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Climate Change: Summary and Analysis of the "Climate Stewardship Act" (S. 139/S.Amdt. 2028, and H.R. 4067)

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Summary

The Climate Stewardship Act (S. 139, S.Amdt. 2028, and H.R. 4067) would substantially 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 emitting fewer than 10,000 metric tons of carbon dioxide equivalents annually.

As introduced, S. 139 required emission reductions in two phases: in the first phase, beginning in 2010, annual greenhouse gas emissions from covered entities would be limited to 2000 levels; in the second phase, beginning in 2016, annual greenhouse gas emissions from covered entities would be further limited to 1990 levels. S.Amdt. 2028 and H.R. 4067 eliminate the second phase; this substantially reduces projected costs. This report will be updated as warranted.

Overview of S. 139, S. Amdt 2028, and H.R. 4067

In January, 2003, Senators McCain and Lieberman introduced S.139: Climate Stewardship Act of 2003. They subsequently proposed an amendment, S.Amdt. 2028, which would reduce the scope of S. 139 and reduce costs. In March, 2004, Representatives Gilchrest and Olver introduced H.R. 4067, which is similar to S.Amdt. 2028. The primary focus of the proposed legislation is to reduce United States emissions of six greenhouse gases through the use of flexible, market-based mechanisms.[1] As

[1] 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 (continued...)

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. S. 139 includes a second phase to cap affected facilities' emissions at their 1990 levels, beginning in 2016. S. Amdt 2028 and H.R. 4067 omit phase 2.
Covered Entities	In metric tons of carbon dioxide equivalents: any electric power, industrial, or commercial entity that emits 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, and reductions from non-covered entities. Under S. 139 this 15% limitation declines to 10% in 2016.
Early Action Credits	Entities that achieve early emission reductions can use them to cover up to 20% of required reductions through 2015.
Banking	Banking of allowances is permitted.
Revenue Recycling	Revenue recycling to reduce consumer costs and to assist dislocated workers and affected communities, is provided through a Climate Change Credit Corporation; however, the methodology and amount is unspecified.
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 technology transfer barriers; the impact on the United States of the Kyoto Protocol (except H.R. 4067); research on abrupt climate change; and creation of a national greenhouse gas database, among others.

[1] (...continued)
the United States), and by the Kyoto Protocol (not ratified by the United States).

As introduced, S. 139 required emission reductions in two phases. In the first phase, beginning in 2010, annual greenhouse gas emissions from covered entities would be limited to 2000 levels (5,696 million metric tons of carbon dioxide equivalent). In the second phase, beginning in 2016, annual greenhouse gas emissions from covered entities would be further limited to 1990 levels (5,123 million metric tons of carbon dioxide equivalent). The bill excludes residential and agricultural sources of greenhouse gases, along with entities responsible for less than 10,000 metric tons of carbon dioxide equivalent annually. Depending on the specifics of the implementing regulations, the bill would cover between 70% and 85% of U.S. greenhouse gas emissions.

On October 30, 2003, the Senate debated an amended version of S. 139. That amendment (S.Amdt. 2028) would have, most notably, eliminated the second phase of S. 139. Further, S.Amdt. 2028 would have eliminated a provision in S. 139 allowing auto makers to generate and sell allocations through improvements in fuel economy, along with changing some of the provisions with respect to research and development, and revenue recycling. Lastly, S.Amdt. 2028 would have provided increased allowance allocations to electric generating units in states that primarily use lignite to produce electricity, and to rural electric cooperatives. The amendment failed on a 43 - 55 vote, and S. 139 was referred back to the Senate Committee on Environment and Public Works. The sponsors of S. 139 have indicated that they intend to move an amended version of the bill later this year.

On March 30, 2004, Representatives Gilchrest and Olver introduced their version of the Climate Stewardship Act. H.R. 4067 is substantially similar to S.Amdt. 2028 except that it does not contain the provision on lignite, or certain provisions on research and development. However, like the Senate amendment, H.R. 4067 would only require emissions reductions to year 2000 levels by 2010, and does not contain the second phase of S. 139. As discussed below, removing the second phase of S. 139 substantially reduces the projected cost of the program.

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 early 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. The definition of covered entities is also a source of uncertainty.

These variables are in addition to the general difficulty in estimating future effects and costs. Phase 1 doesn't begin until 2010. Phase 2 (of S. 139) doesn't begin until 2016. 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.

Most attempts to project the emissions effects of the Climate Stewardship Act focus on covered entities only. The exceptions are the studies conducted by the Energy

Information Administration (EIA).[2] EIA's estimates of reductions under S. 139 and S.Amdt. 2028 are provided in **Table 2**. It should be noted that EIA assumes a considerable amount of banking in its modeling of S. 139; therefore, the transition from phase 1 to phase 2 is less abrupt than the mandated reduction schedule would suggest.

Table 2. EIA Emissions Projections Under S. 139
(millions of metric tonnes of carbon dioxide equivalents)

Year	Reference Case	S. 139	S.Amdt 2028
1990	6,131	6,131	6,131
2000	7,001	7,001	7,001
2010	8,177	7,465	7,622
2016	8,954	7,418	n/a

Sources:
1990 and 2000 data: U.S. submission to the United Nations Framework Convention on Climate Change.
2010 and 2016 projections: EIA, *Analysis of S. 139, the Climate Stewardship Act of 2003*, June 2003, p. 11; EIA, *Analysis of Senate Amendment 2028, the Climate Stewardship Act of 2003*, May 2004, p. 40. N/A - not available.

Mindful of the uncertainties noted above, **Table 2** suggests that S. 139 would substantially reduce greenhouse gas emissions below a "business as usual" reference case. Over the longer term, S. 139 would appear to stabilize greenhouse gases at some level above year 2000 levels.[3] However, it is equally clear that S. 139 would not achieve the 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. As indicated, without the second phase of the legislation, the reductions from H.R. 4067 and S.Amdt. 2028 would be even less.

Cost Estimates

The same uncertainties surrounding emission projections affect cost estimates. The legislation's flexibility that offers opportunities to achieve emission reductions at least-cost, also makes estimating those costs very difficult. Also, amending S. 139 to strike phase 2, as in S.Amdt. 2028 or in H.R. 4067, would have a substantial impact on costs.

Currently, six analyses of the legislation have been conducted with varying degrees of detail. They are:

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[2] 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).

[3] How long that stabilization would last depends on the depletion rate of "banked" allowances requiring additional reductions versus increased emissions from non-covered entities. All else being equal, in the long run, emissions would creep up as non-covered entities increased emissions.

- *2003 EIA Study*: Energy Information Administration, *Analysis of S. 139, the Climate Stewardship Act of 2003*, SR/OIAF/2003-02/S (June 2003);

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

- *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);

- *2003 Tellus Institute Study:* Alison Bailie, *et. al., Analysis of the Climate Stewardship Act* [S. 139], conducted for the Natural Resources Defense Council (NRDC) (July 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).

All of these studies provide a broad, macro-economic perspective on the potential impacts of S. 139. However, it should be noted that the *EIA* studies' cost estimates for S. 139 and 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[4]). Indeed, in contrast to the *EIA* studies, the *Tellus Institute* studies project household savings, not costs, resulting from S. 139 and S.Amdt. 2028 in the out-years (2015, 2020).

Table 3 provides a summary of those analyses in economic areas where two or more of the studies have provided estimates. Within the broad range of estimates provided, one result is straightforward: eliminating phase 2 of the reduction requirement would substantially reduce the cost of S. 139. Comparing complimentary *MIT Study* scenarios, the cost saving in terms of reduced allowance prices from eliminating phase 2 is over half. For the other economic indicators presented in Table 3, the reduction is even greater. This cost reduction is not dependent on the MIT model; as indicated by the complimentary *EIA* studies, a substantial cost reduction could be expected regardless of the analyses.[5]

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[4] *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].

[5] The 2003 and 2004 *Tellus Institute Studies* are not comparable primarily because of substantial differences in their respective basecase assumptions (particularly with respect to scaling back important assumed complimentary policies in the 2004 analysis).

Table 3. Summary of Analyses

	Year	2003 EIA Study (phase 1 & 2)	2004 EIA Study (S.Amdt. 2028)	MIT Study (scenario #7, phase 1 & 2)	MIT Study (scenario #12, phase 1 only)	2003 Tellus Institute Study (phase 1 & 2)	2004 Tellus Institute Study (S.Amdt. 2028)	RFF Analysis*
Allowance Price (2001$/ metric ton) CO2)	2010	$22	$15	$21	$9	$8	$9	$14
	2015	$32	$23	$28	$11	$18	$13	$14
	2020	$49	$34	$36	$14	$22	$21	—
Welfare Cost (or Loss in Personal Income) (%)	2010	-0.3%	-0.2%	-0.09%	-0.02%	—	—	<-0.1%
	2015	-0.7%	—	-0.11%	-0.02%	—	—	<-0.1%
	2020	-0.4%	-0.1%	-0.13%	-0.02%	—	—	—
Welfare Cost (or Loss in Personal Income) or Societal Benefits (billions 2001$)	2010	-$31	-$20	-$7.9	-$1.8	-$6	-$5	-$9
	2015	-$82	—	-$11.2	-$2.0	$15 (benefit)	$17 (benefit)	-$9
	2020	-$49	-$7	-$15.5	-$2.4	$48 (benefit)	$30 (benefit)	—
Cost per Household (2001$)	2010	$263	$169	$67	$15	$53	—	$76
	2015	$672	—	$91	$16	-$124 (savings)	—	$73
	2020	$386	$55	$122	$19	-$379 (savings)	—	—
Oil Consump-tion (% change from reference case)	2010	-1.6%	-1.1%	-11.4%	-4.5%	-4.4%	-2.2%	—
	2015	-3.8%	—	-14.6%	-6.3%	-8.2%	-6.1%	—
	2020	-6.7%	-3.6%	-16.0%	-8.0%	-11.3%	-9.4%	—
Wellhead Natural Gas Prices (change from reference in $/Mcf)	2010	+$0.12	+$0.02	—	—	-$0.10	+$0.1	—
	2015	—	—	—	—	-$0.10	-$0.1	—
	2020	+$0.27	+$0.01	—	—	-$0.30	-$0.3	—
Electricity Prices (change from reference in $/Kwh)	2010	+$0.056	+$0.04	—	—	+$0.01	+$0.007	—
	2015	—	—	—	—	+$0.011	+$0.007	—
	2020	+$0.217	+$0.13	—	—	+$0.009	+$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).