

China's National Emissions Trading System: Features and Perspectives

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The contexts of China's national ETS development

- Emissions features
 - **Over 70%** of China's energy-related emissions come from energy sectors and manufacture sectors;
 - **Over 70%** of the emissions come from *the 7000 largest emitting companies* in the energy intensive sectors;
 - **Over 70%** of China's electricity is used in manufacture sectors;
 - Approximately **50%** of China's coal is used in the power generation sector.
- Energy market features
 - The price of electricity, heat, natural gas, gasoline and diesel is heavily regulated;
 - The increased mitigation costs in these energy sectors are difficult to be passed on the users and consumers.
- Main concerns
 - **Competitiveness**: manufactures covered by ETS;
 - **Fairness**: responsibility distribution between electricity producers and users



China's national ETS: an overview

- Coverage
 - 8 sectors covering the power sector and the main manufacturers
 - electricity/heat, iron & steel, non-ferrous metal, construction material, petrochemical engineering, chemical engineering, and civil aviation.
 - Emission: *direct emissions* from the burning of the fossil fuels and *indirect emissions* associated with the uses of electricity and heat
- Threshold
 - Threshold: 26000 tons CO2 emissions per year
 - Number of enterprises regulated: approximately 7500
- Total emissions (direct): *4.5 billion tons* or a half of China's total energy-related emissions
- Allowance allocation methods
 - Primary allocation method: *Output-based free allocation*
 - *Auction* is to be encouraged.



China's national ETS is essentially a multi-region and multi-sector tradeable performance standard (TPS)

$$CAP_{ets} = \sum_i^M \sum_j^N \delta_{ij} B_j Q_{ij}$$

B_j - The national benchmark physical emissions intensity or performance standard of sector j ;

Q_{ij} - The total physical output of sector j in province i ;

δ_{ij} - The benchmark stringency adjustment factor of sector j in province i ($0 < \delta_{ij} \leq 1$);

M - The number of the sectors covered by ETS; and

N - The number of the provinces/cities covered by ETS



The allowances allocation for a company covered by the ETS

- A two-step allowance allocation based on sectoral performance standard

$$a = \rho q_0 b \quad \text{initial allocation}$$

$$aa = qb - \rho q_0 b \quad \text{adjustment}$$

q_0 - The physical output of the enterprises in the previous year;

b - The sectoral benchmark physical emissions intensity;

ρ - The initial allocation factor ($\rho < 1$);

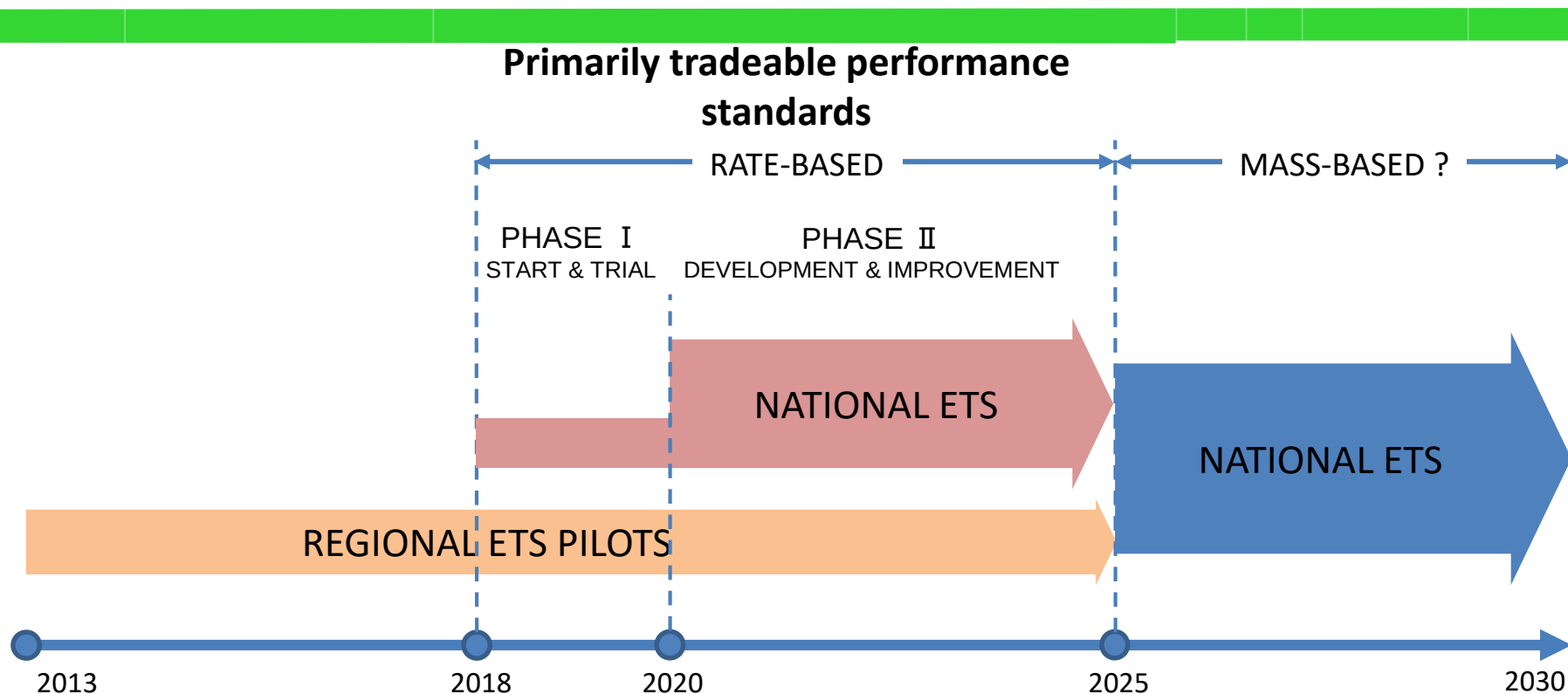
a - The initial allocation at the start of the year;

q - The actual physical output of the enterprises in a year;

aa - The addition allowances that an enterprise would receive before the compliance deadline of next year.



A time stretch of China's national ETS construction



It will start with the *power generation* and ultimately extend to 8 sectors, covering one half of China's energy-related carbon emissions by 2025.



Some remarks and questions

- The heavily regulated electricity and heat pricing is a major constraint on the emissions trading program's benchmark stringency and cost-effectiveness;
- Extending the coverage from the power generation sector to the manufacture sectors can effectively address the issues of *effect, fairness, equity and cost-effectiveness*;
- Innovative auction options such as consignment auction might be considered to set a floor price for the program? and
- Offset mechanisms and auction might be considered to address the equity issue?



Thank you for your attention.

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