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The Case for a Cap-and-Trade System: A Market-Based Policy for Achieving California's Climate Policy Goals

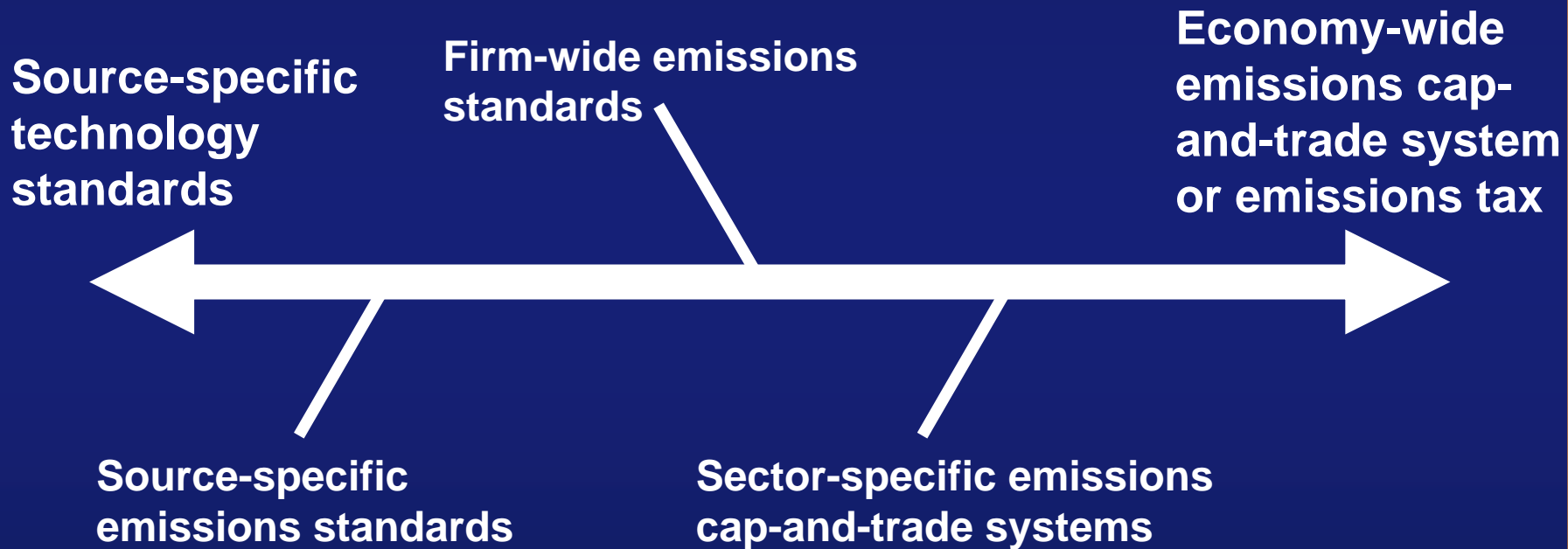
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There is a spectrum of possible approaches to climate policy in California



Overview of a cap-and-trade system

- **Aggregate emissions (from regulated sources) are capped**
- **Cap enforced through limited number of emissions allowances**
- **Allowance trading minimizes costs of meeting cap**
 - **Allowances migrate to highest-valued uses: covering emissions that are most costly to reduce**
 - **So, emission reductions undertaken are those that are *least costly* to achieve**
- **Uniform market price of allowances creates incentive for *all* covered sources to reduce *all* emissions**



Cap-and-Trade systems can be compared with conventional standards along two important dimensions

- **Environmental-Effectiveness: Ensuring achievement of emissions targets**
- **Cost-Effectiveness: Minimizing the cost of achieving emissions targets in the short-run *and the long-run***



Environmental-Effectiveness: Cap-and-trade can ensure achievement of emissions targets

- **Cap-and-trade allows policymakers to set specific *overall* emissions targets**
 - **The system can guarantee achievement of the targets, because emissions will not exceed the number of allowances if the cap is enforced**
- **An economy-wide, upstream cap-and-trade on the carbon content of fossil fuel can cover all fossil-fuel-related CO₂ emissions without the need to regulate individually each emissions source**



Environmental-Effectiveness: Standards cannot ensure achievement of emissions targets

- **Standards typically focus on *new* emissions sources, and do not address emissions from existing sources**
 - **GHG standards for new cars, new power plants, etc.**
- **Standards cannot possibly address all types of new sources**
- **Statewide emissions will depend on many factors that cannot be addressed by standards:**
 - **Emissions from existing sources and from unregulated new sources**
 - **How quickly the existing capital stock is replaced**
 - **How much growth there is in the number of emissions sources**
 - **And how intensively emissions-generating equipment is used**



Environmental-Effectiveness: Experience shows that standards can create unintended consequences

- **By reducing operating costs, energy-efficiency standards can cause more intensive use of regulated equipment (e.g., air conditioners are run more often), leading to offsetting increases in emissions — the “rebound effect”**
- **Firms and households may delay replacing existing equipment if standards make new equipment more costly**
- **Standards may encourage counterproductive, unintended shifts among regulated activities (e.g., from purchasing cars to purchasing SUVs)**
- **These unintended consequences result from the *problematic incentives* that standards can create, compared with the *efficient incentives* created by a cap-and-trade system**



Cost-Effectiveness: A cap-and-trade system minimizes costs

- Unlike NO_x, SO₂, and other pollutants, GHG emission reductions have the same effect no matter *how, where, or when* they are achieved
- This makes the climate change problem unique in the degree to which compliance flexibility can be used to lower costs without compromising environmental integrity
- Three ways in which a cap-and-trade system can offer this flexibility while still meeting environmental objectives:
 - *What* flexibility
 - *Where* flexibility
 - *When* flexibility



Cost-Effectiveness: A cap-and-trade system minimizes costs through “*what flexibility*”

- Many types of actions offer low-cost emission reductions
- A cap-and-trade system allows emission reductions through whatever measures are least costly
- Standards can target only certain *identified* emission reduction measures, leaving other cost-effective opportunities untapped
- And predictions of what measures are cost-effective may be wrong



Cost-Effectiveness: A cap-and-trade system minimizes costs through “*where flexibility*”

- **Costs of emission reductions vary widely across industries, across facilities, and even across users of the same equipment**
- **A cap-and-trade system exploits this variation in costs by achieving reductions wherever they are least costly**
- **Standards would only be cost-effective if they accounted for all of the variation in costs across sectors, technologies, and regulated entities — but they cannot**
- **Emission reduction costs across sectors and technologies will change over time**
- **Also, lower-cost opportunities to reduce emissions may exist in other states or other countries**
 - **A cap-and-trade system creates a common currency (emissions allowances) that makes it possible to link with other systems**



Cost-Effectiveness: A cap-and-trade system minimizes costs through “*when* flexibility”

- **Costs can be reduced through flexibility in the timing of emission reductions by avoiding:**
 - **Premature retirement of capital stock or lock-in of existing technologies**
 - **Unnecessarily costly reductions in one year due to unusual circumstances when less-costly offsetting reductions can be achieved in other years**
- **A cap-and-trade can incorporate “when” flexibility *without compromising cumulative emissions targets* through:**
 - **Allowance banking and borrowing**
 - **Multi-year compliance periods**



Cost-Effectiveness: A cap-and-trade system creates incentives for innovation — and lowers long-run costs

- **By rewarding any means of reducing emissions, a cap-and-trade system provides broad incentives for any innovations that lower the cost of achieving emissions targets**
- **Standards may encourage development of lower cost means of meeting the standards' specific requirements, but do not encourage efforts to exceed those standards**



Experience with cap-and-trade systems

- **Several cap-and-trade systems have been successful at achieving environmental goals *and* cost savings**
 - **Phase-out of leaded gasoline**
 - **Phase-out of ozone depleting substances**
 - **Clean Air Act Title IV SO₂ Allowance Trading Program**
- **Perceived “shortcomings” in other cap-and-trade systems reflect design choices, not problems with the instrument itself**
 - **RECLAIM**
 - **EU Emissions Trading Scheme**



Summary

- **Compared with conventional standards, a cap-and-trade system can be:**
 - **More environmentally-effective**
 - **More cost-effective**
- **As with any policy instrument, careful design is important**

