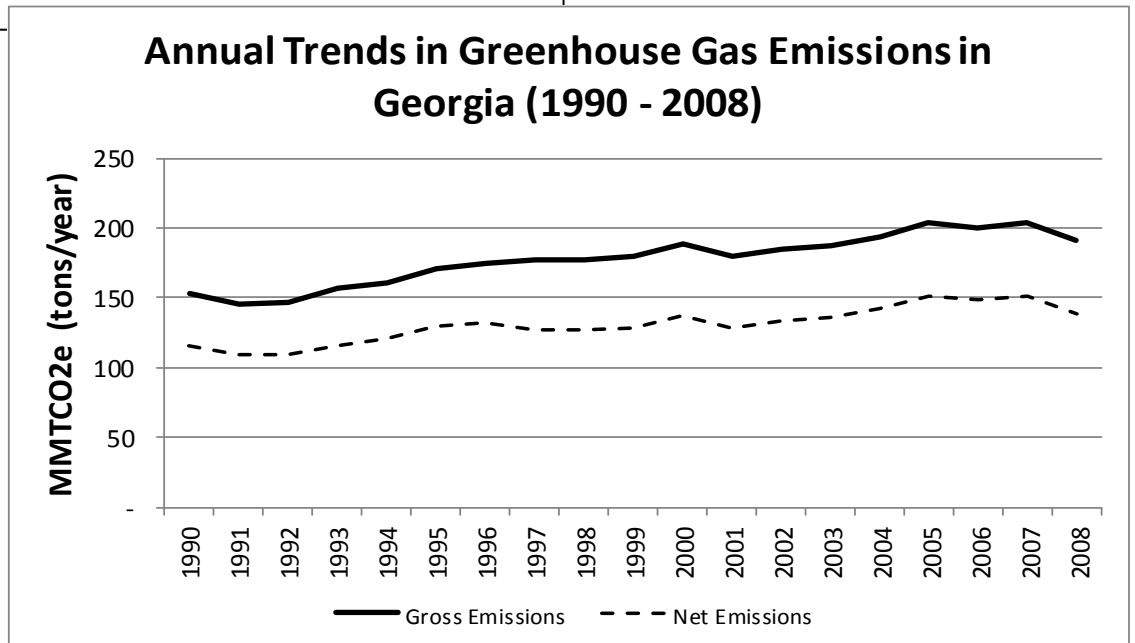
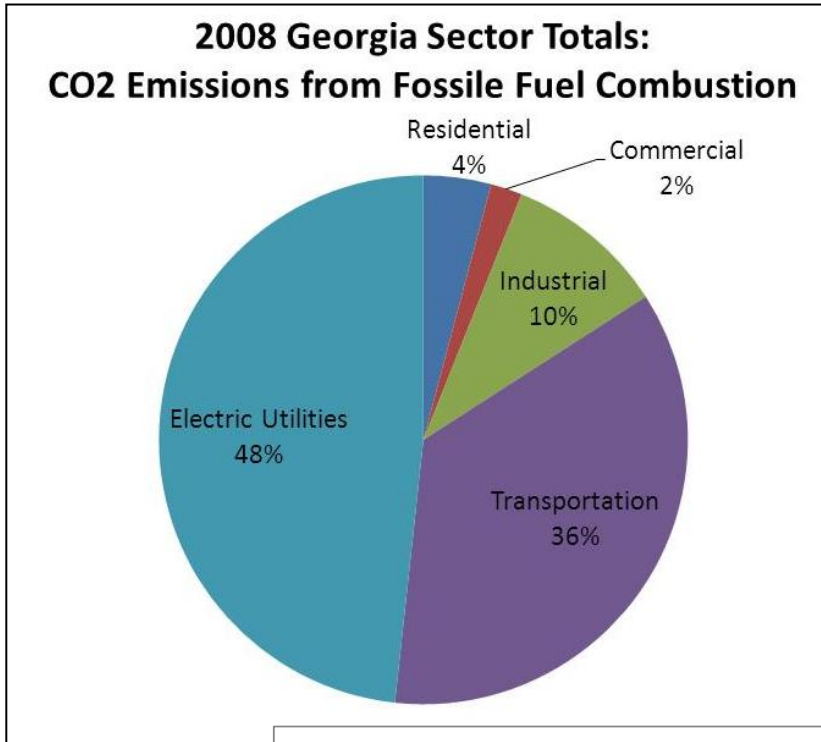


Greenhouse Gas Emissions Inventory for the State of Georgia

Summary Report of 1990 – 2008 baseline and detail on the 2008 inventory, developed using the U.S. EPA State Inventory Tool

Update from the November 2008 “Summary Report of 1990 – 2005 baselines and detail on the 2005 inventory”



Report on Georgia's Greenhouse Gas Emissions Inventory

Introduction

This report summarizes the results of a Greenhouse Gas (GHG) emissions inventory for the state of Georgia over the period 1990 to 2008, developed using the US EPA's State Inventory Tool (SIT) version released on January 6, 2011 with updated modules and data for CO₂ from Fossil Fuel Combustion (CO2FFC), Stationary Combustion, and Mobile Combustion, which were released on August 24, 2011. This report updates a November 2008 report titled "Greenhouse Gas Emissions Inventory for the State of Georgia: Summary Report of 1990 – 2005 baselines and detail on the 2005 inventory". That inventory was developed in response to a unanimous recommendation by the Governor's Energy Policy Council that the Georgia Environmental Protection Division (GA EPD) provide an updated GHG inventory every three years. Since the Nov 2008 report, U.S. federal programs, legislation, and policy directions have been in rapid flux, underscoring the need for Georgia to understand and document our sources and sinks of greenhouse gases.

In response to federal requirements, as of January 2, 2011 the State of Georgia through the GA EPD will operate its own GHG permitting program, covering only large new and modified sources of greenhouse gases. To aid in outreach, GA EPD provided three 1-day workshops on November 9, 10, and 19, 2010 addressing the US EPA greenhouse gas related rules and the State's activities. The materials that were presented at the workshops and other GHG permitting related materials are available at: http://www.georgiaair.org/airpermit/html/sspp/greenhousegas_permit.htm. In addition, as of October 2009, large facilities that release 25,000 metric tons or more of GHGs per year and suppliers of certain fossil fuels and industrial gases were required to report GHG emissions to the US EPA. The EPA released the 2010 data on January 11, 2012. More information and results are available at <http://epa.gov/climatechange/emissions/ghgdata/>.

The updated GHG emissions inventory for the State of Georgia presented here quantifies emissions of the 6 major GHGs or categories (described below) from the major categories of GHG emission sources defined by the US EPA. These sources include fossil fuel combustion (i.e. coal, gasoline and diesel fuels, and natural gas), agriculture, forestry, waste management, and industrial processes. This report presents annual greenhouse gas emission trends in Georgia from 1990 to 2008 and detailed information on 2008 emissions.

Method

The GA GHG inventory was prepared using the U.S. Environmental Protection Agency's (EPA) State Inventory Tool (SIT)¹ with the state-specific defaults provided with the tool. Emissions of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) are calculated. This set of 6 gases (gas categories) is standard in GHG analysis, inventory development, and emission reduction programs. Results are presented in units of carbon dioxide equivalents (CO₂E), often in million metric tons (MMT), for each gas for comparative purposes following the guidance of the Intergovernmental Panel on Climate Change², a widely accepted procedure for greenhouse gas comparative analysis. Selected results for emissions in Georgia during the years 1990 - 2008 and a more detailed description of the 2008 inventory are presented here. More information on the SIT is provided in Appendix A.

Results

Results are presented for annual trends in overall GHG emissions between the years 1990 and 2008 and in more detail for the year 2008, which corresponds with the most recent detailed inventories for other types of emissions submitted under the Consolidated Emissions Reporting Rule (CERR)³. Results are presented in the following order:

- 1. Annual Trends**
 - A. Annual Trends by Sector**
 - B. Annual Trends by Gas**
 - C. Annual Trends by Gas per Sector**
- 2. Detailed Emissions for the Year 2008**

Annual Trends

Gross GHG emissions in Georgia are estimated to have increased by 25% between 1990 and 2008, with a minimum of 144.2 MMTCO₂e tons/year emissions in 1991 and a maximum of 201.4 MMTCO₂e in 2007 (Figure 1). Net emissions, which includes reduction in carbon emission by sequestration from forests and urban trees (discussed later), increased at a slower rate of 20%. Gross emissions trends differ when evaluated with respect to changes in population or gross state product (GSP), measures referred to as 'emissions intensity'. Over the same period, emissions intensity decreased by 16.5% per capita and by 56% per annual GSP (Figure 2). These results indicate that while overall emissions increased in the state from 1990 to 2008, they did not increase as rapidly as population or GSP for the same total time period. The reduction in emissions after 2007 is believed to be a result of the national recession.

¹ Information available at <http://www.epa.gov/climatechange/wycd/stateandlocalgov/analyticaltools.html>. The version applied was publicly released on January 6, 2011 and the module updates were provided on August 24, 2011.

² The Intergovernmental Panel on Climate Change (IPCC) assigned each GHG a GWP based on properties such as solar radiative forcing and average atmospheric lifetime and is often reported as an equivalent mass of CO₂ (GWP = 1) integrated over a 100-year period. SIT GWPs are largely based on the IPCC Technical Summary of Working Group I, *Climate Change 2001: The Scientific Basis*. http://www.grida.no/climate/ipcc_tar/wg1/247.htm.

³ CERR Final Rule. Published in the Federal Register on June 10, 2002 (FR Volume 67, Number 111, pp 39602 - 39616). The CERR requires State agencies under the Clean Air Act to submit emissions inventories for SO_x, VOC, NO_x, CO, Pb, and PM₁₀ for the year 2002 and every 3 years afterward, with delayed reporting requirements for PM_{2.5} and NH₃.

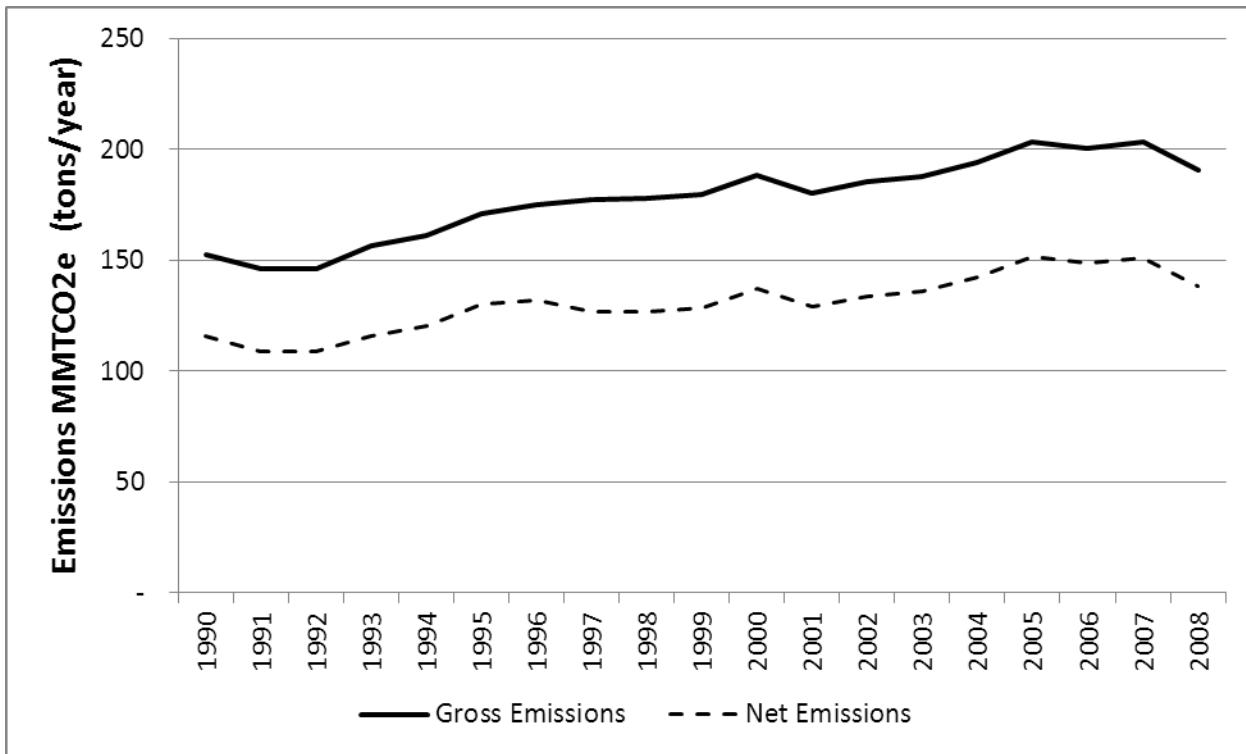


Figure 1. Annual Trends in Greenhouse Gas Emissions in Georgia (1990 - 2008)

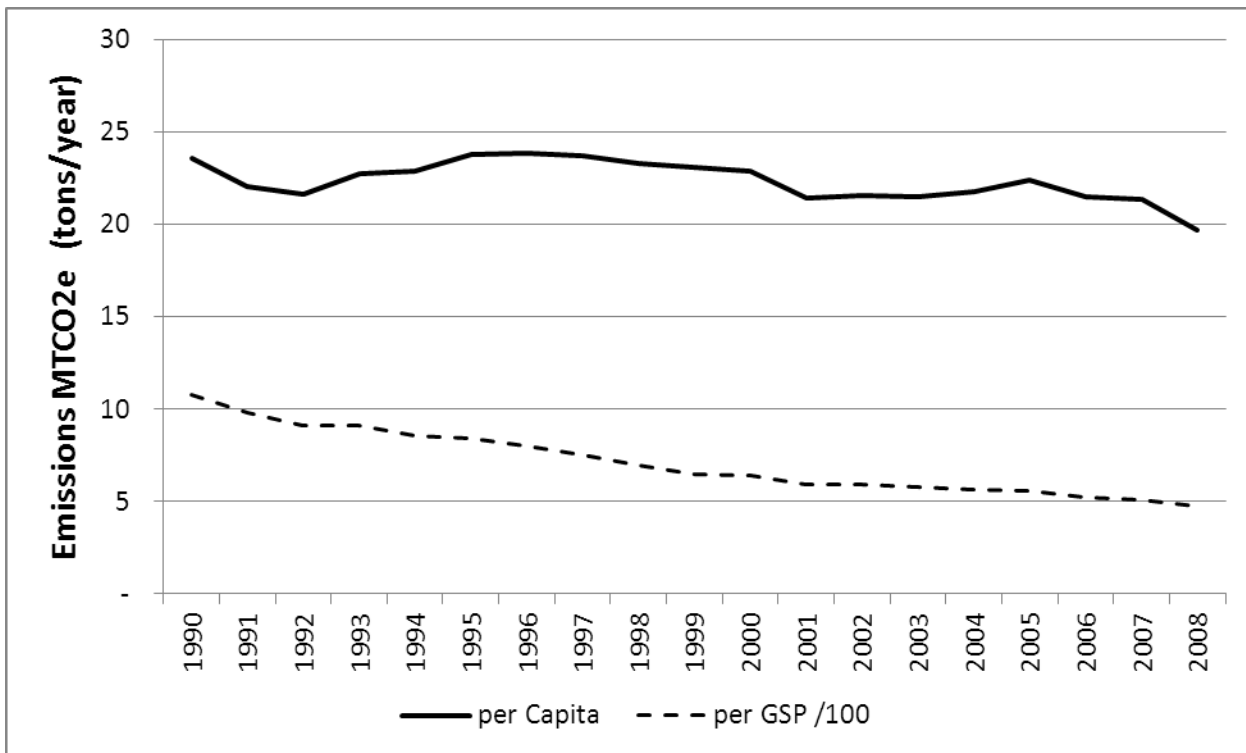


Figure 2. Annual Trends in Gross Emissions of GHGs per Capita and per Gross State Product/100

A. Annual Trends by Sector

The overall sectors and their gases inventoried, as defined by the SIT, are shown in Table 1. These sectors are further broken down as shown in the Appendix. As with other U.S. states, the large majority of Georgia's GHG emissions are caused by energy production and use (Figure 3a), which includes CO₂ emissions from electricity production (coal combustion) and from combustion for transportation (e.g. cars and trucks). These emissions are offset by sequestration of carbon (carbon removed from the atmosphere, indicated by negative emissions values) due to tree and other vegetative growth (Figures 3a and 3b) as reflected in the Land Use, Coverage, and Forestry sector (LUCF).

An increase in sequestration in Georgia through the 1990s was caused by extensive re-forestation and other tree planting activities in the late 1980s (which has a delayed impact on sequestration)⁴. Other sectors slightly contributing to the inventory include Agriculture (e.g. soil management, enteric fermentation, and manure management), Industrial Processes (e.g. electric power transmission and distribution systems, cement manufacture, ammonia and urea production), non-CO₂ Energy production emissions, and Waste (e.g. municipal solid combustion and wastewater). Note that emissions from the Energy sector are 98-99% due to CO₂ emissions from fossil fuel combustion and 1-2% from CH₄ and N₂O emissions from mobile and stationary combustion sources. Emissions estimates for the sectors Natural Gas and Oil Systems and Coal Mining are zero for Georgia.

Category	Sector	Gases	Industries/activities included
Energy	CO ₂ from Fossil Fuel Combustion	CO ₂	transportation, electric utilities, residential, commercial, industrial, international bunker fuels
	Stationary Combustion	CH ₄ , N ₂ O	residential, commercial, industrial, electric utilities
	Natural Gas and Oil	CO ₂ , CH ₄	transmission, distribution, flaring
	Coal Mining	CH ₄	surface, underground, abandoned
	Mobile Combustion	CH ₄ , N ₂ O	on-road, non-road, aviation, marine, locomotive
Industrial Processes	Industrial Processes	CH ₄ , N ₂ O, HFC, PFC, SF ₆	cement production, lime manufacture, electric power transmission and distribution
Agriculture	Agriculture	CH ₄ , N ₂ O	manure management, residue burning
LUCF	Land Use Change and Forestry	CO ₂ , CH ₄ , N ₂ O	soil liming, fertilization, forest fires (nonCO ₂), urban trees, forest management (sources and sinks)
Waste	Municipal Solid Waste	CO ₂ , CH ₄ , N ₂ O	landfill and waste combustion
	Wastewater	CH ₄ , N ₂ O	municipal and industrial (pulp and paper, food production)

Table 1. Sectors and their associated emissions inventoried using the US EPA SIT.

⁴ Georgia Forestry Commission, Nathan McClure, personal communication with Michelle Bergin, GA EPD, March 2008.

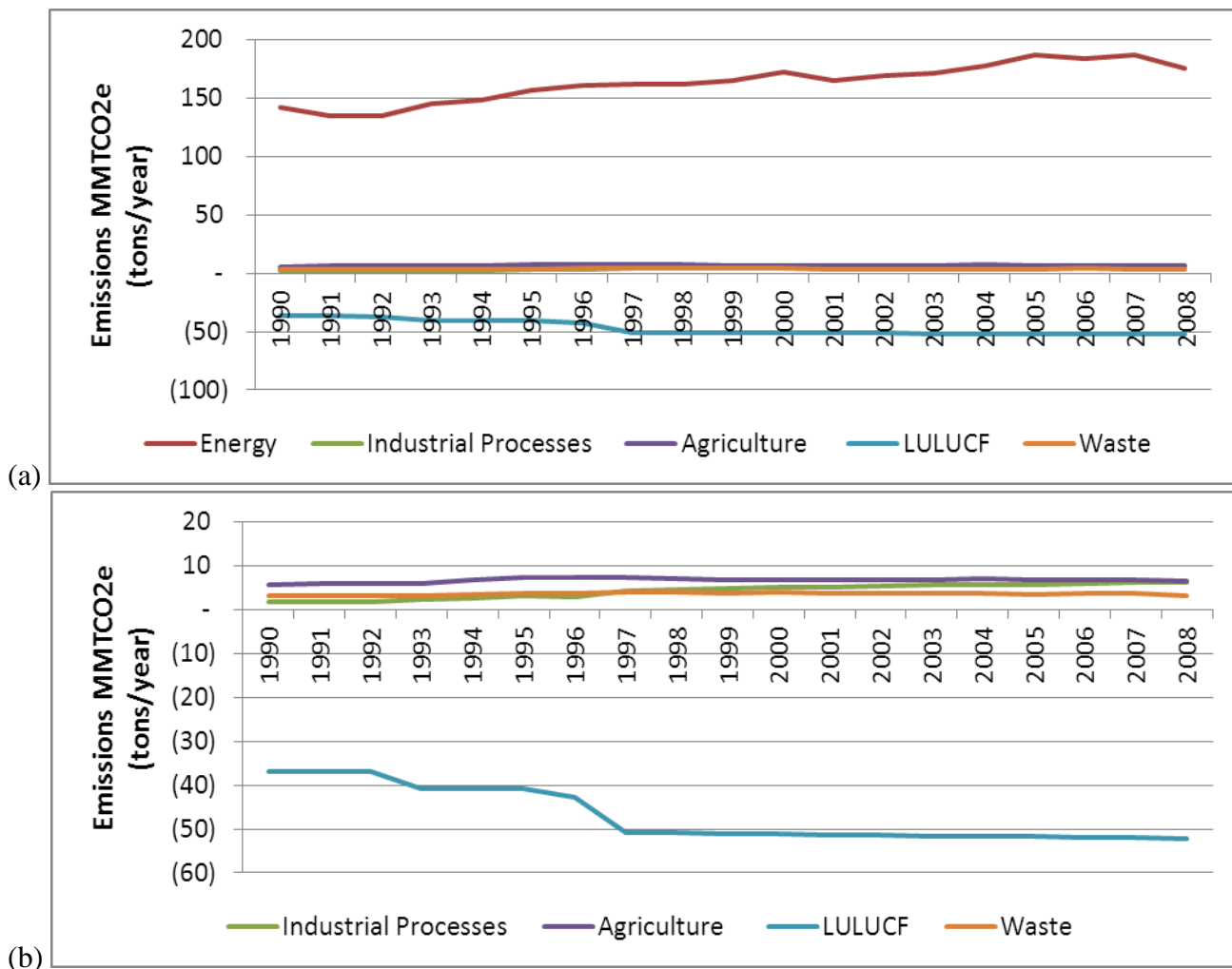


Figure 3. (a) Sector Specific Annual Trends in GHG Emissions from 1990 to 2008 and (b) excluding the Energy sector.

B. Annual Trends by Gas

Viewing the inventory by gas shows that of the six greenhouse gases inventoried, the large majority of emissions and growth is from CO₂, followed by contributions N₂O, CH₄, and then combined emissions of HFC, PFC, and SF₆ (Figure 4). Emissions of N₂O and CH₄ are shown to be relatively steady, while emissions in the HFC, PFC, and SF₆ category is steadily increasing, and has increased by 410% from 1990 to 2008. This category represents a number of compounds with extremely long atmospheric lifetimes.

The large majority of emissions and growth in CO₂ is from fossil fuel combustion from coal use in the electric utility sector and petroleum use in the transportation sector (increasing by 36% and 28% from 1990 to 2008, respectively) (Figures 5a and 5b). The remainder of CO₂ emitted during fossil fuel combustion is estimated to be from the industrial sector, followed by residential and then commercial activities (mostly from natural gas combustion).

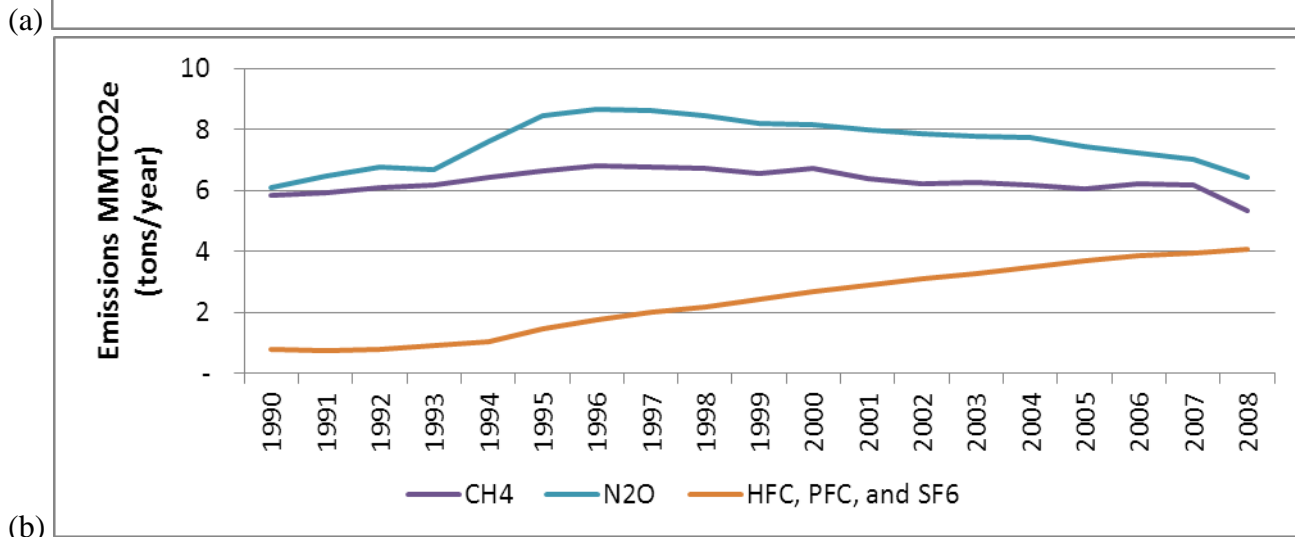
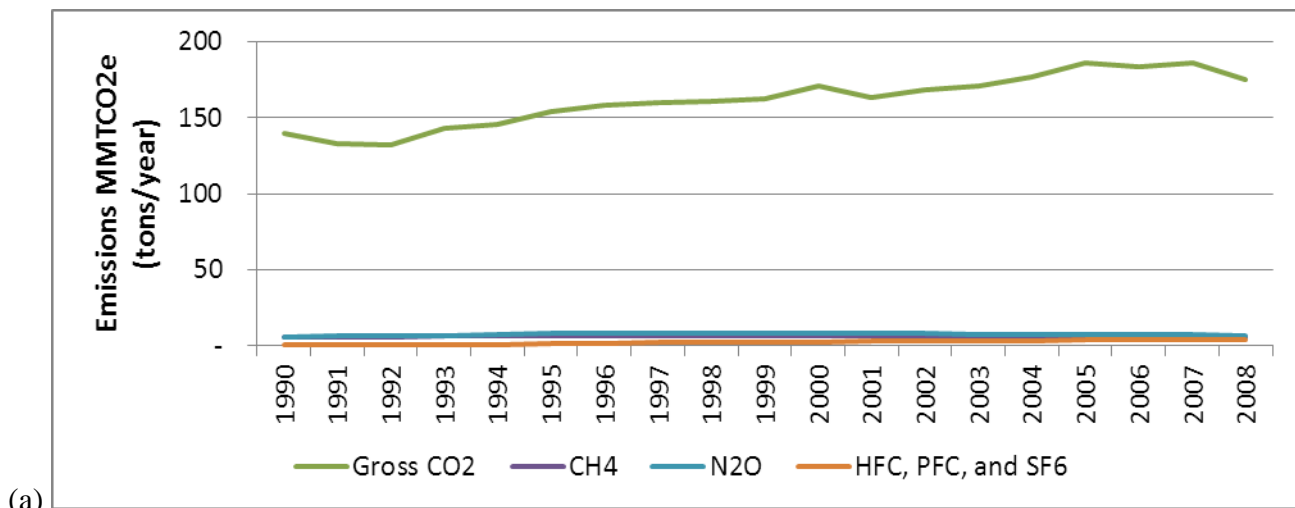
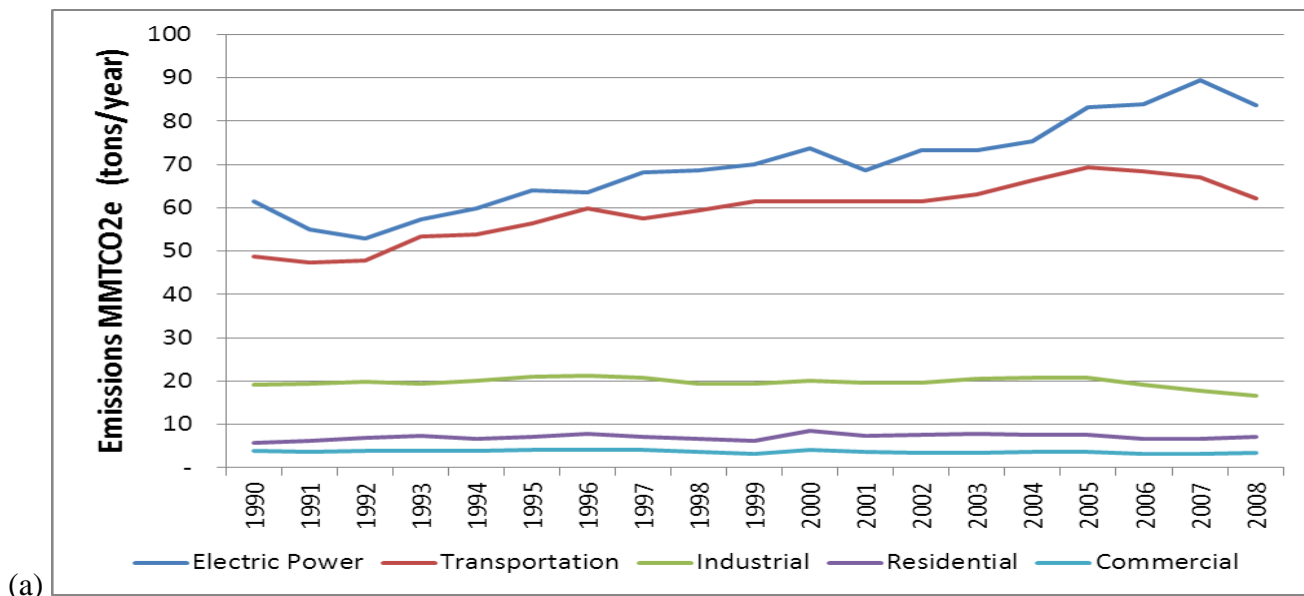


Figure 4. Annual Trends in Emissions of (a) CO₂, CH₄, N₂O, and HFC, PFC, and SF₆, and (b) excluding CO₂.



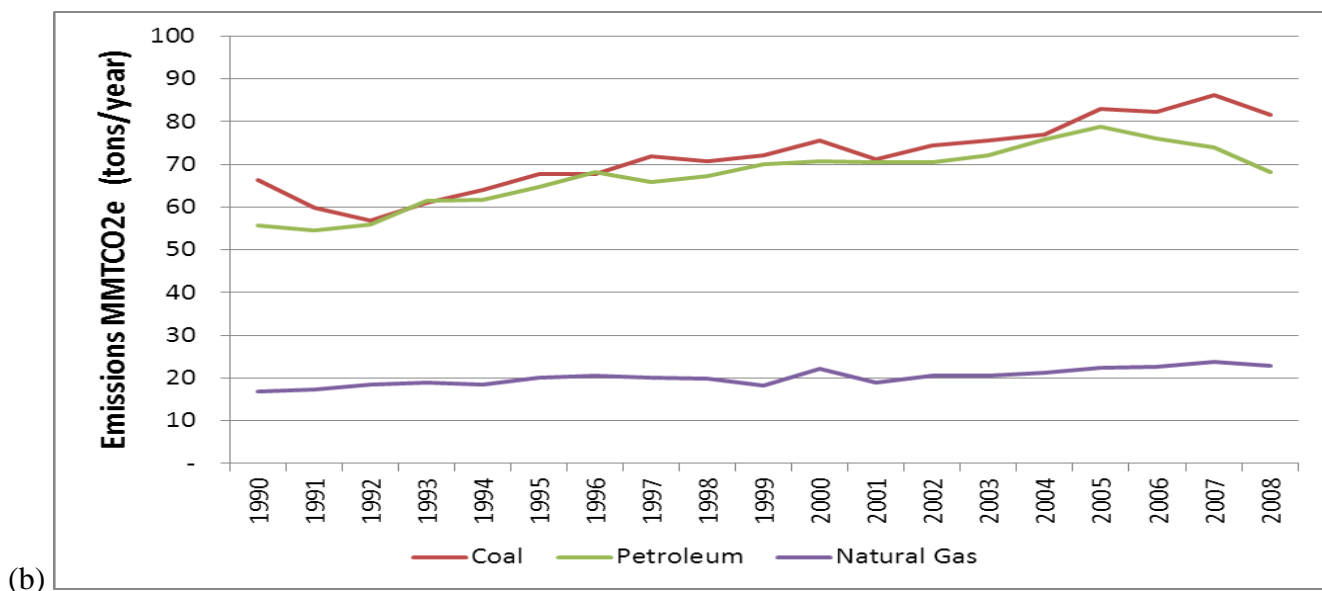


Figure 5. Annual Trends in CO₂ emissions from fossil fuel combustion by (a) sector and (b) fuel.

C. Annual Trends by Gas per Sector

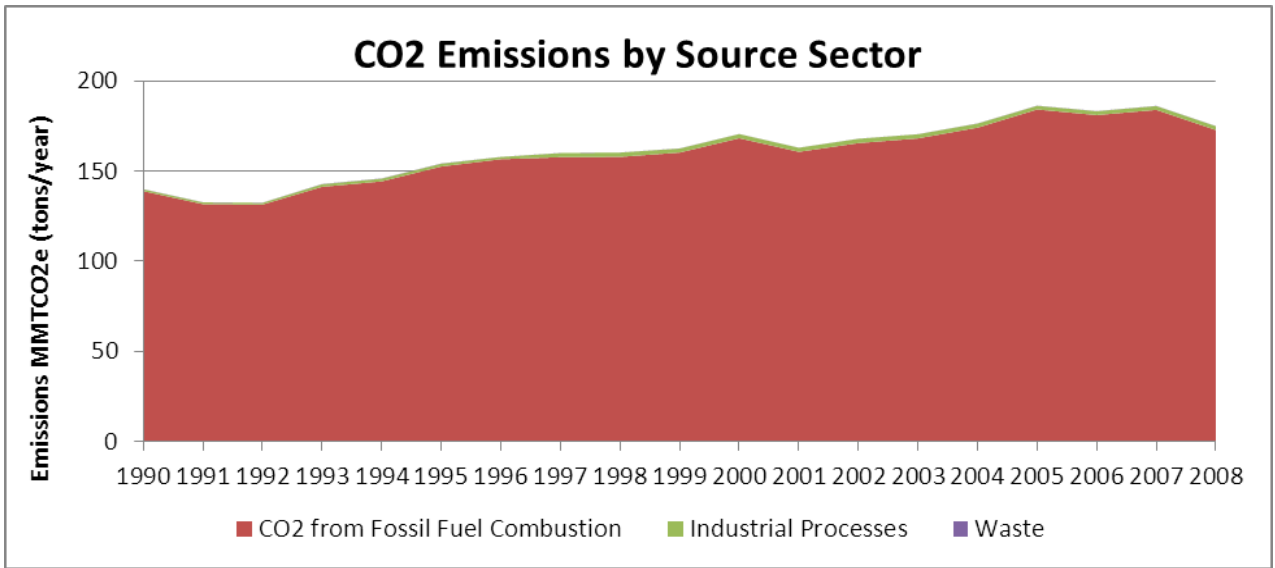
A further look at emissions by source sector reveals the differences in sector contributions of individual greenhouse gases (Figure 6). First, as previously stated, we see that the emissions of CO₂ are much higher than of CH₄, N₂O, HFC, PFC, and SF₆.

CO₂ emissions are overwhelmingly dominated by fossil fuel combustion (Figure 6a), which has been generally increasing since 1992 until after 2007, and peaked at 186.4 annual MMTCO₂e in 2005. Methane and N₂O emissions combined peaked in 1996 at 17.6 and have been slightly decreasing since then. These gases contribute about 6 to 9% of annual total greenhouse gas emissions over the period inventoried. The HFC, PFC, and SF₆ category, responsible for approximately 2% of the total inventory in recent years (peaking at 4.1 MMTCO₂e in 2008), is emitted entirely from industrial processes and has been steadily increasing (Figure 6b).

N₂O emission sources are mainly split between agricultural and combustion processes, including soil management, mobile combustion, manure management, and stationary combustion, and followed by wastewater treatment (Figure 6c). These emissions are estimated to have increased between 1993 and 1996 and then to have begun to gradually decrease, mostly due to changes in mobile combustion and agricultural soil management practices.

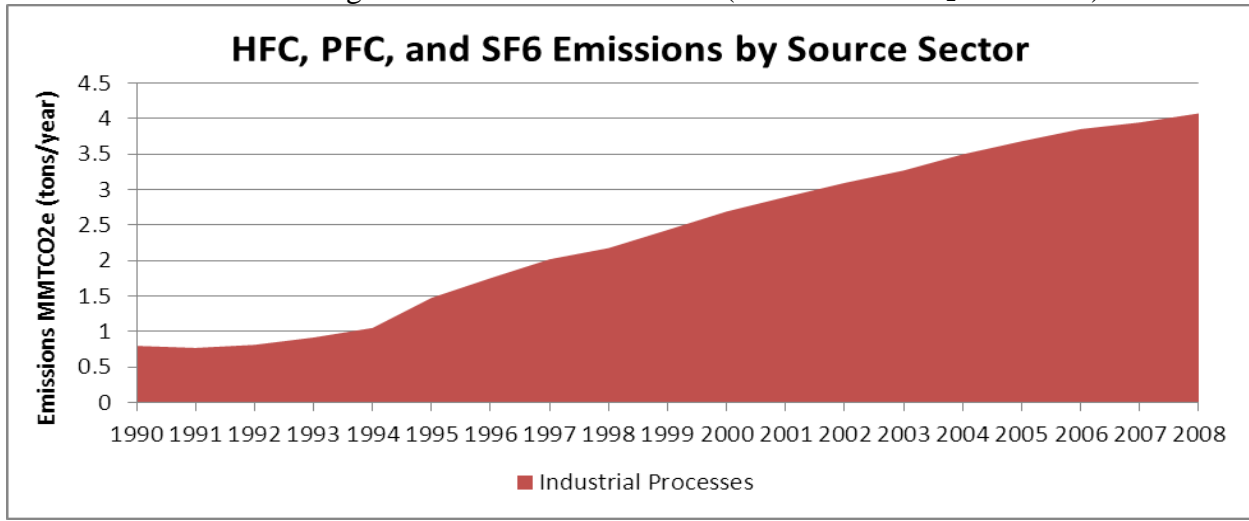
Methane emissions are emitted at a similar, slightly lower level as N₂O, and are largely emitted from waste processes, including from landfills (the main component under ‘waste’) and enteric fermentation, which is part of the digestive process of ruminant animals such as cows. Municipal wastewater treatment and agricultural processes, including and manure management, are also contributors, with lower emissions from mobile and stationary source combustion sources (Figure 6d). These emissions are estimated to have been fairly steady over the period inventoried.

It should be noted that other anthropogenic gases, such as nitrogen trifluoride (NF₃), may be required for inclusion in greenhouse gas emissions inventories in the future.

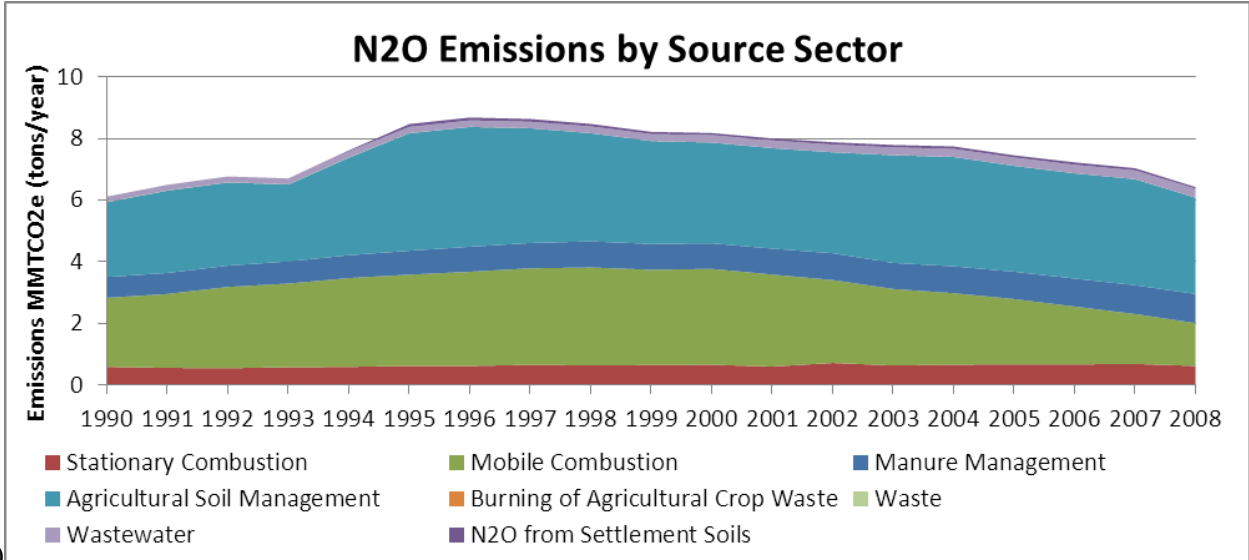


(a)

Note: LULC values are negative and were not included (this is Gross CO₂ emissions)

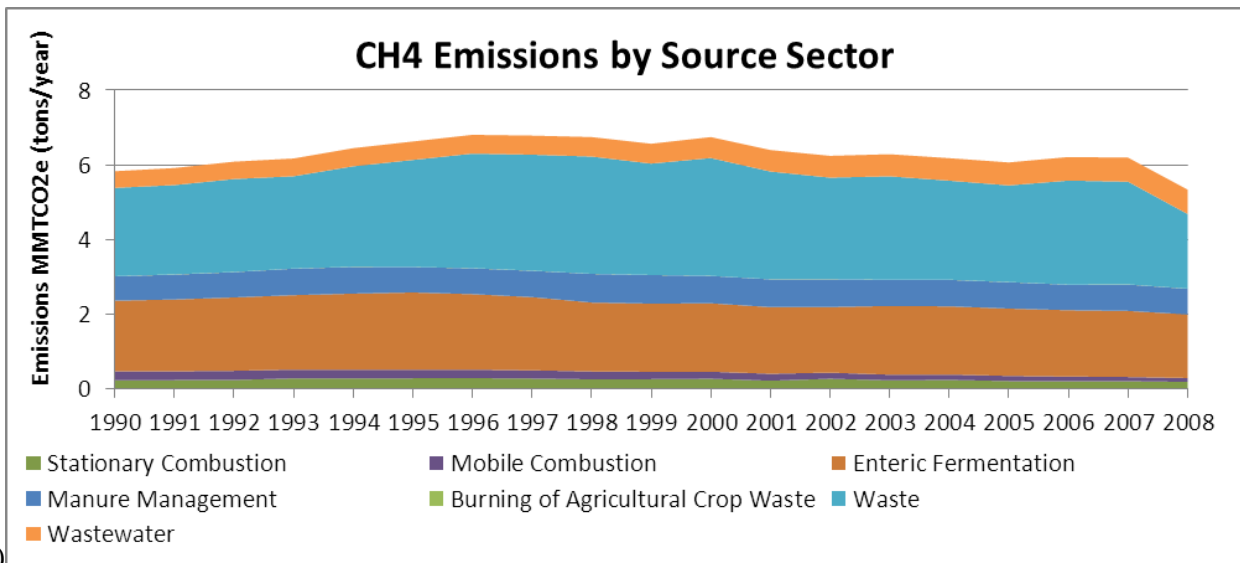


(b)



(c)

Note: Emissions from Industrial Processes and Forest Fires are not estimated.



(d) Note: Emissions from Forest Fires, Coal Mining, Oil and Gas, and Rice Cultivation are estimated as zero.

Figure 6. (a) CO₂, (b) CH₄, (c) N₂O, and (d) HFC, PFC, and SF₆ emissions by source sector.

Detailed Emissions for the Year 2008

Gross emissions during the year 2008 were 191 MMTCO₂e, with source patterns typical of other recent years. The majority of emitted Global Warming Potential (GWP), approximately 92%, was due to CO₂ emissions from activities related to energy production and use (Figure 7 a,b).

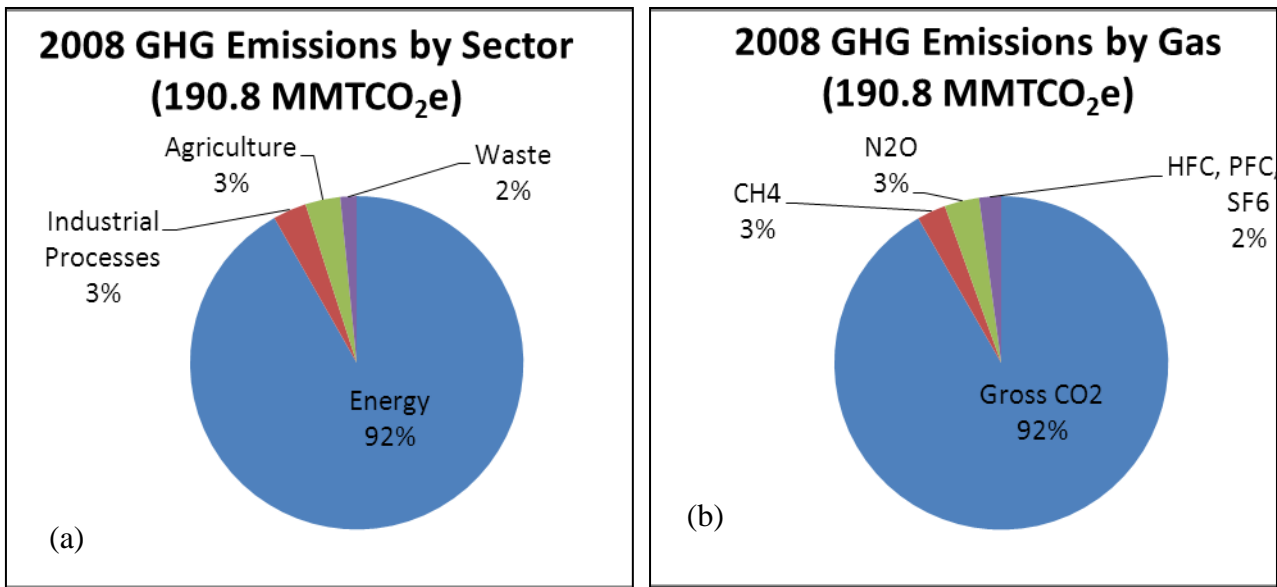


Figure 7. Gross GHG Emissions in Georgia in 2008 by (a) sector and (b) gas.

Viewing the inventory in more detail, it can be seen that the large majority of GHG emissions from energy use and production (92% of total emissions, 7a.) were contributed by CO₂ emissions from fossil fuel combustion (99%, Figure 8a), largely resulting from the electric power production (48%) and transportation (36%) sectors (Figure 8b).

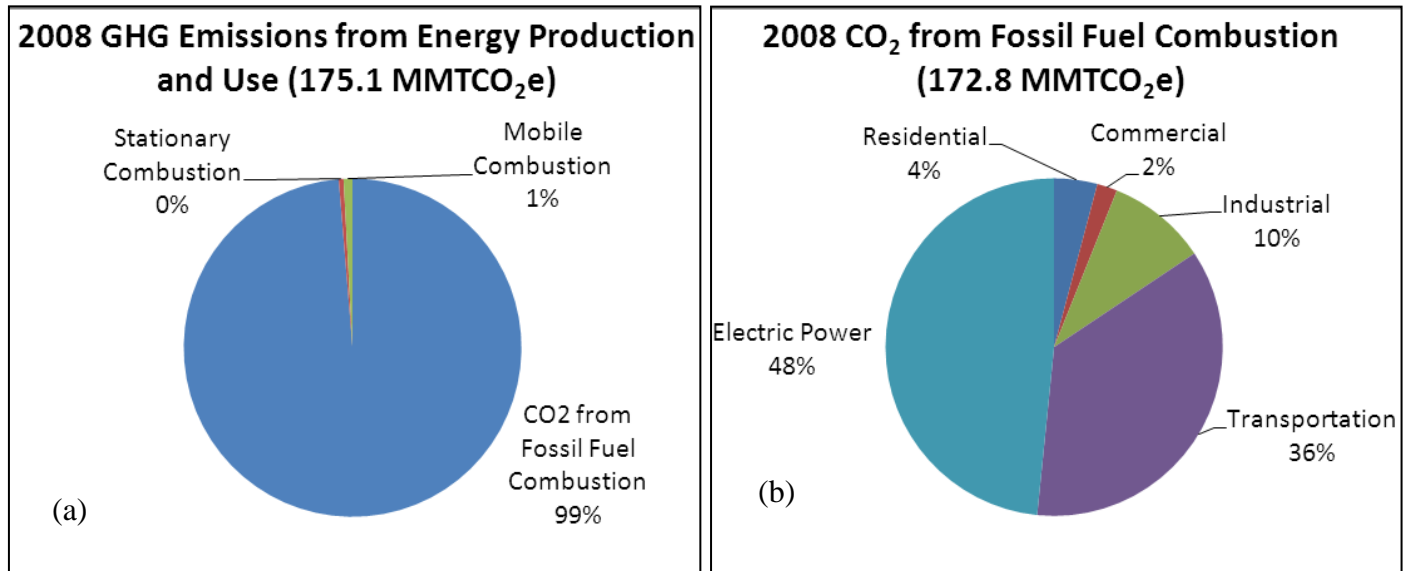
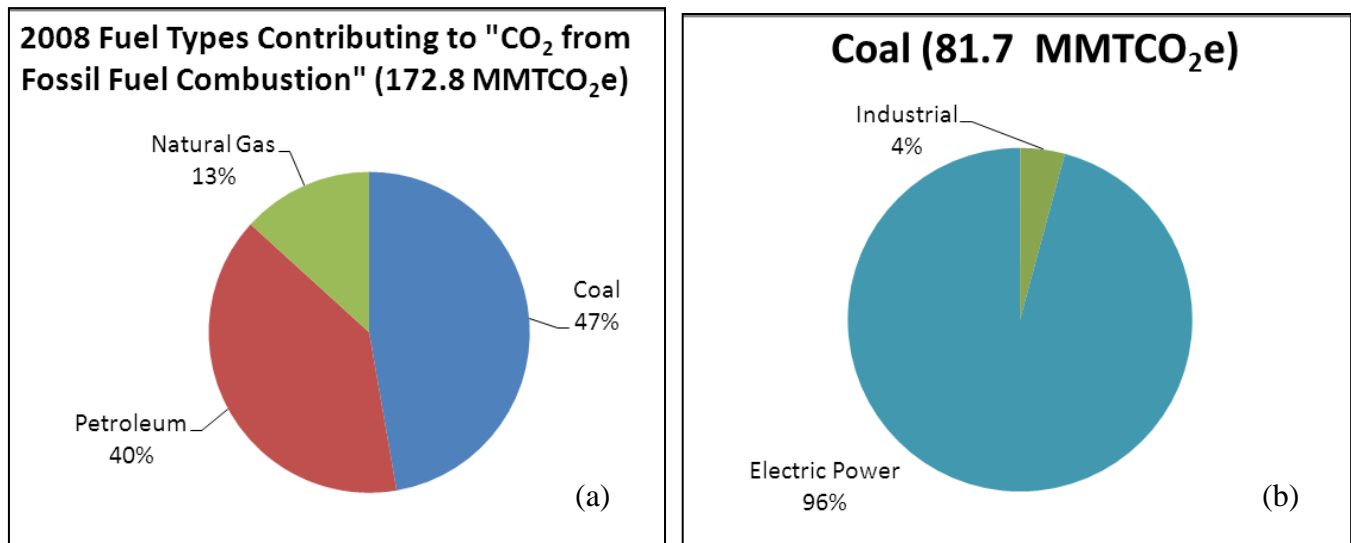


Figure 8. GHG Emissions in Georgia in 2008 from (a) energy production and use and from (b) CO₂ from fossil fuel combustion.

Of the three fossil fuels calculated, combustion of coal (47%) and petroleum (40%) resulted in the largest emissions of CO₂, with natural gas combustion contributing the remaining 13% (Figure 9a). Coal was mostly used for electric power generation (96%) (Figure 9b) and petroleum was mostly used for transportation (90%) (Figure 9c). Natural gas emissions are more evenly split from use by the industrial (35%) and residential (28%) sectors, with smaller contributions from the electric power (23%) and commercial (12%) sectors (Figure 9d).



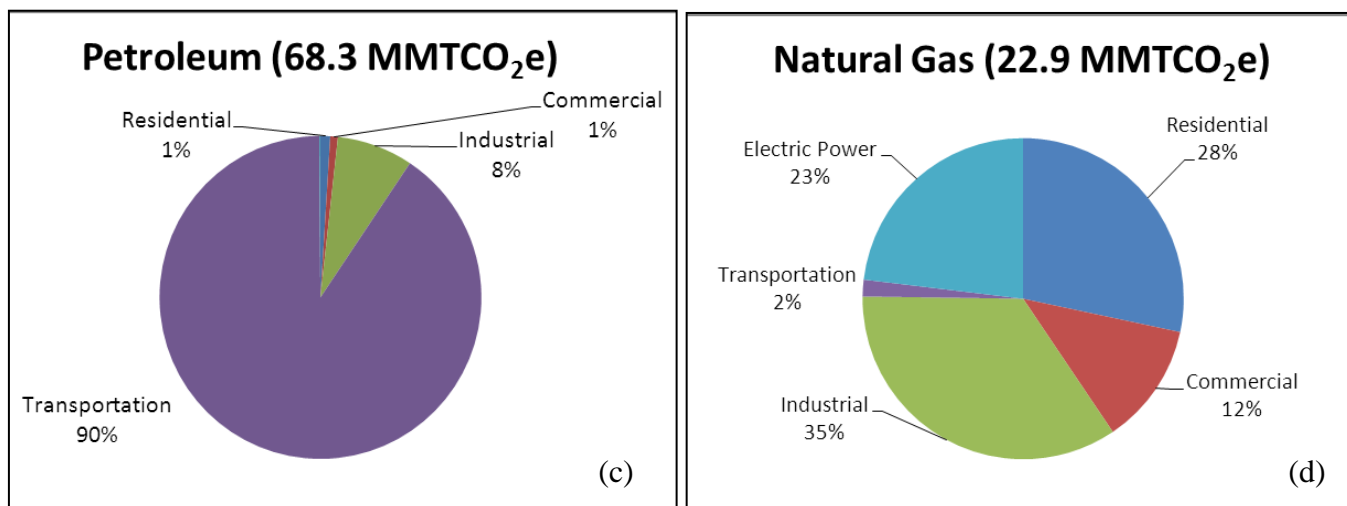


Figure 9. Georgia 2005 CO₂ contributions from fossil fuel combustion by (a) fuel type and by sector for each fuel type, including (b) coal, (c) petroleum, and (d) natural gas. Sectors contributing 0% or less are not shown.

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Appendix

The EPA's State Inventory Tool (SIT)

The SIT is a set of Microsoft Excel based workbooks and is composed of 10 'modules', each addressing a different sector and/or gas type. Six greenhouse gases/categories are accounted for by this system, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF₆), and are reported in units of million metric tons of carbon dioxide equivalent (MMTCO₂e) based on the gas' Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change (IPCC) assigned each GHG a GWP based on properties such as solar radiative forcing and average atmospheric lifetime, and is often reported as an equivalent mass of CO₂ integrated over a 100-year period.⁵ Contribution of these gases to the inventory may differ if normalized over different periods (e.g. 200 years, 500 years.)

The SIT modules are as follows:

	Module Name	Gases	Examples
1	CO ₂ from Fossil Fuel Combustion	CO ₂	transportation, electric utilities, residential, commercial, industrial, international bunker fuels
2	Stationary Combustion	CH ₄ , N ₂ O	residential, commercial, industrial, electric utilities
3	Natural Gas and Oil	CO ₂ , CH ₄	transmission, distribution, flaring
4	Coal Mining	CH ₄	surface, underground, abandoned
5	Mobile Combustion	CH ₄ , N ₂ O	on-road, non-road, aviation, marine, locomotive
6	Industrial Processes	CH ₄ , N ₂ O, HFC, PFC, SF ₆	cement production, lime manufacture, electric power transmission and distribution
7	Agriculture	CH ₄ , N ₂ O	manure management, residue burning
8	Land Use Change and Forestry	CO ₂ , CH ₄ , N ₂ O	soil liming, fertilization, forest fires (nonCO ₂), urban trees, forest management (sources and sinks)
9	Municipal Solid Waste	CO ₂ , CH ₄ , N ₂ O	landfill and waste combustion
10	Wastewater	CH ₄ , N ₂ O	municipal and industrial (pulp and paper, food production)

These sectors are further categorized as:

Energy	CO ₂ from Fossil Fuel Combustion, Stationary Combustion, Mobile Combustion, Coal Mining, and Natural Gas and Oil Systems
Industrial Processes	Industrial Processes
Agriculture	Enteric Fermentation, Manure Management, Rice Cultivation, Agricultural Soil Management, Burning of Agricultural Crop Waste
LUCF	LUCF
Waste	Municipal Solid Waste and Wastewater

The following tables contain a summary of these modules for the state of Georgia through 2008.

⁵ SIT GWPs are largely based on the IPCC Technical Summary of Working Group I, Climate Change 2001: The Scientific Basis. http://www.grida.no/climate/ipcc_tar/wg1/247.htm .

**Appendix to Greenhouse Gas Emissions Inventory for the State of Georgia - Update
December 2012**

The following tables are from the summary sheets of each module of the US EPA State Inventory Tool calculated for the state of Georgia.

Module names

- 1 CO2 from Fossil Fuel Combustion (e.g. energy production, transportation)
- 2 Stationary Combustion (CH4 and N2O emissions)
- 3 Natural Gas and Oil (e.g. transmission, distribution, flaring)
- 4 Coal Mining
- 5 Mobile Combustion (CH4 and N2O emissions)
- 6 Industrial Processes (e.g. cement production, lime manufacture)
- 7 Agriculture (CH4 and N2O, e.g. manure management, residue burning)
- 8 Land Use Change and Forestry (sources and sinks)
- 9 Municipal Solid Waste (landfill and combustion)
- 10 Wastewater

1 CO2 from Fossil Fuel Combustion (e.g. energy production, transportation)

MMTCO2E	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Residential	5.7775	6.1273	6.8323	7.3028	6.6979	7.1741	7.8243	7.1997	6.7101	6.3241	8.6473	7.3375	7.599	7.8537	7.7123	7.5239	6.6256	6.6808	7.151
Coal	0.0104	0.0034	0.0162	0.0092	0.0101	0.018	0.0009	0.0044	0.0029	0.0048	0.0023	0.003	0.0015	0	0.0016	0.0091	0	0.0005	0.0031
Petroleum	0.8533	0.862	0.9368	0.9976	0.9314	0.9202	0.9338	0.9637	0.8604	0.9422	1.0438	0.756	0.7121	0.7653	0.8125	0.6804	0.6091	0.6025	0.6647
Natural Gas	4.9137	5.2619	5.8793	6.296	5.7564	6.2359	6.8897	6.2317	5.8469	5.3772	7.6012	6.5785	6.8854	7.0884	6.8982	6.8344	6.0166	6.0779	6.4833
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	3.8548	3.6106	3.9495	4.0138	3.9019	4.1179	4.1312	4.0537	3.6571	3.2583	4.1229	3.7578	3.35	3.3958	3.7694	3.5954	3.1943	3.2225	3.3513
Coal	0.0417	0.0153	0.0737	0.042	0.0572	0.1205	0.0063	0.0353	0.0233	0.035	0.0183	0.0239	0.0109	0	0.0147	0.1045	0	0.0042	0.0278
Petroleum	1.1192	0.8171	0.9495	0.8403	0.8938	0.9229	0.7969	0.901	0.6167	0.8508	0.9314	0.9569	0.6957	0.6526	0.7527	0.5883	0.5672	0.5789	0.5256
Natural Gas	2.6939	2.7782	2.9263	3.1315	2.9509	3.0745	3.328	3.1174	3.0171	2.3724	3.1732	2.7771	2.6435	2.7431	3.002	2.9026	2.6271	2.6393	2.7979
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	19.182	19.466	19.845	19.389	20.132	20.989	21.266	20.861	19.453	19.33	20.196	19.638	19.747	20.499	20.843	20.734	19.084	17.679	16.533
Coal	5.2029	4.894	4.1595	3.9933	4.4944	4.5538	4.6298	4.7731	4.6089	4.5924	4.7417	4.7664	4.4027	4.236	4.2287	4.0469	3.7904	3.6183	3.3877
Petroleum	5.3386	5.6497	6.5122	6.4602	6.3484	6.6564	6.988	6.7727	6.1102	6.5889	6.7445	7.5309	7.7676	7.7943	8.0986	8.3905	6.8741	6.0424	5.2168
Natural Gas	8.6403	8.9222	9.1737	8.9354	9.2888	9.7792	9.6485	9.3149	8.734	8.1486	8.7094	7.3408	7.5767	8.4692	8.5153	8.2964	8.4193	8.0179	7.9288
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transportation	48.663	47.438	47.931	53.283	53.835	56.405	59.753	57.44	59.467	61.457	61.527	61.418	61.582	63.079	66.407	69.255	68.349	67.072	62.161
Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Petroleum	48.263	47.034	47.524	52.895	53.447	55.98	59.282	56.989	59.035	60.953	61.198	60.983	61.119	62.647	66.028	68.892	67.963	66.734	61.778
Natural Gas	0.3997	0.4046	0.4075	0.3881	0.3879	0.4251	0.4709	0.4515	0.4325	0.5043	0.329	0.4348	0.4625	0.4319	0.3797	0.3637	0.3856	0.338	0.3834
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electric Power	61.444	55.085	52.876	57.329	59.769	63.911	63.673	68.2	68.664	69.955	73.783	68.582	73.316	73.369	75.41	83.139	83.872	89.363	83.62
Coal	61.191	54.947	52.695	56.94	59.539	63.089	63.079	67.052	66.132	67.543	70.811	66.403	70.017	71.291	72.754	78.924	78.527	82.567	78.261
Petroleum	0.1481	0.0927	0.1182	0.2251	0.1566	0.2176	0.2804	0.2355	0.7183	0.6427	0.7091	0.3059	0.2337	0.3257	0.1486	0.2101	0.085	0.0844	0.0742
Natural Gas	0.1049	0.0455	0.0631	0.1641	0.073	0.604	0.3136	0.9125	1.8138	1.769	2.2635	1.8727	3.065	1.7515	2.5075	4.0054	5.2601	6.7108	5.2846
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
International Bunker Fuels	0	0.0002	0.0002	0.0002	0.0005	0.0005	0.0002	0.0007	0.0007	0	0	0	0	0.002	0.0001	0.0063	0.0085	0.0055	0.0018
Petroleum	0	0.0002	0.0002	0.0002	0.0005	0.0005	0.0002	0.0007	0.0007	0	0	0	0	0.002	0.0001	0.0063	0.0085	0.0055	0.0018
TOTAL	138.92	131.73	131.43	141.32	144.33	152.6	156.65	157.75	157.95	160.32	168.28	160.73	165.59	168.2	174.14	184.25	181.12	184.02	172.82
Coal	66.446	59.86	56.944	60.984	64.101	67.782	67.716	71.864	70.767	72.175	75.573	71.196	74.432	75.527	76.999	83.084	82.317	86.19	81.68
Petroleum	55.723	54.455	56.041	61.418	61.777	64.697	68.281	65.862	67.34	69.977	70.627	70.533	70.528	72.185	75.84	78.761	76.099	74.042	68.259
Natural Gas	16.752	17.412	18.45	18.915	18.457	20.119	20.651	20.028	19.844	18.172	22.076	19.004	20.633	20.484	21.303	22.403	22.709	23.784	22.878
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2 Stationary Combustion (CH4 and N2O emissions)																				
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
MMTCO2E	0.0963	0.1005	0.1075	0.1472	0.1392	0.1409	0.1458	0.1196	0.107	0.1111	0.1238	0.0857	0.0871	0.0913	0.093	0.068	0.0607	0.0652	0.069	
Residential	0.0963	0.1005	0.1075	0.1472	0.1392	0.1409	0.1458	0.1196	0.107	0.1111	0.1238	0.0857	0.0871	0.0913	0.093	0.068	0.0607	0.0652	0.069	
N2O	0.018	0.0188	0.0201	0.0269	0.0254	0.0256	0.0267	0.0223	0.02	0.0207	0.0233	0.0164	0.0166	0.0174	0.0178	0.0133	0.012	0.0127	0.0135	
CH4	0.0783	0.0817	0.0873	0.1203	0.1139	0.1152	0.1192	0.0973	0.087	0.0903	0.1004	0.0693	0.0705	0.0739	0.0752	0.0546	0.0488	0.0525	0.0555	
Commercial	0.0216	0.0204	0.0224	0.0295	0.0287	0.0298	0.0295	0.0293	0.0253	0.0259	0.0292	0.0236	0.0221	0.0225	0.0236	0.0185	0.0165	0.017	0.0178	
N2O	0.006	0.0052	0.006	0.0069	0.0069	0.0073	0.0067	0.0069	0.0057	0.0062	0.0069	0.006	0.0052	0.0056	0.0056	0.0048	0.004	0.0042	0.0043	
CH4	0.0157	0.0152	0.0164	0.0226	0.0219	0.0224	0.0228	0.0224	0.0196	0.0197	0.0223	0.0177	0.0169	0.0173	0.0179	0.0137	0.0124	0.0128	0.0134	
Industrial	0.3755	0.3744	0.3713	0.3759	0.3802	0.3995	0.3972	0.4236	0.3999	0.4033	0.3907	0.3486	0.4994	0.3629	0.3888	0.3704	0.372	0.3592	0.2967	
N2O	0.252	0.2512	0.2492	0.2523	0.2552	0.2681	0.2666	0.284	0.2682	0.2709	0.2624	0.2348	0.3348	0.2441	0.2616	0.2494	0.2498	0.2411	0.1991	
CH4	0.1235	0.1231	0.1221	0.1236	0.125	0.1314	0.1306	0.1396	0.1317	0.1324	0.1283	0.1137	0.1646	0.1188	0.1272	0.121	0.1221	0.1181	0.0976	
Electric Power	0.3201	0.2873	0.2761	0.2981	0.31	0.3285	0.3284	0.3518	0.3528	0.3599	0.3778	0.3529	0.3727	0.3786	0.3864	0.4205	0.4191	0.4417	0.4177	
N2O	0.3061	0.2748	0.2641	0.285	0.2964	0.3139	0.3139	0.3355	0.3364	0.3433	0.3602	0.3368	0.3554	0.3614	0.3687	0.4008	0.3992	0.4203	0.3978	
CH4	0.014	0.0125	0.012	0.0131	0.0135	0.0146	0.0145	0.0163	0.0164	0.0166	0.0176	0.0161	0.0173	0.0172	0.0176	0.0197	0.0199	0.0214	0.0199	
TOTAL	0.8135	0.7825	0.7773	0.8506	0.8581	0.8986	0.901	0.9244	0.885	0.9002	0.9215	0.8108	0.9814	0.8553	0.8918	0.8774	0.8682	0.8831	0.8011	
3 Natural Gas and Oil (e.g. transmission, distribution, flaring)																				
Emissions (MMTCO2 Eq.)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Natural Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4 Coal Mining																				
Emissions (MTCO2E)	1990	1991*	1992*	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Coal Mining	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Abandoned Coal Mines	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Vented	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sealed	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Flooded	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5 Mobile Combustion (CH4 and N2O emissions)																				
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	2007	2008	
Gasoline Highway	224454	225290	230884	223564	224489	217193	210772	203425	195661	180146	174714	170287	146025	133439	124847	114933	101910	92009	82199	
Passenger Cars	137775	130189	130648	124611	125314	120768	116807	112136	108607	102487	99331	93262	84801	77005	72775	66744	59460	53347	47073	
Light-Duty Trucks	72037	79453	85252	84832	84703	82076	80175	78600	75359	66695	65352	68850	53467	49152	45107	41752	39933	36213	32745	
Heavy-Duty Vehicles	13780	14751	14027	13158	13455	13290	12754	11680	10697	9920.3	8983.5	7243.3	6860.6	6403.5	6045.2	5514.5	1412.4	1260.8	1138	
Motorcycles	862.7	896.89	957.08	963.36	1016.4	1059.1	1036.8	1008.9	997.73	1042.8	1046.3	930.76	896.35	878.38	919.21	923.18	1103.8	1188.5	1242.9	
Diesel Highway	774.2	812.97	839.78	873.49	958.04	1019	1059.8	1142.5	1180	1230.5	1304.5	1296.7	1303.2	1301.9	1371.8	1353.9	1486.6	1500.9	1483.1	
Passenger Cars	7.6106	6.9919	7.1033	6.8309	6.7603	6.4224	6.2824	6.3075	6.0796	5.8244	5.794	5.3162	5.3118	5.2889	5.4526	5.4669	5.0159	4.9062	4.6794	
Light-Duty Trucks	17.167	19.231	21.926	23.239	24.599	25.507	27.026	29.178	30.096	31.331	33.551	33.997	34.242	35.261	36.073	36.809	42.094	53.399	52.617	
Heavy-Duty Vehicles	749.42	786.74	810.75	843.42	926.68	987.11	1026.5	1107	1143.9	1193.3	1265.2	1257.4	1263.6	1261.4	1330.2	1311.6	1439.5	1442.6	1425.8	
Non-Highway	14360	11767	13007	12127	12071	13505	14141	13294	13354	13634	12833	14044	14530	14083	16393	17289	19921	16002	16473	
Boats	1648.3	1651.4	3546.1	2686.7	2048.9	1666.8	1545.7	1485.1	1299.6	1125	1129.8	1005.2	2163.4	2522.9	4149.4	4624	7762.4	5478.3	6530.6	
Locomotives	1306.7	987.71	1022.3	919.84	1142.6	1237.5	1442.2	1880.2	1397.4	1379.4	1284	1326.5	2134.4	1890.4	1988.8	2013.5	2166	1432.7	1275.9	
Farm Equipment	2855.3	1884.1	1739	2188.6	2022.8	3309.1	3549.5	3211.9	3888.1	3517.4	3616.7	4622.6	3876.4	2764.3	2564.7	2574	2992.7	2620	2447.6	
Construction Equipment	1562.7	1314.8	1395.9	1399.4	1532.1	1681.2	2203.4	1858	2063.4	2294.4	2263	2768.9	2465.9	2565.8	2565.7	2830.3	2880.1	3018.5	3264	
Aircraft	5468.1	4458.3	3895.6	4543.6	4899.3	5225.2	5028.5	4488.8	4347.1	4457.7	3667.9	2857.1	2423	2898.8	3415.9	3592.1	2655.9	2559.3	2085.5	
Other*	1519	1471	1408.4	388.87	425.1	384.78	371.34	369.64	358.52	859.93	871.33	1463.4	1466.7	1440.8	1708.4	1655	1464.3	893.59	869.13	
Alternative Fuel Vehicles	265.6	280.32	297.61	375.31	394.5	521.09	684.04	929.81	1039.3	1122.8	1306.1	1713.6	1978.5	2308	2666.7	2353	2413	2923.5	3465.1	
Light Duty Vehicles	86.255	92.096	98.626	106.81	105.89	183.62	254.2	433.05	479.85	528.87	574.22	611.48	722.84	800.43	825.47	706.23	722.88	839.46	924.32	
Heavy Duty Vehicles	99.394	98.72	97.382	129.42	142.38	189.81	273.73	326.78	376.07	397.11	524.77	853.47	983.11	1226.1	1434.2	1291.9	1344.9	1685.4	2077.3	
Buses	79.949	89.499	101.6	139.07	146.23	147.66	156.11	169.98	183.4	196.8	207.08	248.64	272.51	281.47	407.08	354.9	345.23	398.64	463.54	
Total	239854	238150	245029	232940	237912	232238	226657	218791	211234	196133	190157	187341	163836	151132	145278	135929	125731	112436	103620	

* "Other" includes snow mobiles, 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	2007	2008
Gasoline Highway	2E+06	2E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	2E+06	2E+06	2E+06	2E+06	1E+06	1E+06
Passenger Cars	1E+06	1E+06	1E+06	1E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06	1E+06	1E+06	1E+06	1E+06	1E+06	947243	820415	689917
Light-Duty Trucks	741738	898755	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	932511	837452	772219	663181	558288
Heavy-Duty Vehicles	35264	42455	44353	45006	49123	51236	56176	62868	69424	69952	70417	62492	64906	66476	64576	56701	15603	14493	13679
Motorcycles	1237.1	1286.1	1372.4	1381.4	1457.5	1518.7	1498	1470.9	1465.5	1528.1	1540.1	1375	1328.3	1305.1	1368.8	1377.2	1649	1777.2	1860.2
Diesel Highway	11059	11605	12004	12479	13666	14515	15093	16263	16789	17497	18545	18432	18524	18515	19496	19255	21140	21439	21180
Passenger Cars	246.94	226.87	230.48	221.64	219.35	208.39	203.85	204.66	197.27	188.99	188	172.49	172.35	171.61	176.92	177.39	162.75	159.19	151.83
Light-Duty Trucks	394.37	441.8	503.72	533.88	565.11	585.97	620.87	670.31	691.4	719.78	770.77	781.01	786.65	810.06	828.72	845.63	967.04	1226.7	1208.8
Heavy-Duty Vehicles	10417	10936	11270	11724	12881	13721	14269	15388	15900	16588	17586	17478	17565	17533	18491	18232	20010	20053	19819
Non-Highway	114701	93072	94791	95284	100495	108987	108790	99343	98774	102297	93066	90167	86368	89979	101637	107179	112313	93959	97998
Boats	8463.4	8479.3	18208	13795	10520	8558.3	7936.7	7625.2	6673.1	5776.2	5800.8	5161.2	11108	12954	21305	23742	39857	28129	33532
Locomotives	6172.6	4665.7	4829.1	4345.1	5397.4	5845.8	6812.7	8881.9	6601.2	6516	6065.3	6266	10082	8929.7	9394.7	9511.4	10232	6767.6	6027
Farm Equipment	7493.2	4944.6	4563.6	5743.6	5308.5	8684.2	9315	8429.2	10204	9230.9	9491.4	12131	10173	7254.5	6730.5	6755	7853.9	6875.7	6423.4
Construction Equipment	10252	8626.4	9158.2	9181.3	10052	11030	14456	12190	13538	15053	14847	18166	16179	16834	16833	18569	18896	19804	21415
Aircraft	72354	56705	48792	59668	66428	72344	67833	59792	59406	60079	51145	38841	29204	34555	36165	37743	25868	26520	24899
Other*	9965.7	9651.3	9240.3	2551.3	2789	2524.5	2436.3	2425.2	2352.2	5641.9	5716.6	9601.2	9622.6	9453	11209	10858	9606.9	5862.7	5702.2
Alternative Fuel Vehicles	3718	3543.1	3367.3	4256.5	4097.3	4048.5	4373.3	4850.8	5051.3	4733.6	5362.1	6452.3	7442.8	8332.8	8548.9	7047.3	6739.2	7642.3	8586.7
Light Duty Vehicles	863.61	857.8	859.12	913.3	859.81	953.26	1106	1329.1	1388.3	1371.2	1615.4	1748.9	2086.1	2386.8	2454.7	2158.7	2201.1	2598.2	2908
Heavy Duty Vehicles	2744.2	2560.2	2365.8	3148.9	3034.6	2886.6	3041.2	3290.2	3417.3	3097.9	3474.6	4376.8	4998.6	5576.2	5559.3	4422.3	4084.5	4520.3	5069.6
Buses	110.18	125.08	142.31	194.25	202.88	208.72	226.19	231.48	245.75	264.47	272.1	326.71	358.08	369.85	534.9	466.34	453.63	523.81	609.09
Total	2E+06	2E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	2E+06	2E+06	2E+06	2E+06	2E+06	1E+06
* "Other" includes snow mobiles, small gasoline powered utility equipment, heavy-duty gasoline powered utility equipment, and heavy-duty diesel powered utility equipment.																			
6 Industrial Processes (e.g. cement production, lime manufacture)																			
MTCO2e	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Carbon Dioxide Emissions	1E+06	975260	1E+06	1E+06	2E+06	2E+06	1E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06	2E+06
Cement Manufacture	489554	434195	444282	811651	825355	840353	418883	421986	448360	462840	507518	494558	456290	417504	417316	386993	424712	402620	624772
Lime Manufacture	0	0	0	84887	76383	86407	78683	0	0	0	0	0	0	0	0	0	0	0	0
Limestone and Dolomite Use	0	0	0	0	27877	56958	76550	105530	132305	75680	57395	48237	46642	31952	38225	43770	60733	75488	48719
Soda Ash	70681	68436	69516	69700	70314	73786	73310	75179	76811	76213	77346	78199	79607	78300	79037	79167	79195	77918	75765
Ammonia & Urea	477180	472629	492164	475388	521968	525853	584290	596832	610942	600442	546089	427383	577722	463666	513884	509254	556141	526874	487767
Iron & Steel Production	0	0	0	0	0	0	0	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	923684
Nitrous Oxide Emissions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitric Acid Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Adipic Acid Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HFC, PFC, and SF6 Emissions	798216	770106	813294	916247	1E+06	1E+06	2E+06	2E+06	2E+06	2E+06	3E+06	3E+06	3E+06	3E+06	3E+06	4E+06	4E+06	4E+06	4E+06
ODS Substitutes	8634.2	16807	45948	147915	339545	792464	1E+06	1E+06	2E+06	2E+06	2E+06	2E+06	3E+06	3E+06	3E+06	3E+06	3E+06	3E+06	4E+06
Semiconductor Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Electric Power Transmission and Distribution Systems	789582	753299	767347	768331	711335	683036	639290	583296	517503	530445	523436	522822	516609	494245	508251	504432	485454	463754	473061
HCFC-22 Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aluminum Production	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Emissions	2E+06	2E+06	2E+06	2E+06	3E+06	3E+06	3E+06	4E+06	5E+06	5E+06	5E+06	5E+06	5E+06	6E+06	6E+06	6E+06	6E+06	6E+06	6E+06

7 Agriculture (CH4 and N2O, e.g. manure management, residue burning)

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, Arrow leaf Clover, Crimson Clover,

Ag Soils-Plant-Fertilizers:

Organic: Dried Blood, Compost, Other Sewage Sludge, Tankage

Rice Cultivation:

Ag Residue Burning:

The "National Adjustment Factor" is applied to reconcile differences between the methodologies for estimating nitrous oxide emissions from agricultural soils of the National Inventory of Greenhouse Gas Emissions and the State Inventory Tool. The method used in the SIT underestimates indirect emissions from fertilizers and overestimates indirect emissions from livestock and all direct sources of agricultural soils emissions relative to the National Inventory. Other sources will not be affected.

Emissions (MMTCO₂ Eq.)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Enteric Fermentation	1.8895	1.9229	1.9669	1.9920	2.0380	2.0668	2.0232	1.9624	1.8449	1.8277	1.8325	1.7839	1.7570	1.8423	1.8260	1.8054	1.7778	1.7704	1.7042
Manure Management	1.3299	1.3497	1.3710	1.4341	1.4543	1.4557	1.5047	1.5269	1.6156	1.6016	1.5657	1.5886	1.6154	1.5497	1.5838	1.5961	1.5923	1.6427	1.6308
Ag Soils	2.4274	2.6735	2.6981	2.4945	3.1659	3.8126	3.8889	3.7235	3.5121	3.3384	3.2697	3.2592	3.2763	3.4947	3.5478	3.4349	3.4158	3.4403	3.1246
Rice Cultivation	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Agricultural Residue Burning	0.0061	0.0084	0.0092	0.0055	0.0085	0.0050	0.0065	0.0059	0.0040	0.0040	0.0038	0.0044	0.0038	0.0053	0.0054	0.0047	0.0037	0.0063	0.0080
TOTAL	5.6529	5.9545	6.0452	5.9261	6.6667	7.3401	7.4234	7.2187	6.9766	6.7718	6.6716	6.6361	6.6526	6.8919	6.9630	6.8410	6.7896	6.8598	6.4675

Emissions by Gas (MMTCH₄ or MMTN₂O)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Methane	0.1212	0.1236	0.1261	0.1289	0.1313	0.1309	0.1294	0.1272	0.1245	0.1236	0.1223	0.1206	0.1193	0.1212	0.1209	0.1198	0.1173	0.1182	0.1140
Enteric Fermentation	0.0900	0.0916	0.0937	0.0949	0.0970	0.0984	0.0963	0.0934	0.0879	0.0870	0.0873	0.0849	0.0837	0.0877	0.0870	0.0860	0.0847	0.0843	0.0812
Manure Management	0.0311	0.0318	0.0322	0.0338	0.0340	0.0323	0.0329	0.0336	0.0365	0.0364	0.0349	0.0355	0.0355	0.0333	0.0338	0.0337	0.0325	0.0337	0.0326
Rice Cultivation	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Agricultural Residue Burning	0.0002	0.0002	0.0003	0.0002	0.0003	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0002	0.0002
Nitrous Oxide	0.0100	0.0108	0.0110	0.0104	0.0126	0.0148	0.0152	0.0147	0.0141	0.0135	0.0132	0.0132	0.0134	0.0140	0.0143	0.0140	0.0140	0.0141	0.0131
Manure Management	0.0022	0.0022	0.0022	0.0023	0.0024	0.0025	0.0026	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027	0.0028	0.0027	0.0028	0.0029	0.0029	0.0030
Ag Soils	0.0078	0.0086	0.0087	0.0080	0.0102	0.0123	0.0125	0.0120	0.0113	0.0108	0.0105	0.0105	0.0106	0.0113	0.0114	0.0111	0.0110	0.0111	0.0101
Agricultural Residue Burning	7E-06	1E-05	1E-05	6E-06	1E-05	6E-06	7E-06	7E-06	4E-06	4E-06	4E-06	5E-06	4E-06	6E-06	6E-06	5E-06	4E-06	7E-06	9E-06

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	2007	2008
Direct	6810.2	7588	7650.6	6965.9	8765.8	10172	10374	9903.9	9312	8851.1	8688.5	8695.6	8668.1	9345	9486	9189.1	9070.2	9202.1	8555.9
Fertilizers	0	0	0	0	1006.7	2945.5	3015.5	2840.4	2588	2321.7	2138.4	2022	2236.8	2284.9	2347.1	2132.2	2267.7	2075.6	995.43
Crop Residues	380.86	553.47	607.19	342.39	547.35	322.1	403.5	356.43	246.13	238.46	225.79	263.46	222.28	320.18	344.82	286.16	224.97	383.18	506.93
N-Fixing Crops	834.73	1370.9	1311.8	791.24	1221.4	810.03	878.22	766.72	715.86	640.14	604.86	768.99	594.35	890.76	958.22	940.87	709.05	892.58	1301.8
Histosols	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Livestock	5594.6	5663.6	5731.6	5832.3	5990.3	6094.4	6076.5	5940.3	5762	5650.8	5719.4	5641.2	5614.7	5849.1	5835.8	5829.8	5868.5	5850.7	5751.8
Indirect	1020.2	1036.3	1052.8	1080.8	1446.8	2126.6	2171.2	2107.4	2017.2	1918.1	1858.8	1818	1900.6	1928.1	1958.4	1891.3	1948.5	1895.6	1523.3
Fertilizers	0	0	0	0	111.86	327.3	335.08	315.62	287.58	257.99	237.62	224.68	248.55	253.89	260.81	236.93	251.98	230.64	110.61
Livestock	480.11	487.69	495.46	508.61	521.63	534.86	544.75	542.46	539.93	535.4	536.48	535.71	540.62	545.92	550.33	552.78	558.27	563.75	559.41
Leaching/Runoff	540.12	548.65	557.39	572.19	813.34	1264.5	1291.3	1249.4	1189.7	1124.7	1084.7	1057.6	1111.5	1128.3	1147.2	1101.6	1138.3	1101.2	853.31
Fertilizer Runoff/Leached	0	0	0	0	226.51	662.74	678.49	639.09	582.3	522.39	481.14	454.95	503.28	514.11	528.11	479.75	510.23	467.02	223.97
Manure Runoff/Leached	540.12	548.65	557.39	572.19	586.83	601.71	612.84	610.27	607.42	602.33	603.55	602.67	608.2	614.16	619.13	621.87	628.06	634.22	629.33
TOTAL	7830.4	8624.3	8703.4	8046.7	10213	12299	12545	12011	11329	10769	10547	10514	10569	11273	11444	11080	11019	11098	10079

10 Wastewater																				
Emissions (MMTCO2E)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
Municipal CH4	0.4357	0.4453	0.4546	0.4637	0.4739	0.4835	0.4932	0.5035	0.5136	0.5238	0.5536	0.5662	0.5773	0.5874	0.5993	0.6117	0.6268	0.6405	0.6523	
Municipal N2O	0.1773	0.1828	0.1900	0.1938	0.1998	0.2021	0.2079	0.2104	0.2165	0.2247	0.2395	0.2493	0.2478	0.2521	0.2597	0.2675	0.2754	0.2827	0.2886	
Industrial CH4	0.0101	0.0109	0.0114	0.0109	0.0115	0.0116	0.0089	0.0075	0.0072	0.0077	0.0083	0.0083	0.0065	0.0063	0.0041	0.0034	0.0038	0.0042	0.0003	
Fruits & Vegetables	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Red Meat	0.0101	0.0109	0.0114	0.0109	0.0115	0.0116	0.0089	0.0075	0.0072	0.0077	0.0083	0.0083	0.0065	0.0063	0.0041	0.0034	0.0038	0.0042	0.0003	
Poultry	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Pulp & Paper	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
Total Emissions	0.6231	0.6391	0.6560	0.6684	0.6852	0.6972	0.7100	0.7214	0.7373	0.7563	0.8014	0.8239	0.8317	0.8458	0.8631	0.8826	0.9059	0.9274	0.9411	