

To: Brad Biddle  
From: Kimberly Ruht  
Re: What is a cap-and-trade program?  
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### **What is a cap-and-trade program?**

Under a cap-and-trade program, a policymaking body (usually the government) sets a limit on total CO<sub>2</sub> emissions allowed during a set period of time in a specific area and divides the total emissions among enumerated entities, requiring those entities to hold rights, or allowances, that limit their emissions. Typically, the allowances would be allotted by the ton, so that each allowance would entitle a firm to emit one ton of CO<sub>2</sub> or to have one ton of carbon in the fuel that they sold. Once the allowances for a given period of time are distributed, the firms are free to buy and sell the allowances among themselves. If a firm is able to reduce its emissions cheaply, it would profit from selling its allowances to other entities that had relatively high abatement costs and would not be able to reduce their emissions below the set cap.

The policymakers may initially distribute allowances for free or sell them through an auction. There is considerable debate on the implications these options have on the economic impact of the regulated entities and the consuming public.<sup>1</sup> However, regardless of how the allowances are initially distributed, their presence within the cap-and-trade program will create a need to trade valuable allowances to cover any emissions and the opportunity to market those allowances creates a price signal for emissions. The outcome is that these price signals provide firms with an incentive to reduce emissions and it influences their production and investment decisions. Because allowances are tradable, market forces determine the ultimate distribution of emission reduction efforts necessary to meet the overall emissions cap.

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<sup>1</sup> If the government did choose to sell the allowances, decisions would have to be made about whether to use the resulting revenue to offset other taxes, to assist workers or low-income households that might be adversely affected by the emission cap, to support other legislative priorities, or to reduce the deficit.

Proponents of cap-and-trade programs believe that it is this trading aspect that will lead to substantial cost savings compared to command and control approaches, which mandate how much individual entities could emit or what technologies they should use, because it would provide more flexibility about where and how emissions reductions are achieved.

The cap is placed only on aggregate emissions and imposes no particular limits on emissions from any given source. Therefore, overall a cap-and-trade system provides certainty regarding emissions from regulated sources because aggregate emissions from all regulated entities cannot exceed the total number of allowances.

A well-designed cap-and-trade system will minimize the costs of achieving any given emissions target. Firms will have the flexibility to choose how they emit but because they must buy an allowance for each ton of emissions over the cap, they will normally implement emission reductions that are less costly than the market price of an allowance. Through trading, this allowance price should adjust until aggregate emissions are brought down to the level of the cap.

Cap-and-trade programs can vary substantially in the amount of leeway they provide regulated entities in the timing of reductions. Designs that allow for more timing flexibility are generally more cost-effective. In a very inflexible form, a program could require a specified cap on emissions be met each year, or even month to month. Some argue that lack of flexibility could hinder long-term goals because it would prevent firms from responding to year-to-year differences in conditions that affect emissions reduction costs, such as increase demand for energy during an exceptionally cold winter. If a more flexible cap period were created, such as a 5 or 10-year period, it would allow firms to reduce their emissions by more than a given target in

some years and by less in others, depending on the market, thereby reducing some economic strain associated with year-by-year caps.<sup>2</sup>

There must be a predictable schedule for gradual reduction in cap emissions to motivate (or force) entities to continue their emissions reductions. This is a key component because the cost of achieving significant emission reductions in future years will depend critically on the availability and cost of low- or non-emitting technologies. A cap-and-trade system that establishes caps extending decades into the future provides important price signals and hence incentives for firms to invest in the development and deployment of such technologies, thereby lowering the future costs of achieving emission reductions.<sup>3</sup> Future significant emissions reduction will not succeed without the improvements on and developments of new technologies.

With a cap-and-trade market, there is the concern that the cost of allowances could rise too high or sink too low. A program that included both a ceiling and a floor for allowance prices could achieve a long-term target for emissions while minimizing both the overall cost of achieving the target and the price volatility. Under such a program, policymakers would not only specify annual emission targets, but would create artificial ceilings and floors for the price of

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<sup>2</sup> “Although costs and benefits are difficult to measure, the long-term cumulative nature of climate change implies that the *benefit* of emitting one less ton of CO<sub>2</sub> in a given year—referred to as the marginal benefit—is roughly constant. In other words, the benefit in terms of averted climate damage from each additional ton of emissions reduced is roughly the same as the benefit from the previous ton of emissions reduced, and shifting the reductions from one year to another does not materially affect the ultimate impact on the climate. In contrast, the *cost* of emitting one less ton of CO<sub>2</sub> in a given year—the marginal cost—tends to increase with successive emission reductions. The reason is that the least expensive reductions are made first and progressively more-expensive cuts would then have to be made to meet increasingly ambitious targets for emission reductions.” Orszag, Peter, *Implications for a Cap and Trade Program for Carbon Dioxide Emissions*, Testimony before the Congressional Budget Office, fn 1 (April 24, 2008).

<sup>3</sup> Stavins, Robert, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293, 298 (2008).

allowances during that year. Regulators could adjust the levels of the ceiling and the floor periodically to ensure emissions reductions were on track.

Under a cap-and-trade program, in the long term, firms would likely not bear most of the costs of the allowances, but instead would pass them along to their customers in the form of higher prices. Price increases are essential to the success of a cap-and-trade program because they would be the most important mechanism through which businesses and households would be encouraged to make investments and behavioral changes that reduced CO<sub>2</sub> emissions.

In establishing a cap-and-trade program, a new commodity is created: the right to emit CO<sub>2</sub>. The emissions allowances, each of which would represent the right to emit, say one ton of CO<sub>2</sub>, would have substantial value. The actual value would depend on various factors, including the stringency of the cap, the possibility of offsetting CO<sub>2</sub> emissions through carbon sequestration or international allowance trading and other potential features. Once the allowances are created, they will be traded in a liquid secondary market, because firms or household could buy or sell them, and thus their value to those involved in the program would be similar to cash.

## Sources

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