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Climate Change: Summary and Analysis of the Climate Stewardship Act (S. 342 and H.R. 759)

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Summary

The Climate Stewardship Act (S. 342 and H.R. 759) would reduce emissions of six greenhouse gases from anticipated levels beginning in 2010. Using a flexible, market-based implementation strategy, the bills would require economy-wide reductions, but permit participation in pre-certified international trading systems and in carbon sequestration programs to achieve part of the reduction requirement. The bills exclude residential and agricultural sources of greenhouse gases, along with entities that do not own a single facility that emits more than 10,000 metric tons of carbon dioxide equivalents annually.

As introduced, S. 342 and H.R. 759 would require that greenhouse gas emissions from covered entities be limited to year 2000 levels. By restricting the reduction regime to a single phase with a 2000 level target, S. 342 and H.R. 759 are projected to have substantially reduced costs compared with proposals to further reduce emissions to 1990 levels. The bills are similar (but not identical) to S. 139 (phase one only) and H.R. 4067, introduced in the 108th Congress. This report will be updated as warranted.

Overview of S. 342 and H.R. 759

In February 2005, Senators McCain and Lieberman introduced S. 342, the Climate Stewardship Act of 2005. At the same time, Representatives Gilchrest and Olver introduced H.R. 759, which is very similar to S. 342. The primary focus of the proposed legislation is to reduce U.S. emissions of six greenhouse gases through the use of flexible, market-based mechanisms. The six gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). They are the six gases covered by the United Nations Framework Convention on Climate Change (ratified by the United States), and by the Kyoto Protocol (not ratified by the United States).

As summarized in **Table 1**, the bills would require mandatory and economy-wide emission reductions. The focus is on domestic reductions; however, the bills do permit participation in pre-certified international trading systems and allow use of carbon sequestration to achieve part of the reduction requirement.

Table 1. Summary of the Climate Stewardship Act

Issue	Provision
Emissions Cap	Six greenhouse gas emissions (CO_2, N_2O, CH_4, SF_6, HFC, PFC) from covered entities are capped at their 2000 levels beginning in 2010.
Covered Entities	In metric tons of carbon dioxide equivalents: any electric power, industrial, or commercial entity that emits from any single facility owned by the entity over 10,000 metric tons annually; any refiner or importer of petroleum products for transportation use that when combusted will emit over 10,000 metric tons annually; and any importer or producer of HFCs, PFCs, or SF_6 that when used will emit over 10,000 metric tons.
General Allocating and Implementing Strategy	A tradeable allowance system is established: EPA shall determine allocations based on several economic and equity criteria, including efficiency and impact on consumers. Allowances are to be allocated upstream to refiners and importers of transportation fuel, along with producers of HFCs, PFCs, and SF_6, and downstream to electric generation, industrial, and commercial entities.
Other Market Trading System Features	Up to 15% of required reductions may be achieved through pre-certified international emissions trading programs, carbon sequestration, reductions from non-covered entities, and borrowing against future reductions.
Bonus Credits	Entities that reduce emissions to their 1990 levels by 2010 receive bonus allowances for six years. Entities are also allowed to achieve 20% of their reduction requirement during these six years through international emissions trading, sequestration, or reductions by non-covered entities.
Banking	Banking of allowances is permitted.
Revenue Recycling	Revenue recycling to reduce consumer costs and to assist dislocated workers and affected communities, along with assistance with deploying new technology, is provided through a Climate Change Credit Corporation; however, the methodology and amount is unspecified. S. 342, but not H.R. 759, includes assistance to low-income persons and communities.
Scope	The provisions cover the 50 states and the District of Columbia.
Penalty for non-compliance	The bills establish an excess emission penalty equal to three times the market price for allowances on the last day of the year at issue.
Other Provisions	Provisions include studies of research on abrupt climate change; and creation of a national greenhouse gas database, among others. S. 342 includes studies of technology transfer barriers and the impact on the United States of the Kyoto Protocol; H.R. 759 includes a study on the effects of climate change on coastal communities and ecosystems.

S. 342 and H.R. 759 are very similar to S.Amdt. 2028 (to S. 139) of the 108th Congress, which the Senate debated in 2003. That amendment failed on a 43-55 vote.

Emissions Projections

The flexibility provided in the bills, along with definitions that rely on future regulatory proceedings, make quantifying the bills' effects difficult. The legislation is economy-wide and its market-based implementation strategy very flexible, including bonus reduction credits, banking, international trading within limits, and carbon sequestration within limits. Although criteria are given for allocating allowances, specific allocations are not provided. Likewise, while revenue-recycling is provided for, most details are left for regulatory action.

These variables are in addition to the general difficulty in estimating future effects and costs. The emission limits do not take effect until 2010. Projecting emission trends, technology development, economic growth, and other factors into the future is an inherently uncertain business. The legislation's economy-wide scope and flexibility add to that uncertainty.

Current analyses of the Climate Stewardship Act were conducted on the version introduced in the 108th Congress — S. 139. That bill contained several provisions not included in S. 342 and H.R. 759. Most importantly, the current bills do not include a second reduction phase — a phase that had significant impacts on projected costs.[1] *As introduced, S. 342 and H.R. 759 are similar to phase 1 of S. 139, and even more similar to S.Amdt. 2028 as debated on the Senate floor in 2003. Thus, this discussion uses the analyses of phase 1 of S. 139, as well as analyses of S.Amdt. 2028, to provide insight into the projected effects of S. 342 and H.R. 759.*[2]

Most attempts to project the emissions effects of the proposed Climate Stewardship Act focus on covered entities only. However, the studies conducted by the Energy Information Administration (EIA) include projected emissions growth from non-covered entities under S. 139 and S.Amdt. 2028.[3] EIA's estimates of U.S. emissions if S.Amdt. 2028 had been enacted are provided in **Table 2**.

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[1] See archived CRS Report RS21637, *Climate Change: Summary and Analysis of the "Climate Stewardship Act" (S. 139/S.Amdt. 2028, and H.R. 4067)*, by Larry Parker and Brent Yacobucci (available from the authors).

[2] In addition to removing the second reduction phase, the number of covered entities would be smaller under S. 342/H.R. 759 than under S. 139 of the 108th Congress, as introduced. Thus, using these analyses may overstate the reductions achieved by S. 342/H.R. 759 and overstate the compliance costs.

[3] Energy Information Administration, *Analysis of S. 139, the Climate Stewardship Act of 2003*, SR/OIAF/2003-02/S (June 2003); EIA, *Analysis of Senate Amendment 2028, the Climate Stewardship Act of 2003* (May 2004).

Table 2. EIA Emissions Projections Under S.Amdt. 2028 Provisions
(millions of metric tonnes of carbon dioxide equivalents)

Year	Reference Case	S.Amdt. 2028
1990	6,131	6,131
2000	7,001	7,001
2010	8,177	7,622

Sources:
1990 and 2000 data: U.S. submission to the United Nations Framework Convention on Climate Change.
2010 projections: EIA, *Analysis of Senate Amendment 2028, the Climate Stewardship Act of 2003*, May 2004, p. 40. S.Amdt. 2028 is very similar to S. 342/H.R. 759 and is used as a surrogate here. However, the number of covered entities may be less under S. 342/H.R. 759 than assumed here, so these estimates may overstate actual reductions that would be achieved under S. 342/H.R. 759.

Mindful of the uncertainties noted above, **Table 2** suggests that S. 342 and H.R. 759 would reduce greenhouse gas emissions 6.7% below a "business as usual" reference case. However, it is equally clear that S. 342 and H.R. 759 would not achieve the voluntary reduction goal of stabilizing greenhouse gas emissions at 1990 levels that the United States agreed to at the 1992 United Nations Framework Convention on Climate Change. Likewise, it would not meet the even more stringent 7% reduction below 1990/1995 baseline levels mandated by the Kyoto Protocol that has entered into force, but is unratified by the United States.

Cost Estimates

The same uncertainties surrounding emission projections affect cost estimates. The legislation's flexibility offers opportunities to achieve emission reductions at least-cost, which also makes estimating those costs very difficult.

Once again using phase 1 of S. 139 and S.Amdt. 2028 as surrogates for S. 342 and H.R. 759, four relevant analyses of the Climate Stewardship Act have been conducted with varying degrees of detail.[4] They are:

- *2004 EIA Study*: Energy Information Administration, *Analysis of S.A. 2028, the Climate Stewardship Act of 2003* (May 2004);

[4] A fifth analysis has been conducted by Charles River Associates (CRA) for The Tech Central Science Foundation. However, its cost analysis and results are driven in large part by assumptions about future tax policy, not direct compliance costs as with the analyses presented here. As stated by CRA: "We find that the real-world tax considerations in our model [CRA's assumption that Congress would raise income taxes as a result of revenue losses under S. 139] cause the full costs of a carbon policy to be about 60% higher than would be projected without accounting for these effects. See Charles River Associates, *The Full Costs of S. 139, With and Without its Phase II Requirements*, prepared for The Tech Central Science Foundation (October 27, 2003; corrected, April 2004), p. 40. For a critique of the CRA study, see *Pew Center Assessment of CRA Analysis of the Amended (S.A. 2028) Lieberman-McCain Climate Stewardship Act (S. 139)*, at [http://www.pewclimate.org/policy_center/analyses/assessmentcra.cfm].

- *MIT Study:* Sergey Paltsev et al., *Emissions Trading to Reduce Greenhouse Gas Emissions in the United States: The McCain-Lieberman Proposal* [S. 139], Report No. 97 (June 2003);

- *2004 Tellus Institute Study*: Alison Bailie and William Dougherty, *Analysis of the Climate Stewardship Act Amendment* [S.Amdt. 2028], conducted for NRDC (June 2004);

- *RFF Analysis:* William A Pizer and Raymond J. Kopp, *Summary and Analysis of McCain-Lieberman — "Climate Stewardship Act of 2003"* [S. 139] (January 28, 2003).

Table 3 provides a summary of those analyses in economic areas where two or more of the studies have provided estimates. All of these studies provide a broad, macro-economic perspective on the potential impacts of either phase 1 of S. 139 or S.Amdt. 2028. However, it should be noted that the EIA study's cost estimates for S.Amdt. 2028 are substantially higher than those of the other studies listed above (for a critique of EIA's cost estimates, see the assessment by the Pew Center).[5] Indeed, in contrast to the *EIA* study, the Tellus Institute studies project household savings, not costs, resulting from phase 1 of S. 139 and S.Amdt. 2028 in the out-years (2015, 2020). Major sources of these differing conclusions are differing assumptions about the availability of (1) cost-effective energy efficiency improvements, (2) cost-effective non-CO_2 greenhouse gas reductions, (3) cost-effective carbon sequestration and international credits, and (4) future natural gas supply. With a program designed to achieve a least-cost solution through a market-based allowance trading system, restricting options increases costs.

One factor not accounted for in these analyses is the Kyoto Protocol. With the Kyoto Protocol entering into force in February 2005 for those countries who have ratified it, regional trading programs and projects within developing countries are being implemented. The prime example of these is the European Union's Emission Trading Scheme (EU-ETS). A major component of the EU's Kyoto Protocol implementation plan, the EU-ETS has traded carbon in the $9-$18 a tonne CO_2 range for the period June 2003 to January 2005 in preparation for its full implementation in 2005.[6] This range of prices is similar to the range of allowances projected by the studies reviewed here for the year 2010 (and later for all studies except EIA's). The emergence of the EU-ETS has several implications for the S. 342/H.R. 759 trading program, including (1) potentially increasing the availability of cost-effective carbon credits (subject to the bills' 15% limitation), and (2) providing the United States with useful information on the operation of a carbon trading scheme. Indeed, the existence of the EU-ETS and the entering into force of the Kyoto Protocol may cause some to reassess S. 342/H.R. 759's 15% limitation on international trading and carbon seqestration — a move that could further reduce estimated costs.

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[5] *Pew Center Assessment of EIA Analysis of the Climate Stewardship Act*, available at [http://www.pewclimate.org/policy_center/analyses/eia_analysis.cfm] and [http://www.pewclimate.org/policy_center/analyses/neweia.cfm].

[6] Pew Center on Global Climate Change, *The European Union Emissions Trading Scheme (EU-ETS): Insights and Opportunities* (2005), p. 11.

Table 3. Summary of Analyses

	Year	2004 EIA Study (S.Amdt. 2028)	MIT Study (scenario #12, S. 139, phase 1 only)	2004 Tellus Institute Study (S.Amdt. 2028)	RFF Analysis*
Allowance Price (2001$/metric ton CO_2)	2010	$15	$9	$9	$14
	2015	$23	$11	$13	$14
	2020	$34	$14	$21	—
Annual Welfare Cost (or Loss in Personal Income) (%)	2010	-0.2%	-0.02%	—	<-0.1%
	2015	—	-0.02%	—	<-0.1%
	2020	-0.1%	-0.02%	—	—
Annual Welfare Cost (or Loss in Personal Income) or Societal Benefits (billions 2001$)	2010	-$20	-$1.8	-$5	-$9
	2015	—	-$2.0	$17 (benefit)	-$9
	2020	-$7	-$2.4	$30 (benefit)	—
Annual Cost per Household (2001$)	2010	$169	$15	—	$76
	2015	—	$16	—	$73
	2020	$55	$19	—	—
Oil Consumption (% change from reference case)	2010	-1.1%	-4.5%	-2.2%	—
	2015	—	-6.3%	-6.1%	—
	2020	-3.6%	-8.0%	-9.4%	—
Wellhead Natural Gas Prices (change from reference in $/Mcf)	2010	+$0.02	—	+$0.1	—
	2015	—	—	-$0.1	—
	2020	+$0.01	—	-$0.3	—
Electricity Prices (change from reference in $/Kwh)	2010	+$0.04	—	+$0.007	—
	2015	—	—	+$0.007	—
	2020	+$0.13	—	+$0.008	—

* RFF discussion of costs is based on EPA analysis suggesting 1.3 billion metric tons of domestic reductions are available at about $14 a ton.

— Data either not calculated, not presented, or not presented in a form that an estimate could be determined with sufficient precision (such as in the form of a graph).

Note: Phase 1only of S. 139 and S. Amdt 2028 is very similar to S. 342/H.R. 759 and is used as a surrogate here. However, the number of covered entities may be less under S. 342/H.R. 759 than assumed here, so these estimates may overstate actual costs involved in complying with S. 342/H.R. 759.