



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Air Quality

Draft 2017 Pennsylvania Greenhouse Gas Emission Inventory

Climate Change Advisory Committee

August 7, 2017

Emission Inventory

- State Inventory Tool:
 - Made available on April 13, 2017.
 - Updated all 11 modules with data through 2014.

First Draft

- The first draft of the inventory was completed on July 5, 2017.
- The first draft showed an overall decrease in greenhouse gas emissions in Pennsylvania of approximately 3.6 MMTCO₂e from 2013 to 2014.
- Decreases in GHG emissions occurred in the Transportation (0.63 MMTCO₂e), Electrical Production (6.35 MMTCO₂e), and Agriculture (0.94 MMTCO₂e) sectors.

- Slight increases in GHG emissions occurred in the Residential (2.18 MMTCO₂e), Commercial (0.68 MMTCO₂e), Industrial (1.13 MMTCO₂e), and Waste Management (0.29 MMTCO₂e) sectors.

Industrial Sector Increases

Industrial GHG Emissions (MMTCO ₂ e)	2013	2014
Combustion of Fossil Fuels	49.45	51.25
Industrial Process	19.55	18.88
Coal Mining and Abandoned Coal Mines	11.23	10.65
Natural Gas and Oil Systems	11.13	11.71

Industrial Sector		
Fuel Type (MMTCO ₂ e)	2013 Emissions	2014 Emissions
Coal	18.71	19.08
Petroleum	12.17	12.48
Natural Gas	18.57	19.69
Other	-	-
Total	49.45	51.25

Residential / Commercial Sector

Residential Sector		
Fuel Type (MMTCO ₂ e)	2013 Emissions	2014 Emissions
Distillate Fuel	5.871	6.741
Kerosene	0.084	0.148
LPG	1.171	1.162
Natural Gas	12.901	14.174
Total	20.05	22.23

Commercial Sector		
Fuel Type (MMTCO ₂ e)	2013 Emissions	2014 Emissions
Coal	0.31	0.31
Distillate Fuel	1.37	1.47
LPG	0.4	0.48
Natural Gas	8.31	8.88
Total	10.51	11.19

Transportation / Electric Power Sector

Transportation Sector		
Fuel Type (MMTCO ₂ e)	2013 Emissions	2014 Emissions
Distillate Fuel	15.96	16.36
Jet Fuel, Kerosene	3.00	2.87
Motor Gasoline	39.47	38.85
Residual Fuel	0.47	0.27
Natural Gas	2.13	2.04
Total	61.54	60.91

Electric Power		
Fuel Type (MMTCO ₂ e)	2013 Emissions	2014 Emissions
Coal	83.08	74.68
Distillate Fuel	0.24	0.54
Natural Gas	20.04	21.43
N ₂ O	.416	0.376
CH ₄	.032	0.031
Total	103.41	97.06

Solid Waste Sector

CH ₄ Emissions from Landfills (MMTCO ₂ e)		
	2013	2014
Potential CH ₄	10.43	10.65
MSW Generation	9.75	9.95
Industrial Generation	0.68	0.70
CH ₄ Avoided	-2.21	-2.21
Flare	-0.44	-0.44
Landfill Gas-to-Energy	-1.77	-1.77
Oxidation at MSW Landfills	0.754	0.77
Oxidation at Industrial Landfills	0.07	0.07
Total CH₄ Emissions	7.40	7.60
CO ₂ , N ₂ O, and CH ₄ Emissions for Waste Combustion (MMTCO ₂ e)		
CO ₂	2.28	2.28
Plastics	1.52	1.53
Synthetic Rubber in MSW	0.23	0.19
Synthetic Fibers	0.53	0.56
N ₂ O	0.04	0.04
CH ₄	0.00	0.00
Total CO₂, N₂O, CH₄ Emissions	2.32	2.32
Total Waste Emissions	9.53	9.72

All Sectors – 1st Draft

Sector / Emission Source (MMTCO ₂ e)	2013	2014	Change
Residential	20.05	22.23	2.18
Commercial	10.51	11.19	0.68
Industrial	91.36	92.49	1.13
Combustion of Fossil Fuels	49.45	51.25	1.80
Industrial Process	19.55	18.88	(0.67)
Coal Mining and Abandoned Coal Mines	11.23	10.65	(0.58)
Natural Gas and Oil Systems	11.13	11.71	0.58
Transportation	61.54	60.91	(0.63)
Petroleum	59.42	58.87	(0.55)
Natural Gas	2.13	2.04	(0.09)
Electricity Production (in-state)	103.41	97.06	(6.35)
Coal	83.08	74.68	(8.20)
Natural Gas	20.04	21.43	1.39
Oil	0.29	0.54	0.25
Agriculture	8.74	7.80	(0.94)
Enteric Fermentation	3.63	3.66	0.03
Manure Management	2.23	3.35	1.05
Agricultural Soil Management	2.86	0.77	(2.09)
Burning of Agricultural Crop Waste	0.01	0.01	0.00
Waste Management	11.88	12.17	0.29
Solid Waste and Combustion	10.18	10.41	0.23
Wastewater	1.70	1.76	0.06
Total Statewide Gross Emissions (Production)	307.49	303.85	(3.64)
<i>Increase relative to 2000</i>	-5.66%	-6.77%	
Forestry and Land Use	(34.35)	(34.38)	-0.03
Total Statewide Net Emissions (Production with sinks)	273.14	269.47	(3.67)



Emission Inventory

- All numbers are for 1st draft of inventory.
- Numbers will be verified once Agriculture and Natural Gas/Oil System issue is resolved.
- Preliminary numbers show a decrease of nearly 4 MMTCO₂e between 2013 and 2014.



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Air Quality

Thank You

Mark Brojakowski
Bureau of Air Quality
717-772-3429
mbrojakows@pa.gov