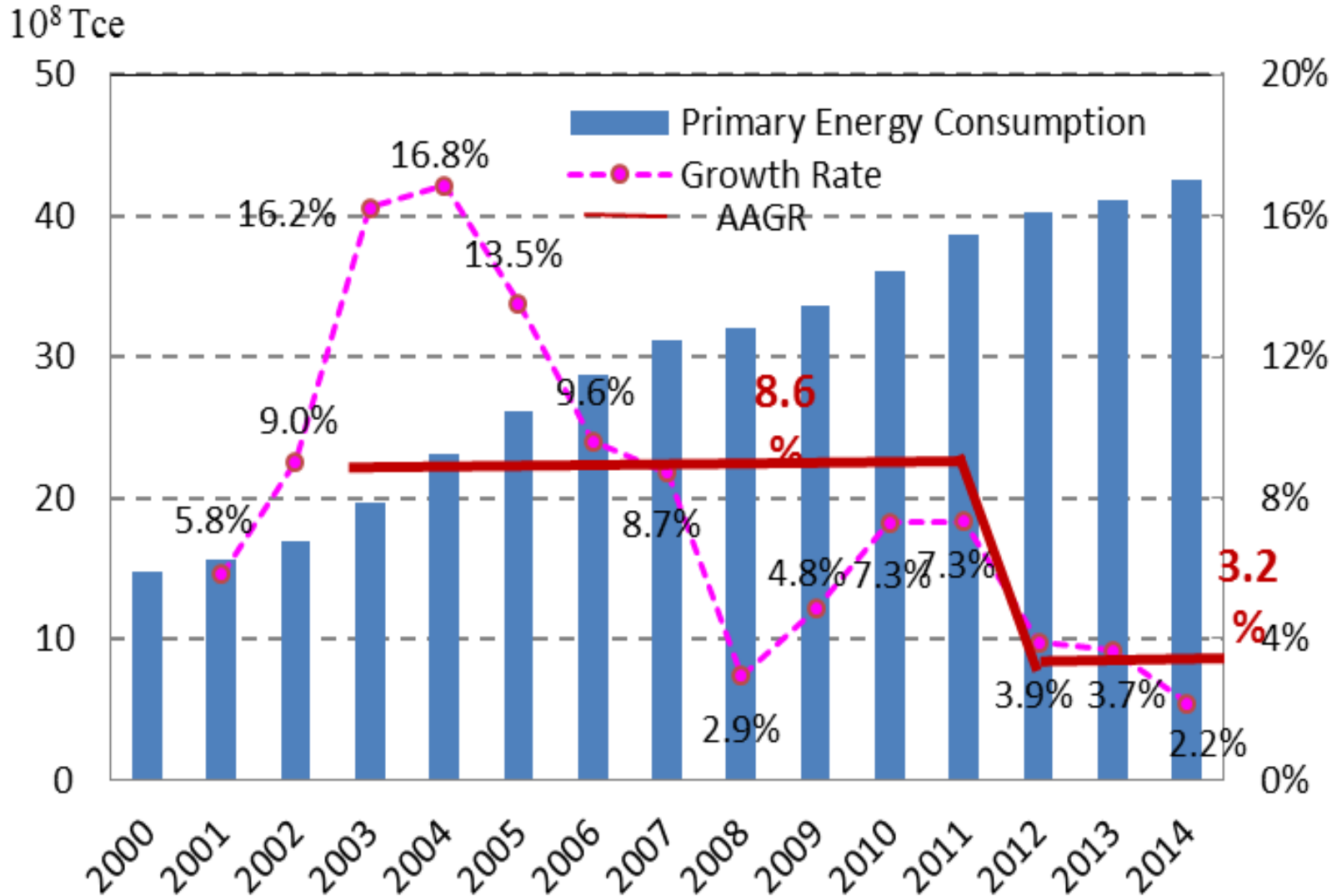
China Energy Conservation Association

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Main Outline

- Background
- Achievements and Key Measures
- Expectation towards 2020

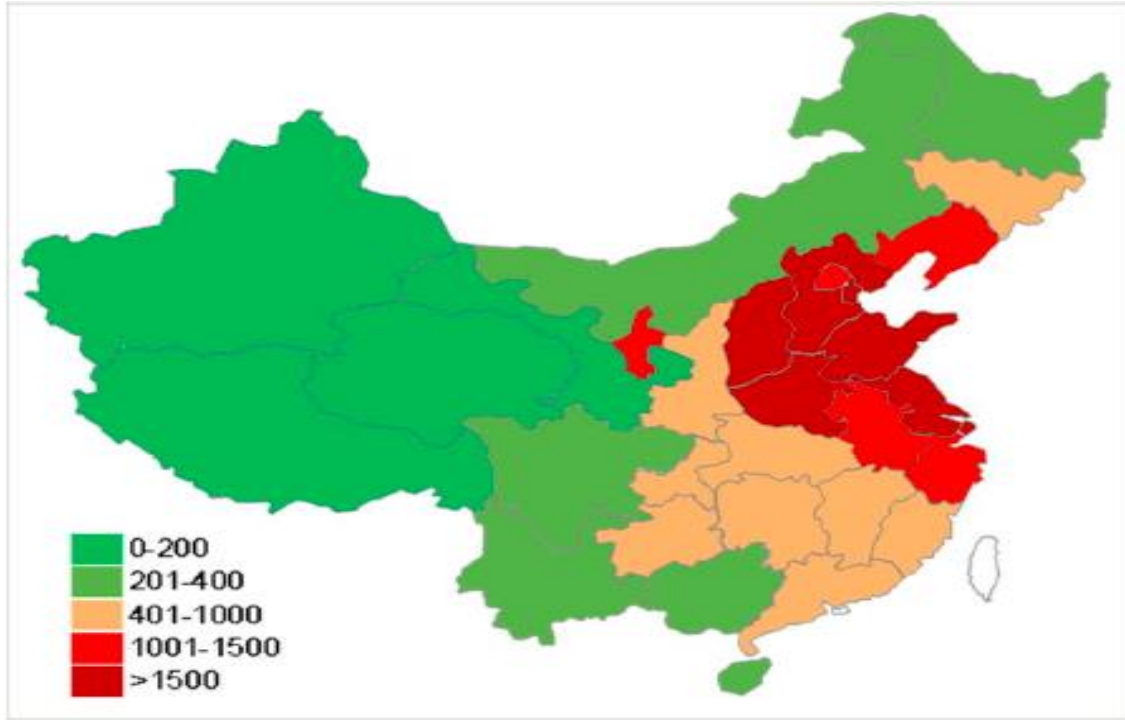
Growing Needs on Energy Revolution



If GDP grows at 7%, total energy consumption by 2020:

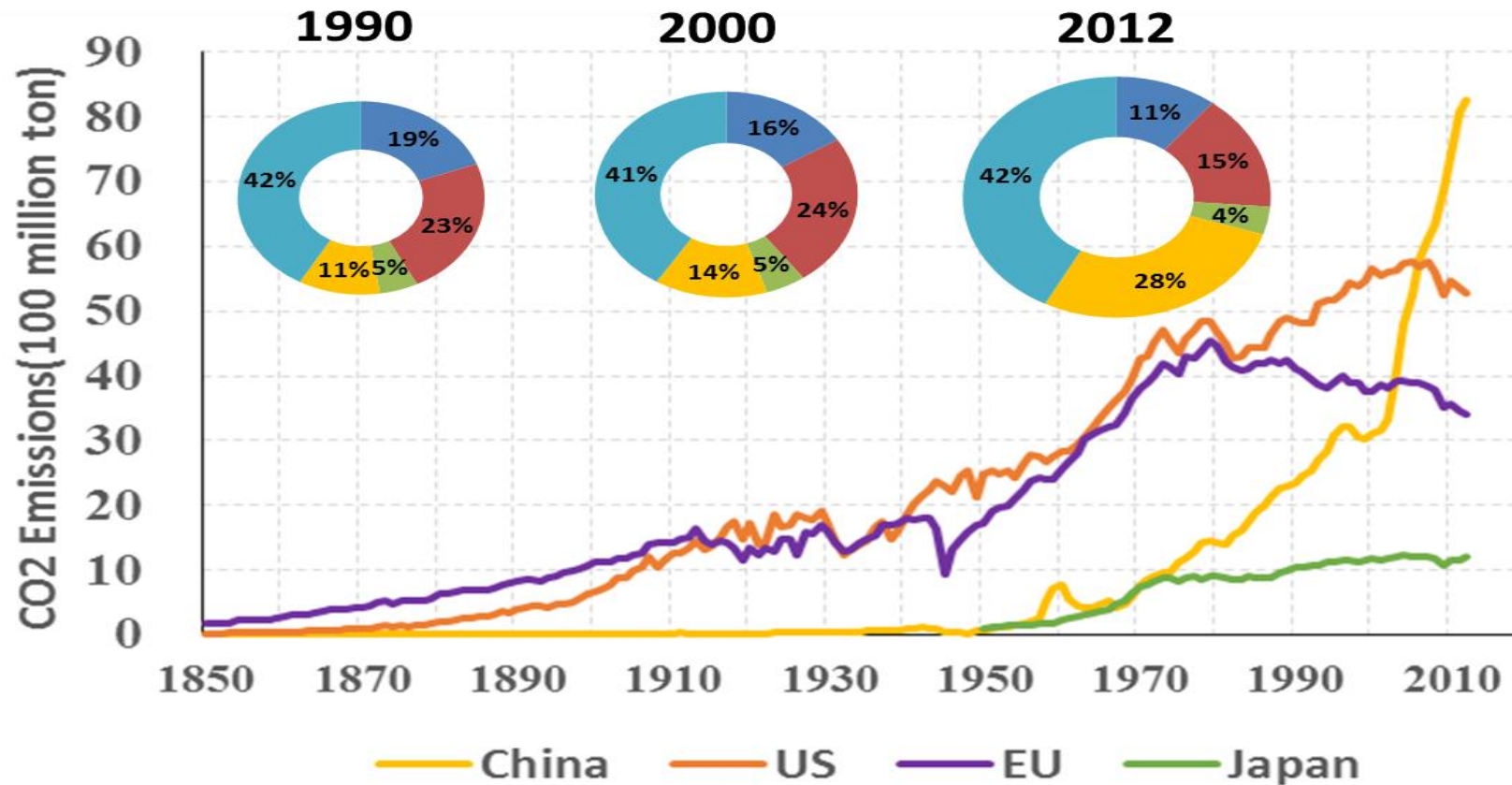
- 6.4 billion tce with same energy intensity of 2010
- 5.1 billion tce with 20% reduction of energy intensity
- 4.8 billion tce with 25% reduction of energy intensity
- 4.5 billion tce with 30% reduction of energy intensity

Increasing Environment Challenge



- 90% of SO₂, 70% of NO_x, and 80% of dust:coal consumption in electricity and heat supply, coal-fired boiler, non-metallic mineral-based industry, non-ferrous metals smelting
- Wide and heavy pollution of PM_{2.5} in North/middle/East China

Rapid Growth of CO2 Emissions



2030 mitigation targets:

1. CO2 emissions peak around 2030 and make best efforts to peak early;
2. Lower carbon intensity by 60-65% on 2005 level;
3. Increase the share of non-fossil fuel to around 20%.

Targets Related with Energy Productivity

- Energy intensity target: 20% reduction during 2005 -2010, and 16% reduction during 2011-2015
- Carbon intensity target: 17% reduction during 2011-2015
- Total energy consumption target: 4 billion tce by 2015
- Main pollutants: 8% reduction for SO₂, 10% reduction for NO_x by 2015

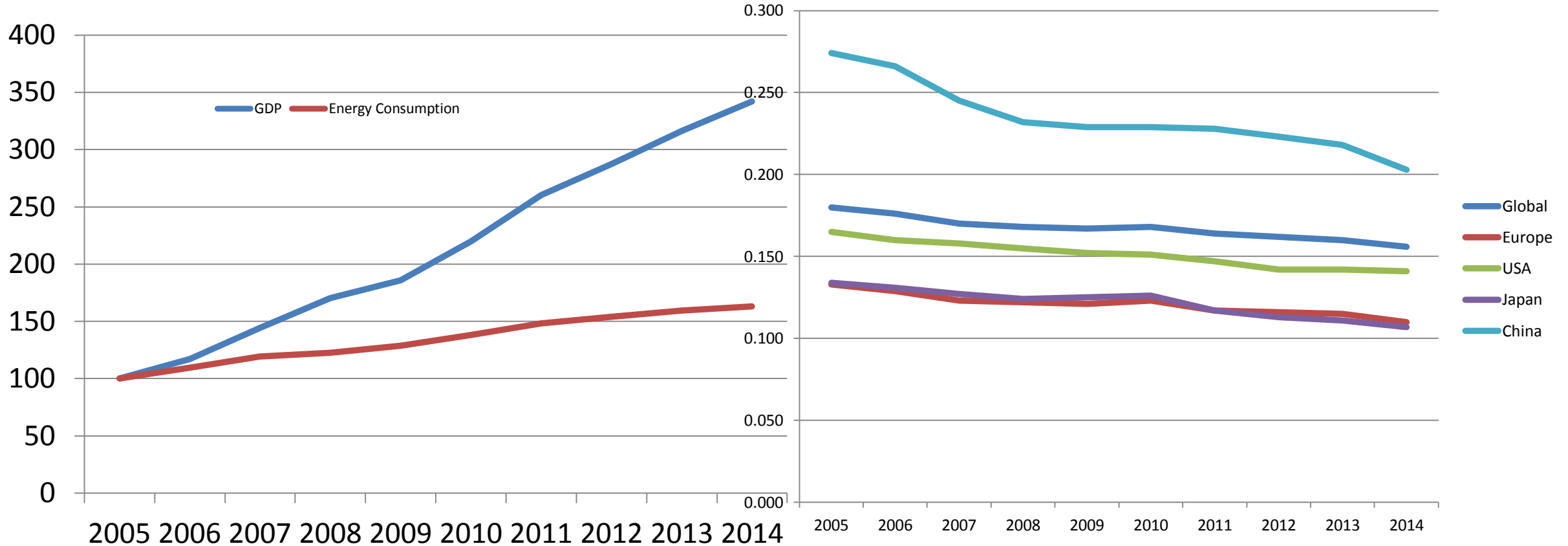
Air Quality Target (2013-2017)



Province	PM ₁₀
Henan	-15%
Shaanxi	-15%
Qinghai	-15%
Xinjiang	-15%
Hubei	-12%
Gansu	-12%
Liaoning	-10%
Jilin	-10%
Anhui	-10%
Hunan	-10%
Guangdong	Other cities -10%
Sichuan	-10%
Ningxia	-10%
Heilongjiang	-5%
Fujian	-5%
Jiangxi	-5%
Guangxi	-5%
Guizhou	-5%
Hainan	Continuously improved
Yunnan	Continuously improved
Tibet	Continuously improved

Province	Beijing	Tianjin	Hebei	Shanxi	Shan-dong	Inner Mongolia	Shanghai, Jiangsu, Zhejiang	Pearl River Delta	Chong-qing
PM _{2.5}	-25% (60ug/m ³)	-25%	-25%	-20%	-20%	-10%	-20%	-15%	-15%

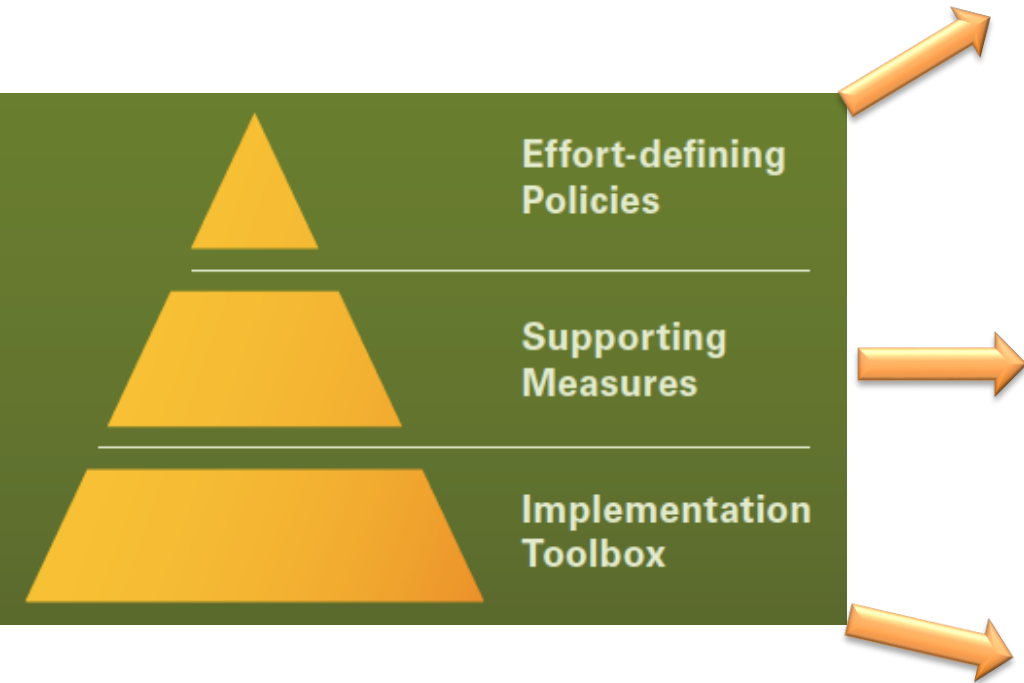
Improved Energy Productivity



- GDP grows 3.4 times while energy consumption grows 1.6 times only

- Close the gap with global average energy intensity by 50% and contributed 25% of global energy productivity

China: Simplified Policy Pyramid



Mandatory energy conservation targets *Top-10,000 enterprise program*

Mandatory appraisals of projects & closures
Industrial Performance Standards

Financial subsidies

Policies targeting other actors (Escos, FI)

Technology catalogues and guidelines from central government

Technical support often provided at the provincial level

EE Target Disaggregation and Evaluation at Provinces



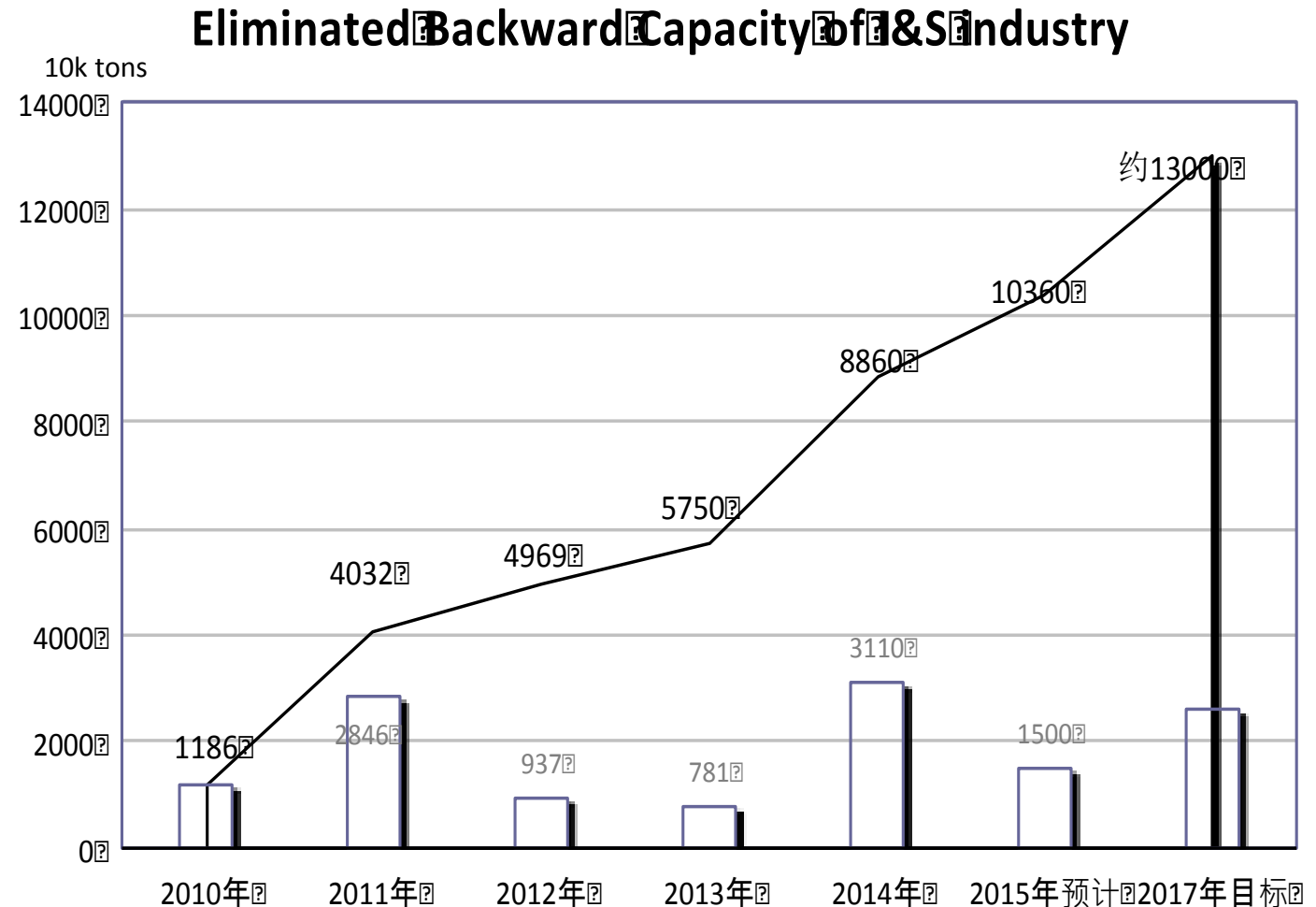
- EE target of provinces were assessed annually and the results was linked with the performance appraisal of lead government officials and new project approval;
- Energy consumption statistics system was improved with new capacity and enhanced monitoring system to local govt and key enterprises

Comprehensive Measures Targeting Key Enterprises



Eliminating Backward Capacity of Energy Intensity Industry

- Release the annual target of eliminating backward capacity to provinces;
- Provide special incentives to western provinces for backward capacity eliminating;
- Differentiate electricity price for 8 industries, update stepped electricity price for electrolytic aluminium.
- Quicken the eliminating speed of key air pollution control regions



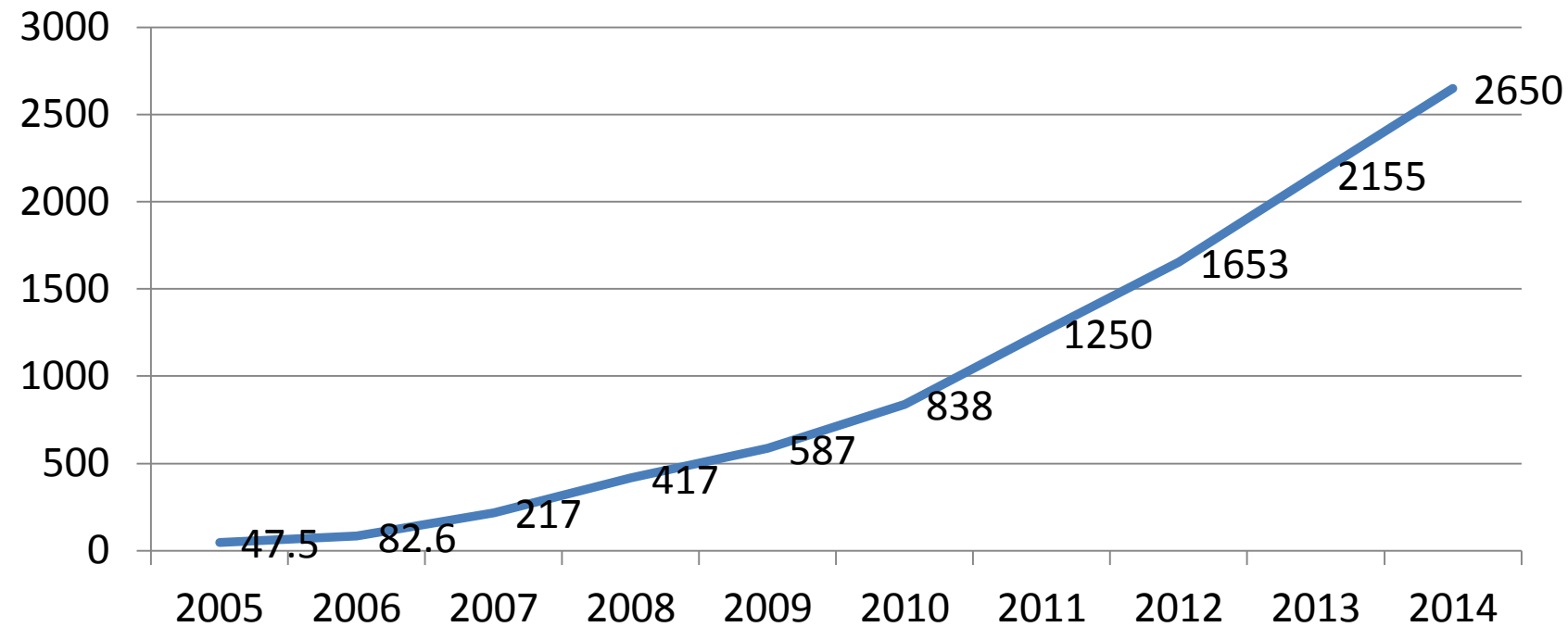
Incentives and Supports on EE Technology Retrofit

- During 2008-2014, 7 batch of Key EE Technology Categories was issued by NDRC, with 237 technologies covered by 13 industry sectors;
- In 2014, in the Regulations for Promoting EE and Low Carbon Technologies, NDRC clearly defined the role of govt agents in technology submission, screening and promotion, and financial incentives to key energy user and energy service companies in EE technology application and promotion.
- In 2012, more than 600 applicable EE technologies covered in 11 industry sectors was released by MIIT;
- Boiler retrofit, Motor system upgrade, Energy system optimization, Waste heat recovery, CHP, by-product-gas recovery, etc. were listed as key EE projects with promotion targets;
- Motor EE Improvement Plan and Coal-fired Boiler EE and Environmental Protection Program were initiated with key objectives to update the equipment and technologies.

Encourage Development of Energy Service Industry

100 million RMB

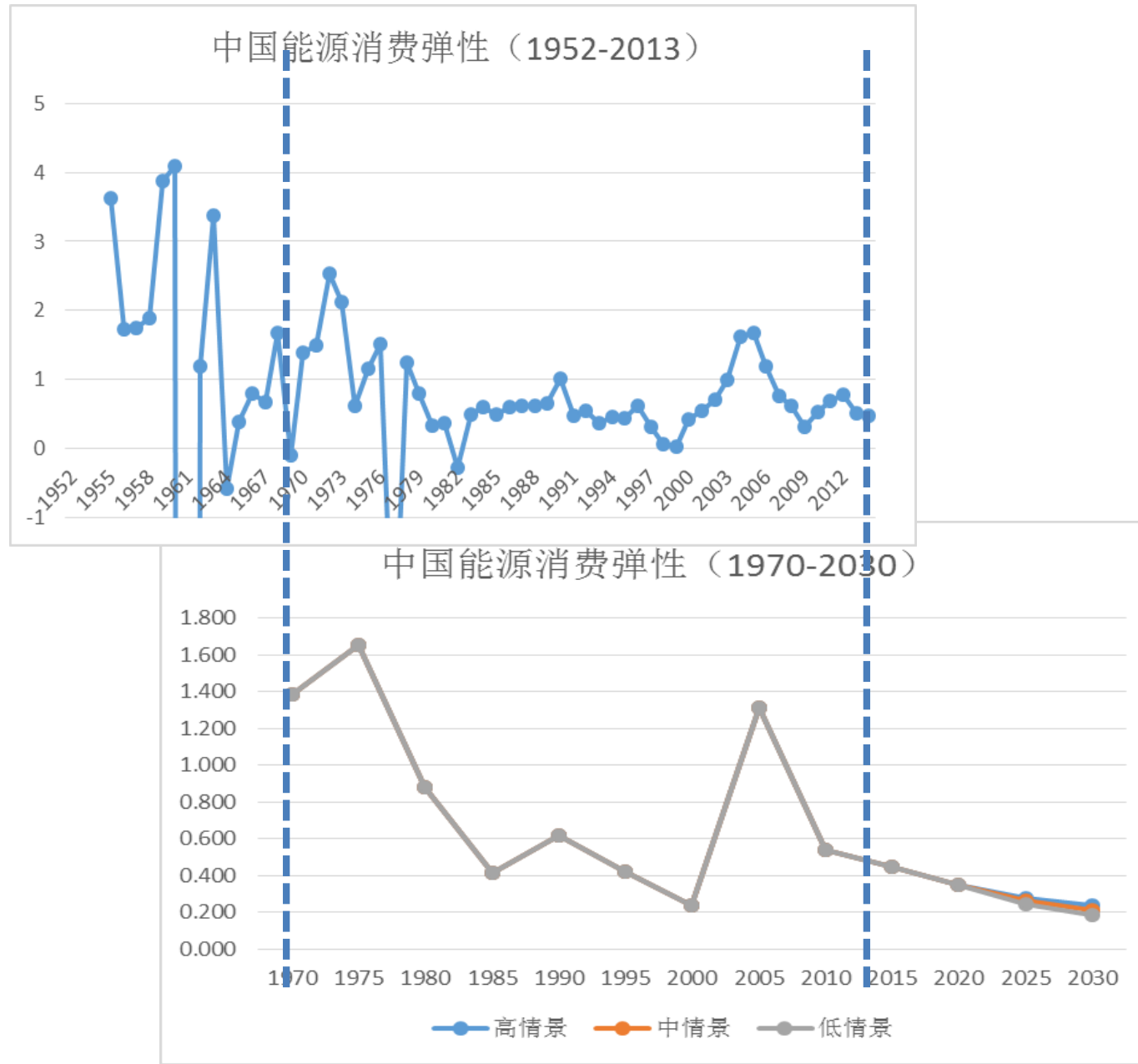
Production Value of Energy Service Industry



- Energy service industry grows 55 times in 10 years time;
- Number of ESCO company increases from 80 to 5000;
- Direct employment increases from 16k to 520k

- EE technology retrofit projects by ESCOs: 240 RMB/tce from center govt, at least 60 RMB/tce from local govt;
- ESCOs enjoy preferred tax and accounting policy;
- Remove the financing barriers of ESCOs through EE Credit Guidelines and Pilot projects with Banks

Estimation of Energy Consumption by 2020

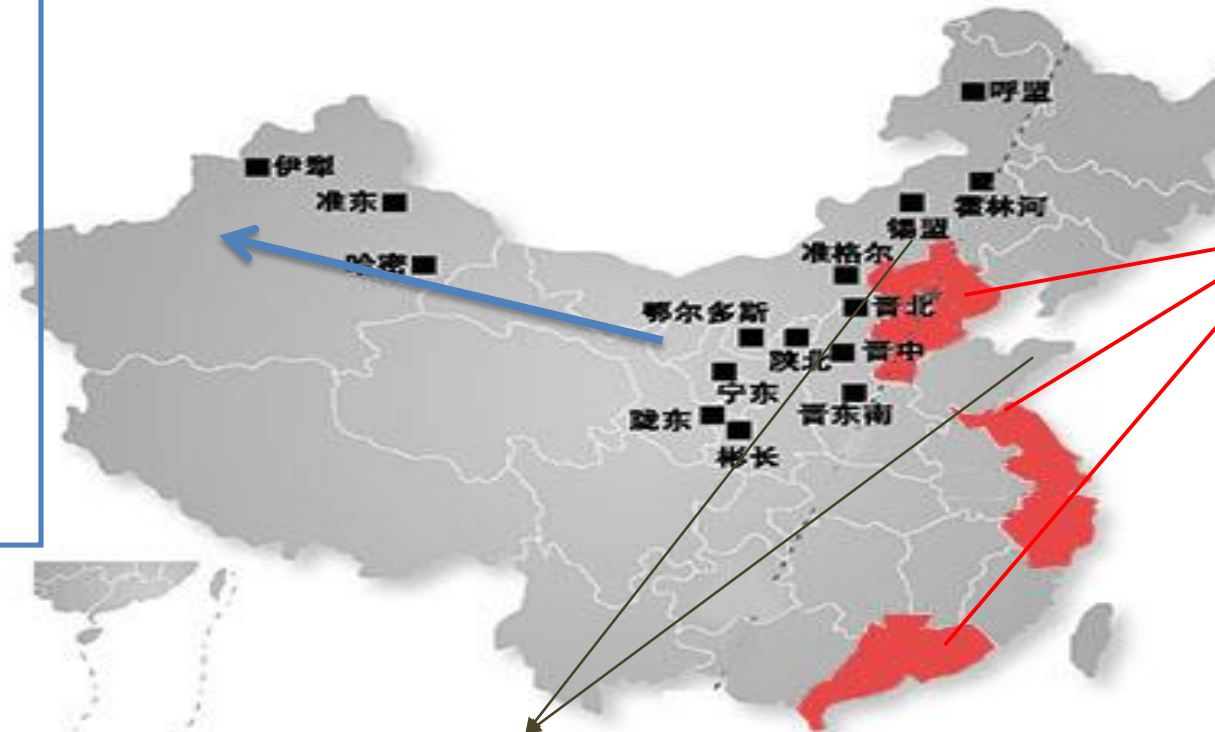


- Energy consumption in 2015 estimated as 4.3 billion tce while energy intensity decreases 18% comparing with that in 2010;
- Energy consumption in 2020 estimated as 4.8 billion tce, with average annual growth of 100 million tce during 2016-2020

Optimize Regional Industry Development by 2020

Coal-rich Regions:

- Properly plan the bases of coal-fired plant
- Increase the power transmission from West to East



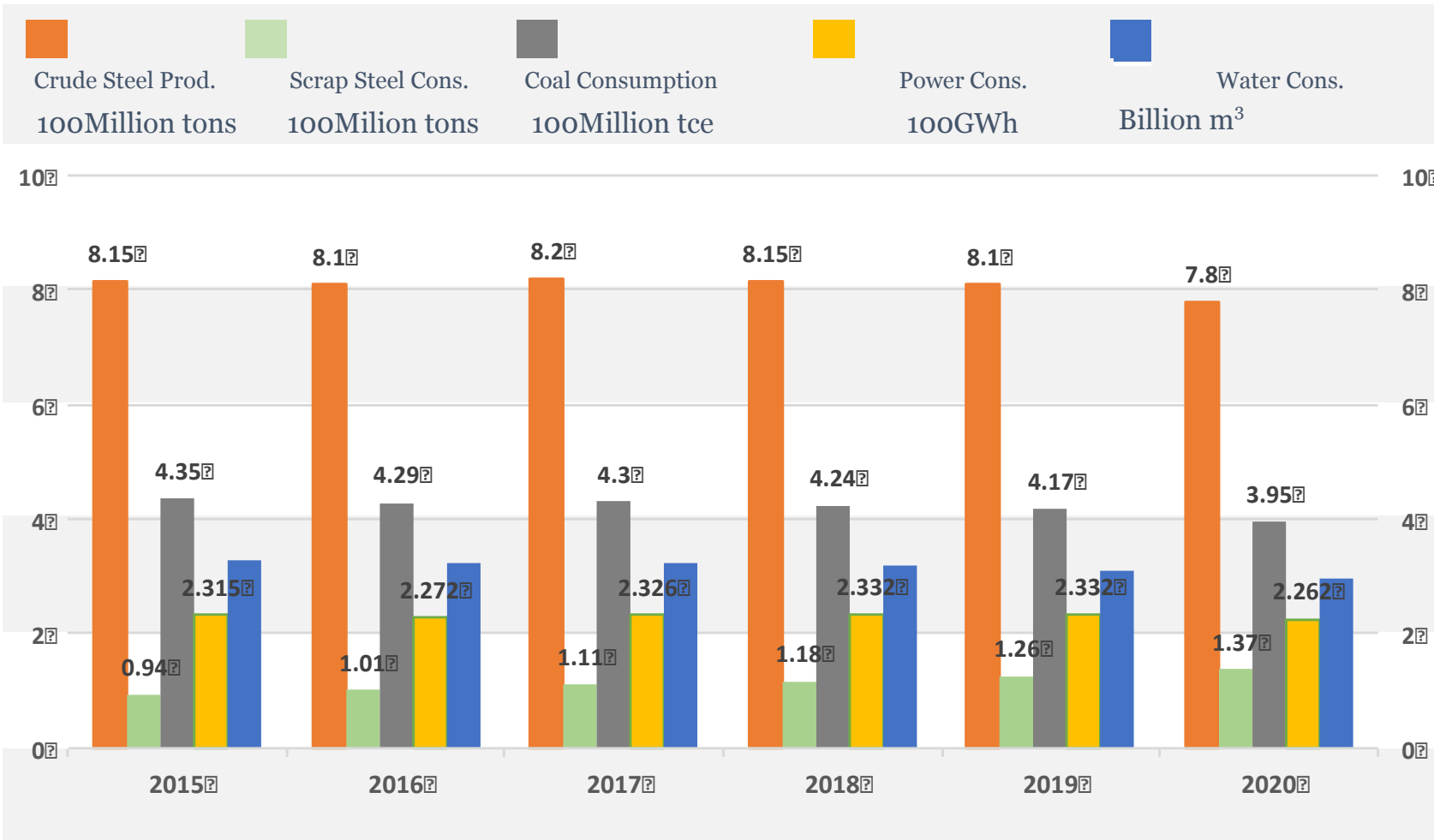
Beijing-Tianjin-Hebei Region, Yangtze River Delta, Pearl River Delta:

- Prohibit the construction of coal-fired power plant except for CHP project;
- Accept input electric power from external regions
- Increase non-fossil fuel

Beijing-Tianjin-Hebei Region and Yangtze River Delta:

- Control iron & steel capacity;
- Transfer newly added efficient capacity to the interiors of Silk Road Economic Belt and Yangtze River Economic Zone.

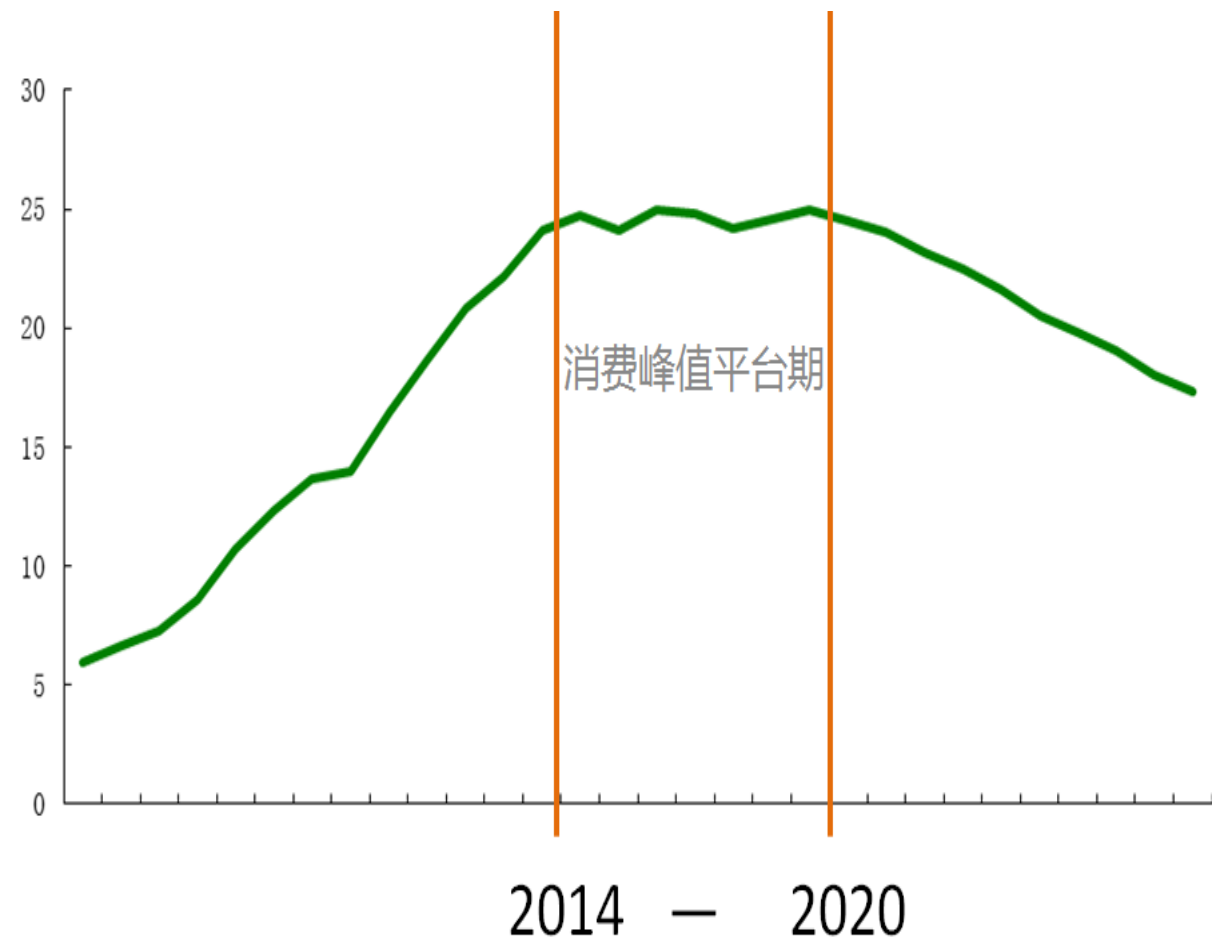
Development of I&S Industry by 2020



- In 2017: Coal consumption get to peak of 430 million tce
- By 2020: crude steel production reaches 780 million tons, scrap steel consumption reaches 137 million tons, and total coal consumption reaches 395 million tce

Development of Cement Industry by 2020

No.	Items	Units	Amount	Notes
1	Cement Production	100 million tons	25	Clinker in cement: 60%
2	Concentration ratio	%	70	Total production of top 10 cement enterprises
3	Backward capacity elimination	100 million tons	1.9	
4	Energy consumption per added value of 10,000 RMB	Kg standard coal/10,000 RMB	4500	
5	Coal consumption	100 million tce	1.56	
6	Coal consumption per unit product	Kg standard coal/ton clinker	104.6	



2020: Tapping Industry Productivity Potentials

- Innovative financial measures to incentivize the EE target achievement in key industry enterprises and at provinces/cities
- Policies to further the elimination of backward capacity of I&S, Cement
- Continuous support on EE technology application and promotion in key industries
- Made in China 2025 Plan to promote the green manufacturing and intelligent manufacturing
- Market-based mechanism, e.g. Carbon Trading Scheme, Energy Performance Contract

Thanks!

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