Analysis of S.139, the Climate Stewardship Act of 2003

Table 2.1. Fossil Fuel Carbon Dioxide Emissions by Sector, EPA Inventory and EIA, 1990 and 2000 (million metric tons)

Sector	1990		2000	
	EPA	EIA	EPA	EIA
Carbon Dioxide Equivalent				
Residential	332	329	375	373
Commercial	217	221	239	234
Industrial	872	1,050	829	1,046
Transportation	1,472	1,579	1,790	1,856
Electricity	1,859	1,805	2,353	2,278
Total	**4,752**	**4,985**	**5,585**	**5,787**
Carbon Equivalent				
Residential	91	90	102	102
Commercial	59	60	65	64
Industrial	238	286	226	285
Transportation	401	431	488	506
Electricity	507	492	642	621
Total	**1,296**	**1,360**	**1,523**	**1,578**

Note: S.139 reports total emissions allowances in carbon dioxide equivalent. Carbon equivalent is shown in this table for comparability with the balance of the report.

Sources: Energy Information Administration. *Emissions of Greenhouse Gases in the United States 2001*, DOE/EIA-0573(2001) (Washington, DC, December 2002); and U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2000,* EPA 430-R-02-003 (Washington, DC, April 2002).

Table 2.2. Comparison of Emissions Data Accompanying Baseline Projections with Data in the 2002 EPA Inventory, 1990 and 2000 (million metric tons)

	1990		2000	
	Data With Baseline Projections	2002 EPA Inventory	Data With Baseline Projections	2002 EPA Inventory
Carbon Dioxide Equivalent				
Methane				
Landfills	217.4	217.4	208.6	208.6
Coal Mines	88.0	88.0	77.7	77.7
Natural Gas	121.0	121.0	131.3	131.3
Other	218.5	218.5	224.0	224.0
Total Methane	**645.0**	**645.0**	**641.7**	**641.7**
Non-Energy Carbon Dioxide				
New Categories, 2002 Inventory	NA	144.4	NA	119.1
Other Non-Energy CO_2	77.4	74.3	132.0	97.6
Total	**77.4**	**218.7**	**132.0**	**216.7**
Nitrous Oxide				
Agriculture	285.4	283.5	317.0	315.6
Mobile Combustion	54.3	50.9	62.0	58.3
Other	57.1	52.9	54.0	51.4
Total Nitrous Oxide	**396.7**	**387.3**	**433.0**	**425.3**
High GWP Gases	83.9	93.6	121.3	121.3
Total	**1,203.0**	**1,344.6**	**1,328.0**	**1,405.0**
Carbon Equivalent				
Methane				
Landfills	59.3	59.3	56.9	56.9
Coal Mines	24.0	24.0	21.2	21.2
Natural Gas	33.0	33.0	35.8	35.8
Other	59.6	59.6	61.1	61.1
Total Methane	**175.9**	**175.9**	**175.0**	**175.0**
Non-Energy Carbon Dioxide				
New Categories, 2002 Inventory	NA	39.4	NA	32.5
Other Non-Energy CO_2	21.1	20.3	36.0	26.6
Total	**21.1**	**59.6**	**36.0**	**59.1**
Nitrous Oxide				
Agriculture	77.8	77.3	86.5	86.1
Mobile Combustion	14.8	13.9	16.9	15.9
Other	15.6	14.4	14.7	14.0
Total Nitrous Oxide	**108.2**	**105.6**	**118.1**	**116.0**
High GWP Gases	22.9	25.5	33.1	33.1
Total	**328.1**	**366.7**	**362.2**	**383.2**

Sources: U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2000*, EPA 430-R-02-003 (Washington, DC, April 2002). Data for High-GWP Emissions, Nitrous Oxide and Non-energy CO_2 as included with projections is from EPA, *Climate Action Report 2001*, Tables 3-1 and 5-2. See web sites http://www.epa.gov/globalwarming/publications/car/index.html and http://www.epa.gov/globalwarming/publications/emissions/us2002/index.html).

Table 2.3. Assumed Phase I and Phase II Allowance Caps (million metric tons)

	Carbon Dioxide Equivalent		Carbon Equivalent	
	Phase I Allowances (Based On 2000 Emissions)	Phase II Allowances (Based On 1990 Emissions)	Phase I Allowances (Based On 2000 Emissions)	Phase II Allowances (Based On 1990 Emissions)
Carbon Dioxide				
Industrial Sector[a]	986	997	269	272
Transportation Sector	1,855	1,580	506	431
Electricity Sector	2,277	1,804	621	492
Subtotal	*5,119*	*4,382*	*1,396*	*1,195*
High GWP Gases	121	84	33	23
Nitrous Oxide, Other[b]	55	59	15	16
Methane, Coal Mining	77	88	21	24
Total Covered Emissions	**5,372**	**4,613**	**1,465**	**1,258**

[a] Excludes the energy-related carbon dioxide emissions from the agriculture sector, normally included in emissions of the industrial sector, as these agricultural entities are assumed to be uncovered.

[b] Includes Adipic and Nitric Acid.

Sources: **CO_2:** Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2001,* DOE/EIA-0573(2001) (Washington, DC, December 2002). **Other Gases:** U.S. Environmental Protection Agency, Office of Air and Radiation, 1990 and 2000 data included with a Business as Usual forecast. S.139 cites the more recent data on emissions in EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2000*, EPA 430-R-02-003 (Washington, DC, April 2002). The more recent data was not used so as to avoid bias from using updated history data with inconsistent forecasts and marginal abatement curves.

Table 2.4. Annex I Countries Greenhouse Gas Baseline Emissions, Excluding United States, Historical and Forecast (million metric tons carbon equivalent)

Year	GHG Baseline Emissions	Kyoto Target	Reductions Needed From Baseline To Meet Kyoto Target
1990	3,188		
1995	2,906		
2000	2,875		
2005	3,109		
2010	3,299	2,898	401
2015	3,462	2,898	564
2020	3,605	2,898	707
2025	3,688	2,898	790

Source: Energy Information Administration, Office of Integrated Analysis and Forecasting, calculations based on the EMF21/EPA IMAC model. See Appendix B.

Table 2.5. Aggregate Greenhouse Gas Marginal Abatement Curves for Annex I Countries, Excluding the United States, Adjusted for Agriculture and Forestry Sinks and CDM (reductions in million metric tons carbon equivalent)

Carbon Price (2001 dollars per metric ton carbon equivalent)	2010	2015	2020	2025
0	32	34	36	39
10	116	137	159	172
15	348	379	410	427
20	380	420	460	482
30	427	481	535	563
40	462	529	595	627
50	492	569	645	680
75	562	660	754	795
100	630	743	850	898
125	693	821	940	995
150	742	880	1,009	1,066
175	788	935	1,074	1,132
200	835	992	1,140	1,199
225	927	1,096	1,256	1,320

Source: Energy Information Administration, Office of Integrated Analysis and Forecasting. The results are the sum of Tables B11-B14 in Appendix B.

Table 2.6. Aggregate Greenhouse Gas Marginal Abatement Curves for Annex I Countries, Excluding the United States, Adjusted for Agriculture and Forestry Sinks, CDM, Kyoto Targets, After Reduction Factor (million metric tons carbon equivalent)

Carbon Price (2001 dollars per metric ton carbon equivalent)	2010	2015	2020	2025
0	0	0	0	0
10	0	0	0	0
15	0	0	0	0
20	0	0	0	0
30	13	0	0	0
40	31	0	0	0
50	45	3	0	0
75	81	48	23	3
100	115	90	71	54
125	146	129	116	102
150	170	158	151	138
175	193	186	183	171
200	217	214	216	205
225	263	266	274	265

Source: Energy Information Administration, Office of Integrated Analysis and Forecasting calculations. See Appendix B for the calculations and methodology.