Lessons Learned from Cap-and-Trade Experience

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Identifying Cap-and-Trade Systems for Analysis

- *Dozens* of emissions trading systems have been proposed, planned, and implemented
  - We select *seven* for analysis, based on *three criteria* …

1. Focus exclusively on *cap-and-trade* mechanisms (excluding emission-reduction-credit or offset systems)

2. Among cap-and-trade mechanisms, focus on *pollution abatement* (excluding applications to natural resource management, such as ITQ systems)

3. Focus on *most prominent* applications – those that are particularly important environmentally, economically, or both

Seven Cap-and-Trade Systems for Analysis

- Leaded Gasoline Phasedown (1982 – 1987)
- Sulfur Dioxide Allowance Trading (1994 – 2010)
- NO_x Trading in the Eastern United States (1998 – 2009)
- Regional Clean Air Incentives Market (1993 – present)
- Regional Greenhouse Gas Initiative (2009 – present)
- California's AB-32 Cap-and-Trade System (2013 – present)
- European Union Emissions Trading System (2008 – present)

Lessons from Design, Implementation & Performance of Seven Cap-and-Trade Policies

The Basics

- Cap-and-trade proven to be environmentally effective & cost-effective [Lead, SO_2]
- Economy-wide systems shown to be feasible [AB-32], but downstream, sectoral systems more common [RGGI, EU ETS]
  - For CO_2, downstream/midstream emissions trading used, not upstream carbon rights
- Transaction costs low, particularly with homogeneous compliance entities [Lead, SO_2]
  - Avoid requirements for prior government approval of trades [Lead, SO_2]
- Good monitoring & enforcement plus penalties yield high level of compliance [SO_2]
- Final rules in place before beginning of first compliance period can avoid price volatility [SO_2, NO_x, EU ETS]

Lessons from Design, Implementation & Performance of Seven Cap-and-Trade Policies (continued)

Specific Elements of Design

- *Banking* very important economically – large share of gains from trade [Lead, SO_2]
  - Absence of banking can lead to price spikes & price collapse [RECLAIM, EU ETS]
- *Price collars* are valuable
  - Changing economy can render cap non-binding [RGGI, EU ETS] or drive prices to excessive level [RECLAIM]
  - Price collar feasible via auction price floor & allowance reserve [RGGI, AB-32]
- *Constraints on offset use* → thin market → ineffective cost containment [RGGI, AB-32]

Lessons from Design, Implementation & Performance of Seven Cap-and-Trade Policies (continued)

Allowance Allocation

- Very significant *distributional* issue, hence *important politically*
- *Free allowances* foster valuable *political support*, …
  - … but opportunity forgone to cut program's social *cost* by *using auction revenue to cut distortionary taxes* [SO_2, AB-32]
- Empirical experience *reveals political pressure* to use *auction revenue* to fund new or existing government programs or relieve deficits [AB-32, RGGI]
  - *Political attraction* of auctioning has been *revenue* for governments [AB-32, RGGI]
  - Globally, *70%* of CAT revenue *earmarked for green spending* (but 72% of carbon tax revenue refunded or dedicated to general funds – Carl and Fedor 2016)

Lessons from Design, Implementation & Performance of Seven Cap-and-Trade Policies (continued)

Leakage and Competitiveness

- Frequent *political concern* re emissions & economic leakage and related competitiveness impacts, but *reality* can range from non-existent [Lead] to potentially serious [RGGI]
  - Most likely to be *serious* if limited geographic scope, particularly in power sector due to interconnected electricity markets [RGGI, AB-32]
- Although free allocation *fosters political support*, free allocation *per se* does *not* address leakage/competitiveness (inframarginal) [EU ETS, but changes going forward]
  - But *output-based updating* system makes allocations *marginal* [AB-32]
- But, ultimately, *only way to eliminate* leakage/competitiveness risk is through broader (national & international) coalitions of action

Lessons from Design, Implementation & Performance of Seven Cap-and-Trade Policies (continued)

Interactions with Other Policies

- Carbon pricing is necessary, but *not* sufficient -- other market failures
  - Examples include principal-agent problem (renter-occupied buildings) and R&D
  - So, specific non-pricing policies *can be* complementary
- But some "complementary policies" can *conflict* rather than complement
  - *Consequences* of policy for sources *under the cap* of a cap-and-trade system
    - *Achieves no incremental CO_2 emission reductions* – relocates emissions (*unless* allowance price floor or ceiling is binding; acts as carbon tax)
    - *Drives up abatement costs* (marginal costs not equated)
    - *Suppresses allowance price* (by reducing overall demand for allowances)
- So, some "complementary policies" have perverse effects [EU-ETS, AB-32]
- But some policy makers may intend to keep allowance price low by having other policies do "heavy lifting"

Conclusions

- China and other countries are planning to launch cap-and-trade systems as part of their NDCs under the Paris Climate Agreement.
  - *Thirty years of experience* with emissions trading exists in USA and Europe.
  - We can learn from successes *and* from failures.
  - *Careful design* of carbon markets in *real-world political context* matters.
- But *converting lessons* from experience in USA & Europe to *specific design recommendations* for other jurisdictions requires …
  - familiarity with *planned design* of the specific systems, and
  - understanding of broader economic & political *context in those parts of the world*
- So, we leave it to colleagues in other countries to *adapt & adopt* any lessons they may judge to be relevant.

For More Information

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