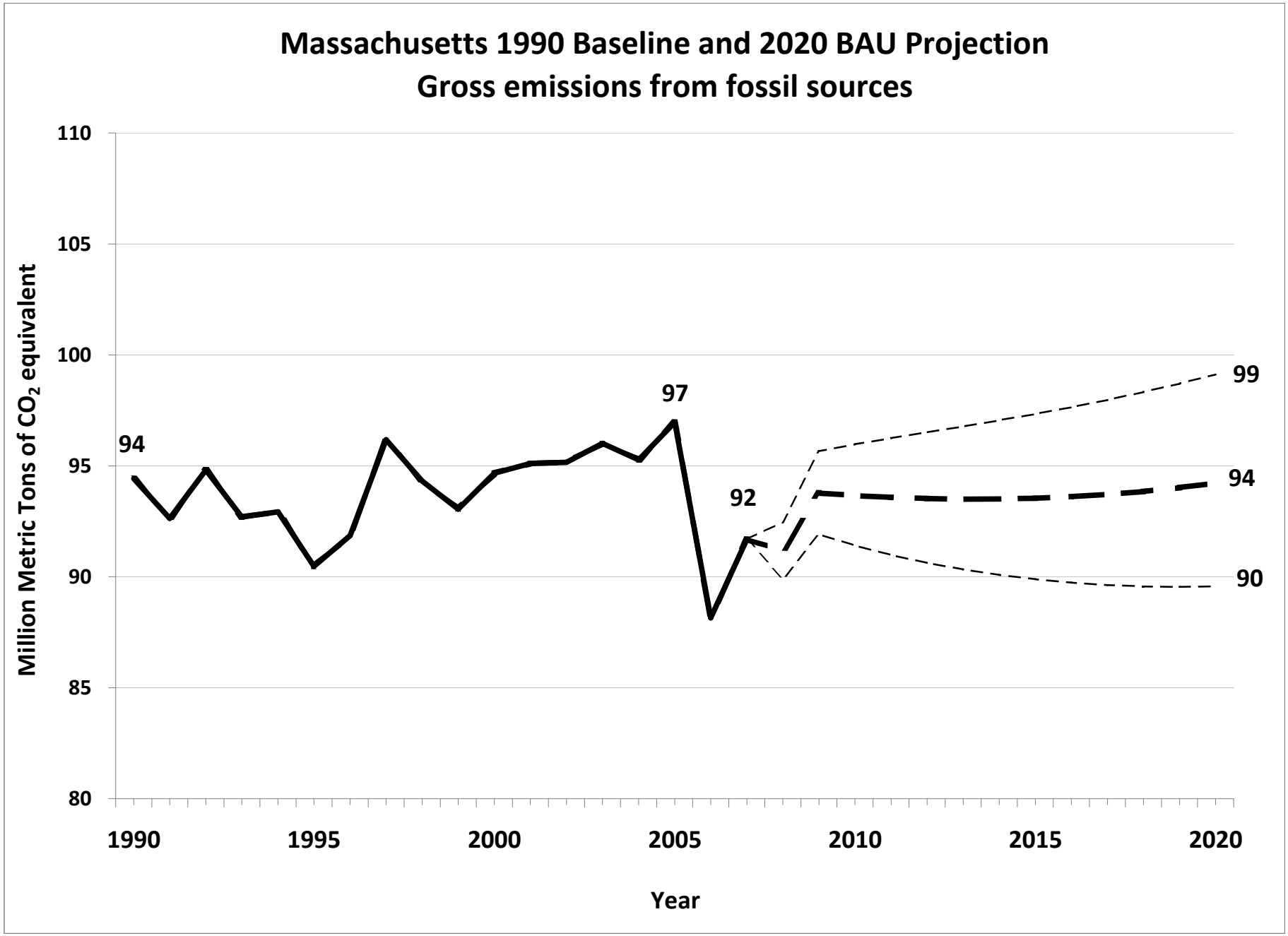
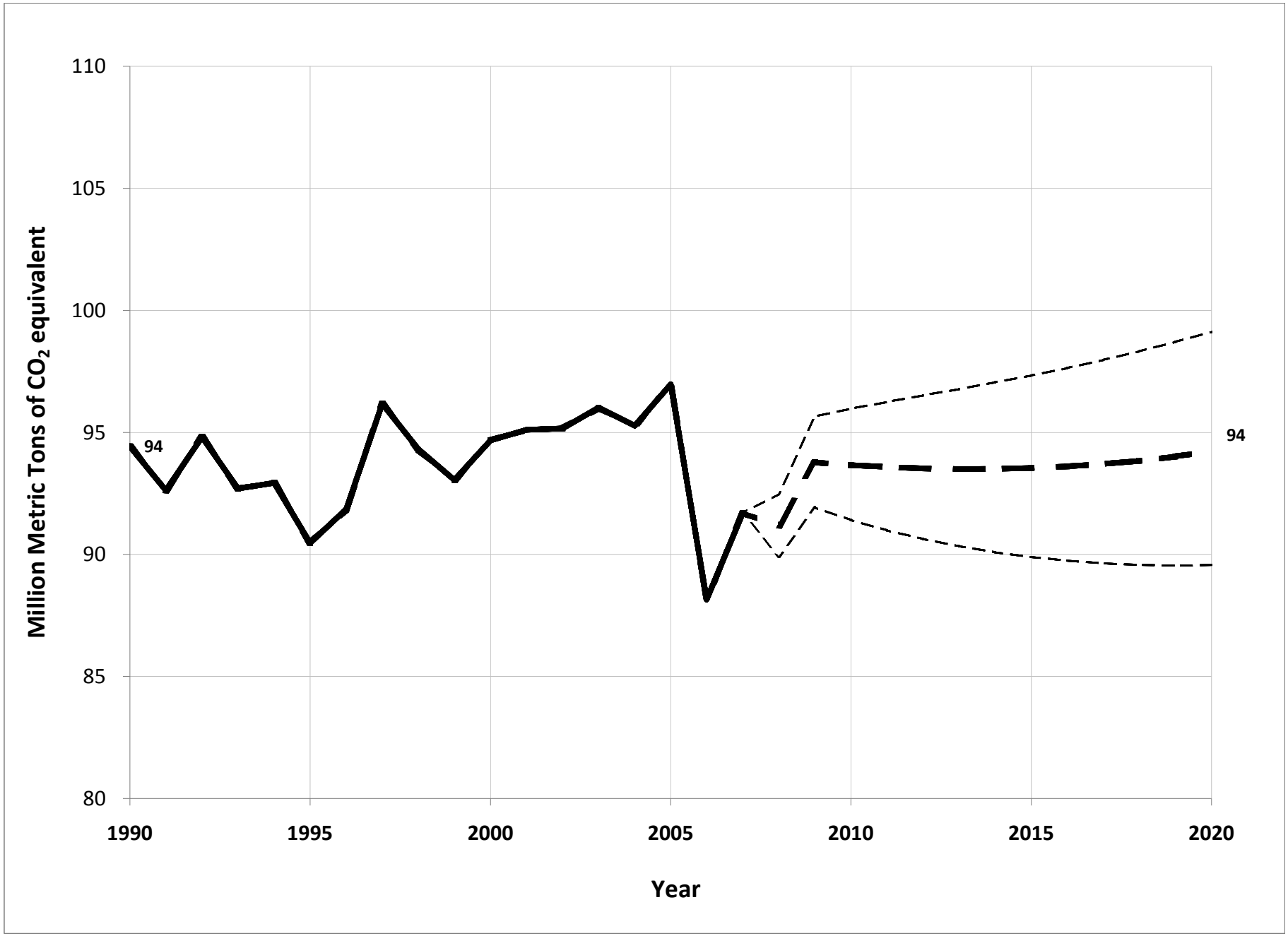
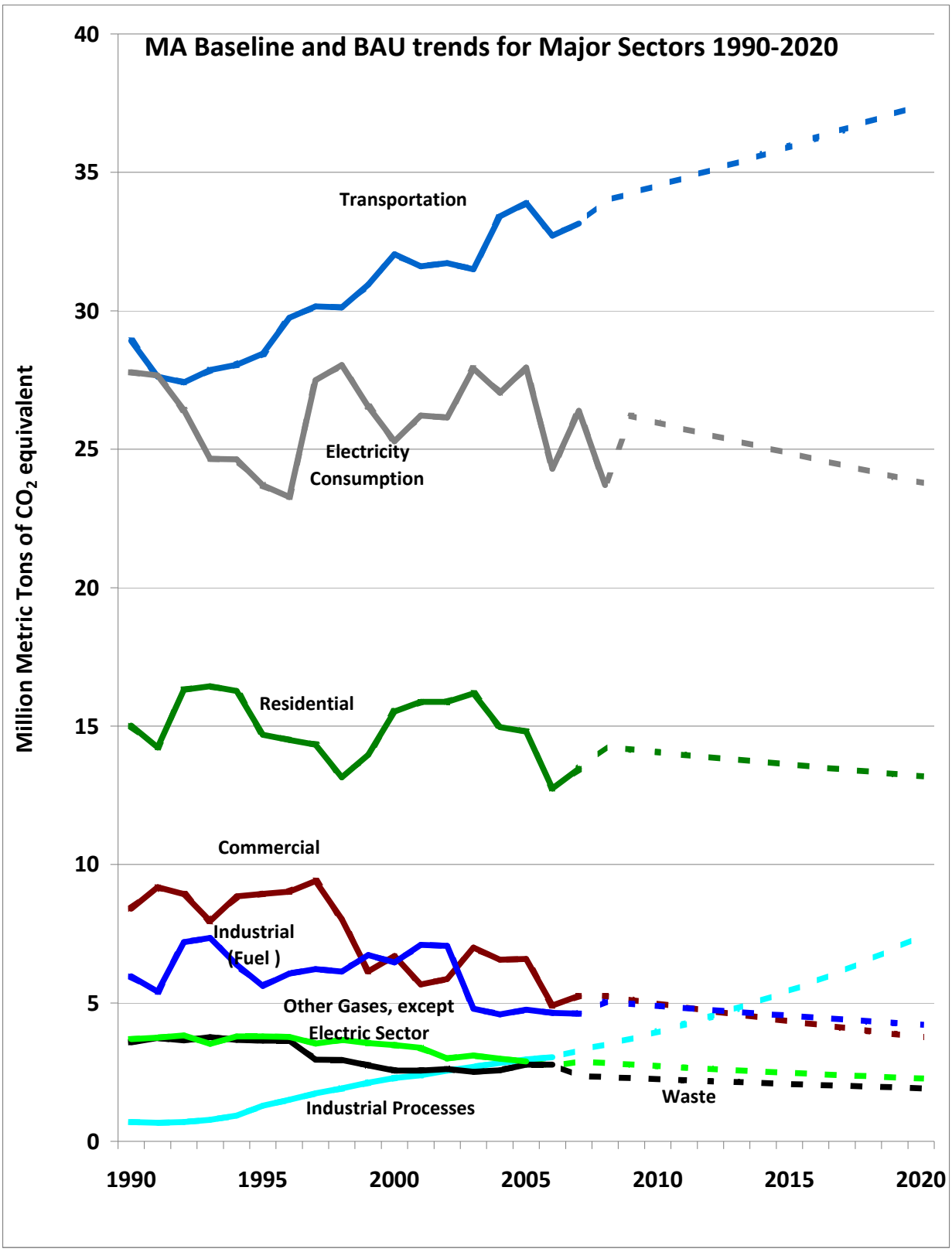
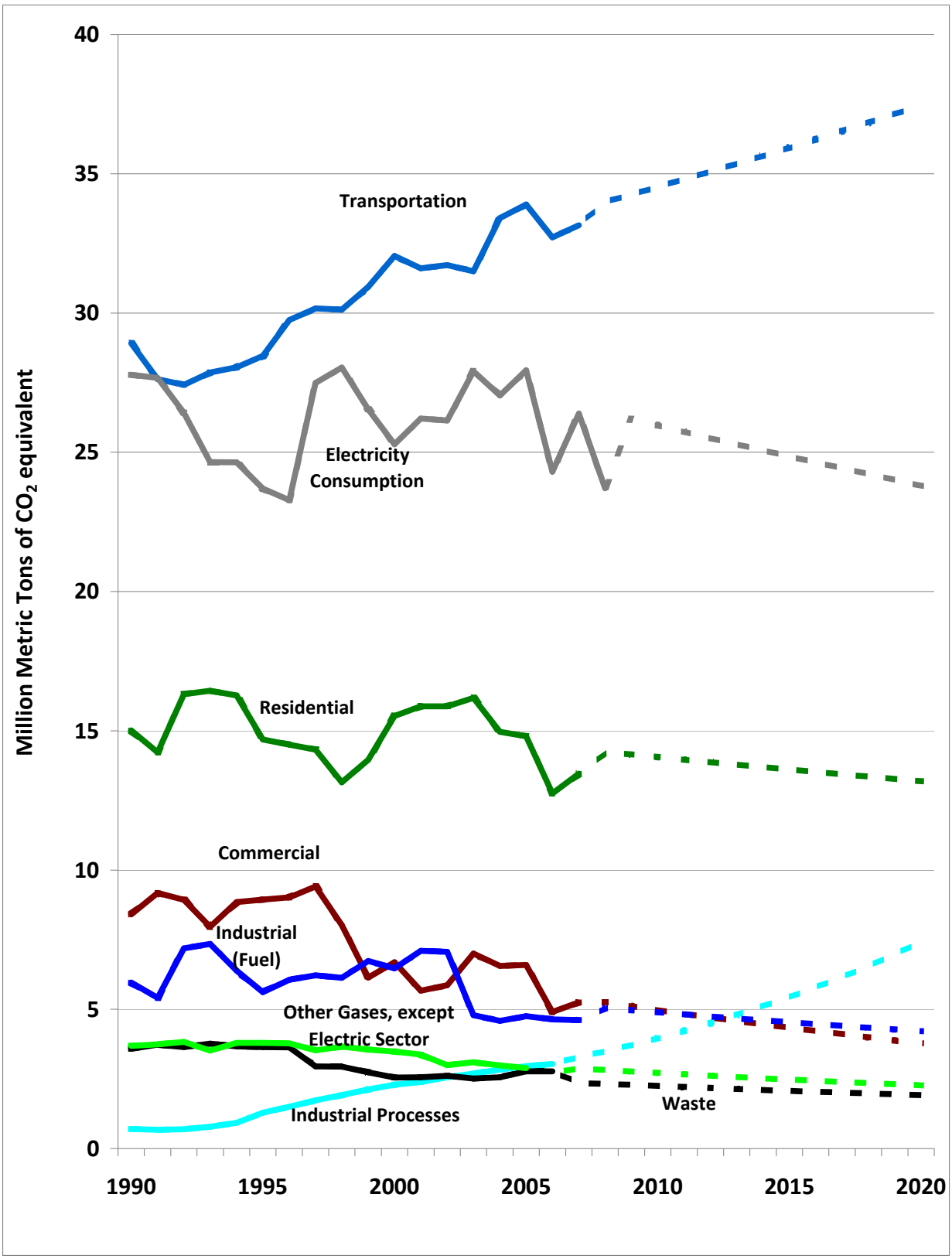

Massachusetts 1990 Baseline and 2020 BAU Projection
Gross emissions from fossil sources
Million Metric Tons of CO_2 equivalent
110
105
100
95
90
85
80
94
97
92
99
94
90
1990
1995
2000
2005
2010
2015
2020
Year

7/1/09


110
105
100
95
90
85
80
Million Metric Tons of CO_2 equivalent
94
94
1990
1995
2000
2005
2010
2015
2020
Year

7/1/09


MA Baseline and BAU trends for Major Sectors 1990-2020
Million Metric Tons of CO_2 equivalent
40
35
30
25
20
15
10
5
0
1990
1995
2000
2005
2010
2015
2020
Transportation
Electricity
Consumption
Residential
Commercial
Industrial
(Fuel)
Other Gases, except
Electric Sector
Industrial Processes
Waste


Million Metric Tons of CO_2 equivalent
40
35
30
25
20
15
10
5
0
1990
1995
2000
2005
2010
2015
2020
Transportation
Electricity
Consumption
Residential
Commercial
Industrial
(Fuel)
Other Gases, except
Electric Sector
Industrial Processes
Waste

Summary of Massachusetts GHG Emissions

Emissions (MMTCO2E)	1990	1995	2000	2005	2010	2015	2020
Energy Total	89.8	85.2	89.5	90.9	*87.1*	*85.8*	*84.6*
CO_2 from Fossil Fuel Combustion	58.3	57.7	60.7	60.0	*58.5*	*58.4*	*58.6*
Residential CO_2	15.0	14.7	15.5	14.8	*14.1*	*13.6*	*13.2*
Commercial CO_2	8.4	8.9	6.7	6.6	*5.0*	*4.3*	*3.8*
Industrial CO_2	6.0	5.6	6.5	4.8	*4.9*	*4.5*	*4.2*
Transportation CO_2	28.9	28.5	32.0	33.9	*34.5*	*35.9*	*37.4*
Electricity Consumption GHGs	27.8	23.7	25.3	27.9	*26.0*	*24.9*	*23.8*
Other Gases, except Electric Sector	3.7	3.8	3.5	2.9	*2.7*	*2.5*	*2.3*
Stationary Combustion, except electric sector	0.3	0.3	0.2	0.2	*0.2*	*0.2*	*0.1*
Mobile Combustion	1.5	1.6	1.5	1.0	*1.0*	*0.8*	*0.7*
Natural Gas and Oil Systems	1.9	1.9	1.8	1.6	*1.6*	*1.5*	*1.4*
Industrial Processes	0.7	1.3	2.3	3.0	*4.0*	*5.4*	*7.4*
Agriculture	0.4	0.4	0.3	0.4	*0.3*	*0.3*	*0.3*
Waste	3.6	3.6	2.6	2.8	*2.2*	*2.1*	*1.9*
Gross Emissions	**94.4**	**90.5**	**94.7**	**97.0**	**93.7**	**93.5**	**94.2**

1990 Baseline and 2020 BAU Development Process

Step 1: Report *SGITool* data, with modifications

The table below is the default output of the *EPA SGITool* (7/21/2008 version), with the following modifications:

1) The *CO2 Emissions from Combustion of Fossil Fuels Module* and *Stationary Combustion Module* were updated with EIA data through 2008 for Electric Power and through 2007 for other sectors. 2008 data was taken from Electric Power Monthly (EPM), as summarized on the "2008 electric sector Btu" tab. Biomass emissions are largely not available for 2007 and 2008, and are not included anywhere in developing the 2020 BAU. Only non-biogenic emissions are included on this Process tab (i.e.,

2) The *Emissions from Natural Gas and Oil Systems Module* contains no defaults for MA, so it has been updated using data from U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration "Distribution, Transmission, and Liquid Annual Data" at http://phmsa.dot.gov/pipeline/library/data-stats. On average, this data increases yearly emissions by 1.76 MMTCDE.

3) The *Industrial Processes Module* output was extrapolated for missing lime production and limestone use in certain years using a linear least-squares trendline to fill in the missing years' data.

4) The *Methane and Nitrous Oxide Emissions From Agriculture Module* provides the option of applying a "National Adjustment Factor" that reconciles the SGIT methodology for estimating nitrous oxide emissions from agricultural soils with that of the *National Inventory of Greenhouse Gas Emissions* . On average, applying this adjustment reduces yearly emissions by 0.046 MMTCDE. We have chosen not to apply this adjustment, which will result in a slightly higher and thus more conservative

5) The *Solid Waste Module* was modified by entering Massachusetts solid waste combusted and landfilled.

The following sector-by-sector yearly emissions numbers are linked to their corresponding SGIT summary tables, which are included as tabs in this spreadsheet.

Emissions (MMTCO2E)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Energy	87.74	86.60	88.55	85.51	85.99	83.09	84.15	90.15	88.16	85.50	86.46	85.65	86.38	87.55	86.22	87.37			
CO_2 from Fossil Fuel Combustion	83.92	82.73	84.60	81.87	82.08	79.19	80.26	86.49	84.36	81.82	82.86	82.17	83.28	84.34	83.13	84.37	76.33	79.85	
Stationary Combustion	0.40	0.40	0.42	0.41	0.41	0.39	0.40	0.38	0.35	0.34	0.36	0.31	0.31	0.32	0.31	0.32	0.29		
Mobile Combustion	1.52	1.57	1.63	1.62	1.64	1.65	1.69	1.67	1.66	1.52	1.47	1.40	1.23	1.15	1.09	1.03	0.89		
Natural Gas and Oil Systems	1.89	1.89	1.91	1.60	1.87	1.86	1.79	1.62	1.79	1.82	1.77	1.77	1.56	1.74	1.69	1.65			
Industrial Processes	0.70	0.67	0.70	0.78	0.93	1.29	1.50	1.74	1.92	2.12	2.29	2.39	2.56	2.69	2.84	2.96	3.04		
Agriculture	0.38	0.37	0.38	0.37	0.36	0.36	0.35	0.35	0.33	0.32	0.33	0.32	0.32	0.33	0.33	0.36	0.31		
Enteric Fermentation	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.11	0.11	0.11	0.10	0.09	0.10	0.09	0.09	0.09	0.09		
Manure Management	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02		
Agricultural Soil Management	0.21	0.20	0.21	0.21	0.20	0.20	0.20	0.21	0.18	0.19	0.20	0.20	0.20	0.21	0.22	0.24	0.19		
Waste	3.58	3.73	3.65	3.76	3.67	3.64	3.64	2.95	2.94	2.74	2.55	2.56	2.61	2.51	2.56	2.77	2.77		
Municipal Solid Waste	3.01	3.16	3.07	3.19	3.09	3.06	3.05	2.37	2.35	2.15	1.94	1.94	1.99	1.89	1.94	2.15	2.15		
Wastewater	0.57	0.57	0.57	0.57	0.58	0.58	0.58	0.58	0.59	0.59	0.61	0.62	0.62	0.62	0.62	0.62	0.62	0.62	
Gross Emissions	**92.40**	**91.38**	**93.27**	**90.42**	**90.94**	**88.38**	**89.64**	**95.19**	**93.34**	**90.68**	**91.63**	**90.92**	**91.87**	**93.08**	**91.95**	**93.45**			

Step 2: Adjust energy data to reflect electricity imports

Estimates of emissions from MA electricity imports for 1990-2008 have been derived following the method on the "ElecImport" tab. Inclusion of these emissions, which the SGITool ignores, increases emissions by an average of 2.49 MMTCDE.

Emissions (MMTCO2E)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Energy	89.76	87.85	90.10	87.78	87.97	85.18	86.37	91.13	89.13	87.87	89.50	89.84	89.67	90.48	89.54	90.88			
CO_2 from Fossil Fuel Combustion	83.92	82.73	84.60	81.87	82.08	79.19	80.26	86.49	84.36	81.82	82.86	82.17	83.28	84.34	83.13	84.37	76.33	79.85	
Residential CO_2	15.01	14.23	16.31	16.43	16.27	14.69	14.50	14.33	13.15	13.96	15.53	15.87	15.88	16.18	14.96	14.80	12.75	13.46	
Commercial CO_2	8.40	9.18	8.93	7.96	8.85	8.94	9.02	9.41	8.02	6.14	6.69	5.67	5.86	7.00	6.56	6.59	4.90	5.25	
Industrial CO_2	5.96	5.41	7.19	7.35	6.38	5.61	6.06	6.22	6.13	6.73	6.46	7.10	7.06	4.79	4.58	4.76	4.64	4.61	
Transportation CO_2	28.91	27.62	27.42	27.86	28.05	28.46	29.75	30.16	30.12	30.94	32.04	31.60	31.72	31.50	33.41	33.90	32.72	33.15	
Electric Generation CO_2	25.64	26.29	24.75	22.27	22.53	21.50	20.94	26.38	26.94	24.04	22.12	21.93	22.75	24.87	23.62	24.33	21.32	23.38	20.15
Electricity Imports CO_2, CH_4 & N_2O	2.02	1.24	1.55	2.27	1.99	2.09	2.22	0.98	0.97	2.37	3.04	4.18	3.29	2.93	3.32	3.51	2.88	2.93	3.49
Other Gasses	3.82	3.87	3.95	3.63	3.91	3.90	3.89	3.66	3.80	3.68	3.60	3.48	3.10	3.21	3.09	2.99			
Stationary Combustion	0.40	0.40	0.42	0.41	0.41	0.39	0.40	0.38	0.35	0.34	0.36	0.31	0.31	0.32	0.31	0.32	0.29		
Electric Power	0.12	0.13	0.12	0.11	0.12	0.11	0.11	0.13	0.13	0.12	0.12	0.10	0.10	0.10	0.10	0.11	0.09	0.07	0.07
Other	0.27	0.27	0.29	0.30	0.29	0.28	0.29	0.24	0.21	0.22	0.23	0.21	0.21	0.21	0.21	0.21	0.19		
Mobile Combustion	1.52	1.57	1.63	1.62	1.64	1.65	1.69	1.67	1.66	1.52	1.47	1.40	1.23	1.15	1.09	1.03	0.89		
Natural Gas and Oil Systems	1.89	1.89	1.91	1.60	1.87	1.86	1.79	1.62	1.79	1.82	1.77	1.77	1.56	1.74	1.69	1.65			
Industrial Processes	0.70	0.67	0.70	0.78	0.93	1.29	1.50	1.74	1.92	2.12	2.29	2.39	2.56	2.69	2.84	2.96	3.04		
Agriculture	0.38	0.37	0.38	0.37	0.36	0.36	0.35	0.35	0.33	0.32	0.33	0.32	0.32	0.33	0.33	0.36	0.31		
Waste	3.58	3.73	3.65	3.76	3.67	3.64	3.64	2.95	2.94	2.74	2.55	2.56	2.61	2.51	2.56	2.77	2.77		
Gross Emissions	**94.42**	**92.63**	**94.81**	**92.69**	**92.93**	**90.47**	**91.86**	**96.17**	**94.31**	**93.05**	**94.67**	**95.10**	**95.16**	**96.01**	**95.27**	**96.96**			

Step 3: Sum electric sector emissions

Emissions (MMTCO2E)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Energy	89.76	87.85	90.10	87.78	87.97	85.18	86.37	91.13	89.13	87.87	89.50	89.84	89.67	90.48	89.54	90.88			
CO_2 from Fossil Fuel Combustion	58.29	56.44	59.85	59.61	59.55	57.69	59.32	60.11	57.43	57.78	60.73	60.25	60.53	59.47	59.51	60.04	55.01	56.47	
Residential CO_2	15.01	14.23	16.31	16.43	16.27	14.69	14.50	14.33	13.15	13.96	15.53	15.87	15.88	16.18	14.96	14.80	12.75	13.46	
Commercial CO_2	8.40	9.18	8.93	7.96	8.85	8.94	9.02	9.41	8.02	6.14	6.69	5.67	5.86	7.00	6.56	6.59	4.90	5.25	
Industrial CO_2	5.96	5.41	7.19	7.35	6.38	5.61	6.06	6.22	6.13	6.73	6.46	7.10	7.06	4.79	4.58	4.76	4.64	4.61	
Transportation CO_2	28.91	27.62	27.42	27.86	28.05	28.46	29.75	30.16	30.12	30.94	32.04	31.60	31.72	31.50	33.41	33.90	32.72	33.15	
Electricity Consumption GHGs	27.78	27.67	26.42	24.65	24.63	23.70	23.28	27.49	28.04	26.54	25.28	26.21	26.14	27.91	27.04	27.95	24.30	26.39	23.71
Other Gasses, except Electric Sector	3.69	3.74	3.83	3.52	3.79	3.79	3.77	3.53	3.66	3.55	3.48	3.38	3.00	3.10	2.99	2.89			
Stationary Combustion, except electric sector	0.27	0.27	0.29	0.30	0.29	0.28	0.29	0.24	0.21	0.22	0.23	0.21	0.21	0.21	0.21	0.21	0.19		
Mobile Combustion	1.52	1.57	1.63	1.62	1.64	1.65	1.69	1.67	1.66	1.52	1.47	1.40	1.23	1.15	1.09	1.03	0.89		

Natural Gas and Oil Systems	1.89	1.89	1.91	1.60	1.87	1.86	1.79	1.62	1.79	1.82	1.77	1.77	1.56	1.74	1.69	1.65
Industrial Processes	0.70	0.67	0.70	0.78	0.93	1.29	1.50	1.74	1.92	2.12	2.29	2.39	2.56	2.69	2.84	2.96
Agriculture	0.38	0.37	0.38	0.37	0.36	0.36	0.35	0.35	0.33	0.32	0.33	0.32	0.32	0.33	0.33	0.36
Waste	3.58	3.73	3.65	3.76	3.67	3.64	3.64	2.95	2.94	2.74	2.55	2.56	2.61	2.51	2.56	2.77
Gross Emissions	**94.42**	**92.63**	**94.81**	**92.69**	**92.93**	**90.47**	**91.86**	**96.17**	**94.31**	**93.05**	**94.67**	**95.10**	**95.16**	**96.01**	**95.27**	**96.96**

Step 4: Determine log growth rates of historic data

All years of data available are used to determine averages, standard deviations and statistical t-values, with the exception of the Industrial Processes sector, which saw dramatic growth in the early 1990s following the Montreal Protocol-driven changes to production of substitutes for ozone depleting gases. The calculation here uses a shorter time period to reflect the more mature growth path of this sector.

Emissions (MMTCO2E)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Energy		-2.15%	2.53%	-2.61%	0.22%	-3.23%	1.39%	5.37%	-2.23%	-1.43%	1.84%	0.38%	-0.19%	0.91%	-1.05%	1.49%			
CO_2 from Fossil Fuel Combustion		-3.22%	5.87%	-0.41%	-0.10%	-3.17%	2.79%	1.32%	-4.57%	0.61%	4.99%	-0.80%	0.46%	-1.77%	0.08%	0.88%	-8.76%	2.63%	
Residential CO_2		-5.37%	13.69%	0.73%	-0.99%	-10.24%	-1.29%	-1.20%	-8.59%	6.02%	10.64%	2.19%	0.01%	1.88%	-7.79%	-1.10%	-14.94%	5.44%	
Commercial CO_2		8.88%	-2.82%	-11.47%	10.56%	1.02%	0.90%	4.25%	-15.90%	-26.76%	8.64%	-16.60%	3.37%	17.73%	-6.54%	0.46%	-29.55%	6.91%	
Industrial CO_2		-9.66%	28.45%	2.16%	-14.08%	-12.91%	7.72%	2.55%	-1.37%	9.31%	-4.05%	9.39%	-0.52%	-38.80%	-4.49%	3.75%	-2.51%	-0.65%	
Transportation CO_2		-4.58%	-0.73%	1.62%	0.66%	1.44%	4.44%	1.38%	-0.13%	2.69%	3.50%	-1.39%	0.37%	-0.71%	5.90%	1.45%	-3.54%	1.31%	
Electricity Consumption GHGs		-0.41%	-4.63%	-6.92%	-0.07%	-3.87%	-1.80%	16.65%	1.97%	-5.51%	-4.85%	3.61%	-0.27%	6.54%	-3.18%	3.31%	-14.00%	8.26%	-10.71%
Other Gasses, except Electric Sector		1.36%	2.33%	-8.42%	7.40%	0.01%	-0.52%	-6.63%	3.65%	-3.05%	-2.01%	-3.03%	-11.93%	3.54%	-3.92%	-3.33%			
Stationary Combustion, except electric sector		0.88%	6.70%	1.09%	-2.79%	-2.07%	1.05%	-16.25%	-12.90%	1.19%	8.18%	-12.47%	-0.48%	3.84%	-2.24%	0.97%	-9.96%		
Mobile Combustion		3.18%	3.31%	-0.18%	0.76%	0.65%	2.64%	-1.41%	-0.65%	-8.85%	-2.81%	-5.31%	-12.91%	-6.71%	-5.59%	-5.68%	-14.46%		
Natural Gas and Oil Systems		-0.07%	0.86%	-17.70%	15.39%	-0.24%	-3.64%	-10.28%	10.07%	1.54%	-2.62%	-0.01%	-12.59%	10.88%	-3.04%	-2.39%			
Industrial Processes		-4.20%	3.66%	11.01%	17.71%	32.99%	15.13%	14.44%	9.88%	10.26%	7.71%	4.09%	6.94%	4.91%	5.37%	4.12%	2.89%		
Agriculture		-2.55%	0.35%	-0.02%	-3.79%	-1.17%	-2.17%	1.10%	-7.40%	-1.00%	1.16%	-3.02%	1.82%	1.05%	2.00%	6.27%	-15.41%		
Waste		4.29%	-2.37%	3.19%	-2.62%	-0.72%	-0.10%	-20.91%	-0.43%	-6.93%	-7.08%	0.25%	1.96%	-3.85%	1.96%	7.98%	-0.13%		
Gross Emissions		**-1.92%**	**2.33%**	**-2.26%**	**0.25%**	**-2.68%**	**1.52%**	**4.59%**	**-1.96%**	**-1.34%**	**1.72%**	**0.46%**	**0.06%**	**0.89%**	**-0.77%**	**1.76%**			

	Percentile Range 25%	Percentile Range 75%	T-Value
Final Year	Avg	Std	# Obs	Low	High
2005	0.08%	2.29%	15	-0.69	0.69
2007	-0.19%	3.52%	17	-0.69	0.69
2007	-0.64%	7.35%	17	-0.69	0.69
2007	-2.76%	13.30%	17	-0.69	0.69
2007	-1.51%	13.78%	17	-0.69	0.69
2007	0.80%	2.63%	17	-0.69	0.69
2008	-0.88%	7.13%	18	-0.69	0.69
2005	-1.64%	5.03%	15	-0.69	0.69
2006	-2.20%	7.10%	16	-0.69	0.69
2006	-3.38%	5.46%	16	-0.69	0.69
2005	-0.92%	8.70%	15	-0.69	0.69
2006	6.24%	2.62%	9	-0.71	0.71
2006	-1.42%	4.81%	16	-0.69	0.69
2006	-1.60%	6.44%	16	-0.69	0.69
2005	0.18%	2.03%	15	-0.69	0.69

Step 5: Determine Medium Range Projection sector-by-sector to 2020

Emissions (MMTCO2E)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy	89.76	87.85	90.10	87.78	87.97	85.18	86.37	91.13	89.13	87.87	89.50	89.84	89.67	90.48	89.54	90.88	82.03	85.73	85.05	87.45	87.15	86.85	86.56	86.28	86.02	85.76	85.52	85.28	85.06	84.84	84.64
CO_2 from Fossil Fuel Combustion	58.29	56.44	59.85	59.61	59.55	57.69	59.32	60.11	57.43	57.78	60.73	60.25	60.53	59.47	59.51	60.04	55.01	56.47	58.52	58.48	58.46	58.44	58.42	58.42	58.42	58.43	58.45	58.47	58.50	58.54	58.58
Residential CO_2	15.01	14.23	16.31	16.43	16.27	14.69	14.50	14.33	13.15	13.96	15.53	15.87	15.88	16.18	14.96	14.80	12.75	13.46	14.24	14.15	14.06	13.97	13.88	13.79	13.70	13.61	13.52	13.44	13.35	13.27	13.18
Commercial CO_2	8.40	9.18	8.93	7.96	8.85	8.94	9.02	9.41	8.02	6.14	6.69	5.67	5.86	7.00	6.56	6.59	4.90	5.25	5.26	5.12	4.98	4.84	4.71	4.58	4.46	4.34	4.22	4.10	3.99	3.88	3.78
Industrial CO_2	5.96	5.41	7.19	7.35	6.38	5.61	6.06	6.22	6.13	6.73	6.46	7.10	7.06	4.79	4.58	4.76	4.64	4.61	5.04	4.97	4.89	4.82	4.75	4.68	4.61	4.54	4.47	4.40	4.34	4.27	4.21
Transportation CO_2	28.91	27.62	27.42	27.86	28.05	28.46	29.75	30.16	30.12	30.94	32.04	31.60	31.72	31.50	33.41	33.90	32.72	33.15	33.98	34.25	34.53	34.81	35.09	35.37	35.66	35.94	36.23	36.53	36.82	37.12	37.42
Electricity Consumption GHGs	27.78	27.67	26.42	24.65	24.63	23.70	23.28	27.49	28.04	26.54	25.28	26.21	26.14	27.91	27.04	27.95	24.30	26.39	23.71	26.20	25.97	25.75	25.52	25.30	25.08	24.86	24.64	24.42	24.21	24.00	23.78
Other Gasses, except Electric Sector	3.69	3.74	3.83	3.52	3.79	3.79	3.77	3.53	3.66	3.55	3.48	3.38	3.00	3.10	2.99	2.89	2.73	2.87	2.82	2.77	2.72	2.67	2.62	2.57	2.52	2.48	2.43	2.39	2.35	2.31	2.27
Stationary Combustion, except electric sector	0.27	0.27	0.29	0.30	0.29	0.28	0.29	0.24	0.21	0.22	0.23	0.21	0.21	0.21	0.21	0.21	0.19	0.19	0.18	0.18	0.17	0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.14	0.14
Mobile Combustion	1.52	1.57	1.63	1.62	1.64	1.65	1.69	1.67	1.66	1.52	1.47	1.40	1.23	1.15	1.09	1.03	0.89	1.06	1.02	0.99	0.95	0.92	0.89	0.86	0.83	0.81	0.78	0.75	0.73	0.70	0.68
Natural Gas and Oil Systems	1.89	1.89	1.91	1.60	1.87	1.86	1.79	1.62	1.79	1.82	1.77	1.77	1.56	1.74	1.69	1.65	1.65	1.63	1.62	1.60	1.59	1.57	1.56	1.54	1.53	1.51	1.50	1.49	1.47	1.46	1.45
Industrial Processes	0.70	0.67	0.70	0.78	0.93	1.29	1.50	1.74	1.92	2.12	2.29	2.39	2.56	2.69	2.84	2.96	3.04	3.29	3.50	3.73	3.97	4.23	4.50	4.79	5.10	5.42	5.77	6.15	6.54	6.96	7.41
Agriculture	0.38	0.37	0.38	0.37	0.36	0.36	0.35	0.35	0.33	0.32	0.33	0.32	0.32	0.33	0.33	0.36	0.31	0.31	0.31	0.30	0.30	0.29	0.29	0.29	0.28	0.28	0.27	0.27	0.27	0.26	0.26
Waste	3.58	3.73	3.65	3.76	3.67	3.64	3.64	2.95	2.94	2.74	2.55	2.56	2.61	2.51	2.56	2.77	2.77	2.36	2.32	2.28	2.25	2.21	2.18	2.14	2.11	2.07	2.04	2.01	1.98	1.95	1.92
Gross Emissions	**94.42**	**92.63**	**94.81**	**92.69**	**92.93**	**90.47**	**91.86**	**96.17**	**94.31**	**93.05**	**94.67**	**95.10**	**95.16**	**96.01**	**95.27**	**96.96**	**88.15**	**91.69**	**91.18**	**93.77**	**93.66**	**93.58**	**93.52**	**93.50**	**93.50**	**93.54**	**93.61**	**93.71**	**93.84**	**94.01**	**94.22**

Step 6: Determine Range Projections to 2020

Year forecast uncertainty begins: 2008

Emissions (MMTCO2E)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
High Range Projection	**94.42**	**92.63**	**94.81**	**92.69**	**92.93**	**90.47**	**91.86**	**96.17**	**94.31**	**93.05**	**94.67**	**95.10**	**95.16**	**96.01**	**95.27**	**96.96**	**88.15**	**91.69**	**92.47**	**95.65**	**95.97**	**96.25**	**96.51**	**96.78**	**97.05**	**97.33**	**97.64**	**97.97**	**98.32**	**98.71**	**99.12**
Medium Range Projection	**94.42**	**92.63**	**94.81**	**92.69**	**92.93**	**90.47**	**91.86**	**96.17**	**94.31**	**93.05**	**94.67**	**95.10**	**95.16**	**96.01**	**95.27**	**96.96**	**88.15**	**91.69**	**91.18**	**93.77**	**93.66**	**93.58**	**93.52**	**93.50**	**93.50**	**93.54**	**93.61**	**93.71**	**93.84**	**94.01**	**94.22**
Low Range Projection	**94.42**	**92.63**	**94.81**	**92.69**	**92.93**	**90.47**	**91.86**	**96.17**	**94.31**	**93.05**	**94.67**	**95.10**	**95.16**	**96.01**	**95.27**	**96.96**	**88.15**	**91.69**	**89.91**	**91.92**	**91.41**	**90.98**	**90.63**	**90.33**	**90.09**	**89.89**	**89.74**	**89.63**	**89.57**	**89.54**	**89.56**

CO_2 Emissions from Combustion of Fossil Fuels & Biomass - MA Summary

Other = Biomass Ethanol, Wood and Waste; not summed in sectors, only in last row of table; not included in 1990-2020 graphs

$MMTCO_2E$	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Residential	15.01	14.23	16.31	16.43	16.27	14.69	14.50	14.33	13.15	13.96	15.53	15.87	15.88	16.18	14.96	14.80	12.75	13.46	
Coal	0.03	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.02	0.02	0.01	0.01	0.00	0.01	
Petroleum	9.12	8.54	9.70	9.73	9.77	8.93	8.27	8.25	7.65	8.01	9.21	9.96	9.76	9.16	8.71	8.44	7.23	7.30	
Natural Gas	5.86	5.67	6.59	6.69	6.50	5.75	6.22	6.07	5.49	5.94	6.32	5.91	6.09	7.00	6.25	6.35	5.51	6.16	6.05
Other	1.70	1.78	1.87	1.93	1.83	1.83	1.90	1.36	1.21	1.28	1.37	1.08	1.10	1.15	1.18	1.30	1.18		
Commercial	8.40	9.18	8.93	7.96	8.85	8.94	9.02	9.41	8.02	6.14	6.69	5.67	5.86	7.00	6.56	6.59	4.90	5.25	
Coal	0.12	0.06	0.11	0.09	0.05	0.06	0.07	0.06	0.06	0.09	0.04	0.03	0.18	0.11	0.07	0.09	0.03	0.05	
Petroleum	5.50	6.19	5.27	4.26	4.21	4.40	3.72	3.63	3.11	2.39	3.13	2.22	2.07	3.42	3.33	3.46	2.10	1.92	
Natural Gas	2.78	2.93	3.55	3.61	4.59	4.47	5.23	5.72	4.85	3.66	3.53	3.42	3.61	3.48	3.15	3.03	2.77	3.29	3.04
Other	0.19	0.19	0.20	0.26	0.25	0.25	0.26	0.23	0.20	0.21	0.22	0.19	0.19	0.20	0.20	0.20	0.18		
Industrial	5.96	5.41	7.19	7.35	6.38	5.61	6.06	6.22	6.13	6.73	6.46	7.10	7.06	4.79	4.58	4.76	4.64	4.61	
Coal	0.17	0.20	0.36	0.27	0.15	0.10	0.09	0.09	0.08	0.08	0.14	0.14	0.11	0.14	0.14	0.17	0.19	0.21	
Petroleum	3.41	2.26	2.99	3.23	2.76	2.13	2.68	2.71	2.75	2.39	2.30	2.60	2.29	2.26	2.10	2.11	2.23	2.01	
Natural Gas	2.38	2.96	3.84	3.85	3.47	3.38	3.29	3.42	3.30	4.26	4.02	4.36	4.66	2.39	2.34	2.47	2.22	2.40	2.42
Other	0.71	0.71	0.74	0.71	0.81	0.90	0.92	0.95	0.64	0.66	0.63	0.47	0.30	0.31	0.33	0.33	0.34		
Transportation	28.91	27.62	27.42	27.86	28.05	28.46	29.75	30.16	30.12	30.94	32.04	31.60	31.72	31.50	33.41	33.90	32.72	33.15	
Coal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Petroleum	28.85	27.54	27.32	27.74	27.95	28.35	29.63	30.03	30.01	30.79	31.91	31.42	31.48	31.38	33.30	33.76	32.60	33.02	
Natural Gas	0.07	0.08	0.10	0.12	0.10	0.10	0.12	0.13	0.11	0.15	0.14	0.18	0.24	0.12	0.11	0.14	0.12	0.13	
Other	-	-	-	0.00	-	-	-	-	-	-	-	-	0.00	0.00	0.05	0.41	1.09	1.41	
Electric Power	25.64	26.29	24.75	22.27	22.53	21.50	20.94	26.38	26.94	24.04	22.12	21.93	22.75	24.87	23.62	24.33	21.32	23.38	20.15
Coal	10.36	10.79	10.01	8.97	9.34	9.71	10.49	11.35	9.98	10.30	10.39	9.87	10.59	9.82	9.46	10.72	10.11	10.81	9.92
Petroleum	11.90	12.16	10.62	9.05	7.72	4.81	4.85	8.63	11.34	8.74	6.90	6.76	5.21	5.84	5.53	5.26	1.97	2.50	1.74
Natural Gas	3.38	3.34	4.12	4.24	5.47	6.98	5.60	6.39	5.62	5.01	4.83	5.29	6.94	9.22	8.62	8.35	9.25	10.07	8.49
Other	2.29	2.43	2.59	2.75	3.05	2.95	3.09	3.22	3.15	2.98	3.20	1.99	1.83	1.92	1.93	1.98	1.97		
International Bunker Fuels	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	-	-	-
Petroleum	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0.00	-	-	-
TOTAL	83.92	82.73	84.60	81.87	82.08	79.19	80.26	86.49	84.36	81.82	82.86	82.17	83.28	84.34	83.13	84.37	76.33	79.85	
Coal	10.68	11.06	10.52	9.35	9.54	9.88	10.66	11.51	10.13	10.47	10.57	10.05	10.91	10.08	9.68	11.00	10.34	11.07	
Petroleum	58.77	56.69	55.89	54.01	52.40	48.63	49.14	53.24	54.86	52.32	53.45	52.97	50.82	52.05	52.98	53.04	46.13	46.74	
Natural Gas	14.47	14.99	18.19	18.51	20.13	20.69	20.46	21.74	19.37	19.03	18.84	19.16	21.55	22.21	20.47	20.34	19.87	22.04	
Other	4.89	5.12	5.40	5.65	5.94	5.94	6.17	5.76	5.20	5.12	5.42	3.72	3.43	3.59	3.68	4.21	4.77		

CH4 and N2O Emissions from Stationary Combustion - MA Summary

MMTCO2E	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Residential	0.196	0.197	0.213	0.218	0.210	0.203	0.206	0.164	0.148	0.156	0.171	0.151	0.153	0.156	0.154	0.155	0.144	0.055	
N2O	0.048	0.047	0.052	0.053	0.052	0.049	0.049	0.042	0.038	0.040	0.044	0.042	0.042	0.042	0.041	0.040	0.037	0.022	
CH4	0.148	0.150	0.161	0.165	0.158	0.154	0.158	0.123	0.110	0.116	0.126	0.109	0.111	0.114	0.113	0.114	0.107	0.033	
Commercial	0.051	0.055	0.053	0.052	0.053	0.054	0.053	0.051	0.044	0.038	0.043	0.035	0.036	0.043	0.041	0.041	0.032	0.019	
N2O	0.018	0.020	0.018	0.016	0.016	0.017	0.016	0.015	0.013	0.011	0.013	0.010	0.011	0.014	0.013	0.013	0.009	0.007	
CH4	0.033	0.035	0.035	0.036	0.036	0.037	0.037	0.036	0.031	0.027	0.030	0.025	0.026	0.029	0.028	0.028	0.023	0.012	
Industrial	0.026	0.023	0.028	0.027	0.027	0.026	0.027	0.028	0.021	0.022	0.021	0.021	0.017	0.015	0.015	0.015	0.016	0.014	
N2O	0.018	0.015	0.019	0.019	0.018	0.018	0.018	0.019	0.015	0.014	0.014	0.014	0.011	0.010	0.010	0.011	0.011	0.010	
CH4	0.008	0.007	0.009	0.009	0.009	0.009	0.009	0.009	0.007	0.007	0.007	0.007	0.005	0.005	0.005	0.005	0.005	0.004	
Electric Power	0.124	0.129	0.123	0.114	0.117	0.110	0.115	0.133	0.134	0.125	0.122	0.104	0.102	0.104	0.100	0.106	0.093	0.074	0.066
N2O	0.110	0.115	0.110	0.103	0.106	0.101	0.106	0.121	0.120	0.113	0.112	0.094	0.093	0.093	0.090	0.096	0.086	0.066	0.059
CH4	0.014	0.014	0.013	0.011	0.011	0.009	0.009	0.013	0.014	0.012	0.010	0.010	0.010	0.011	0.010	0.010	0.008	0.008	0.007
TOTAL	0.397	0.404	0.417	0.412	0.406	0.393	0.401	0.377	0.348	0.341	0.357	0.311	0.309	0.318	0.310	0.318	0.285	0.163	

CH4 and N2O Emissions from Mobile Combustion - MA Summary

Total CH4 and N2O Emissions from Mobile Sources (MTCO2E)

Fuel Type/Vehicle Type	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Gasoline Highway	1450652	1510336	1571348	1577318	1579784	1594181	1626259	1603760	1597948	1456315	1410348	1331911	1169865	1084700	1012201	943971	846034
Passenger Cars	925265	899695	902522	882154	875112	870935	874096	846787	840333	788340	757199	690017	638967	589630	555673	514841	455367
Light-Duty Trucks	498079	580229	638533	666199	675302	693116	719450	723219	721353	635068	621271	609610	497417	461356	422028	395623	379860
Heavy-Duty Vehicles	26196	29291	29152	27840	28239	29001	31613	32711	35236	31810	30824	31317	32540	32789	33539	32539	9661
Motorcycles	1113	1122	1141	1125	1131	1130	1099	1044	1026	1098	1054	967	941	925	960	968	1146
Diesel Highway	5606	5640	5788	5697	6185	6404	6626	6928	7247	6860	7084	8688	8828	8713	8893	8767	9572
Passenger Cars	157	140	135	128	120	114	111	108	102	94	90	79	80	80	81	82	74
Light-Duty Trucks	241	263	285	297	299	308	324	336	343	327	338	358	342	354	358	370	427
Heavy-Duty Vehicles	5207	5237	5368	5272	5766	5982	6191	6484	6801	6439	6655	8251	8406	8279	8454	8315	9071
Non-Highway	67291	56868	48633	39664	49188	45248	56889	55330	49936	51677	55269	55661	48224	49157	58733	67842	26395
Boats	11780	6351	4731	3581	3699	2741	13400	10050	1685	1826	4877	2820	3267	1369	1342	5449	1576
Locomotives	1470	1692	1156	848	1667	1502	1303	1042	1340	1227	1915	2214	1274	1921	4670	6490	7095
Farm Equipment	597	745	591	620	540	514	744	693	407	742	421	572	765	732	808	651	918
Construction Equipment	9597	6422	6818	0	9805	10416	10408	10777	12101	11241	10717	16939	15580	14557	13005	13046	13273
Aircraft	41328	39245	32958	32641	31323	28113	29136	30874	32654	34184	34842	29600	23806	27089	34815	38251	0
Other*	2519	2413	2379	1974	2153	1962	1897	1893	1749	2455	2496	3515	3532	3490	4093	3955	3532
Alternative Fuel Vehicles	767	735	706	891	866	884	980	1127	1187	1143	1298	1580	1665	6289	6586	5881	6231
Light Duty Vehicles	187	187	190	202	189	235	271	353	376	387	450	514	544	1894	1904	1714	1884
Heavy Duty Vehicles	542	505	469	624	609	582	638	698	730	667	756	968	1021	4039	4302	3828	3976
Buses	37	42	47	65	68	67	71	76	82	89	92	98	99	356	380	339	371
Total	1524315	1573579	1626477	1623570	1636024	1646716	1690753	1667145	1656319	1515994	1473999	1397840	1228582	1148859	1086413	1026460	888233

* "Other" includes snowmobiles, small gasoline powered utility equipment, heavy-duty gasoline powered utility equipment, and heavy-duty diesel powered utility equipment.

CH4 Emissions from Mobile Sources (MTCO2E)

Fuel Type/Vehicle Type	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Gasoline Highway	132804	129339	126569	120621	114840	109875	105559	98321	93014	82025	76662	73304	61996	56601	52124	47947	41824
Passenger Cars	82943	76192	72887	68599	65476	62435	59909	55598	52831	48527	45303	40423	36649	33083	30460	27532	23722
Light-Duty Trucks	42354	45392	46418	45422	42957	41112	39788	37541	35407	29152	27534	29384	22016	20413	18708	17621	17027
Heavy-Duty Vehicles	7049	7293	6795	6139	5942	5864	5412	4758	4360	3901	3399	3107	2951	2734	2570	2405	615
Motorcycles	457	461	469	462	465	464	449	424	415	445	426	390	379	372	386	388	460
Diesel Highway	364	367	376	370	403	418	432	452	474	449	463	571	581	573	585	576	629
Passenger Cars	5	4	4	4	4	3	3	3	3	3	3	2	2	2	2	2	2
Light-Duty Trucks	10	11	12	12	12	13	14	14	14	14	14	15	14	15	15	15	18
Heavy-Duty Vehicles	349	351	360	354	387	401	415	435	456	432	447	554	564	556	567	558	609
Non-Highway	6805	5148	4446	3476	4791	4543	6388	5911	4774	4989	5604	5821	5267	5122	6011	7259	3973
Boats	1920	1035	771	584	603	447	2184	1638	275	298	795	460	532	223	219	888	257
Locomotives	257	296	202	148	291	262	228	182	234	214	335	387	223	336	816	1134	1240
Farm Equipment	165	206	163	171	149	142	205	191	112	205	116	158	211	202	223	180	253
Construction Equipment	1269	849	902	0	1297	1378	1377	1425	1601	1487	1417	2240	2061	1925	1720	1725	1756
Aircraft	2860	2444	2093	2312	2166	2055	2143	2223	2322	2460	2611	2111	1773	1975	2492	2809	0
Other*	333	319	315	261	285	259	251	250	231	325	330	465	467	462	541	523	467
Alternative Fuel Vehicles	52	55	58	74	77	103	136	186	208	225	260	338	358	1484	1594	1427	1550
Light Duty Vehicles	18	19	21	22	22	42	54	91	101	111	123	146	151	526	514	449	489
Heavy Duty Vehicles	19	19	19	25	27	33	53	63	72	76	97	149	163	805	915	831	900
Buses	15	17	19	27	28	28	30	32	35	38	40	42	43	154	164	147	160
Total	140025	134909	131449	124541	120111	114939	112515	104870	98470	87688	82989	80034	68201	63781	60313	57209	47975

* "Other" includes snowmobiles, small gasoline powered utility equipment, heavy-duty gasoline powered utility equipment, and heavy-duty diesel powered utility equipment.

N2O Emissions from Mobile Sources (MTCO2E)

Fuel Type/Vehicle Type	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Gasoline Highway	1317849	1380998	1444779	1456696	1464944	1484306	1520700	1505440	1504935	1374289	1333686	1258607	1107870	1028099	960077	896024	804210
Passenger Cars	842321	823502	829635	813555	809636	808500	814187	791189	787502	739812	711896	649594	602317	556547	525213	487309	431644
Light-Duty Trucks	455725	534837	592115	620777	632344	652003	679661	685678	685946	605916	593737	580226	475401	440943	403320	378002	362833
Heavy-Duty Vehicles	19147	21998	22357	21701	22298	23137	26201	27953	30876	27908	27425	28210	29589	30055	30969	30134	9046
Motorcycles	656	661	672	663	667	666	650	620	611	653	628	577	562	553	575	579	687
Diesel Highway	5242	5273	5412	5327	5782	5986	6194	6476	6773	6412	6620	8117	8247	8140	8308	8191	8943
Passenger Cars	152	136	131	124	117	110	108	105	99	91	88	77	77	77	79	79	72
Light-Duty Trucks	231	252	273	285	287	295	311	322	329	313	324	343	328	339	343	355	409
Heavy-Duty Vehicles	4858	4886	5008	4919	5379	5581	5775	6049	6345	6007	6209	7697	7842	7724	7886	7757	8462
Non-Highway	60486	51720	44188	36189	44397	40705	50501	49420	45162	46688	49665	49840	42957	44035	52722	60583	22423
Boats	9860	5315	3960	2997	3096	2294	11216	8412	1410	1529	4082	2360	2734	1146	1123	4561	1319
Locomotives	1213	1397	954	700	1376	1240	1076	860	1106	1013	1580	1827	1052	1585	3854	5356	5856
Farm Equipment	432	539	428	449	391	373	538	502	294	537	305	414	554	530	585	471	665
Construction Equipment	8327	5573	5916	0	8509	9038	9032	9352	10501	9754	9300	14699	13519	12631	11285	11320	11518
Aircraft	38467	36801	30865	30330	29157	26058	26993	28651	30333	31724	32232	27489	22033	25114	32324	35442	0
Other*	2186	2094	2064	1713	1869	1702	1646	1643	1518	2131	2166	3050	3065	3028	3551	3432	3065
Alternative Fuel Vehicles	714	680	648	818	788	781	844	941	980	918	1038	1243	1307	4805	4993	4454	4682
Light Duty Vehicles	169	168	170	180	167	193	217	262	275	276	327	368	393	1368	1390	1265	1395
Heavy Duty Vehicles	523	486	451	599	581	548	586	635	658	591	659	819	858	3235	3387	2996	3075
Buses	22	25	28	39	40	39	41	43	47	51	52	56	56	202	216	198	211
Total	1384291	1438670	1495027	1499030	1515912	1531777	1578239	1562275	1557849	1428306	1391009	1317806	1160381	1085078	1026100	969252	840257

* "Other" includes snowmobiles, small gasoline powered utility equipment, heavy-duty gasoline powered utility equipment, and heavy-duty diesel powered utility equipment.

Emissions from Natural Gas and Oil Systems - MA Summary

From NESCAUM

Emissions were not calculated for the following sources: Natural Gas Production, Natural Gas Flaring, and Oil.

Emissions (MMTCO2 Eq.)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural Gas	1.89	1.89	1.91	1.60	1.87	1.86	1.79	1.62	1.79	1.82	1.77	1.77	1.56	1.74	1.69	1.65
Oil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Emissions by Gas (MTCH4)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural Gas	90,204	90,145	90,925	76,174	88,850	88,641	85,470	77,118	85,285	86,608	84,371	84,362	74,382	82,931	80,449	78,551
Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transmission	14,579	14,785	15,832	14,801	14,674	14,547	14,539	14,531	14,595	14,595	14,595	15,356	15,468	15,216	15,570	15,599
Distribution	75,625	75,360	75,093	61,373	74,176	74,094	70,931	62,586	70,690	72,013	69,776	69,006	58,914	67,716	64,879	62,952
Oil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

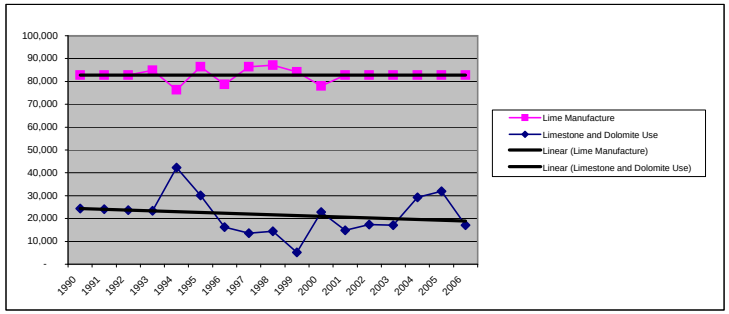
Emissions by Gas (MMTCO2)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural Gas Flaring	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Emissions from Industrial Processes - MA Summary

Emissions were not calculated for the following sources: Cement Manufacture, Iron & Steel, Nitric Acid Production, Adipic Acid Production, Magnesium Production, HCFC-22 Production, and Aluminum Production.

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Carbon Dioxide Emissions	172,872	169,134	168,440	169,300	179,182	179,038	155,979	161,624	163,631	150,255	160,958	157,548	159,953	157,675	169,352	170,946	154,686
Cement Manufacture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lime Manufacture	82,730	82,732	82,735	84,887	76,383	86,407	78,683	86,428	87,047	84,154	77,989	82,759	82,762	82,765	82,768	82,770	82,773
Limestone and Dolomite Use	24,420	24,071	23,722	23,374	42,327	30,044	16,219	13,527	14,451	5,174	22,762	14,898	17,340	17,028	29,268	31,963	17,116
Soda Ash	65,381	62,001	61,639	60,770	60,189	62,226	60,844	61,414	61,803	60,428	59,786	59,472	59,562	57,622	56,941	55,827	54,518
Ammonia & Urea	342	330	344	269	282	361	233	255	331	499	421	418	288	260	376	386	279
Iron & Steel Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrous Oxide Emissions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitric Acid Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Adipic Acid Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HFC, PFC, and SF6 Emissions	527,314	502,267	527,980	608,187	748,982	1,111,922	1,345,901	1,573,486	1,751,710	1,971,942	2,131,226	2,230,381	2,399,551	2,530,563	2,667,135	2,784,943	2,887,853
ODS Substitutes	7,987	15,227	40,741	127,026	284,329	658,157	910,518	1,155,728	1,295,302	1,449,428	1,599,510	1,740,383	1,883,240	2,015,723	2,151,146	2,265,816	2,361,540
Semiconductor Manufacturing	71,944	71,944	71,944	89,929	98,922	122,529	136,054	143,796	228,546	289,198	303,898	257,713	293,192	294,993	295,773	300,882	325,506
Magnesium Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric Power Transmission and Distribution Systems	447,383	415,096	415,295	391,231	365,731	331,235	299,329	273,962	227,862	233,316	227,817	232,285	223,119	219,847	220,216	218,245	200,807
HCFC-22 Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum Production	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Emissions	700,186	671,401	696,420	777,487	928,164	1,290,959	1,501,880	1,735,110	1,915,342	2,122,196	2,292,184	2,387,929	2,559,504	2,688,237	2,836,487	2,955,890	3,042,539



= interpolated data

CH4 and N2O Emissions from Agriculture - MA Summary

Note: Totals below do not account for emissions from the following animals, fertilizers, crops, or harvested areas:

Enteric Fermentation:

Manure Management and Ag Soils-Animal:

Ag Soils-Plant-Residues, Legumes, Histosols: Red Clover, White Clover, Birdsfoot Trefoil, Arrowleaf Clover, Crimson Clover,

Ag Soils-Plant-Fertilizers: Organic: Dried Blood, Compost, Other Sewage Sludge, Tankage

Rice Cultivation:

Ag Residue Burning:

Emissions (MMTCO2 Eq.)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Enteric Fermentation	0.137	0.133	0.135	0.130	0.127	0.122	0.116	0.114	0.112	0.107	0.104	0.091	0.095	0.094	0.091	0.091	0.090
Manure Management	0.036	0.036	0.034	0.034	0.032	0.030	0.030	0.030	0.031	0.030	0.028	0.026	0.026	0.025	0.023	0.023	0.022
Ag Soils	0.210	0.205	0.206	0.211	0.203	0.205	0.203	0.209	0.185	0.188	0.197	0.202	0.203	0.209	0.221	0.242	0.193
Rice Cultivation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Agricultural Residue Burning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**0.383**	**0.374**	**0.375**	**0.375**	**0.361**	**0.357**	**0.349**	**0.353**	**0.328**	**0.325**	**0.328**	**0.319**	**0.324**	**0.328**	**0.334**	**0.356**	**0.305**

Emissions by Gas (MMTCH4 or MMTN2O)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Methane	**0.008**	**0.007**	**0.007**	**0.007**	**0.007**	**0.007**	**0.006**	**0.006**	**0.006**	**0.006**	**0.006**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**	**0.005**
Enteric Fermentation	0.007	0.006	0.006	0.006	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.004	0.005	0.004	0.004	0.004	0.004
Manure Management	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Rice Cultivation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Agricultural Residue Burning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrous Oxide	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**
Manure Management	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ag Soils	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Agricultural Residue Burning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Nitrous Oxide Emissions from Ag Soils (metric tons N2O)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Direct	**436**	**424**	**419**	**434**	**407**	**414**	**401**	**417**	**366**	**375**	**387**	**400**	**401**	**418**	**437**	**487**	**396**
Fertilizers	160	154	169	171	176	183	193	198	168	173	194	208	209	210	231	251	171
Crop Residues	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Fixing Crops	28	27	28	26	24	17	11	14	12	12	13	14	14	11	8	8	7
Histosols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Livestock	248	243	222	237	207	214	198	204	186	190	180	177	178	198	198	228	218
Indirect	**243**	**236**	**247**	**247**	**246**	**246**	**255**	**258**	**230**	**230**	**247**	**251**	**255**	**256**	**275**	**295**	**225**
Fertilizers	18	17	19	19	20	20	21	22	19	19	22	23	23	23	26	28	19
Livestock	22	22	21	21	20	19	19	18	18	17	17	15	16	16	16	17	16
Leaching/Runoff	203	197	207	207	207	207	215	217	194	194	208	213	216	217	233	250	190
Fertilizer Runoff/Leached	120	116	127	128	132	137	145	149	126	130	146	156	157	157	173	188	129
Manure Runoff/Leached	83	81	80	79	74	70	70	69	67	64	63	57	59	60	60	62	61
TOTAL	**679**	**660**	**666**	**681**	**653**	**660**	**656**	**674**	**596**	**605**	**634**	**651**	**656**	**674**	**712**	**782**	**621**

Emissions from Municipal Solid Waste - MA Summary

Total Emissions from Landfills and Waste Combustion (MMTCO2E)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CH4	1.863	1.877	1.793	1.759	1.599	1.616	1.463	0.763	0.767	0.602	0.282	0.165	0.207	0.041	0.020	0.016	0.023
CO2	1.107	1.250	1.243	1.392	1.449	1.407	1.551	1.563	1.544	1.509	1.621	1.736	1.747	1.813	1.883	2.098	2.086
N2O	0.037	0.037	0.038	0.039	0.041	0.040	0.041	0.040	0.039	0.036	0.038	0.039	0.038	0.039	0.038	0.038	0.038
Total	**3.007**	**3.164**	**3.074**	**3.191**	**3.090**	**3.062**	**3.055**	**2.367**	**2.350**	**2.147**	**1.940**	**1.939**	**1.992**	**1.893**	**1.941**	**2.152**	**2.147**

CH4 Emissions from Landfills (MTCO2E)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Potential CH4	**2,528,497**	**2,598,406**	**2,613,390**	**2,575,604**	**2,558,868**	**2,604,212**	**2,638,538**	**2,688,912**	**2,725,896**	**2,741,861**	**2,744,154**	**2,732,224**	**2,718,044**	**2,708,769**	**2,695,508**	**2,683,312**	**2,690,618**
MSW Generation	2,363,081	2,428,417	2,442,421	2,407,106	2,391,465	2,433,843	2,465,923	2,513,002	2,547,567	2,562,487	2,564,630	2,553,481	2,540,228	2,531,560	2,519,167	2,507,768	2,514,597
Industrial Generation	165,416	169,989	170,969	168,497	167,403	170,369	172,615	175,910	178,330	179,374	179,524	178,744	177,816	177,209	176,342	175,544	176,022
CH4 Avoided	**(458,632)**	**(513,233)**	**(620,757)**	**(620,757)**	**(781,676)**	**(809,077)**	**(1,012,754)**	**(1,840,590)**	**(1,873,922)**	**(2,072,858)**	**(2,430,950)**	**(2,548,843)**	**(2,487,850)**	**(2,662,832)**	**(2,673,416)**	**(2,665,433)**	**(2,665,433)**
Flare	(458,632)	(513,233)	(620,757)	(547,989)	(708,908)	(736,309)	(612,170)	(1,148,935)	(1,097,372)	(1,231,626)	(1,050,268)	(1,168,161)	(1,107,168)	(1,383,578)	(1,384,460)	(1,376,477)	(1,376,477)
Landfill Gas-to-Energy	-				(72,768)	(72,768)	(400,584)	(691,654)	(776,550)	(841,232)	(1,380,682)	(1,380,682)	(1,380,682)	(1,279,253)	(1,288,956)	(1,288,956)	(1,288,956)
Oxidation at MSW Landfills	**190,445**	**191,518**	**182,166**	**178,635**	**160,979**	**162,477**	**145,317**	**67,241**	**67,364**	**48,963**	**13,368**	**464**	**5,238**	**(13,127)**	**(15,425)**	**(15,766)**	**(15,084)**
Oxidation at Industrial Landfills	**16,542**	**16,999**	**17,097**	**16,850**	**16,740**	**17,037**	**17,261**	**17,591**	**17,833**	**17,937**	**17,952**	**17,874**	**17,782**	**17,721**	**17,634**	**17,554**	**17,602**
Total CH4 Emissions	**1,862,878**	**1,876,656**	**1,793,370**	**1,759,362**	**1,599,473**	**1,615,622**	**1,463,205**	**763,490**	**766,777**	**602,103**	**281,883**	**165,043**	**207,175**	**41,343**	**19,883**	**16,091**	**22,667**
			(72,768)														

CO2 and N2O Emissions from Waste Combustion (MTCO2E) -

Gas/Waste Product	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CO2	**1,107,322**	**1,249,784**	**1,242,771**	**1,391,806**	**1,448,900**	**1,406,683**	**1,550,608**	**1,563,369**	**1,544,265**	**1,508,850**	**1,620,517**	**1,735,551**	**1,746,939**	**1,812,920**	**1,883,375**	**2,098,078**	**2,086,419**
Plastics	742,620	840,080	830,393	932,810	959,865	938,005	1,034,138	1,054,681	1,042,409	1,033,066	1,102,379	1,175,672	1,182,837	1,219,775	1,243,342	1,354,715	1,332,709
Synthetic Rubber in MSW	161,746	177,672	170,200	186,072	191,260	167,245	181,853	176,438	171,575	159,115	174,106	190,680	189,377	197,902	262,606	344,099	335,248
Synthetic Fibers	202,956	232,032	242,178	272,924	297,775	301,432	334,616	332,250	330,282	316,670	344,032	369,199	374,725	395,243	377,426	399,264	418,462
N2O	**36,751**	**37,369**	**37,864**	**39,473**	**41,329**	**39,721**	**40,710**	**40,092**	**38,854**	**36,380**	**37,988**	**38,731**	**38,236**	**38,731**	**38,112**	**38,236**	**38,359**
Total CO2 and N2O Emissions	**1,144,073**	**1,287,154**	**1,280,636**	**1,431,279**	**1,490,229**	**1,446,404**	**1,591,318**	**1,603,461**	**1,583,119**	**1,545,229**	**1,658,505**	**1,774,282**	**1,785,174**	**1,851,650**	**1,921,487**	**2,136,314**	**2,124,779**

Emissions from Wastewater - MA Summary

Emissions were not calculated for the following sources: Industrial Fruits & Vegetables, Industrial Red Meat & Poultry, and Industrial Pulp & Paper.

Emissions (MMTCO2E)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Municipal CH4	0.40	0.40	0.40	0.40	0.41	0.41	0.41	0.41	0.41	0.42	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Municipal N2O	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Industrial CH4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fruits & Vegetables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Red Meat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poultry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pulp & Paper	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Emissions	0.57	0.57	0.57	0.57	0.58	0.58	0.58	0.58	0.59	0.59	0.61	0.62	0.62	0.62	0.62	0.62	0.62	0.62

DATA SOURCE KEY

ISO	*ISO Adjusted*
EIA	*EIA Adjusted*
ISO + EIA	*ISO + EIA Adjusted*
EPA + EIA (manual entering into SGIT)	
ISO + EPA + EIA (manual entering into SGIT)	*ISO + EIA + EPA Adjusted*
ISO + Environment Canada	
ISO + EPA + EIA + Environment Canada	

ACCOUNTED FOR ELSEWHERE

RESULT

BASED ON PLACEHOLDER AVERAGE†

*ADJUSTED (italics)**

MA Electricity Import Emissions

† A placeholder average was used as the emissions factor for extra-NE imports in the years 1990-1999 and 2007-2008 (see T55:73)

** Adjusted numbers indicate where generation numbers for New England States from 1990-1999 were adjusted to reconcile EIA and ISO generation data (see EIA Adjust sheet).*

NB: Maine emissions (see AE29:AF47) were adjusted using placeholder averages to match the geographic scope of the EPA emissions data for Maine to that of ISO generation data (see Y50:AL70). This adjustment is not marked in italics or red numbering as these indicators would then permeate most of the document.

Master Table

	MA Basic Information						MA Import Need	MA Share of NE Imports		MA Total Import (MWh) - Assigned			MA Emissions from Intra-NE Imports	MA Emissions from Extra-NE Imports				MA Electricity Import Emissions	MA Electricity Consumption Emissions
Year	MA Electric Generation (MWh)	MA Electric Load (MWh)	MA Electric Load Including Pumping (MWh)	CO2 Emissions from Electricity (MMTCDE)	CH4 and N2O Emissions from Electricity (MMTCDE)	GHG Emissions from Electricity (MMTCDE)	MA Electricity Imports [Gen-Load] (MWh)	Total of State/Region Shortfalls [incl. NY, NB, Q] (MWh)	MA Fraction of Intra-NE imports	Imports to MA from other NE States (MWh)	Imports to MA from outside NE (MWh)	Total Imports to MA (MWh)	MA GHG Emissions from Intra-NE Imports (MMTCDE)	MA CO2 Emissions from NY Imports (MMTCDE)	MA CH4 and N2O Emissions from NY Imports (MMTCDE)	MA Total Emissions from NB and Quebec Imports (MMTCDE)	MA Total Emissions from Extra-NE Imports (MMTCDE)	MA Total Emissions from Electricity Imports (MMTCDE)	MA Total Emissions from Electricity Consumption (MMTCDE)
1990	*41,567,784*	48,929,000	49,989,040	25.64	0.12	25.76	*8,421,256*	*15,288,906*	*0.55*	*4,461,116*	*3,960,702*	*8,421,818*	*1.47*	See T29	See T29	See T29	0.55	*2.02*	*27.78*
1991	*42,829,901*	48,155,000	49,162,568	26.29	0.13	26.42	*6,332,667*	*14,729,187*	*0.43*	*3,424,798*	*2,907,430*	*6,332,228*	*0.84*	See T30	See T30	See T30	0.40	*1.24*	*27.67*
1992	*41,856,634*	48,161,000	49,221,794	24.75	0.12	24.87	*7,365,160*	*11,832,330*	*0.62*	*4,653,822*	*2,710,701*	*7,364,524*	*1.17*	See T31	See T31	See T31	0.38	*1.55*	*26.42*
1993	*38,715,430*	48,644,000	49,737,183	22.27	0.11	22.38	*11,021,753*	*13,886,865*	*0.79*	*6,919,753*	*4,101,189*	*11,020,942*	*1.70*	See T32	See T32	See T32	0.57	*2.27*	*24.65*
1994	*39,613,228*	49,354,000	50,383,481	22.53	0.12	22.65	*10,770,253*	*14,826,410*	*0.73*	*4,496,565*	*6,274,429*	*10,770,995*	*1.11*	See T33	See T33	See T33	0.87	*1.99*	*24.63*
1995	*39,316,090*	49,681,000	50,726,174	21.50	0.11	21.61	*11,410,084*	*19,024,201*	*0.60*	*3,597,919*	*7,812,165*	*11,410,084*	*1.00*	See T34	See T34	See T34	1.09	*2.09*	*23.70*
1996	*39,628,844*	50,467,000	51,509,767	20.94	0.11	21.05	*11,880,922*	*26,016,593*	*0.46*	*5,037,197*	*6,843,725*	*11,880,922*	*1.27*	See T35	See T35	See T35	0.95	*2.22*	*23.28*
1997	*46,949,550*	50,855,000	51,677,364	26.38	0.13	26.51	*4,727,814*	*23,599,940*	*0.20*	*1,764,963*	*2,962,647*	*4,727,611*	*0.57*	See T36	See T36	See T36	0.41	*0.98*	*27.49*
1998	*47,699,530*	51,778,000	52,457,523	26.94	0.13	27.07	*4,757,993*	*21,895,002*	*0.22*	*1,897,079*	*2,860,914*	*4,757,993*	*0.57*	See T37	See T37	See T37	0.40	*0.97*	*28.04*
1999	*42,365,897*	54,492,000	55,430,007	24.04	0.12	24.17	*13,064,110*	*21,735,743*	*0.60*	*3,740,661*	*9,323,449*	*13,064,110*	*1.07*	See T38	See T38	See T38	1.30	*2.37*	*26.54*
2000	41,234,000	56,342,000	57,525,059	22.12	0.12	22.25	16,291,059	21,931,567	0.74	3,044,470	13,246,589	16,291,059	0.92	0.74	0.0030	1.38	2.12	3.04	25.28
2001	41,480,000	56,953,000	58,117,861	21.93	0.10	22.03	16,637,861	21,795,994	0.76	5,609,817	11,026,517	16,636,334	1.76	0.99	0.0038	1.43	2.43	4.18	26.21
2002	44,506,000	57,992,000	59,045,585	22.75	0.10	22.85	14,539,585	22,979,904	0.63	8,071,404	6,467,548	14,538,952	2.35	0.00	0.0000	0.93	0.93	3.29	26.14
2003	49,336,000	59,471,000	60,315,921	24.87	0.10	24.98	10,979,921	19,046,499	0.58	7,590,220	3,389,701	10,979,921	2.48	0.00	0.0000	0.45	0.45	2.93	27.91
2004	48,657,000	59,983,000	60,819,938	23.62	0.10	23.72	12,162,938	19,377,213	0.63	9,010,656	3,150,390	12,161,047	2.90	0.00	0.0000	0.42	0.42	3.32	27.04
2005	48,635,000	61,805,000	62,629,490	24.33	0.11	24.44	13,994,490	20,270,993	0.69	9,568,526	4,426,654	13,995,180	2.97	0.00	0.0000	0.54	0.54	3.51	27.95
2006	46,977,000	60,180,000	61,161,837	21.32	0.09	21.42	14,184,837	18,955,918	0.75	8,895,058	5,290,527	14,185,585	2.57	0.00	0.0000	0.31	0.31	2.88	24.30
2007	49,557,000	61,559,000	62,659,102	23.38	0.07	23.45	13,102,102	21,693,702	0.60	7,894,165	5,207,936	13,102,102	2.21	0.00	0.0000	See T46	0.72	*2.93*	*26.39*
2008	44,957,000	60,487,000	61,521,029	20.15	0.07	20.22	16,564,029	24,000,447	0.69	9,129,667	7,433,659	16,563,327	2.46	See T47	See T47	See T47	1.03	*3.49*	*23.71*

Emissions Factor for Extra-NE Imports (All Gases)	
	(MMTCDE/MWh)
1990	0.000000139
1991	0.000000139
1992	0.000000139
1993	0.000000139
1994	0.000000139
1995	0.000000139
1996	0.000000139
1997	0.000000139
1998	0.000000139
1999	0.000000139
2000	0.000000160
2001	0.000000220
2002	0.000000144
2003	0.000000133
2004	0.000000134
2005	0.000000122
2006	0.000000059
2007	0.000000139
2008	0.000000139

Note: 1990-1999 and 2007-2008 are the average of the 2000-2006 emissions factors.

DATA SOURCE KEY

ISO	*ISO Adjusted*
EIA	*EIA Adjusted*
ISO + EIA	*ISO + EIA Adjusted*
EPA + EIA (manual entering into SGIT)	
ISO + EPA + EIA (manual entering into SGIT)	*ISO + EIA + EPA Adjusted*
ISO + Environment Canada	
ISO + EPA + EIA + Environment Canada	

ACCOUNTED FOR ELSEWHERE

RESULT

BASED ON PLACEHOLDER AVERAG

*ADJUSTED (italics)**

† A placeholder average was used as the emissions factor for extra-NE imports in the years 1990-1999 and 2007-2008 (see T55:73)

** Adjusted numbers indicate where generation numbers for New England States from 1990-1999 were adjusted to reconcile EIA and ISO generation data (see EIA Adjust sheet).*

NB: Maine emissions (see AE29:AF47) were adjusted using placeholder averages to match the geographic scope of the EPA emissions data for Maine to that of ISO generation data (see Y50:AL70). This adjustment is not marked in italics or red numbering as these indicators would then permeate most of the document.

Intra-ISO-NE Electricity Imports

	ME									
	Electric Generation (MWh)	Electric Load (MWh)	Electric Load Including Pumping (MWh)	Net Export (MWh)	MA Share of Net Exports (MWh)	CO2 Emissions from Electricity (MMTCDE)	CH4 and N2O Emissions from Electricity (MMTCDE)	GHG Emissions from Electricity (MMTCDE)	GHG Emissions from Exports (MMTCDE)	MA Share of GHG Emissions from Exports (MMTCDE)
1990	*11,933,711*	10,094,000	10,312,685	*1,621,026*	*892,875*	2.04	0.0316	2.07	*0.28*	*0.15*
1991	*12,980,525*	9,953,000	10,161,251	*2,819,274*	*1,212,119*	1.64	0.0320	1.68	*0.36*	*0.16*
1992	*11,737,284*	9,889,000	10,106,815	*1,630,469*	*1,014,903*	1.61	0.0363	1.65	*0.23*	*0.14*
1993	*11,685,442*	9,995,000	10,219,619	*1,465,823*	*1,163,397*	1.27	0.0407	1.32	*0.16*	*0.13*
1994	*12,315,487*	9,977,000	10,185,111	*2,130,376*	*1,547,555*	1.18	0.0324	1.21	*0.21*	*0.15*
1995	*7,306,493*	9,620,000	9,822,383	*0*	*0*	1.21	0.0262	1.23	*0.00*	*0.00*
1996	*11,176,617*	10,139,000	10,348,496	*828,122*	*378,176*	1.06	0.0273	1.09	*0.08*	*0.04*
1997	*7,733,337*	10,291,000	10,457,413	*0*	*0*	1.71	0.0282	1.74	*0.00*	*0.00*
1998	*8,234,688*	10,167,000	10,300,430	*0*	*0*	1.90	0.0326	1.93	*0.00*	*0.00*
1999	*9,484,941*	11,215,000	11,408,051	*0*	*0*	3.21	0.0392	3.25	*0.00*	*0.00*
2000	10,354,000	12,189,000	12,444,942	0	0	3.35	0.0380	3.39	0.00	0.00
2001	15,669,000	12,015,000	12,260,743	3,408,257	2,601,676	5.51	0.0445	5.55	1.21	0.92
2002	16,065,000	11,553,000	11,762,892	4,302,108	2,721,981	5.70	0.0433	5.74	1.54	0.97
2003	14,736,000	11,692,000	11,858,112	2,877,888	1,659,044	4.63	0.0437	4.67	0.91	0.53
2004	14,747,000	11,987,000	12,154,254	2,592,746	1,627,448	4.38	0.0436	4.42	0.78	0.49
2005	14,249,000	12,209,000	12,371,870	1,877,130	1,295,914	3.64	0.0545	3.70	0.49	0.34
2006	12,024,000	11,731,000	11,922,391	101,609	76,034	2.53	0.0499	2.58	0.02	0.02
2007	11,551,000	11,969,000	12,182,894	0	0	2.43	0.0044	2.44	0.00	0.00
2008	12,554,000	11,806,000	12,007,824	546,176	376,946	2.14	0.0027	2.15	0.09	0.06

	NH									
	Electric Generation (MWh)	Electric Load (MWh)	Electric Load Including Pumping (MWh)	Net Export (MWh)	MA Share of Net Exports (MWh)	CO2 Emissions from Electricity (MMTCDE)	CH4 and N2O Emissions from Electricity (MMTCDE)	GHG Emissions from Electricity (MMTCDE)	GHG Emissions from Exports (MMTCDE)	MA Share of GHG Emissions from Exports (MMTCDE)
1990	*12,570,060*	9,098,000	9,295,107	*3,274,953*	*1,803,871*	4.85	0.0395	4.89	*1.27*	*0.70*
1991	*14,410,342*	9,074,000	9,263,859	*5,146,483*	*2,212,679*	4.42	0.0388	4.46	*1.59*	*0.68*
1992	*15,318,160*	9,268,000	9,472,137	*5,846,023*	*3,638,919*	4.28	0.0385	4.32	*1.65*	*1.03*
1993	*16,458,624*	9,278,000	9,486,506	*6,972,119*	*5,533,644*	4.46	0.0400	4.50	*1.91*	*1.51*
1994	*13,641,413*	9,386,000	9,581,784	*4,059,629*	*2,949,010*	4.41	0.0380	4.45	*1.32*	*0.96*
1995	*15,639,501*	9,442,000	9,640,638	*5,998,863*	*3,597,919*	4.32	0.0366	4.36	*1.67*	*1.00*
1996	*17,290,424*	9,534,000	9,730,995	*7,559,429*	*3,452,143*	4.11	0.0367	4.14	*1.81*	*0.83*
1997	*16,091,268*	9,705,000	9,861,937	*6,229,331*	*1,247,932*	5.09	0.0415	5.13	*1.99*	*0.40*
1998	*16,302,671*	9,822,000	9,950,902	*6,351,769*	*1,380,300*	4.73	0.0400	4.77	*1.86*	*0.40*
1999	*16,404,400*	10,499,000	10,679,726	*5,724,674*	*3,440,774*	4.61	0.0390	4.65	*1.61*	*0.97*
2000	15,060,000	10,736,000	10,961,433	4,098,567	3,044,470	4.49	0.0403	4.53	1.23	0.92
2001	15,030,000	10,867,000	11,089,263	3,940,737	3,008,142	4.14	0.0371	4.18	1.09	0.84
2002	17,199,000	10,938,000	11,136,719	6,062,281	3,835,658	4.30	0.0367	4.34	1.53	0.97
2003	21,881,000	11,430,000	11,592,389	10,288,611	5,931,176	7.17	0.0415	7.21	3.39	1.95
2004	23,720,000	11,793,000	11,957,547	11,762,453	7,383,208	7.71	0.0426	7.75	3.84	2.41
2005	24,299,000	12,154,000	12,316,137	11,982,863	8,272,612	7.70	0.0424	7.74	3.82	2.64
2006	22,411,000	11,934,000	12,128,703	10,282,297	7,694,309	6.74	0.0401	6.78	3.11	2.33
2007	23,601,000	12,075,000	12,290,789	11,310,211	6,830,901	6.63	0.0248	6.65	3.19	1.93
2008	23,426,000	11,805,000	12,006,807	11,419,193	7,881,013	6.32	0.0214	6.34	3.09	2.13

	VT		
	Electric Generation (MWh)	Electric Load (MWh)	Electric Load Including Pumping (MWh)
1990	*4,847,376*	5,725,000	5,849,031
1991	*5,057,522*	5,672,000	5,790,678
1992	*4,571,441*	5,849,000	5,977,830
1993	*4,358,947*	5,841,000	5,972,266
1994	*5,272,519*	5,867,000	5,989,380
1995	*4,843,578*	5,903,000	6,027,186
1996	*5,021,978*	6,025,000	6,149,491
1997	*5,332,132*	6,076,000	6,174,254
1998	*4,642,924*	6,118,000	6,198,291
1999	*5,353,773*	6,182,000	6,288,415
2000	5,638,000	6,186,000	6,315,892
2001	4,923,000	6,094,000	6,218,641
2002	4,943,000	6,181,000	6,293,295
2003	5,697,000	6,197,000	6,285,043
2004	5,170,000	6,173,000	6,259,131
2005	5,455,000	6,335,000	6,419,510
2006	6,588,000	6,220,000	6,321,479
2007	6,035,000	6,292,000	6,404,442
2008	6,322,000	6,194,000	6,299,887

Adjustment for Northern Maine

Northern Maine Independent System Administrator (NMISA)
Total Load and Total Generation
2000 - 2008

	Total Load	Total Gen
	MWh	MWh
2000	829,647	666,582
2001	815,125	658,577
2002	822,909	542,465
2003	836,046	509,343
2004	849,760	526,510
2005	824,351	716,583
2006	823,009	769,959
2007	816,978	748,969
2008	789,396	840,899

4/3/2009, NMISA

Maine Emissions Adjustment to Account for NMISA (2000-2008)

	NMISA Generation	ISO ME Generation	Total ME Generation	ISO Gen % of Total ME Generation
	MWh	MWh	MWh	Generation
2000	666,582	10,354,000	11,020,582	93.95%
2001	658,577	15,669,000	16,327,577	95.97%
2002	542,465	16,065,000	16,607,465	96.73%
2003	509,343	14,736,000	15,245,343	96.66%
2004	526,510	14,747,000	15,273,510	96.55%
2005	716,583	14,249,000	14,965,583	95.21%
2006	769,959	12,024,000	12,793,959	93.98%
2007	748,969	11,551,000	12,299,969	93.91%
2008	840,899	12,554,000	13,394,899	93.72%
			Average=	95.19%

DATA SOURCE KEY

ISO	*ISO Adjusted*
EIA	*EIA Adjusted*
ISO + EIA	*ISO + EIA Adjusted*
EPA + EIA (manual entering into SGIT)	
ISO + EPA + EIA (manual entering into SG	*ISO + EIA + EPA Adjusted*
ISO + Environment Canada	
ISO + EPA + EIA + Environment Canada	

ACCOUNTED FOR ELSEWHERE

RESULT

BASED ON PLACEHOLDER AVERAGE†

*ADJUSTED (italics)**

† A placeholder average was used as the emissions factor for extra-NE imports in the years 1990-1999 and 2007-2008

** Adjusted numbers indicate where generation numbers for New England States from 1990-1999 were adjusted to reconcile EIA and ISO generation data (see EIA Adjust sheet).*

NB: Maine emissions (see AE29:AF47) were adjusted using placeholder averages to match the geographic scope of the EPA emissions data for Maine to that of ISO generation data (see Y50:AL70). This adjustment is not marked in italics or red numbering as these indicators would then permeate most of the document.

Net Export (MWh)	MA Share of Net Exports (MWh)	CO2 Emissions from Electricity (MMTCDE)	CH4 and N2O Emissions from Electricity (MMTCDE)	GHG Emissions from Electricity (MMTCDE)	GHG Emissions from Exports (MMTCDE)	MA Share of GHG Emissions from Exports (MMTCDE)
0	0	0.04	0.0012	0.04	0.00	0.00
0	0	0.06	0.0014	0.07	0.00	0.00
0	0	0.05	0.0017	0.05	0.00	0.00
0	0	0.02	0.0034	0.02	0.00	0.00
0	0	0.02	0.0036	0.02	0.00	0.00
0	0	0.02	0.0042	0.03	0.00	0.00
0	0	0.01	0.0044	0.01	0.00	0.00
0	0	0.02	0.0047	0.02	0.00	0.00
0	0	0.06	0.0046	0.06	0.00	0.00
0	0	0.04	0.0051	0.05	0.00	0.00
0	0	0.12	0.0050	0.13	0.00	0.00
0	0	0.04	0.0048	0.05	0.00	0.00
0	0	0.02	0.0101	0.03	0.00	0.00
0	0	0.03	0.0114	0.04	0.00	0.00
0	0	0.02	0.0082	0.03	0.00	0.00
0	0	0.01	0.0064	0.01	0.00	0.00
266,521	199,439	0.01	0.0070	0.01	0.00	0.00
0	0	0.01	0.0000	0.01	0.00	0.00
22,113	15,262	0.00	0.0000	0.00	0.00	0.00

CT

	Electric Generation (MWh)	Electric Load (MWh)	Electric Load Including Pumping (MWh)	Net Export (MWh)	MA Share of Net Exports (MWh)	CO2 Emissions from Electricity (MMTCDE)	CH4 and N2O Emissions from Electricity (MMTCDE)	GHG Emissions from Electricity (MMTCDE)	GHG Emissions from Exports (MMTCDE)	MA Share of GHG Emissions from Exports (MMTCDE)
1990	32,569,974	28,744,000	29,366,735	3,203,239	1,764,371	11.26	0.0605	11.32	1.11	0.61
1991	25,053,939	28,690,000	29,290,293	0	0	10.83	0.0600	10.89	0.00	0.00
1992	27,069,370	28,575,000	29,204,393	0	0	8.68	0.0580	8.74	0.00	0.00
1993	30,473,214	29,529,000	30,192,609	280,605	222,711	7.50	0.0535	7.55	0.07	0.06
1994	28,892,632	30,332,000	30,964,699	0	0	7.33	0.0534	7.38	0.00	0.00
1995	29,164,661	30,805,000	31,453,067	0	0	8.14	0.0629	8.20	0.00	0.00
1996	18,729,338	31,095,000	31,737,496	0	0	9.26	0.0634	9.32	0.00	0.00
1997	16,378,277	31,180,000	31,684,204	0	0	12.45	0.0728	12.52	0.00	0.00
1998	18,247,557	31,352,000	31,763,457	0	0	11.32	0.0677	11.39	0.00	0.00
1999	26,499,947	31,767,000	32,313,827	0	0	10.13	0.0590	10.19	0.00	0.00
2000	31,873,000	32,009,000	32,681,119	0	0	10.81	0.0742	10.89	0.00	0.00
2001	29,903,000	32,580,000	33,246,359	0	0	9.56	0.0513	9.61	0.00	0.00
2002	27,111,000	33,192,000	33,795,024	0	0	8.59	0.0423	8.63	0.00	0.00
2003	27,825,000	33,647,000	34,125,032	0	0	7.82	0.0444	7.87	0.00	0.00
2004	30,095,000	34,159,000	34,635,618	0	0	8.60	0.0448	8.64	0.00	0.00
2005	32,660,000	35,202,000	35,671,601	0	0	9.89	0.0481	9.94	0.00	0.00
2006	30,310,000	33,655,000	34,204,081	0	0	9.40	0.0458	9.45	0.00	0.00
2007	29,475,000	33,981,000	34,588,264	0	0	8.77	0.0266	8.79	0.00	0.00
2008	27,617,000	32,958,000	33,521,419	0	0	7.76	0.0260	7.79	0.00	0.00

RI

	Electric Generation (MWh)	Electric Load (MWh)	Electric Load Including Pumping (MWh)	Net Export (MWh)	MA Share of Net Exports (MWh)	CO2 Emissions from Electricity (MMTCDE)	CH4 and N2O Emissions from Electricity (MMTCDE)	GHG Emissions from Electricity (MMTCDE)	GHG Emissions from Exports (MMTCDE)	MA Share of GHG Emissions from Exports (MMTCDE)
1990	1,461,386	7,172,000	7,327,380	0	0	0.67	0.0022	0.67	0.00	0.00
1991	3,861,362	7,139,000	7,288,372	0	0	1.36	0.0026	1.36	0.00	0.00
1992	6,315,296	7,085,000	7,241,054	0	0	2.17	0.0034	2.17	0.00	0.00
1993	6,157,047	7,246,000	7,408,840	0	0	1.99	0.0033	2.00	0.00	0.00
1994	6,246,295	7,360,000	7,513,523	0	0	2.12	0.0033	2.12	0.00	0.00
1995	5,923,339	7,394,000	7,549,553	0	0	1.98	0.0032	1.98	0.00	0.00
1996	10,188,553	7,393,000	7,545,757	2,642,797	1,206,878	3.44	0.0048	3.44	0.89	0.41
1997	10,174,721	7,473,000	7,593,844	2,580,877	517,031	3.36	0.0046	3.36	0.85	0.17
1998	10,128,474	7,650,000	7,750,397	2,378,077	516,779	3.28	0.0047	3.29	0.77	0.17
1999	8,415,919	7,783,000	7,916,974	498,945	299,888	2.97	0.0045	2.97	0.18	0.11
2000	6,035,000	7,932,000	8,098,555	0	0	2.66	0.0042	2.67	0.00	0.00
2001	7,620,000	7,976,000	8,139,133	0	0	3.21	0.0047	3.22	0.00	0.00
2002	10,714,000	8,173,000	8,321,485	2,392,515	1,513,765	2.93	0.0043	2.93	0.65	0.41
2003	7,720,000	8,341,000	8,459,503	0	0	2.29	0.0036	2.29	0.00	0.00
2004	7,068,000	8,423,000	8,540,526	0	0	1.96	0.0033	1.96	0.00	0.00
2005	6,580,000	8,650,000	8,765,393	0	0	2.39	0.0023	2.39	0.00	0.00
2006	9,740,000	8,367,000	8,503,508	1,236,492	925,275	2.33	0.0044	2.33	0.30	0.22
2007	10,504,000	8,590,000	8,743,509	1,760,491	1,063,264	2.81	0.0027	2.81	0.47	0.28
2008	9,871,000	8,485,000	8,630,052	1,240,948	856,447	3.02	0.0028	3.02	0.38	0.26

DATA SOURCE KEY

ISO	*ISO Adjusted*
EIA	*EIA Adjusted*
ISO + EIA	*ISO + EIA Adjusted*
EPA + EIA (manual entering into SGIT)	
ISO + EPA + EIA (manual entering into SGIT)	*ISO + EIA + EPA Adjusted*
ISO + Environment Canada	
ISO + EPA + EIA + Environment Canada	

ACCOUNTED FOR ELSEWHERE

RESULT

BASED ON PLACEHOLDER AVERAGE

*ADJUSTED (italics)**

† A placeholder average was used as the emissions factor for extra-NE imports in the years 1990-1999 and 2007-2008 (see

** Adjusted numbers indicate where generation numbers for New England States from 1990-1999 were adjusted to reconcile EIA and ISO generation data (see EIA Adjust sheet).*

NB: Maine emissions (see AE29:AF47) were adjusted using placeholder averages to match the geographic scope of the EPA emissions data for Maine to that of ISO generation data (see Y50:AL70). This adjustment is not marked in italics or red numbering as these indicators would then permeate most of the document.

Extra-ISO-NE Electricity Imports

	NY									
	Generation (MWh)	Exports into NE minus Imports from NE (MWh)	Net Exports into NE (MWh)	MA Share of NY Net Exports (MWh)	Electricity CO2 Emissions (MMTCDE)	CO2 Emissions from Exports (MMTCDE)	MA Share of CO2 Emissions from Exports (MMTCDE)	Electricity CH4 and N2O Emissions (MMTCDE)	CH4 and N2O Emissions from Exports (MMTCDE)	MA Share of CH4 and N2O Emissions from Exports (MMTCDE)
1990	135,345,692				64.01		See T29	0.2585		See T29
1991	134,600,500				59.51		See T30	0.2467		See T30
1992	125,948,924				54.31		See T31	0.2393		See T31
1993	124,221,032				47.95		See T32	0.2111		See T32
1994	126,029,570				47.68		See T33	0.2094		See T33
1995	133,413,281				51.38		See T34	0.2005		See T34
1996	135,732,248				47.01		See T35	0.2040		See T35
1997	140,831,647				52.47		See T36	0.2127		See T36
1998	144,863,251				56.44		See T37	0.2310		See T37
1999	146,280,863				57.10		See T38	0.2248		See T38
2000	138,079,074	2,443,000	2,443,000	1,814,693	56.16	0.99	0.74	0.2320	0.0041	0.0030
2001	143,914,537	3,383,000	3,383,000	2,582,396	55.35	1.30	0.99	0.2106	0.0050	0.0038
2002	139,591,687	-406,000	0	0	51.04	0.00	0.00	0.1931	0.0000	0.0000
2003	137,643,316	-439,000	0	0	52.36	0.00	0.00	0.2109	0.0000	0.0000
2004	137,964,794	-112,000	0	0	52.86	0.00	0.00	0.2126	0.0000	0.0000
2005	146,887,419	-115,000	0	0	55.58	0.00	0.00	0.2124	0.0000	0.0000
2006	142,265,432	-877,000	0	0	46.54	0.00	0.00	0.1755	0.0000	0.0000
2007	145,878,687	-2,477,000	0	0	49.19	0.00	0.00	0.1492	0.0000	0.0000
2008		-1,532,000	0	0	42.72		See T47	0.1262		See T47

	NB			
	Exports into NE minus Imports from NE (GWh)	Net Exports into NE (MWh)	MA Share of NB Net Exports (MWh)	MA Share of Total Emissions from Exports (MMTCDE)
1990				See T29
1991				See T30
1992				See T31
1993				See T32
1994				See T33
1995				See T34
1996				See T35
1997				See T36
1998				See T37
1999				See T38
2000	3,957,000	3,957,000	2,939,312	1.364
2001	3,523,000	3,523,000	2,689,264	1.412
2002	2,883,000	2,883,000	1,824,099	0.925
2003	1,645,000	1,645,000	948,309	0.428
2004	1,330,000	1,330,000	834,831	0.400
2005	1,620,000	1,620,000	1,118,400	0.529
2006	1,047,000	1,047,000	783,477	0.287
2007	896,000	896,000	541,147	See T46
2008	1,285,000	1,285,000		See T47

	Quebec			
	Exports into NE minus Imports from NE (GWh)	Net Exports into NE (MWh)	MA Share of Quebec Net Exports (MWh)	MA Share of Total Emissions from Exports (MMTCDE)
1990				See T29
1991				See T30
1992				See T31
1993				See T32
1994				See T33
1995				See T34
1996				See T35
1997				See T36
1998				See T37
1999				See T38
2000	11,433,000	11,433,000	8,492,584	0.017
2001	7,539,000	7,539,000	5,754,857	0.017
2002	7,339,000	7,339,000	4,643,449	0.009
2003	4,235,000	4,235,000	2,441,392	0.024
2004	3,689,000	3,689,000	2,315,559	0.021
2005	4,792,000	4,792,000	3,308,254	0.010
2006	6,023,000	6,023,000	4,507,050	0.027
2007	7,727,000	7,727,000	4,666,789	See T46
2008	9,486,000	9,486,000	6,546,810	See T47

Canadian Provinces' Electricity Generation Greenhouse Gas Intensity

Includes emissions of CO_2, CH_4 and N_2O. Does not include line losses.

	Quebec		New Brunswick	
	g CO_2E/ kWh	MMTCDE/MWh	g CO_2E/ kWh	MMTCDE/MWh
1990	**12**	0.000000012	**365**	0.000000365
1991	**4**	0.000000004	**350**	0.000000350
1992	**7**	0.000000007	**391**	0.000000391
1993	**2**	0.000000002	**346**	0.000000346
1994	**3**	0.000000003	**392**	0.000000392
1995	**2**	0.000000002	**547**	0.000000547
1996	**2**	0.000000002	**393**	0.000000393
1997	**2**	0.000000002	**513**	0.000000513
1998	**10**	0.000000010	**512**	0.000000512
1999	**6**	0.000000006	**453**	0.000000453
2000	**2**	0.000000002	**464**	0.000000464
2001	**3**	0.000000003	**525**	0.000000525
2002	**2**	0.000000002	**507**	0.000000507
2003	**10**	0.000000010	**451**	0.000000451
2004	**9**	0.000000009	**479**	0.000000479
2005	**3**	0.000000003	**473**	0.000000473
2006	**6**	0.000000006	**366**	0.000000366

Environment Canada, National Inventory Report, 1990-2005: Greenhouse Gas Sources and Sinks in Canada (April 2007), Annex 9: Electricity Intensity Tables
http://www.ec.gc.ca/pdb/ghg/inventory_report/2006_report/a9_eng.cfm#ta9_6

DATA SOURCE KEY

ISO	*ISO Adjusted*
EIA	*EIA Adjusted*
ISO + EIA	*ISO + EIA Adjusted*
EPA + EIA (manual entering into SGIT)	
ISO + EPA + EIA (manual entering into SGIT)	*ISO + EIA + EPA Adjusted*
ISO + Environment Canada	
ISO + EPA + EIA + Environment Canada	

ACCOUNTED FOR ELSEWHERE

RESULT

BASED ON PLACEHOLDER AVERAGE†

*ADJUSTED (italics)**

† A placeholder average was used as the emissions factor for extra-NE imports in the years 1990-1999 and 2007-2008 (see T55:73)

** Adjusted numbers indicate where generation numbers for New England States from 1990-1999 were adjusted to reconcile EIA and ISO generation data (see EIA Adjust sheet).*

NB: Maine emissions (see AE29:AF47) were adjusted using placeholder averages to match the geographic scope of the EPA emissions data for Maine to that of ISO generation data (see Y50:AL70). This adjustment is not marked in italics or red numbering as these indicators would then permeate most of the document.

MA electricity consumption emissions based on region-wide generation and imports

	New England							
	Total NE Generation [except N. ME] (MWh)	NE Load (MWh)	NE Hydro Pumping Load (MWh)	Total NE Load (MWh)	Actual Imports (MWh)	NE GHG Emissions Associated with Load (MMTCDE)	NE Average GHG Emission Factor (MMTCDE/MWh)	MA Electricity Consumption Emissions based on NE Average GHG Emission Factor (MMTCDE)
1990	*104,950,291*	109,763,000	2,378,000	112,141,000	*7,190,709*	45.31	0.00000040	20.20
1991	*104,193,591*	108,682,000	2,274,000	110,956,000	*6,762,409*	45.28	0.00000041	20.06
1992	*106,868,185*	108,826,000	2,397,000	111,223,000	*4,354,815*	42.18	0.00000038	18.67
1993	*107,848,704*	110,532,000	2,484,000	113,016,000	*5,167,296*	38.34	0.00000034	16.87
1994	*105,981,574*	112,277,000	2,342,000	114,619,000	*8,637,426*	38.71	0.00000034	17.02
1995	*102,193,662*	112,845,000	2,374,000	115,219,000	*13,025,338*	38.50	0.00000033	16.95
1996	*102,035,755*	114,653,000	2,369,000	117,022,000	*14,986,245*	40.02	0.00000034	17.61
1997	*102,659,285*	115,579,000	1,869,000	117,448,000	*14,788,715*	49.69	0.00000042	21.87
1998	*105,255,844*	116,887,000	1,534,000	118,421,000	*13,165,156*	48.90	0.00000041	21.66
1999	*108,524,876*	121,938,000	2,099,000	124,037,000	*15,512,124*	46.57	0.00000038	20.81
2000	110,195,000	125,394,000	2,633,000	128,027,000	17,832,000	46.70	0.00000036	20.99
2001	114,626,000	126,485,000	2,587,000	129,072,000	14,446,000	47.82	0.00000037	21.53
2002	120,539,000	128,029,000	2,326,000	130,355,000	9,816,000	46.00	0.00000035	20.84
2003	127,195,000	130,778,000	1,858,000	132,636,000	5,441,000	47.84	0.00000036	21.76
2004	129,459,000	132,517,000	1,849,000	134,366,000	4,907,000	47.19	0.00000035	21.36
2005	131,877,000	136,355,000	1,819,000	138,174,000	6,297,000	49.00	0.00000035	22.21
2006	128,049,000	132,087,000	2,155,000	134,242,000	6,193,000	42.99	0.00000032	19.59
2007	130,723,000	134,466,000	2,403,000	136,869,000	6,146,000	44.87	0.00000033	20.54
2008	124,747,000	131,734,000	2,252,000	133,986,000	9,239,000	40.55	0.00000030	18.62

EIA Generation Data Adjustment

State-by-State generation data is not available from ISO-NE for the years 1990-1999. The following tables adjust EIA generation data for these years to ameliorate any systematic discrepancies between the two datasets.

MA ADJUSTMENT

Year	EIA MA Generation (MWh)	ISO-NE MA Generation (MWh)	Difference (MWh)	Difference as Percent	Adjusted EIA MA Generation (MWh)
1990	39811013			4.41%	41567784
1991	41019789			4.41%	42829901
1992	40087655			4.41%	41856634
1993	37079207			4.41%	38715430
1994	37939062			4.41%	39613228
1995	37654482			4.41%	39316090
1996	37954018			4.41%	39628844
1997	44965330			4.41%	46949550
1998	45683614			4.41%	47699530
1999	40575395			4.41%	42365897
2000	38697880	41,234,000	2,536,120	6.55%	41234000
2001	38478433	41,480,000	3,001,567	7.80%	41480000
2002	42027818	44,506,000	2,478,182	5.90%	44506000
2003	48385024	49,336,000	950,976	1.97%	49336000
2004	47500483	48,657,000	1,156,517	2.43%	48657000
2005	47515443	48,635,000	1,119,557	2.36%	48635000
2006	45597775	46,977,000	1,379,225	3.02%	46977000
2007	47075975	49,557,000	2,481,025	5.27%	49557000
2008		44,957,000			

ME ADJUSTMENT

Year	EIA ME Generation (MWh)	ISO-NE ME Generation (MWh)	Difference (MWh)	Difference as Percent	Adjusted EIA ME Generation (MWh)
1990	15946014			-25.16%	11933711
1991	17344783			-25.16%	12980525
1992	15683545			-25.16%	11737284
1993	15614272			-25.16%	11685442
1994	16456149			-25.16%	12315487
1995	9763051			-25.16%	7306493
1996	14934373			-25.16%	11176617
1997	10333407			-25.16%	7733337
1998	11003320			-25.16%	8234688
1999	12673928			-25.16%	9484941
2000	14047948	10,354,000	-3,693,948	-26.30%	10354000
2001	19564815	15,669,000	-3,895,815	-19.91%	15669000
2002	22535033	16,065,000	-6,470,033	-28.71%	16065000
2003	18971635	14,736,000	-4,235,635	-22.33%	14736000
2004	19098885	14,747,000	-4,351,885	-22.79%	14747000
2005	18843978	14,249,000	-4,594,978	-24.38%	14249000
2006	16816173	12,024,000	-4,792,173	-28.50%	12024000
2007	16128567	11,551,000	-4,577,567	-28.38%	11551000
2008		12,554,000			

NH ADJUSTMENT

Year	EIA NH Generation (MWh)	ISO-NE NH Generation (MWh)	Difference (MWh)	Difference as Percent	Adjusted EIA NH Generation (MWh)
1990	12405196			1.33%	12570060
1991	14221342			1.33%	14410342
1992	15117253			1.33%	15318160
1993	16242760			1.33%	16458624
1994	13462498			1.33%	13641413
1995	15434380			1.33%	15639501
1996	17063650			1.33%	17290424
1997	15880222			1.33%	16091268
1998	16088852			1.33%	16302671
1999	16189247			1.33%	16404400
2000	15031497	15,060,000	28,503	0.19%	15060000
2001	15074629	15,030,000	-44,629	-0.30%	15030000
2002	15953078	17,199,000	1,245,922	7.81%	17199000
2003	21597107	21,881,000	283,893	1.31%	21881000
2004	23875787	23,720,000	-155,787	-0.65%	23720000
2005	24470013	24,299,000	-171,013	-0.70%	24299000
2006	22063695	22,411,000	347,305	1.57%	22411000
2007	23277171	23,601,000	323,829	1.39%	23601000
2008		23,426,000			

VT ADJUSTMENT

Year	EIA VT Generation (MWh)	ISO-NE VT Generation (MWh)	Difference (MWh)	Difference as Percent	Adjusted EIA VT Generation (MWh)
1990	5164108			-6.13%	4847376
1991	5387985			-6.13%	5057522
1992	4870143			-6.13%	4571441
1993	4643765			-6.13%	4358947
1994	5617030			-6.13%	5272519
1995	5160062			-6.13%	4843578
1996	5350119			-6.13%	5021978
1997	5680538			-6.13%	5332132
1998	4946297			-6.13%	4642924
1999	5703593			-6.13%	5353773
2000	6303014	5,638,000	-665,014	-10.55%	5638000
2001	5480612	4,923,000	-557,612	-10.17%	4923000
2002	5456190	4,943,000	-513,190	-9.41%	4943000
2003	6027962	5,697,000	-330,962	-5.49%	5697000
2004	5470379	5,170,000	-300,379	-5.49%	5170000
2005	5716755	5,455,000	-261,755	-4.58%	5455000
2006	7084344	6,588,000	-496,344	-7.01%	6588000
2007	5823582	6,035,000	211,418	3.63%	6035000
2008		6,322,000			

CT ADJUSTMENT

Year	EIA CT Generation (MWh)	ISO-NE CT Generation (MWh)	Difference (MWh)	Difference as Percent	Adjusted EIA CT Generation (MWh)
1990	35147248			-7.33%	32569974
1991	27036466			-7.33%	25053939
1992	29211379			-7.33%	27069370
1993	32884571			-7.33%	30473214
1994	31178916			-7.33%	28892632
1995	31472471			-7.33%	29164661
1996	20211397			-7.33%	18729338
1997	17674296			-7.33%	16378277
1998	19691493			-7.33%	18247557
1999	28596897			-7.33%	26499947
2000	32967568	31,873,000	-1,094,568	-3.32%	31873000
2001	30490640	29,903,000	-587,640	-1.93%	29903000
2002	31311218	27,111,000	-4,200,218	-13.41%	27111000
2003	29545050	27,825,000	-1,720,050	-5.82%	27825000
2004	32633408	30,095,000	-2,538,408	-7.78%	30095000
2005	33549747	32,660,000	-889,747	-2.65%	32660000
2006	34681736	30,310,000	-4,371,736	-12.61%	30310000
2007	33171209	29,475,000	-3,696,209	-11.14%	29475000
2008		27,617,000			

RI ADJUSTMENT

Year	EIA RI Generation (MWh)	ISO-NE RI Generation (MWh)	Difference (MWh)	Difference as Percent	Adjusted EIA RI Generation (MWh)
1990	1107316			31.98%	1461386
1991	2925818			31.98%	3861362
1992	4785204			31.98%	6315296
1993	4665296			31.98%	6157047
1994	4732921			31.98%	6246295
1995	4488212			31.98%	5923339
1996	7720035			31.98%	10188553
1997	7709554			31.98%	10174721
1998	7674512			31.98%	10128474
1999	6376881			31.98%	8415919
2000	5971544	6,035,000	63,456	1.06%	6035000
2001	7501894	7,620,000	118,106	1.57%	7620000
2002	7056765	10,714,000	3,657,235	51.83%	10714000
2003	5621145	7,720,000	2,098,855	37.34%	7720000
2004	4939420	7,068,000	2,128,580	43.09%	7068000
2005	6053294	6,580,000	526,706	8.70%	6580000
2006	5967725	9,740,000	3,772,275	63.21%	9740000
2007	7049844	10,504,000	3,454,156	49.00%	10504000
2008		9,871,000			

WHOLE ISO-NE ADJUSTMENT

Year	EIA MA Generation (MWh)	CT	ME	NH	RI	VT	EIA Total NE generation (MWh)
1990	*41567784*	*32569974*	*11933711*	*12570060*	*1461386*	*4847376*	104950291
1991	*42829901*	*25053939*	*12980525*	*14410342*	*3861362*	*5057522*	104193591
1992	*41856634*	*27069370*	*11737284*	*15318160*	*6315296*	*4571441*	106868185
1993	*38715430*	*30473214*	*11685442*	*16458624*	*6157047*	*4358947*	107848704
1994	*39613228*	*28892632*	*12315487*	*13641413*	*6246295*	*5272519*	105981574
1995	*39316090*	*29164661*	*7306493*	*15639501*	*5923339*	*4843578*	102193662
1996	*39628844*	*18729338*	*11176617*	*17290424*	*10188553*	*5021978*	102035755
1997	*46949550*	*16378277*	*7733337*	*16091268*	*10174721*	*5332132*	102659285
1998	*47699530*	*18247557*	*8234688*	*16302671*	*10128474*	*4642924*	105255844
1999	*42365897*	*26499947*	*9484941*	*16404400*	*8415919*	*5353773*	108524876
2000	*41234000*	*31873000*	*10354000*	*15060000*	*6035000*	*5638000*	110194000
2001	*41480000*	*29903000*	*15669000*	*15030000*	*7620000*	*4923000*	114625000
2002	*44506000*	*27111000*	*16065000*	*17199000*	*10714000*	*4943000*	120538000
2003	*49336000*	*27825000*	*14736000*	*21881000*	*7720000*	*5697000*	127195000
2004	*48657000*	*30095000*	*14747000*	*23720000*	*7068000*	*5170000*	129457000
2005	*48635000*	*32660000*	*14249000*	*24299000*	*6580000*	*5455000*	131878000
2006	*46977000*	*30310000*	*12024000*	*22411000*	*9740000*	*6588000*	128050000
2007	*49557000*	*29475000*	*11551000*	*23601000*	*10504000*	*6035000*	130723000
2008							

NB: Whole ISO-NE generation numbers for 1990-1999 (ElecImport!CS31:40) are the sum of the state-by-state adjustments.

Electricity Generation Data by Fuel for NE States and NY for 2008

These Btu data were entered in the SGIT *CO2 Emissions from Combustion of Fossil Fuels Module.* The results are reported in the ElecImport tab.

Summary

	Coal (thousand tons)			
	Utilities	IPP	Total	B BTU
Connecticut	0	2,135	2,135	44258.55
Maine	0	32	32	826.88
Massachusetts	0	4,633	4,633	107670.92
New Hampshire	1481	0	1,481	37987.65
Rhode Island	0	0	0	0
Vermont	0	0	0	0
New York	213	8,535	8,748	198492.12

	Petroleum (thousand barrels)			
	Utilities	IPP	Total	B BTU
Connecticut	0	973	973	5974.22
Maine	0	356	356	2242.80
Massachusetts	120	3,425	3,545	22156.25
New Hampshire	234	8	242	1558.48
Rhode Island	0	15	15	90.60
Vermont	0	0	0	0.00
New York	3,684	2,121	5,805	36861.75

	Natural Gas (thousand Mcf)			
	Utilities	IPP	Total	B BTU
Connecticut			58,846	60023.32
Maine	0	36,576	36,576	38404.80
Massachusetts			155,527	160192.99
New Hampshire	73	48,615	48,688	50635.52
Rhode Island			55,743	56857.59
Vermont	38	0	38	38.38
New York			393,670	401543.13

	Petroleum Coke (thousand tons)		
Utilities	IPP	Total	B BTU
	68	68	1929.84

Base Data for Coal, Petroleum Liquids and Natural Gas http://www.eia.doe.gov/cneaf/electricity/epm/epm_ex_bkis.html

Table 2.5.B. Consumption of Coal for Electricity Generation by State by Sector, Year-to-Date through December 2008
(Thousand Tons)

State	Electric Power Sector: Electric Utilities	Electric Power Sector: Independent Power Producers	Total
Connecticut	--	2,135	2,135
Maine	--	32	32
Massachusetts	--	4,633	4,633
New Hampshire	1,481	--	1,481
Rhode Island	--	--	0
Vermont	--	--	0
New York	213	8535	8,748

Table 2.6.B. Consumption of Petroleum Liquids for Electricity Generation by State by Sector, Year-to-Date through December 2008
(Thousand Barrels)

State	Electric Power Sector: Electric Utilities	Electric Power Sector: Independent Power Producers	Total
Connecticut	NM	973	973
Maine	NM	356	356
Massachusetts	120	3,425	3,545
New Hampshire	234	8	242
Rhode Island	NM	15	15
Vermont	NM	--	
New York	3684	2121	5,805

Table 2.7.B. Consumption of Petroleum Coke for Electricity Generation by State by Sector, Year-to-Date through December 2008
(Thousand Tons)

State	Electric Power Sector: Electric Utilities	Electric Power Sector: Independent Power Producers	Total
New York		68	68

Table 2.8.B. Consumption of Natural Gas for Electricity Generation by State by Sector, Year-to-Date through December 2008
(Thousand Mcf)

State	Electric Power Sector: Electric Utilities	Electric Power Sector: Independent Power Producers	Total	Natural Gas Deliveries to Electric Power Consumers (MMcf)
Connecticut	29	56,760	56,789	58,846.394
Maine	--	36,576	36,576	W
Massachusetts	1,816	151,349	153,165	155,527.172
New Hampshire	73	48,615	48,688	W
Rhode Island	--	55,743	55,743	55,742.734
Vermont	38	--	38	W
New York	141,752	230,257	372,009	393,669.733

Natural Gas Navigator release date 5/29/09
http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_nus_m.htm

W = Withheld to avoid disclosure of individual company data.

Table C1. Average Heat Content of Fossil-Fuel Receipts, December 2008

State	Coal (Million Btu per Ton)[1]	Petroleum Liquids (Million Btu per Barrel)[2]	Petroleum Coke (Million Btu per Ton)	Natural Gas (Million Btu per Thousand Cubic Feet)[3]
Connecticut	20.73	6.14	--	1.02
Maine	25.84	6.3	--	1.05
Massachusetts	23.24	6.25	--	1.03
New Hampshire	25.65	6.44	--	1.04
Rhode Island	--	6.04	--	1.02
Vermont	--	5.86	--	1.01
New York	22.69	6.35	28.38	1.02

Apportioning Petroleum Liquids between Residual and Distillate using 2006 and 2007 as reference years

State	06 Dist	06 Res	06 %D	07 Dist	07 Res	07 %D	Avg %D	08 Petrol	08 D Asgnd	08 R Asgnd
Connecticut	415.44	13579.6308	3.0%	415.439	13797.7	2.9%	2.9%	5974.22	175.98242	5798.2376
Maine	98.047	995.43335	9.0%	151.0306	4383.65	3.3%	6.1%	2242.80	137.89907	2104.9009
Massachusetts	904.19	24167.687	3.6%	840.1747	30979.5	2.6%	3.1%	22156.25	692.03128	21464.219
New Hampshire	1490.9	2664.31115	35.9%	487.72725	3383.59	12.6%	24.2%	1558.48	377.7708	1180.7092
Rhode Island	144.56	0	100.0%	206.08268	0	100.0%	100.0%	90.60	90.6	0
Vermont	47.468	0	100.0%	51.35903	0	100.0%	100.0%	0.00	0	0
New York	3620.9	61326.0763	5.6%	7992.2262	73730.9	9.8%	7.7%	36861.75	2830.0274	34031.723

CO_2 Emissions Absorbed by Forest Sequestration and Emissions due to I

	Forest Acres (MassGIS)	Land Use Change (acres lost)	Carbon stock (metric tons C)	Carbon stock all trees/shrubs (metric tons C/acre)	Sequestration rate (metric tons C/acre)
1985	3,434,286	13,998	122,884,133	36	
1986	3,420,288	13,998	122,383,257	36	-0.49
1987	3,406,290	13,998	123,564,384	36	-0.49
1988	3,392,292	13,998	124,731,687	37	-0.49
1989	3,378,293	13,998	125,885,166	37	-0.49
1990	3,364,295	13,998	127,024,820	38	-0.49
1991	3,350,297	13,998	128,150,649	38	-0.49
1992	3,336,299	13,998	129,262,655	39	-0.49
1993	3,322,301	13,998	130,360,836	39	-0.49
1994	3,308,303	13,998	131,445,192	40	-0.49
1995	3,294,305	13,998	132,515,724	40	-0.49
1996	3,280,306	13,998	133,572,432	41	-0.49
1997	3,266,308	13,998	134,615,316	41	-0.49
1998	3,252,310	13,998	135,644,375	42	-0.51
1999	3,238,312	8,597	136,723,020	42	-0.53
2000	3,229,715	8,597	138,081,341	43	-0.55
2001	3,221,118	8,597	139,493,571	43	-0.57
2002	3,212,520	8,597	140,959,207	44	-0.59
2003	3,203,923	8,597	142,477,743	44	-0.61
2004	3,195,326	8,597	144,048,675	45	-0.63
2005	3,186,729	8,597	145,671,496	46	-0.65
2006	3,178,132		147,345,703	46	-0.66

Forest acreage calculated from statewide orthophotos, MassGIS
Stock,growth and harvest data from FIA 1985, 1998, 2003-2006
Conversion of tree growth to mass: Assumed 38.6 lbs per ft3 of wood, weighted average of hard and softwood
Soil density: 50 tons C/acre is an average weighted by forest type (Heath et al, 2003)
Belowground sequestration:
Soil carbon: 0.1 ton C/ac (Post and Kwon, 2000; Gaudinski et al., 2000; Hooker and Compton, 2003)
Belowground biomass: 20% of above ground sequestration (Barford et al, 2001)
Emissions:
Due to land use change: Aboveground, assumed 10% of biomass not removed, 80% of removed stock goes to bioma
Below ground assumed 30% of stored C is emitted, counted in the first year of the change (adapted from Weinert, 2(
Due to harvest: 40% of harvested is sawtimber and considered sequestered (adapted from Kelty et al, 2008)

Note, Biogenic CO_2 emissions due to combustion of biomass are reported on tab CO2FFC, as the "Other" category f
To the extent that biomass harvested in MA is combusted in MA, associated CO_2 emissions are double-reported in c

Land Use Change

Aboveground					
Annual sequestration (metric tons C)	**Annual sequestration (metric tons CO2)**	**Emissions due to LUC (metric tons C)**	**Emissions due to LUC (metric tons CO2)**	**Emissions due to timber harvesting (metric tons C)**	**Total annual emissions (metric tons CO2)**
		360,000		140,000	
1,698,000	**-6,193,000**	360,000	**1,300,000**	140,000	1,800,000
-1,682,000	**-6,167,000**	365,000	**1,300,000**	140,000	1,800,000
-1,675,000	**-6,142,000**	370,000	**1,400,000**	140,000	1,900,000
-1,668,000	**-6,117,000**	375,000	**1,400,000**	140,000	1,900,000
-1,661,000	**-6,091,000**	380,000	**1,400,000**	140,000	1,900,000
-1,654,000	**-6,066,000**	385,000	**1,400,000**	140,000	1,900,000
-1,647,000	**-6,041,000**	390,000	**1,400,000**	140,000	1,900,000
-1,641,000	**-6,015,000**	395,000	**1,400,000**	140,000	1,900,000
-1,634,000	**-5,990,000**	400,000	**1,500,000**	140,000	2,000,000
-1,627,000	**-5,965,000**	405,000	**1,500,000**	140,000	2,000,000
-1,620,000	**-5,939,000**	410,000	**1,500,000**	140,000	2,000,000
-1,613,000	**-5,914,000**	415,000	**1,500,000**	140,000	2,000,000
-1,670,000	**-6,122,000**	420,000	**1,500,000**	170,000	2,100,000
-1,726,000	**-6,328,000**	260,000	**1,000,000**	190,000	1,700,000
-1,785,000	**-6,543,000**	265,000	**1,000,000**	220,000	1,800,000
-1,843,000	**-6,757,000**	270,000	**1,000,000**	240,000	1,900,000
-1,901,000	**-6,970,000**	270,000	**1,000,000**	250,000	1,900,000
-1,959,000	**-7,181,000**	275,000	**1,000,000**	270,000	2,000,000
-2,016,000	**-7,391,000**	280,000	**1,000,000**	280,000	2,000,000
-2,073,000	**-7,600,000**	280,000	**1,000,000**	300,000	2,100,000
-2,110,000				310,000	

ass, fuelwood, or otherwise emitted (72% of total stock) (Adapted from Wienert, 2006)
006)

for each sector.
ombustion and land use change emissions.

	Belowground				
Net annual CO2 movement (1yr prev. to yr) (tonsCO2)	**Soil C density (stock) (metric tons C)**	**Soil C sequestration (tC/yr)**	**Below ground biomass C sequestration (tC/yr)**	**Total annual sequestration (tC/yr)**	**Total annual sequestration (metric tons CO2)**
	172,000,000	-340,000			
-4,900,000	171,000,000	-340,000	-340,000	-680,000	**-2,500,000**
-4,900,000	170,000,000	-340,000	-340,000	-680,000	**-2,500,000**
-4,700,000	170,000,000	-340,000	-340,000	-680,000	**-2,500,000**
-4,700,000	169,000,000	-340,000	-330,000	-670,000	**-2,500,000**
-4,700,000	168,000,000	-340,000	-330,000	-670,000	**-2,500,000**
-4,700,000	168,000,000	-340,000	-330,000	-670,000	**-2,400,000**
-4,600,000	167,000,000	-330,000	-330,000	-660,000	**-2,400,000**
-4,600,000	166,000,000	-330,000	-330,000	-660,000	**-2,400,000**
-4,500,000	165,000,000	-330,000	-330,000	-660,000	**-2,400,000**
-4,500,000	165,000,000	-330,000	-330,000	-660,000	**-2,400,000**
-4,400,000	164,000,000	-330,000	-320,000	-650,000	**-2,400,000**
-4,400,000	163,000,000	-330,000	-320,000	-650,000	**-2,400,000**
-4,600,000	163,000,000	-330,000	-330,000	-660,000	**-2,400,000**
-5,300,000	162,000,000	-320,000	-350,000	-670,000	**-2,500,000**
-5,500,000	162,000,000	-320,000	-360,000	-680,000	**-2,500,000**
-5,800,000	161,000,000	-320,000	-370,000	-690,000	**-2,500,000**
-6,000,000	161,000,000	-320,000	-380,000	-700,000	**-2,600,000**
-6,200,000	160,000,000	-320,000	-390,000	-710,000	**-2,600,000**
-6,400,000	160,000,000	-320,000	-400,000	-720,000	**-2,600,000**
-6,600,000	160,000,000	-320,000	-410,000	-730,000	**-2,700,000**
		-320,000	-420,000	-740,000	

		Total		
Emissions due to LUC (metric tons C)	**Emissions due to LUC (metric tons C02)**	**TOTAL sequestration (metric tons CO2)**	**TOTAL emissions from land use change (metric tons CO2)**	**TOTAL net CO2 movement no harvesting (tons CO2)**
210,000				
210,000	**800,000**	**-8,693,000**	**2,100,000**	-6,600,000
210,000	**800,000**	**-8,667,000**	**2,100,000**	-6,600,000
210,000	**800,000**	**-8,642,000**	**2,200,000**	-6,400,000
210,000	**800,000**	**-8,617,000**	**2,200,000**	-6,400,000
210,000	**800,000**	**-8,591,000**	**2,200,000**	-6,400,000
210,000	**800,000**	**-8,466,000**	**2,200,000**	-6,300,000
210,000	**800,000**	**-8,441,000**	**2,200,000**	-6,200,000
210,000	**800,000**	**-8,415,000**	**2,200,000**	-6,200,000
210,000	**800,000**	**-8,390,000**	**2,300,000**	-6,100,000
210,000	**800,000**	**-8,365,000**	**2,300,000**	-6,100,000
210,000	**800,000**	**-8,339,000**	**2,300,000**	-6,000,000
210,000	**800,000**	**-8,314,000**	**2,300,000**	-6,000,000
210,000	**800,000**	**-8,522,000**	**2,300,000**	-6,200,000
130,000	**500,000**	**-8,828,000**	**1,500,000**	-7,300,000
130,000	**500,000**	**-9,043,000**	**1,500,000**	-7,500,000
130,000	**500,000**	**-9,257,000**	**1,500,000**	-7,800,000
130,000	**500,000**	**-9,570,000**	**1,500,000**	-8,100,000
130,000	**500,000**	**-9,781,000**	**1,500,000**	-8,300,000
130,000	**500,000**	**-9,991,000**	**1,500,000**	-8,500,000
130,000	**500,000**	**-10,300,000**	**1,500,000**	-8,800,000