Greenhouse Gas Emissions Pricing in China: Current Status and the Future Perspective

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China's INDC to the Paris Agreement

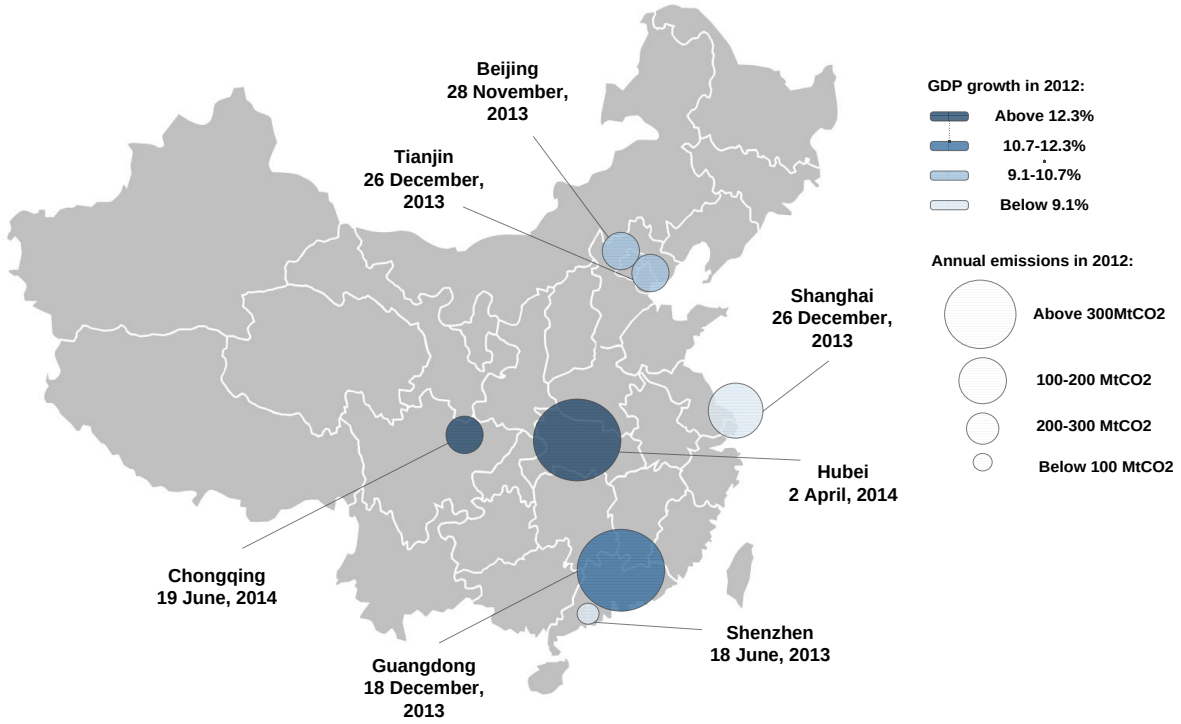
- On June 30, 2015, China formally submitted its INDC (intended nationally determined contribution) (UNFCCC, 2015)
  - Peaking of carbon emissions around 2030 and making best efforts to peak early
  - Lowering carbon intensity by 60-65% from the 2005 level
  - Increasing the share of non-fossil fuels in primary energy consumption to 20%
  - Increasing the forest stock volume by 4.5 billion cubic meters from the 2005 level

Source: UNFCCC & Department of Climate Change, NDRC

Overview of Carbon Pricing System in China

- Switching to market-based approaches in emissions control
  - 2011 - **Cap-and-Trade Programs**: establish seven pilot carbon trading systems in five municipalities and two provinces across the country (NDRC, 2011)
  - Difficulties in linking each pilot

- **National ETS is** expected to be operational in 2017
  - On September 25, 2015, Chinese president Xi Jinping announced a plan to launch a nationwide cap-and-trade program in 2017



Source: National Development and Reform Commission (NDRC) http://en.ndrc.gov.cn/

China's National ETS

- To be operational in 2017
- Approach: top-down with consideration of local interests
- Interim Management Rules on Emissions Trading published in December 2014 by NDRC
- ETS Regulation listed in 2016 State Council Legislation Plan and preparation in process
- Firms from eight sectors and 18 sub-sectors, which consume over 10,000 tonnes of coal equivalent per year will be included
- Hybrid free allocation/auctioning system
- A mix of historical emission data and industrial benchmarks
  - some sectors allowances will be grandfathered
  - others will be benchmarked (power, petrochemicals, chemical manufacturers, and aviation)
- NDRC will nominate verifiers to perform MRV services
  - covered entities will have to submit annual emissions reports to their provincial DRCs

National system with unified rules

- Two-level management system
  - Central government: NDRC
  - Provincial-level government: provincial-level DRCs
- Central government in charge of rule setting
  - Coverage and scope
  - Free allocation approach
  - Monitoring and reporting guidelines/standards
  - Verification standards: verifier and verification
  - Offsetting
  - Transaction rules
  - Compliance rules

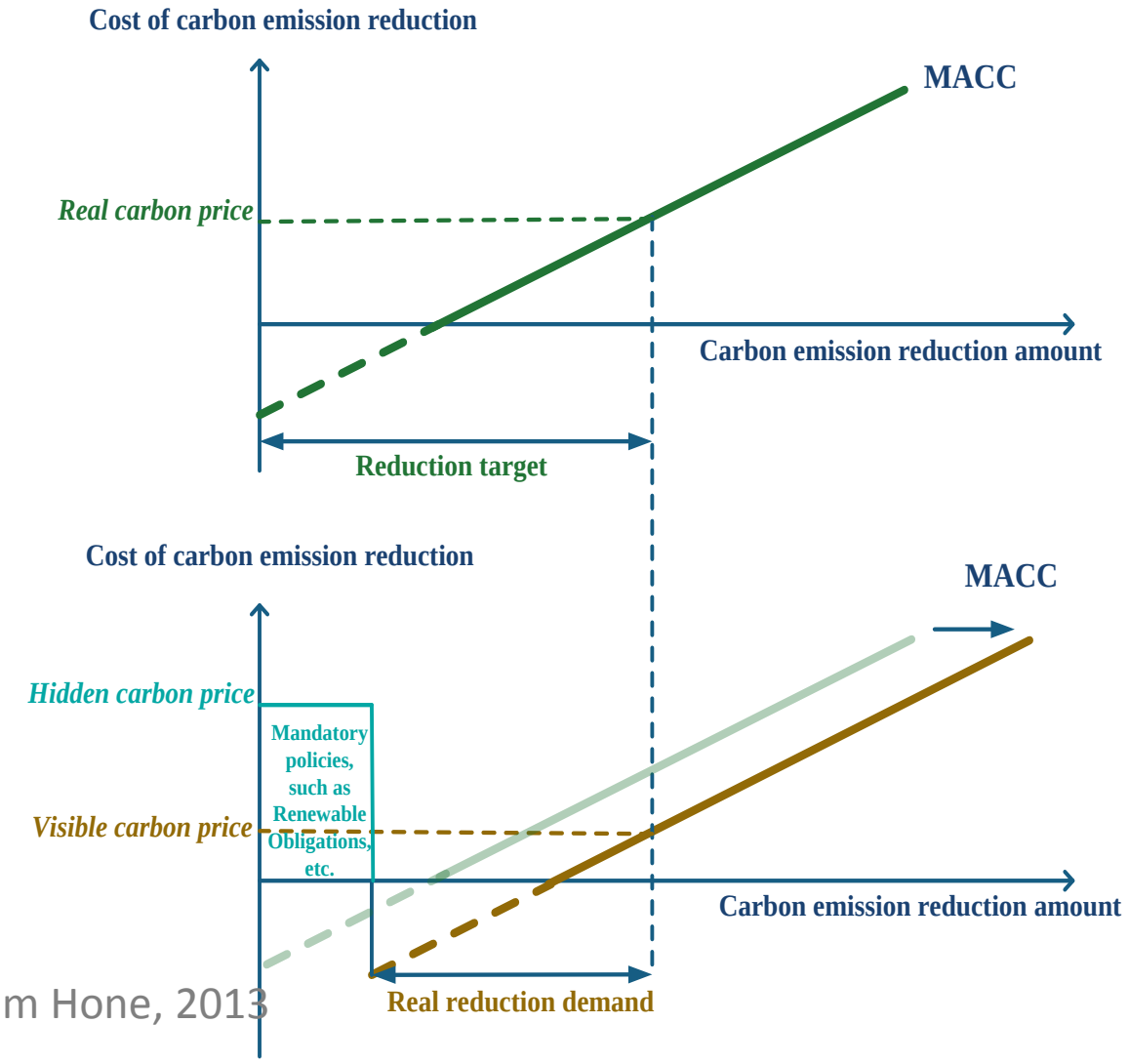
Provincial-level government in charge of rule Implementation

- Identification of covered entities
- Approval of monitoring plans
- Determination of emissions of covered entities
- Compliance assessment

- Flexibilities given to provinces
  - Extension of coverage and scope
  - Stricter free allocation approaches
- Comprehensive compliance rules

Carbon Pricing and Parallel Energy and Climate Policies

- Depressing effects on allowance pricing from other low-carbon policies:
  - Renewable Energy subsidy or binding obligation
  - Green Certificate Trading
  - Energy Efficiency Certificate Trading
  - Carbon taxation
  - Industrial Emission performance standard
  - Preferential policy for Natural Gas and encouragement policy for Nuclear Power



Source: figure adopted from Hone, 2013

China's National ETS

- Mitigation Value to reveal the relationship of domestic efforts to mitigation global climate change in different jurisdictions.

$$P_{link}^{A} = m_{A,B} \cdot P_{link}^{B}$$

The actual mitigation outcomes at jurisdiction level, measured in tonnes of CO_2 (α_A, α_B) could be derived from the estimated baseline level in tonnes of CO_2 (θ_A, θ_B), and the estimated leftover amount of allowances, measured in tonnes of CO_2 (β_A, β_B), as follows:

$$\alpha_A = \theta_A - \pi_A + \beta_A \quad (4)$$

$$\alpha_B = \theta_B - \pi_B + \beta_B \quad (5)$$

Thus,

$$m_{A,B} = \frac{((\theta_A - \pi_A + \beta_A)/\pi_A)}{((\theta_B - \pi_B + \beta_B)/\pi_B)} \quad (6)$$

Through a bottom up approach:

$$m_{A,B} = \frac{(\sum_{0}^{N_A} \sigma_{A,n})/\pi_A}{(\sum_{0}^{N_B} \sigma_{B,n})/\pi_B}$$