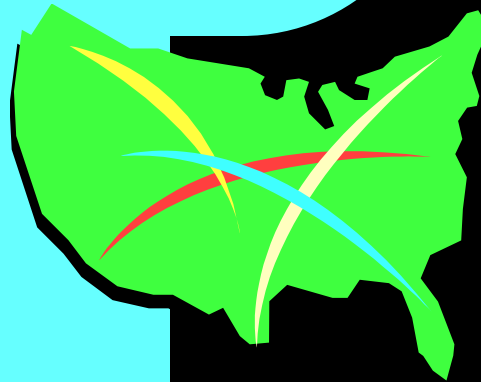


Air Quality Management Comparison of Cap-and-Trade, Command-and Control and Rate-Based Programs



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Presentation Overview

- Description of US experience with cap-based, command-and-control and rate-based programs
 - What do we mean by an emissions cap and an emissions rate?
 - Emission market mechanisms
 - Cap-and-trade
 - Command-and-control and Rate-based
- Program comparison and what to consider when establishing policies
- Recommendations applicable to China

What Do We Mean by an Emissions Cap and an Emissions Rate?

- What is a cap?
 - A cap limits the amount of emissions from a certain source or category of sources - e.g. tons
- What is an emission standard?
 - An emission standard is a number that limits the amount of a pollutant that can be released into the atmosphere under a command-and-control program – e.g. lbs/ft³
- What is a rate?
 - A rate limits the amount of pollutant per amount of either heat input or facility output from a certain source or group of sources - e.g. lbs/mmBtu or lbs/MWh

Emission Market Mechanisms

An emissions market system:

- Can help sources minimize compliance costs
- Can provide incentives for continuous innovation
- Can provide sources with economic incentives for compliance
- Can reveal the true cost of compliance

A market system should support the achievement and maintenance of the environmental goals.

Cap-and-Trade Programs

- The cap applies to source categories (instead of specific units)
- Individual sources are allocated a portion of the cap (or budget) which they are free to trade with other sources:
 - Reduce emissions to their budget allocation,
 - Free up allowances to sell (or save for future use) by emitting below their allocation,
 - Buy allowances from sources with excess allowances, rather than reduce emissions.
- Government must track allowance holdings
- Standard currency (allowance) and environmental accountability are supported by standardized emission monitoring, reporting, and record keeping

Command-and-Control Programs

- The emission standard applies to sources, or specific units
- Individual sources are to meet the standard at all times. Few exceptions are contemplated
 - Can be expensive for sources to comply,
 - Applies regardless of the source's level of activity
 - Low and high emitting sources are not able to interact regarding their emissions limiting the flexibility of the program.
- Government must track compliance with the standard
- This programs are very effective in places where a pollutant causes a hot spot - e.g. Toxic releases

Rate-Based Programs

- Sources must meet an emission rate target -- either individually or through rate-based averaging
- If trading is included:
 - Sources must convert rate increases or decreases to mass emission credits or debits, multiplying the rate change by a utilization level,
 - Government must approve and track the creation/compliance of credits
- Overall emissions may be lower or higher than expected
- In the US standardized reporting and particularly record-keeping procedures are not currently available for this type of trading system

- Program comparison:
 - Environment
 - Economic Implications
 - Cost
 - Timing
 - Administrative
 - Benefits
- Recommendations

Environmental Implications

- Cap-and-trade programs provide the strong assurance of achieving emission reduction objective and of maintaining environmental benefits
- Command and control programs can reduce emissions but are expensive and sometimes not very flexible. Helpful for certain kind of pollutants
- Rate-based programs can reduce emissions -- but source specific variances and growth may undermine achievement of emissions objective and maintenance of environmental benefits

Economic Implications

- All programs allow for economic growth, but with different levels of flexibility
- Under cap-and-trade, sources are responsible for addressing the emission consequences of economic growth:
 - If there are new sources or increased use of existing sources, sources must compensate by improving efficiency, reducing emission rates, or replacing old sources with new sources
 - Each source chooses the most cost-effective approach to maintain emissions below the cap

Economic Implications

- With a rate-based program or a command-and-control program the government is responsible for addressing the emissions consequences of growth:
 - If there are new sources or increased use of existing sources, the government must impose more stringent regulations to prevent (or correct for) an increase in emissions.
- Upwind and downwind sources are less certain of future regulatory requirements and/or obligations
- Under certain circumstances local impacts can be mitigated

Program Cost Implications

- A cost-effective program should have:
 - Reasonable compliance costs
 - Low implementation costs
- If the same emissions level is maintained under a rate-based program and a cap-and-trade program, compliance costs should be similar. However:
 - Averaging under a rate-based program is less flexible and more expensive than trading/banking under a cap-and-trade program,
 - Trading/banking under a rate-based program is much more complicated than under a cap-and-trade program, causing transaction costs to be higher.
- Rate-based programs have lower compliance costs if emissions are allowed to increase

Timing Implications

- Chinese cities and municipalities should consider that further delays impose additional health and ecological costs
- Experience with cap and trade and command and control programs already developed and implemented can provide insights
- A rate-based trading program would need to be developed taking into consideration the specifics of China's situation and make take time

Administrative Implications

- In order to be efficient
 - All programs would require States and Municipalities to adopt rules
 - All programs require systems for monitoring and reporting emissions for large emitters
 - A cap-and-trade program may require less State resources to administer than a comparably effective, rate-based program with trading

Environmental Benefits

- a cap guarantees to both upwind and downwind locations that the emissions reductions be met over the long-term:
 - Sets a mass limit on emissions
 - New sources and increased utilization of existing sources will not increase aggregate emissions
- The protection of public health and the environment may be achieved more quickly under a cap-and-trade system because the infrastructure can be built faster

Economic and Industrial Growth

- A capped program allows for growth:
 - Cap can be set at a level to accommodate projected growth at a reasonable cost
 - Sources can manage their growth by buying, selling and banking allowances
 - A capped program encourages clean growth and efficient utilization of existing units
- In a rate-based system or a command and control system, the addition of new sources or an increase in activity at existing sources can increase total emissions, even though the desired emission rate or emission standard is met

Compliance Costs

- Under comparable emissions reductions and maintenance, a cap-and-trade program will be less expensive for sources than a command-and-control or rate-based program because it provides:
 - More certainty about future regulatory requirements
 - More certainty about the validity, quantity, and price of the tradable commodity
 - Greater flexibility in managing facilities, resources and capital expenditures
 - Lower transaction costs

Administrative Benefits

- Our experience is that :
- Capped programs require fewer resources to administer than rate-based programs that offer comparable effectiveness and compliance flexibility
- Capped programs require fewer regulatory adjustments (i.e., SIP revisions) for both upwind and downwind locations

Conclusions

- In the US, Cap-and-Trade Programs...
 1. When properly designed provide certainty that a specific level of emission will actually be achieved
 2. Provide regulatory certainty for upwind and downwind States,
 3. Provide maximum flexibility for sources
 4. Ensure low transaction costs
 5. Allow for economic growth while ensuring environmental protection
 6. Require limited administrative resources