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Introducing Auction in China's National ETS

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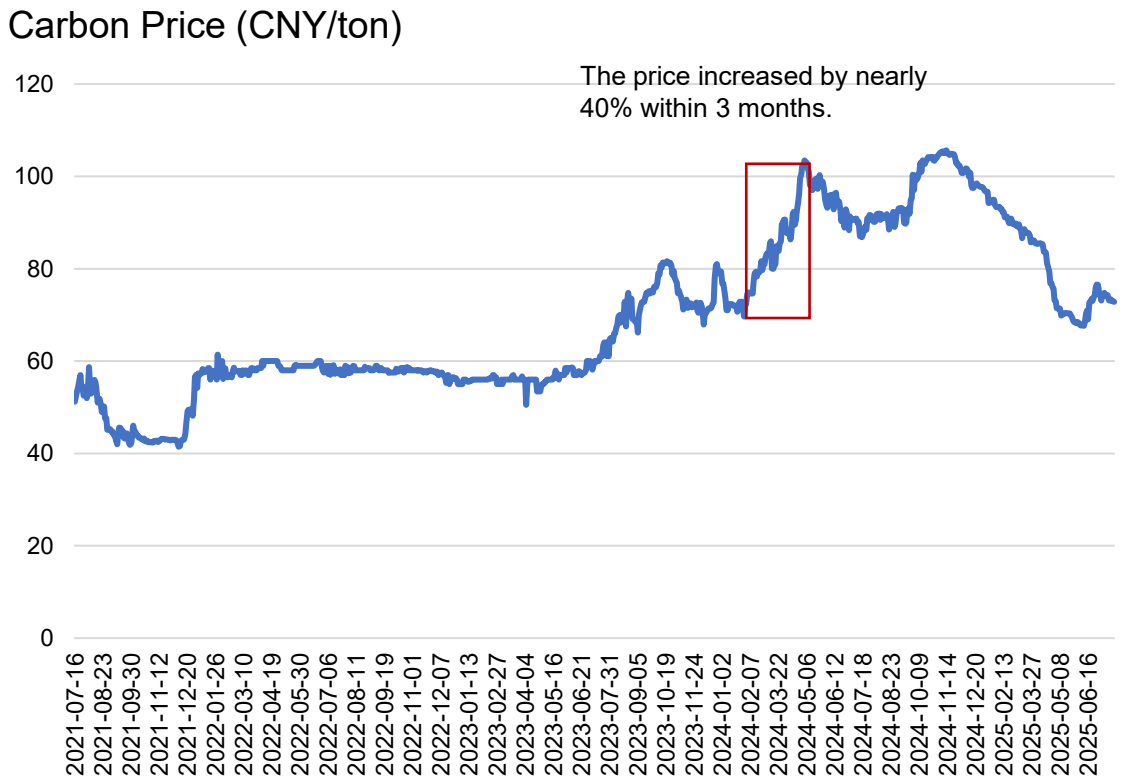
CONTENTS

Background

Need for auctioning

- Set long-term price signals
- Support price control
- Increase permit liquidity
- Enhance the cost-effectiveness
- Improve compatibility with other mainstream markets
- Raise revenue and promote low-carbon investment



Feasibility

Compatible with the existing legislative framework

- *Opinions on Carbon Peaking and Carbon Neutrality*
- *Opinions on Green Transition and Carbon Market Development*
- *Interim Administrative Measures* and *Regulations for ETS*

Comprehensive domestic and international experience

- All of China's pilot markets have implemented auctions
- Other major international markets: Auctioning is the primary allocation approach

IT infrastructure is ready

- Registry and trading systems

High acceptance among regulated sectors

Mild cost increase for covered industries, with potential overall **positive impacts**

A comprehensive implementation plan has been formulated

Proposed Design

From research to policy

- **Academic research (2019–2021)**
  - Large-scale lab-in-the-field experiments on potential auction designs
  - *EfD Discussion Paper*: Emissions Trading with Consignment Auctions
- **Policy research, field study, and international exchange (2021–2023)**
  - EDF-sponsored research projects on auction mechanisms, price impacts, and implementation plan
  - Field studies on China's pilot carbon markets
  - *China–EU Carbon Market Dialogue*: workshops on auctions and MSR in EU ETS, Workshops with the EPA and California ARB
- **Policy design (2023–present)**
  - Drafting *the Implementation Plan for Auction in the National ETS*

Sida

EfD
Environment for Development

Roadmap for introducing auction in the ETS

- **Phase I: Institutional Development (2025–2027)**
  - Establish legal framework, implementation rules, and supporting systems.
- **Phase II: Initial Implementation (2028–2030)**
  - The initial auction share could be between X% and X% across all covered sectors.
- **Phase III: Deepening & Improvement (2031 onwards)**
  - The auction share is planned to stably increase, with the level expected to exceed X% by 2035.

Auction rules in EU ETS

- **Auction Format**
  - **Single round:** Bids will be submitted during one given bidding window
  - **Sealed bid**: Bids will be submitted without seeing other participants' bids
  - **Uniform price**: All successful bidders will pay the same clearing price
- **Auction Frequency:** High frequency (2–3 times per week)
- **Reserve Price:** No public reserve price
- **Unsold Allowances:**
  - Carried over to subsequent auctions
  - If persistently unsold, transferred to MSR or cancelled

Potential auction rules in China's national ETS

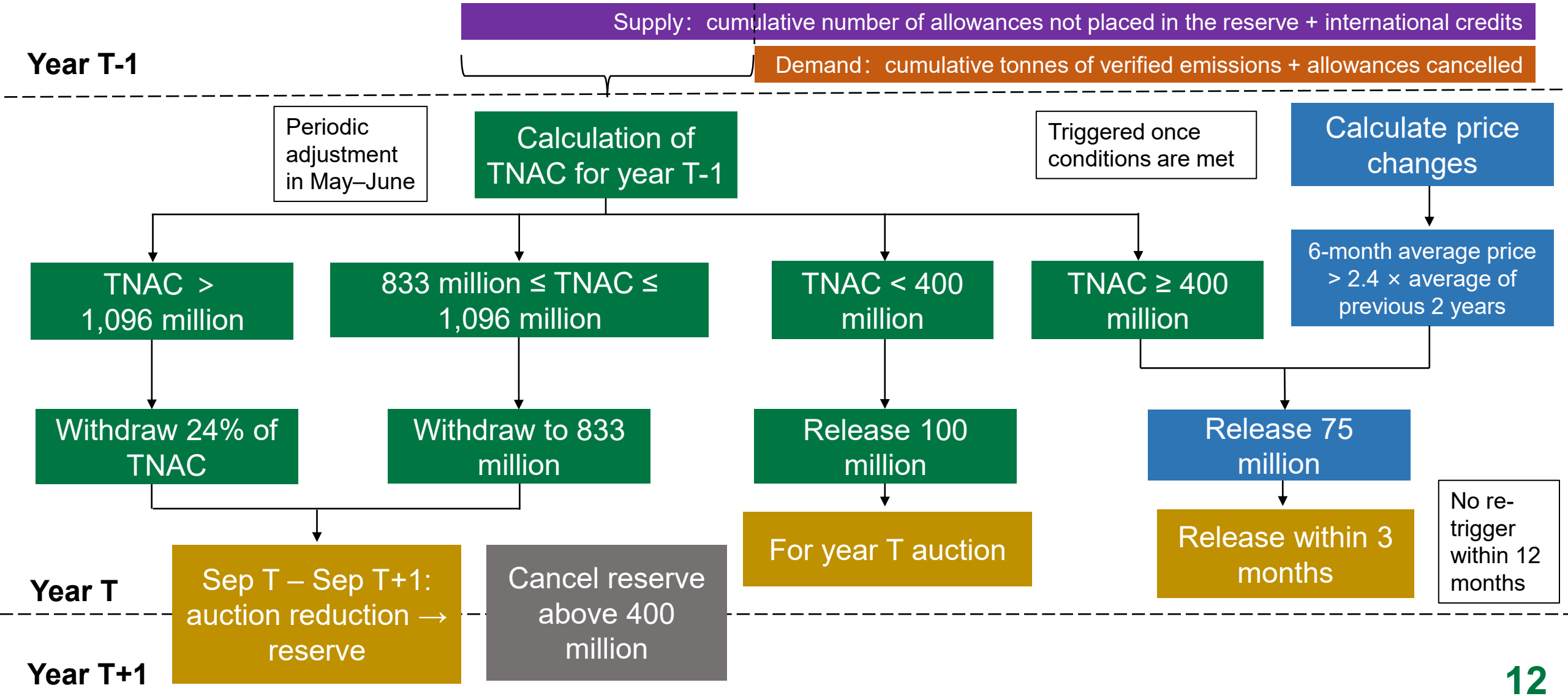
- **Auction Format: Uniform Price Auction** (Single round, sealed bid) is preferable
  - Widely used in carbon markets
  - Simple and transparent
  - Stabilize expectations
- **Auction Frequency:** No less than X times a year (e.g., four times a year, plus ad-hoc ones?)
- **Reserve Price:** A **public reserve price** is preferable (e.g. 0.8 × 6-month average price?)
  - Reduces information asymmetry
  - Prevents distortions from low bids
  - Supports effective price discovery

Market stability measures in EU ETS

- **Quantity-based: Market Stability Reserve (MSR)**
  - Adjusts auction supply based on surplus (TNAC)
  - When surplus is high → cut auction volumes
  - When surplus is low → release allowances
  - Cancels excess MSR holdings
  - Rule-based functioning, leaves no discretion
- **Price-based: Article 29a of Directive 2003/87/EC**
  - Trigger: price > **2.4** (was 3) × two-year average → release allowances
  - **Never triggered**

  (***Q: Due to strict conditions? Any possible Improvements?***).

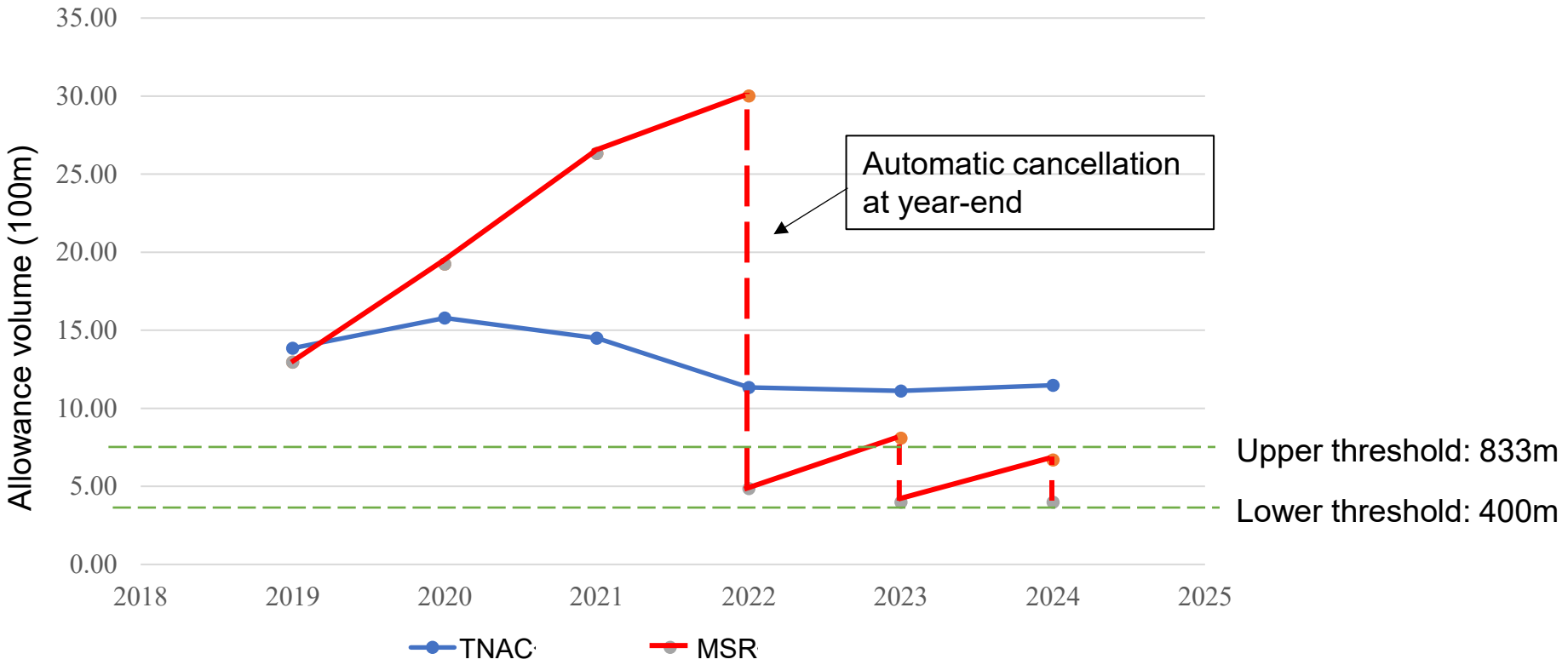
Detailed Rules



Main consideration: Market surplus

- **Surplus in the market**: The market functions well under a certain level of surplus. Surplus can serve as a buffer to absorb fluctuations. However, excessive surplus undermines market stability and weakens incentives.
- **Sources of surplus demand**:
  - **Hedging demand**: EU power companies sell electricity via forward contracts (typically 1–3 years). To hedge future emissions, they purchase EUA futures, so do other market participants
  - **Liquidity-driven banking**: Surplus is held to prepare for potential allowance shortage in the future.
  - **Speculation**: Participants holding allowances or EUA futures for profits.
  - **Passive banking**: Regardless of price movements, all surplus allowances are retained.
- ***Q: Which of these surplus demand sources exist in China?***

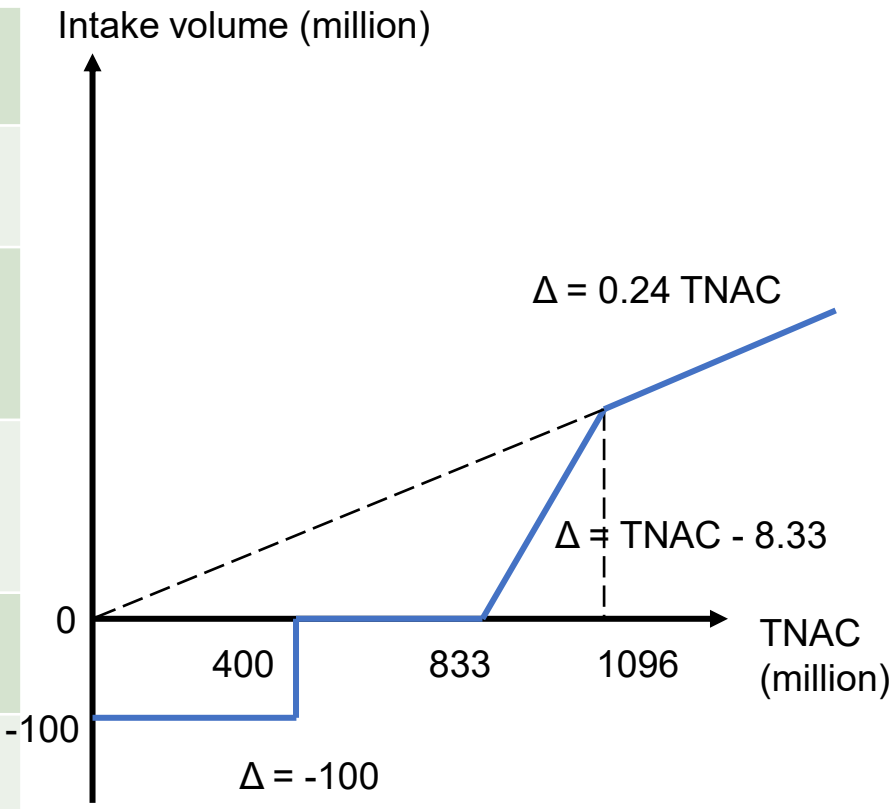
Performance of the MSR



- MSR launched in 2019; triggered annually as TNAC exceeded upper threshold
- After 2022: Cancellation rule applied; one-off removal of excess reserves

How are MSR parameters set?

Mechanism	Parameters	Main Considerations	Formula
Withdraw allowances when trigger	Upper threshold: **1,096 million**	Mitigates the "threshold effect"	1,096m × 24% = 1,096m – 833m
	Intake rate: **24%**	Monthly adjustment: 2% (initially 1%)	2% × 12 = 24%
	Upper threshold: **833 million**	A 12% intake rate leads to annual adjustments exceeding 100m	833m = 100m ÷ 12%
Release allowances when trigger	Lower threshold: **400 million**	Keeping TNAC at 40%–50% of the annual cap is considered reasonable	?
	Release volume: **100 million**	?	
Annual cancellation of excess reserves	Invalidation threshold: **400 million**	Ensure surplus reaches lower bound?	



Potential design of market stability measures in China

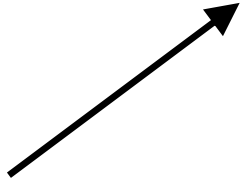
Price-based measures are preferable

- Based on price fluctuation in the secondary market
  - Auction quantity adjustment is triggered when the market price increases or decreases by a certain percentage within a certain period
- China's rate-based system could lead to uncertainty in allowance quantities
- More effective in preventing excessive carbon price spikes

Potential design of market stability measures in China

Option 1: Establish a Reserve Pool

- E.g. *CAP = XX% Free allocation + X% Auction + X% Reserve*



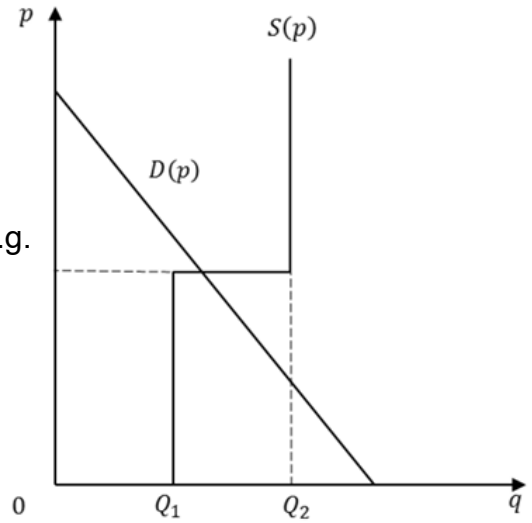
- Released as planned
- Unsold allowances transferred to reserve

- Reserve volume based on market surplus needs
- Ad-hoc release depending on price volatility
- Periodical cancellations to avoid over-accumulation

Potential design of market stability measures in China

Option 2: Establish a Cost Containment Reserve

- E.g. *CAP = XX% Free allocation + X% Auction + X% Reserve*



Trigger price (e.g. 1.2 × 6-month average price)

- Rule-based functioning
- No ad-hoc auctions
- Release reserve responding to excess market demand

The Cost Containment Reserve (CCR) was designed under the Regional Greenhouse Gas Initiative (RGGI) in the United States. It withholds a portion of allowances at predefined price levels and releases them when auction prices reach those thresholds.

Revenue management in EU ETS

- **Allowance Allocation**
  - Auction allowances are distributed directly to Member States according to predefined shares.
- **Revenue Ownership**
  - Revenues go directly to the Member States, not to the EU budget.
- **Use of Revenues**
  - In Phase IV (2021–2030), Member States are required to use all auction revenues for climate- and energy-related purposes.

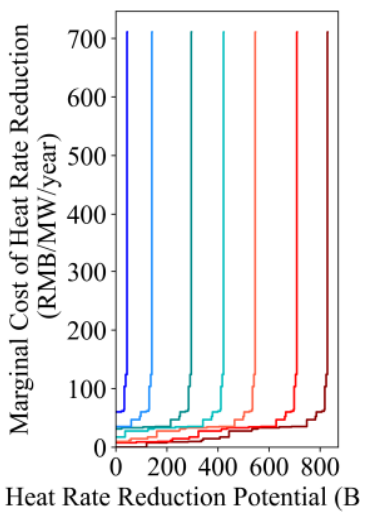
Design of revenue management in China's national ETS

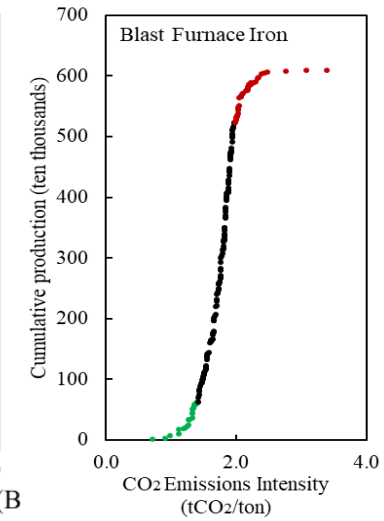
- **Two-line management**: All revenues from auctions go directly into the national treasury.
- Expenditures arranged through **special funds** to ensure clear purpose and exclusive use.
- **Expenditure priorities**
  - **Stage-based focus**: Early phase — build market infrastructure (data, verification, training)
  - **Balanced support**: As revenues increase, support green transition in regions and key industries
  - **Long-term guidance**: Support for low-carbon tech, leverage private investment

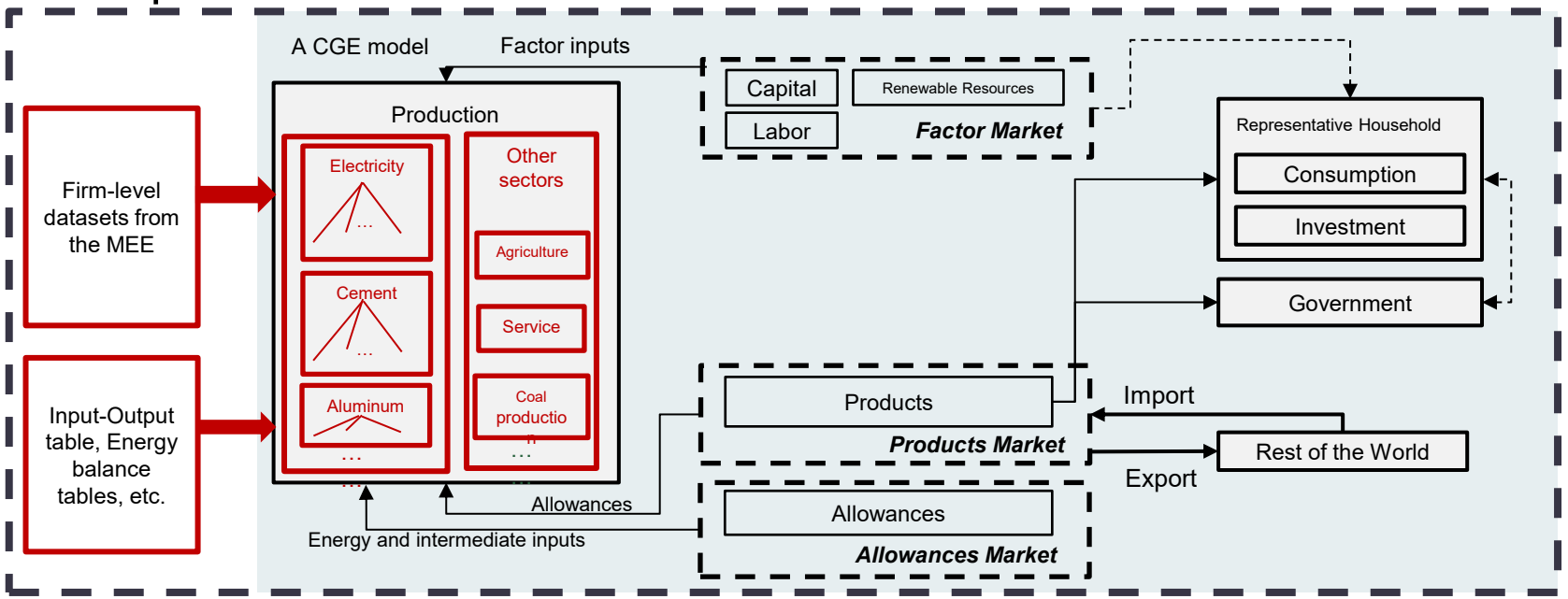
Ex-ante Evaluation

Model

- **Multi-sector general equilibrium; multi-period (2020-2035) model**
- **Unique features**
  - Heterogeneity within sectors
  - Existing taxes and subsidies
  - Fixed and market prices of electricity price
  - State-owned and private enterprises







Goulder, Lawrence, Xianling Long, Chenfei Qu, and Da Zhang. China's Nationwide CO2 Emissions Trading System: A General Equilibrium Assessment. ***American Economic Journal: Economic Policy***, in press.

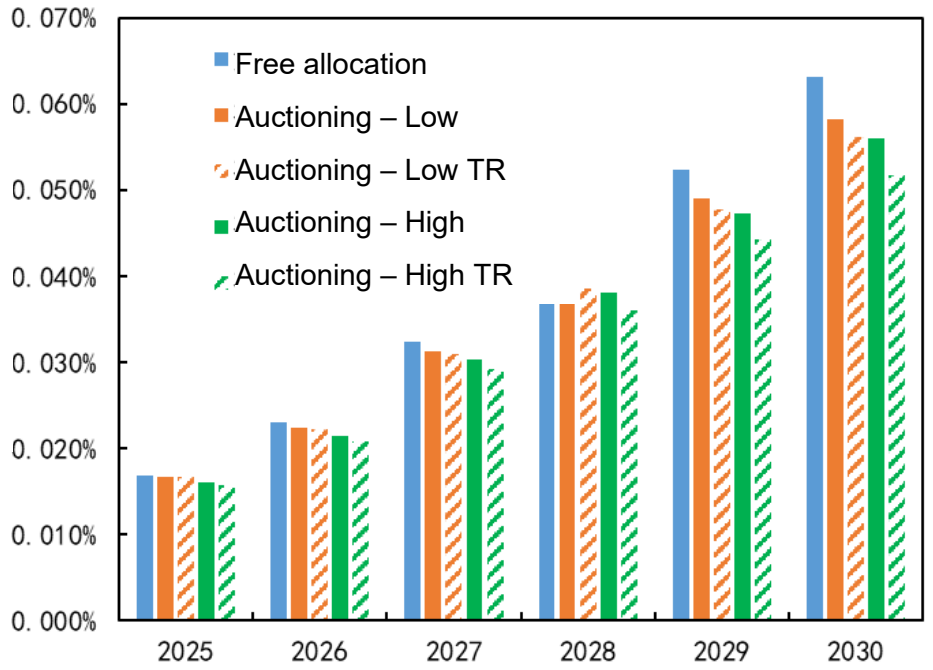
Scenarios

Scenarios	Share of Auctioning	Benchmarks for Free Allocation	Revenue Recycle
Free Allocation	0	Current policy settings	--
Auctioning - Low	0.5% in 2025，5% in 2030	Proportionally decreased from the “Free Allocation” scenario so that the total allowance /emissions remains the same	Lump-sum transfer to households
Auctioning - High	3% in 2025，10% in 2030		Lump-sum transfer to households
Auctioning - Low - TR	0.5% in 2025，5% in 2030		Returned to ETS-covered firms via tax cut
Auctioning - High - TR	3% in 2025，10% in 2030		Returned to ETS-covered firms via tax cut

Impacts on policy costs

When auction revenues are distributed to households in the form of lump-sum transfers, introducing auctioning reduces the policy cost by **8–11%** relative to free allocation, while achieving the same emissions reduction.

The policy cost can be reduced by **11–18%** relative to free allocation if auction revenues are returned to firms through tax cuts.

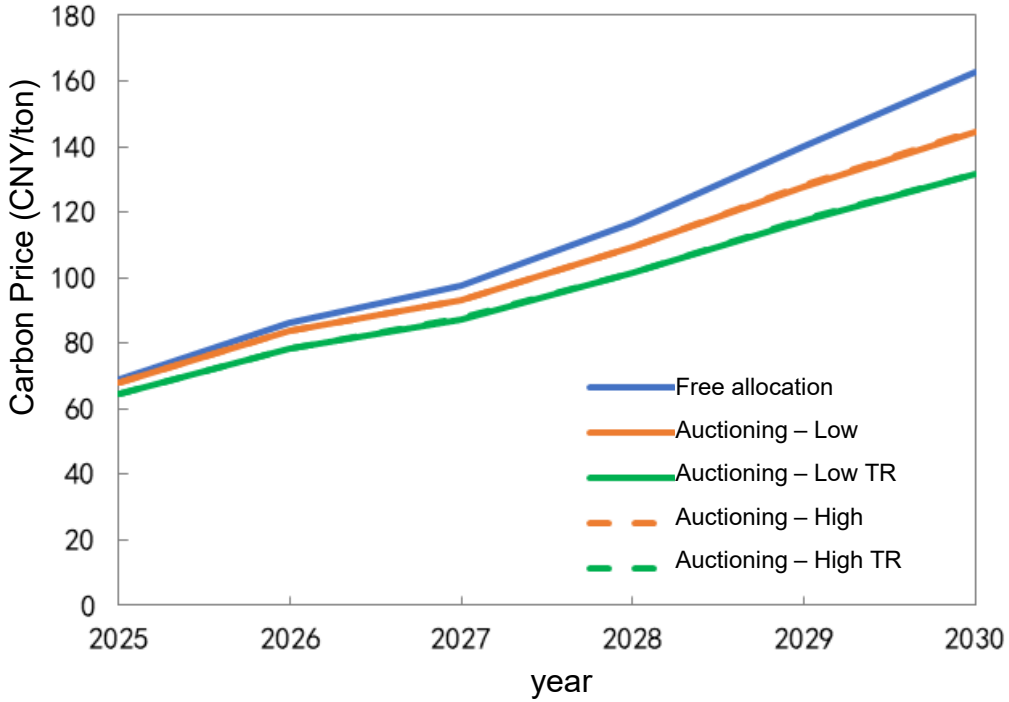


Policy cost in terms of GDP reduction under the ETS relative to a no-policy baseline

Impacts on policy costs

Free allowances are allocated according to **a rate-based method**, which **implicitly subsidizes output** (see Goulder et al., 2023), raises the carbon price, and reduces the cost-effectiveness of the ETS.

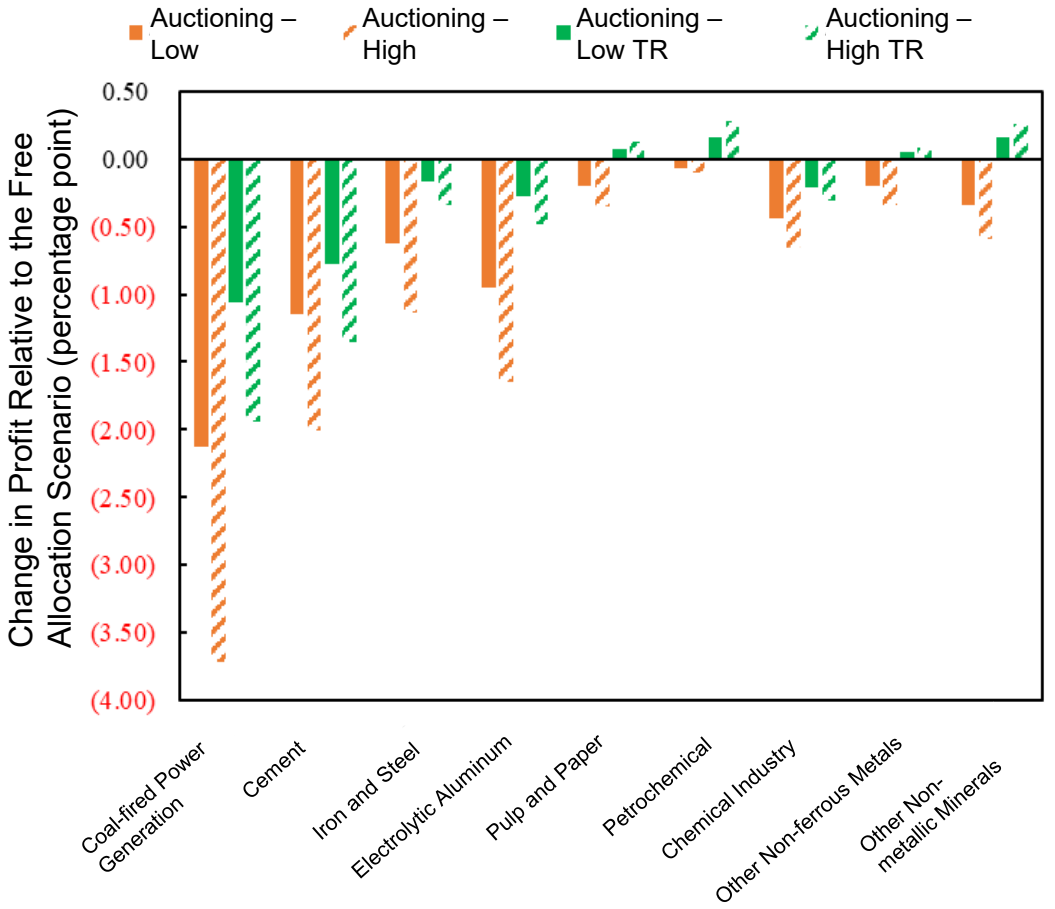
Introducing auctioning can help reduce these implicit output subsidies, lower the carbon price, and improve the cost-effectiveness of the ETS.



Impacts on firm profits

Introducing auctioning will generate additional fiscal revenue.

The negative impact of introducing auctioning on firm profits is limited: In 2030, total profit of all regulated enterprises would decrease by approximately 30 to 55 billion CNY under 5% to 10% auction shares, compared to the free allocation scenario. This represents only about **0.7% to 1.2% of total profits** under the free allocation scenario.



Impact of introducing auctioning in the ETS on industry-level profits (2030)

Thank you!

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