

China's Carbon Market

in Its Evolving Energy and Environment Policy Context

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Innovative Green Development Program, China

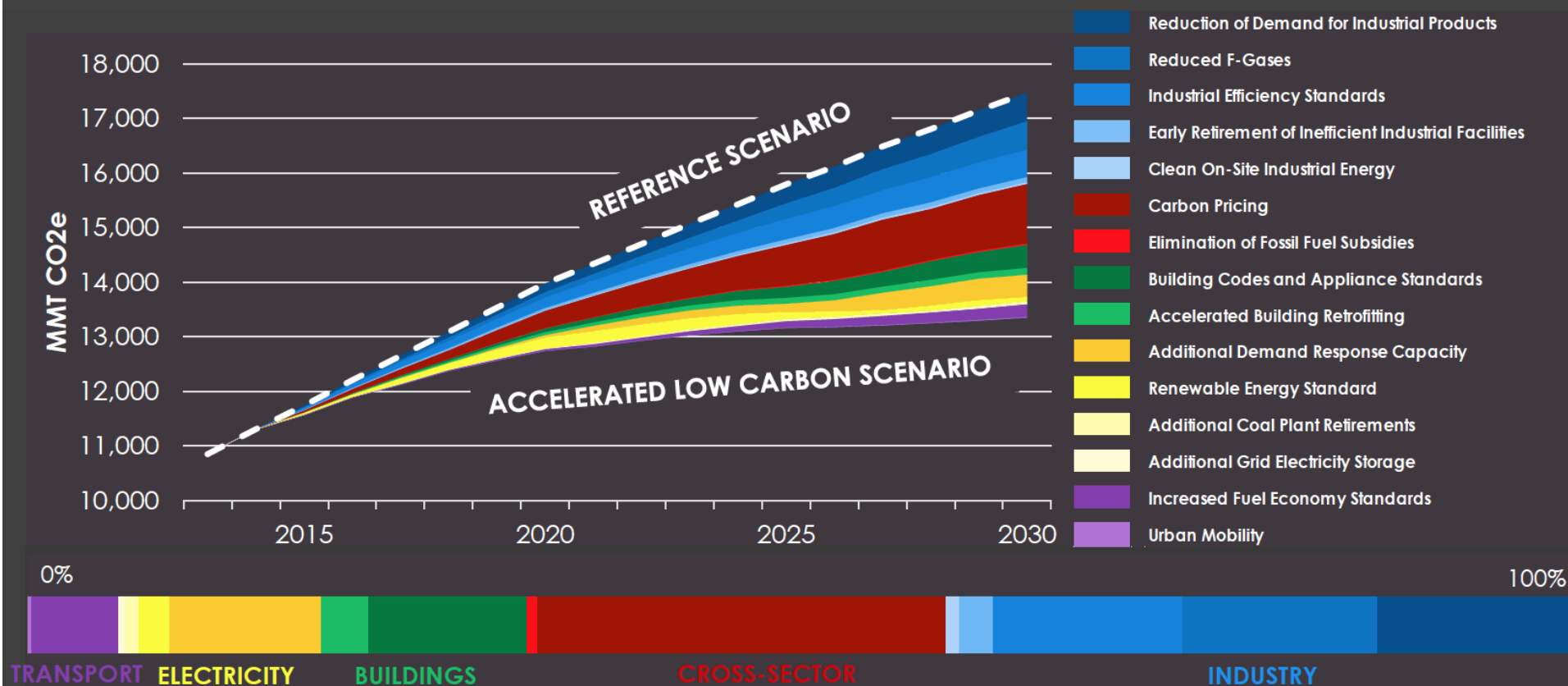
3 October 2019, IEA

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CARBON PRICING: THE MOST EFFECTIVE POLICY

BUT: No Economy-wide Carbon Price Yet



USD\$30 2030

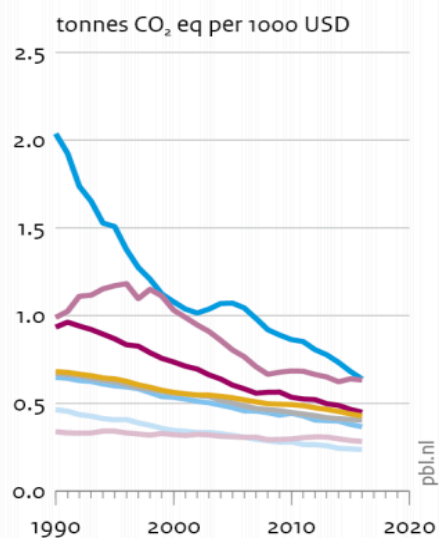
Source: *Energy Policy Solution for China*, Energy Innovation



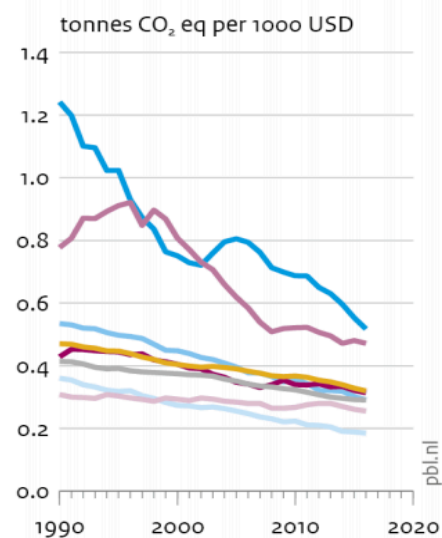
CHINA'S ACHIEVEMENT

Emissions per US dollar of Gross Domestic Product (GDP, at PPP 2011 prices)

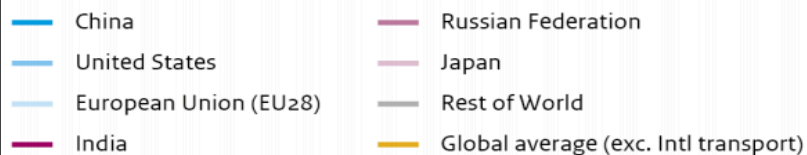
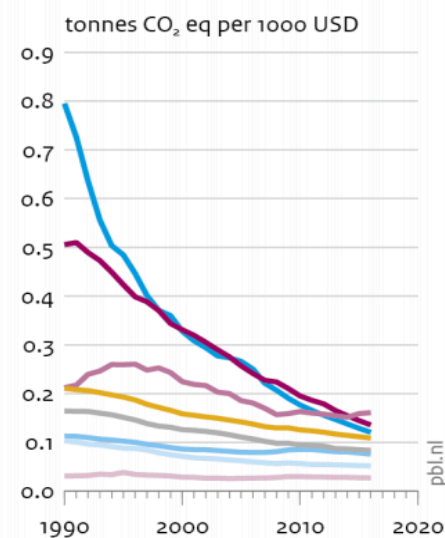
Greenhouse gases



CO₂



non-CO₂ greenhouse gases



Source: EDGAR v4.3.2 (EC-JRC/PBL 2017); World Bank (2017); IEA (2017); BP (2017)



POLICY CONTEXT

- Regulations:
 - Power
 - Industries
- Other Market-based Instruments
- Green Finance Development
- System integration



NEW SECTORIAL STRATEGIC PLANS SINCE 2016

- <Energy Production and Consumption Revolution Plan 2016-2030>
- <Green Industries Development Plan 2016-2020>
- <Air Quality Improvement Plan 2017-2020>
- Series of government administrative orders regarding “Reducing Overcapacity” of heaving industries
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CLEAN ENERGY

- Energy Consumption Cap
 - 5Billion tce by 2020
 - 6Billion tec by 2030
 - Coal Consumption Caps for key air quality regions
- RE share above 20% by 2030
- Non-fossil fuel share over 50% by 2050
- 30% Electricity Production from clean energy by 2030 (including nature gas)
- Efficiency requirements for coal-fired power plant
 - Average by 2020: 310 gce/kwh
 - New: Below 300 gce/kwh
- The Share of coal-fired power units with ultra-low pollutant emissions over 80% by 2030
- Electricity Growth Mainly Coming from Clean Energy Sources

INDUSTRIES: Energy Efficiency

Main Pillars:

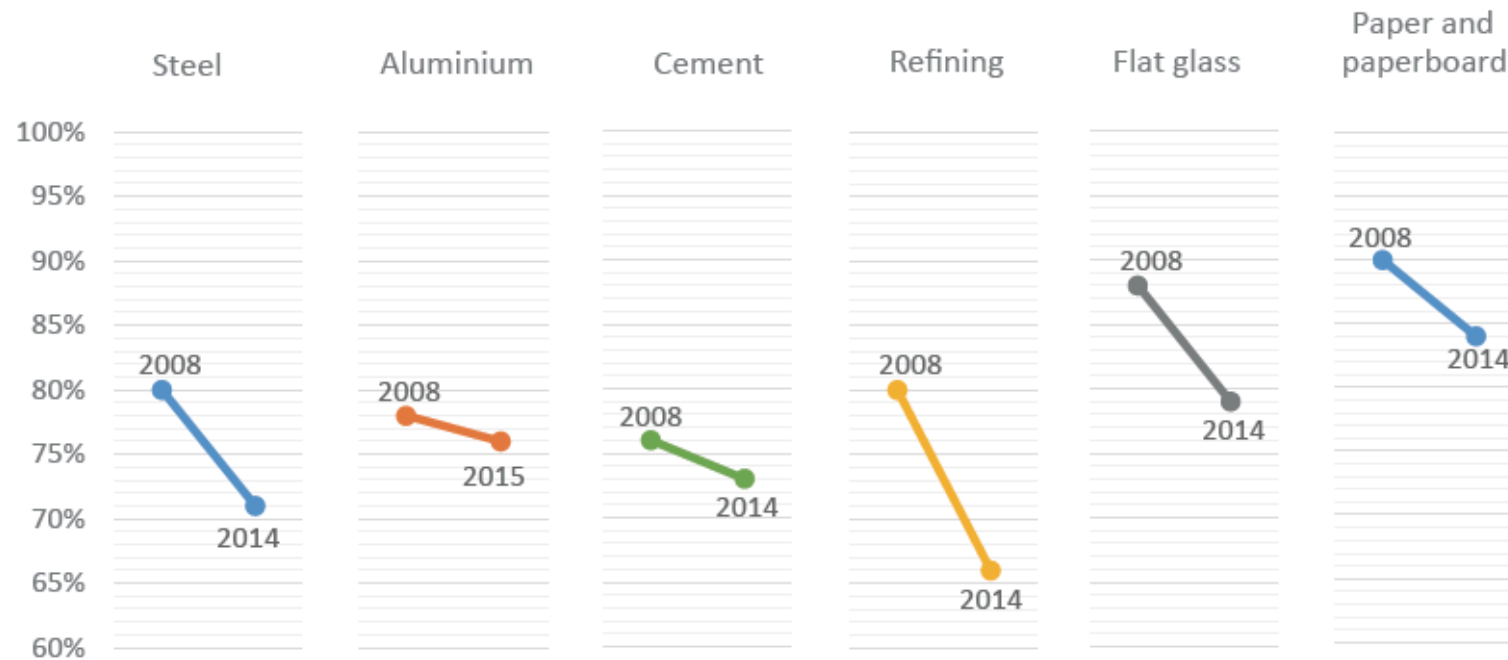
- Carbon intensity of industrial added value decrease compared with 2015 (22% by 2030, 40% by 2025)
- **Mandatory Energy Consumption Standards for 22 Industrial Products**
- Binding Sectorial Industrial Efficiency Improvement Goals in most of the energy intensive sectors (*ranging from 7% to 150%*)

Goal from *Green Industry Development Plan 2016-2020*

- Energy consumption growth rate declines
- Energy consumption of **Key heavy industry** peak
- Carbon emission of **key industries** peak

INDUSTRIES: Over-Capacity Reduction

Utilisation rates for six industries



N.B. As the chemical industry covers an extremely wide range of products and quantifying capacity in the shipbuilding industry is highly complex, for the sake of clarity these two sectors have not been included in this chart.

Source: *European Chamber*

INDUSTRIES: Over-Capacity Reduction

Incremental capacity	Loans and credits	Stricter control on loans and credit
	Stricter standards	Higher market entry and project approval standards with regard to several factors such as technology, capacity scale, emission control and equipment standards of production lines
	Accountability system	Implementation of accountability system for local governments and related institutions
	Better supervision and enforcement	Strengthening of the supervision and inspection of overcapacity enforcement
Existing capacity-Upgrade	Less raw material and energy subsidies	Standardisation of the energy pricing system and curbing energy subsidies (especially in the aluminium sector)
	Better land resource allocation	Improve land resources supply and management
Existing capacity-Eliminate	Transparent information system	Build an industrial database to be able to provide market information on the capacity status of affected industries
	Industry restructuring, consolidation	Granting of fiscal, tax, finance, debt and social welfare support to encourage industry consolidation and to accelerate the elimination of backward capacity
	Social support	Provision of social support for unemployed labour



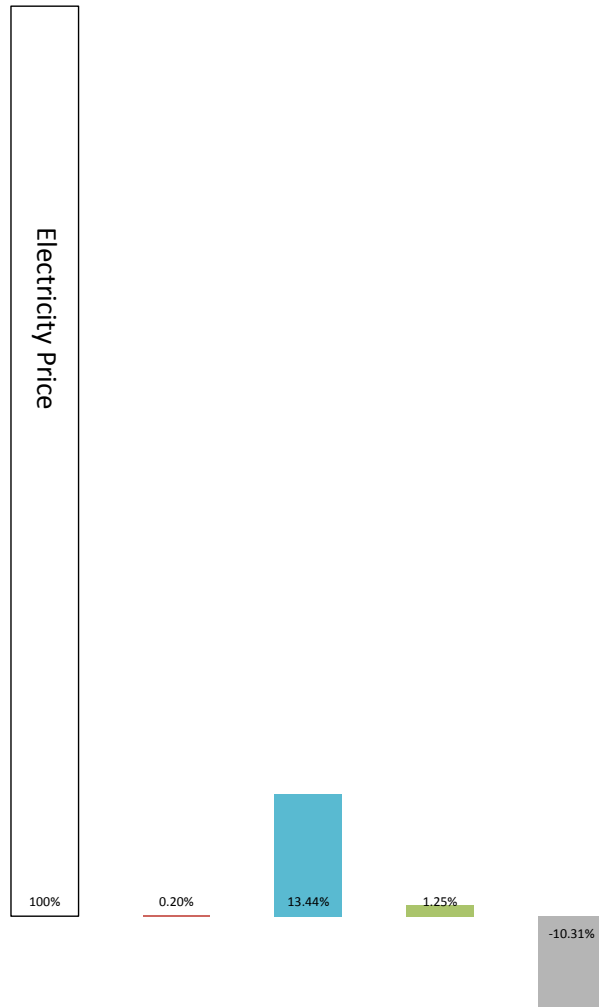
Source: *European Chamber*

MARKET-BASED INSTRUMENT

Impacting Power and Industrial Sectors

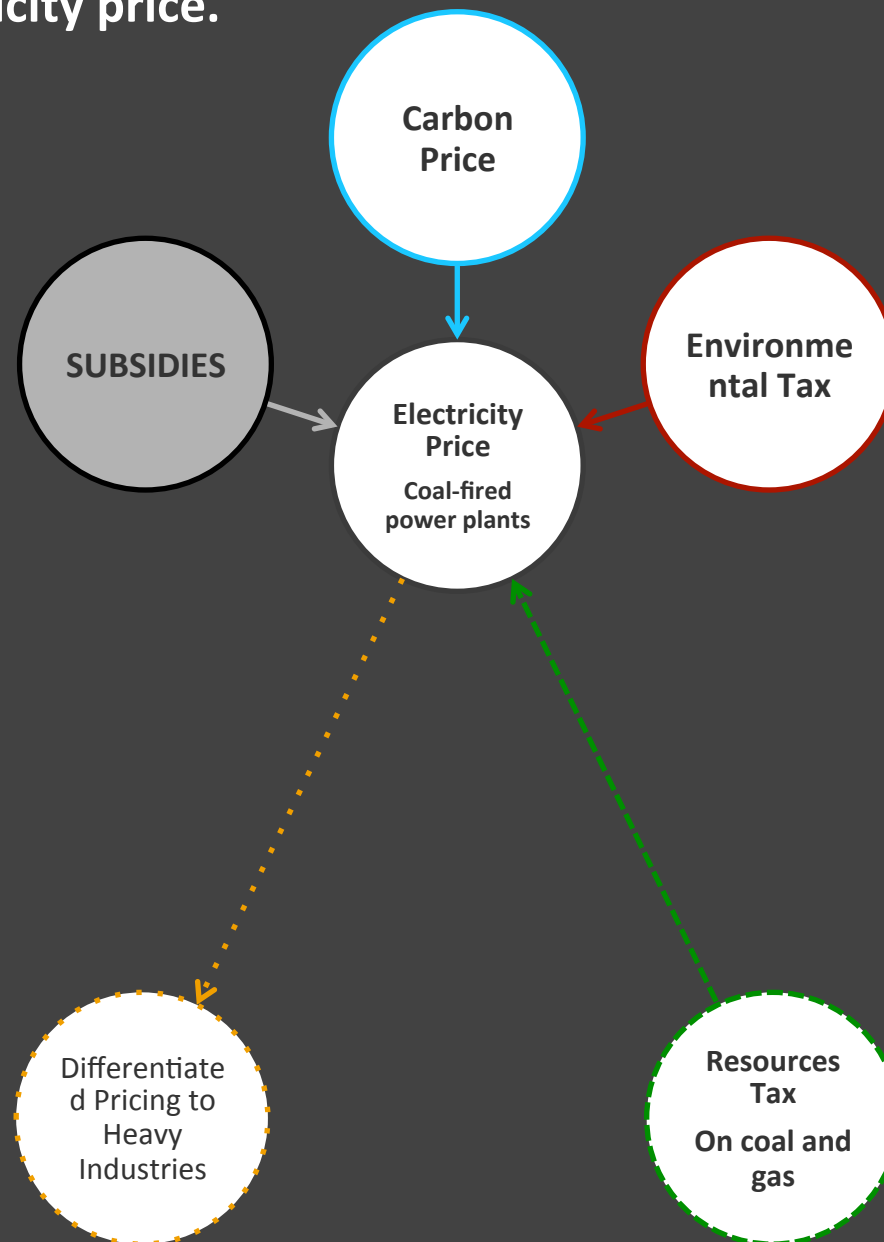
MECHANISM	GOV. AGENCY	IMPLEMENTATION
Energy Utilization Rights Trading	NDRC	-
Energy Efficiency Credits	NDRC	Pilots
Renewable Energy Green Credits	NEA	Just Started
Pollutant Emissions Trading	MEE	Ongoing, Small Scale
Carbon Tax / Environmental Tax	MEE / MOF	Under consideration

- Coal Electricity Price
- Environmental Tax
- Potential Carbon Price
- Resources Tax in coal price
- Subsidies



Source, iGDP Estimation

Existing factors internalizing social cost into electricity price.



GREEN FINANCE PROGRESS

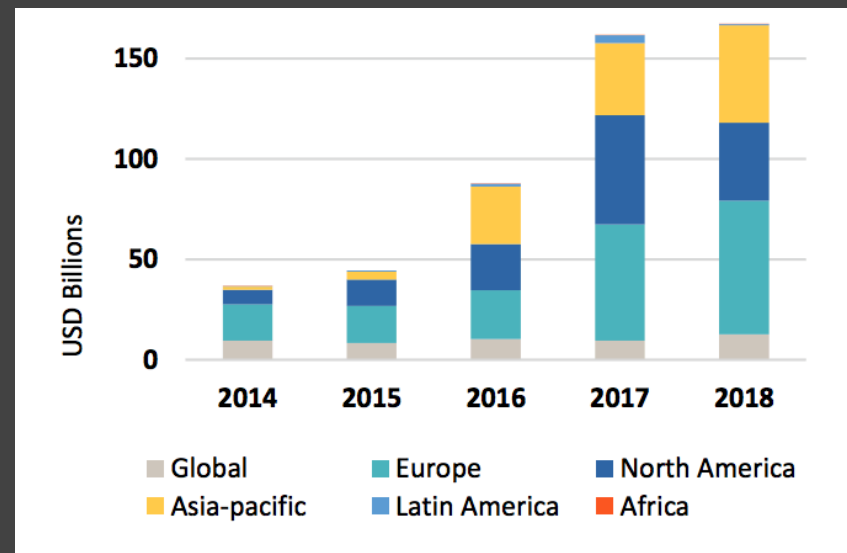
Carbon Price Expectation Helps

Policy

- The State Council Administrative Order: *Guiding Principals to Develop China's Green Finance System*, June, 2016
- Five Green Finance Pilots: Zhejiang, Jiangxi, Guangdong, Guizhou, Xinjiang

Progress

- China Green Finance Committee: two third of financial asset Covered
- Green Bond reached 42.8Billion in 2018, Second of the world



GREEN FINANCE: Risk Management

Institutional Investors

Carbon Price Risk Analysis of Hu-Shen 300 index covering 300 listed companies in Shanghai and Shenzhen stock market:

- carbon price doubles: from rmb 60-120,
- VaR: around 10% of the total market value
- Probability: 5% extreme risk

Commercial Banks

- *Stress Test of Carbon Market to ICBC's Loan to Coal-Fired Power Plants*
 - Testing Indicators: *Price, Benchmark Setting, share of paid allocation, mitigation technologies*
 - Risk of Stranded Assets Increases
 - Electricity Cost increase from 0.6% to 20%
 - ICBC could manage the risk if start de-vest coal plants



INTEGRATION:

With Environmental Regulatory System & Financing System *Approaches for Consideration*

Environment

- Include GHGs into Environmental Permitting system
- Pollution Emissions Statistics System
- Emissions Monitoring

Financing System

- Governor of Central Bank joining the climate change leading commission
- Trading rules
- Price supervision
- Consignment Auction



China Has Over-performed NDC Commitments



Policy Targets	2016	2017	2018	2019	Target 2020	Target 2020	Target 2030	Target Type in Domestic planning
CO ₂ emissions per unit of GDP fell compared to 2005	45.8%				40%-45%		60% — 65%	Mandatory
The share of non-fossil fuels in primary energy consumption	13.30%	13.80%	14.30%		15%		20%	Mandatory
Forest stocks increased by 2005 (100 million cubic meters)					13		45	Mandatory
Average coal consumption of newly-built coal-fired generating units (g standard coal/kWh)	<300				300			Mandatory
The share of natural gas in primary energy consumption					10% or more			Predictive
Coalbed methane production (100 million cubic meters)					300			Predictive
Wind power installed (100 million kilowatts)	1.64	1.84			2			Predictive
Photovoltaic installation (100 million kilowatts)	1.3	1.74			Around 1			Predictive
The annual utilization scale of geothermal energy (10,000 tons of standard coal)	1900				5000			Predictive
The added value of strategic emerging industries accounts for the proportion of GDP	8.90%				15%			Predictive
Reduce the production and consumption of HCFC-22 for controlled use from the 2010 level					35%	68%		Mandatory
Control HFC-23 emissions					Effective control			Mandatory
Fertilizer and pesticide utilization	Zero growth				Zero growth			Predictive
The share of green buildings in newly built buildings					50%			Predictive
The share of public transport in motorized modes in large and medium cities					30%			Predictive

Sources: Documents and press statements from National Bureau of Statistics, Ministry of Ecology and Environment, Ministry of Housing and Urban-Rural Development and China Electricity Council; National White Paper on Climate Change, Statistical Yearbook and special planning including 13th Five-Year Electricity Plan, 13th Five-Year Energy Development Plan, etc.
Note: Target type is from China's economic and social development plans and sector-specific plans.

	Beyond expectation	On track	Below expectation	Unclear
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Are we waiting for a better plan?

- **CARBON CAP** is important even with strict energy efficiency regulations in place.
- Investors have already taken action only with the **CARBON PRICE EXPECTATION**; needs to be long term.
- Integrating carbon market operation with existing environmental regulatory system is important.

