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Five Recent Senate Bills Propose Mandatory Greenhouse Gas Caps: Side-by-Side Comparison and Analysis

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The current Congress has its hands full with many high priority issues, but for the first time, climate change is one of them. Under active discussion in the U.S. Senate are four bills – Sanders-Boxer, Kerry-Snowe, McCain-Lieberman, and Bingaman-Specter – that set mandatory caps on economywide greenhouse gas emissions, along with a narrower bill – Feinstein-Carper – that restricts emissions from the electricity sector.

These five bills are similar in many respects. They all call for mandatory caps on greenhouse gas (GHG) emissions and either mandate or recommend a market-based cap-and-trade permit system. In addition, each bill addresses all six GHGs – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride – and contains provisions to accelerate research and development (R&D) and deployment of climate-friendly technologies.

But although they share many similarities, the bills do differ. When comparing these or any additional bills that will be forthcoming in the Senate or the House, there are at least six important questions to ask:

1. What is the scope of the regulatory program – that is, how many sources of GHG emissions are regulated by the program?
2. Who gets regulated?
3. What are the emissions reduction targets?
4. What do we know about the expected cost to reach the target?
5. Do the bills try to limit uncertainty about costs?
6. And if a permit cap-and-trade program is used, how are the permits allocated?

What Is the Scope of the Regulation?

While four of the bills address emissions throughout the economy, the Feinstein-Carper bill regulates only the electricity industry, which represents approximately one-third of GHG emissions in the United States.

The scope of a regulatory program is important because market-based approaches like cap and trade work by seeking out the cheapest reductions wherever they are in the economy. The larger the program (i.e., the more GHG sources covered by the program), the more opportunities exist to find cheap reductions.

Who Gets Regulated?

The Feinstein-Carper bill regulates the electric power generators downstream, where the fossil fuels are combusted and the GHGs emitted. The McCain-Lieberman bill regulates electric utilities and other large sources downstream as well but regulates emissions from the transportation sector upstream at the point of the petroleum importer and refiner. This potentially leaves smaller sources outside of the transportation sector uncovered. Bingaman-Specter regulates all sources upstream, providing virtually economywide coverage, while Kerry-Snowe and Sanders-Boxer leave the determination of regulated entities to the discretion of the U.S. Environmental Protection Agency (EPA).

What Are the Emissions Reduction Targets?

Kerry-Snowe and Sanders-Boxer share common long-term emissions reduction goals, specifically the stabilization of global GHGs at 450 parts per million of carbon dioxide equivalent (ppm CO₂e), slightly more than the current level of 430 ppm. To achieve this goal the bills call for reductions in U.S. GHG emissions of about 60% below business as usual (BAU) by 2030 (although they do not specify the assumed targets for other countries).

The other three bills do not set long-term goals for atmospheric GHG concentrations. Bingaman-Specter requires reductions in GHG emissions intensity (GHG emissions per unit of gross domestic product), resulting in a reduction in U.S. emissions on the order of 22% below BAU by 2030. Feinstein-Carper would cap emissions from the electricity sector at 45% below BAU in 2030. And McCain-Lieberman would reduce emissions by almost 60% in 2030.

A table of specified caps in 2020 and 2030 is provided below.

Emissions Reduction Targets		
	2020	2030
Sanders-Boxer	42.0%	63.0%
Kerry-Snowe	42.0%	61.0%
McCain-Lieberman	39.0%	59.0%
Feinstein-Carper – electricity only	25.0%	45.0%
Bingaman-Specter	7.6%	21.9%

What Do We Know about the Cost to Reach the Target?

With the exception of Bingaman-Specter, there is limited analysis to draw upon when attempting to estimate the costs of implementing the various proposals. The recent Energy Information Administration (EIA) analysis of Bingaman-Specter found that the permit price in 2025 would be about \$11/ton CO₂e, corresponding to an emissions reduction of 10% below BAU. However, to examine more aggressive targets, we must turn to other information.

An earlier 2004 EIA analysis of the McCain-Lieberman bill (S.A. 2028) sheds some additional light. The 2004 analysis had different target and baseline assumptions and different assumptions about natural gas prices and the availability and prices of offsets, and it used different base years for pricing permits than one would use in an analysis of the current bill. Keeping these differences in mind, EIA found that a 22% reduction in GHG emissions from BAU in 2025 led to a \$45/per ton CO₂e permit price. Thus, a doubling in the percent reduction from BAU (10 % to 22%) led to a four-fold increase in the permit price.

The table below provides information on electricity prices and coal consumption from these two studies.

Permit Prices, Electricity Prices and Coal Consumption

GHG reduction	Permit Price	Electricity Price	Coal Consumption
10 % below BAU in 2025	\$11	↑ 6.5%	↓ 12.2%
22 % below BAU in 2025	\$45	↑ 35%	↓ 56%

The McCain-Lieberman, Kerry-Snowe, and Sanders-Boxer bills all call for emissions reductions of around 40% by 2020 and 60% by 2030, so allowance prices under these plans could be considerably higher – so, too, the affects on coal consumption and electricity prices.

Do the Bills Try to Limit Uncertainty about Costs?

Four of the bills allow banking (while Sanders-Boxer is silent on this issue). That is, businesses can hold extra allowances for use in the future, rather than having to use all their current allowances in a given year. This has the effect of creating a floor on the price of allowances determined by expectations about the future. As long as businesses view the future as one with tighter carbon constraints, they will tend to hold onto permits rather than sell them at a price that is too low.

Both McCain-Lieberman and Bingaman-Specter have features that provide flexibility when prices are unexpectedly high. Bingaman-Specter provides a transparent “safety valve” that literally sets the maximum price for allowances. When they reach that price, the government stands ready to sell additional allowances to prevent the price from going higher. McCain-Lieberman instead allows borrowing: if businesses perceive a temporary shortage, they can borrow for up to five years, a total of 25% of their obligation (while

paying a 10% annual interest charge). This does not provide guarantees of a maximum cost but does provide flexibility in the face of short-term weather, economic, or other shocks.

How Are Permits Allocated?

A GHG cap-and-trade permit system creates and distributes responsibilities to reduce GHG emissions to regulated entities. At the same time, the system creates and distributes wealth in the form of permits. In the case of the SO₂ trading system set up under the U.S. Clean Air Act, responsibilities and permits both went to regulated entities, with the permits allocated gratis (for free). However, other allocation schemes are possible. Under many of the new bills, responsibilities and permits flow to different entities and some permits are sold at auction rather than freely distributed.

Bingaman-Specter calls for an initial auction of 10% of all permits in 2012, a figure that is to gradually increase to 65%. The remainder of each year's permits will be distributed gratis to industry and states. Feinstein-Carper begins with the auction of 15% of permits in 2011, steadily increasing until 100% of permits are auctioned in 2036. The other bills leave the allocation of allowances to the discretion of the EPA administrator (Sanders-Boxer), the president (Kerry-Snowe), or the secretary of commerce jointly with the EPA administrator (McCain-Lieberman).

Other Features of the Bills

The functionality of the proposed cap-and-trade systems also differs across bills. While most contain specific provisions for the banking and borrowing of allowances, the Sanders-Boxer bill leaves it to the EPA administrator to determine the rules for any system of tradable allowances.

All bills have provisions for offsets credits generated from biological sequestration for GHGs (both above and below ground), while Bingaman-Specter and Feinstein-Carper also allow for more general offset programs. Furthermore, Bingaman-Specter, Feinstein-Carper, and McCain-Lieberman have provisions that permit international credits to be used to meet domestic commitments.

As mentioned above, all bills have stipulations for programs designed to accelerate the pace of climate-friendly technology. However, the specificity of the provisions and the range of actions considered vary. On one hand, Kerry-Snowe call for a generic increase in federally funded R&D for low-carbon energy technologies (to be funded with proceeds from a yet-to-be-determined permit auction) and then turn to very specific tax credits for consumer purchases of hybrid cars and for manufacturer investment in new equipment for the production of such climate friendly cars (although with no funding source identified). On the other extreme, Bingaman-Specter and Feinstein-Carper list specific technology polices and allocate resources from the permit auctions to fund these programs.

Finally, Sanders-Boxer and Kerry-Snowe contain multiple additional regulatory provisions that extend beyond a cap-and-trade permit system. Since EIA has not

undertaken any analysis of these bills, it is not possible to state how costly these additional provisions will be.