POINT SOURCES OF CARBON DIOXIDE IN MARYLAND

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By Alan Mikowychok, ERM; Paul Petzrick, MD DNR

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MARYLAND CO2

CO2 enters the atmosphere through the burning of fossil fuels, solid waste, wood products, and as a result of other chemical reactions (such as cement manufacturing).

CO2 emissions in Maryland represent **0.8%** of total CO2 emissions in the US in 2018.

Compared to neighboring states:

- PA: 3.9% of total emissions
- VA: 1.5% of total emissions
- WV: 2.5% of total emissions
- DE: 0.3% of total emissions
- DC: 0.01% of total emissions

Source: EPA's Facility Level Information of Greenhouse gases Tool (FLIGHT) Database.

CO2 EQUIVALENT

All GHG emissions are reported on a CO2 equivalent (CO2e) basis, which multiplies the emissions in tons by each GHG's global warming potential.

2018 Emissions from all GHGs in MD: 22,297,242 metric tons of CO2e
2018 Emissions from CO2 in MD: 21,166,462 metric tons of CO2e

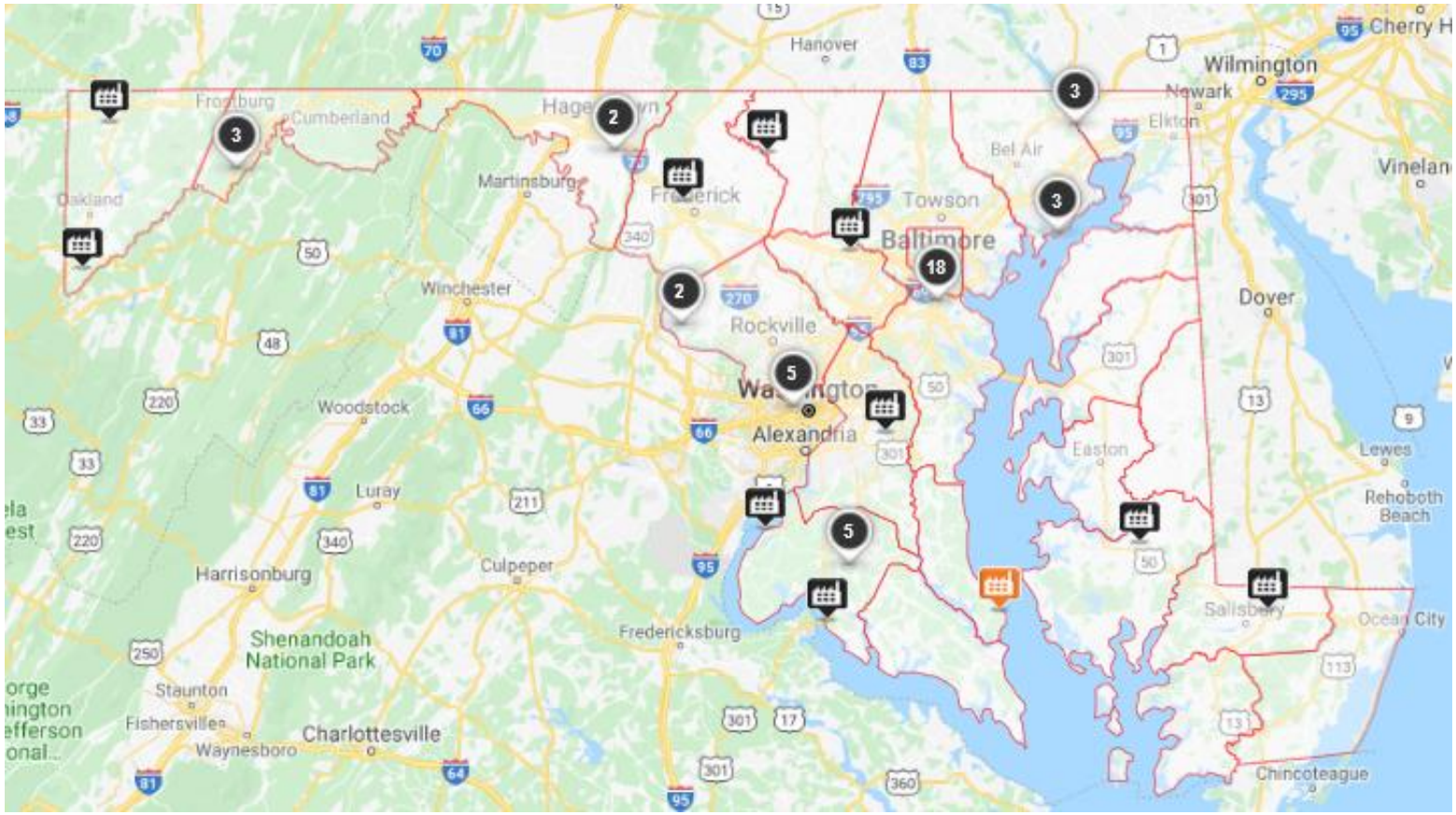
CO2 represents **95%** of all GHG emissions in Maryland.

Methane (CH4) represents nearly all (93%) of the non-CO2 emissions reported; 96% of methane emissions are from the waste sector (primarily from landfills).

SOURCE LOCATIONS

MARYLAND DEPARTMENT OF NATURAL RESOURCES

Overview Map of Point Sources of CO_2 in Maryland



Source: EPA FLIGHT database

SOURCES BY COUNTY

County	Number of Facilities	2018 Emissions (Metric Tons CO2)
Allegany	3	1,815,118
Anne Arundel	4	5,620,834
Baltimore	4	249,761
Baltimore City	11	728,703
Calvert	1	933,262
Carroll	1	1,809,968
Cecil	3	1,644,867
Charles	3	2,436,402
Dorchester	1	28,331

County	Number of Facilities	2018 Emissions (Metric Tons CO2)
Frederick	1	8,083
Garrett	2	65,364
Harford	2	286,376
Howard	1	21
Montgomery	6	928,803
Prince George's	5	2,574,368
Washington	2	391,417
Wicomico	1	43,711
Unknown	N/A	1,602,704

Counties with no reported sources: Caroline, St. Mary's, Talbot, and Worcester

Data Source: EPA FLIGHT database

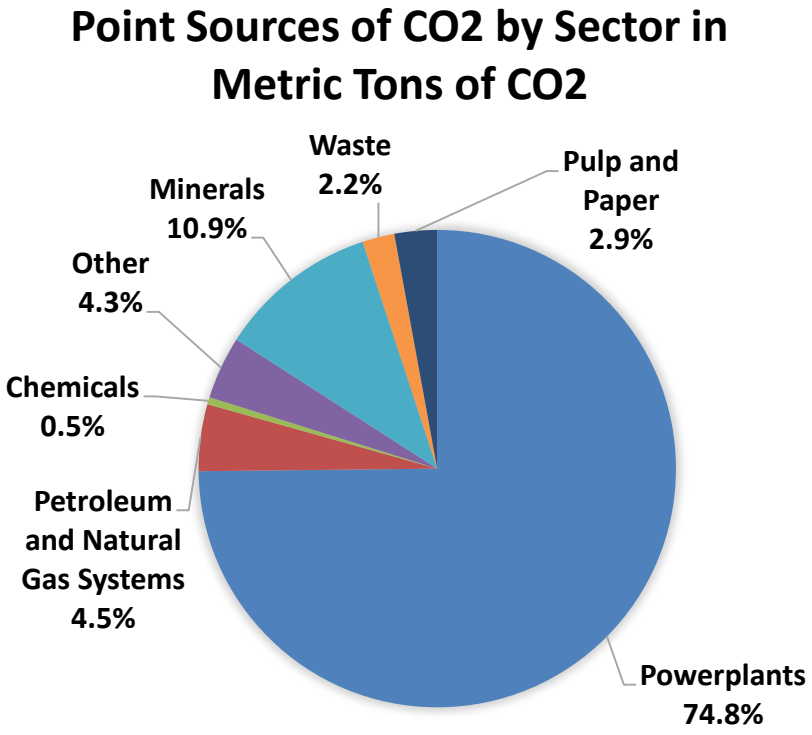
SOURCE SECTORS

52 Facilities Reporting Carbon Dioxide in Maryland in 2018:

- 22 Power Plants
- 2 Petroleum and Natural Gas Systems
- 1 Chemical Source
- 3 Mineral Sources
- 10 Waste Sources
- 1 Pulp and Paper Source
- 13 Other Sources

Total 2018 Reported Emissions: 21,166,462 metric tons of CO2

Total 2018 Emissions from Power Plants: 15,837,769 metric tons of CO2



Data Source: EPA FLIGHT database

SECTORS BREAKDOWN

"Other" sources include universities, hospitals, military installations, and food processing facilities.

Largest Sources by Sector:

- Petroleum and Natural Gas System: Cove Point LNG Facility (97.5%)
- Chemical: GRACE (100%)
- Minerals: Lehigh Cement Company (78.8%)
- Waste: Wheelabrator Baltimore LP (54.8%) and Montgomery County Resource Recovery Facility (44.8%)
- Pulp and Paper: Verso Luke LLC (100%)
- Other: US Public Health Service National Institutes of Health (23.0%)

Percentages represent the percent of the total CO2 emissions reported for that sector.

POWER PLANTS

Largest Power Plant Emissions Sources:

- Brandon Shores LLC in Anne Arundel (31.6%)
- Morgantown in Charles County (15.1%)
- St. Charles Energy Center in Charles County (10.1%)
- Chalk Point in Prince George's County (9.2%)
- Wildcat Point Generation Facility in Cecil County (8.8%)
- AES Warrior Run in Alleghany County (7.6%)

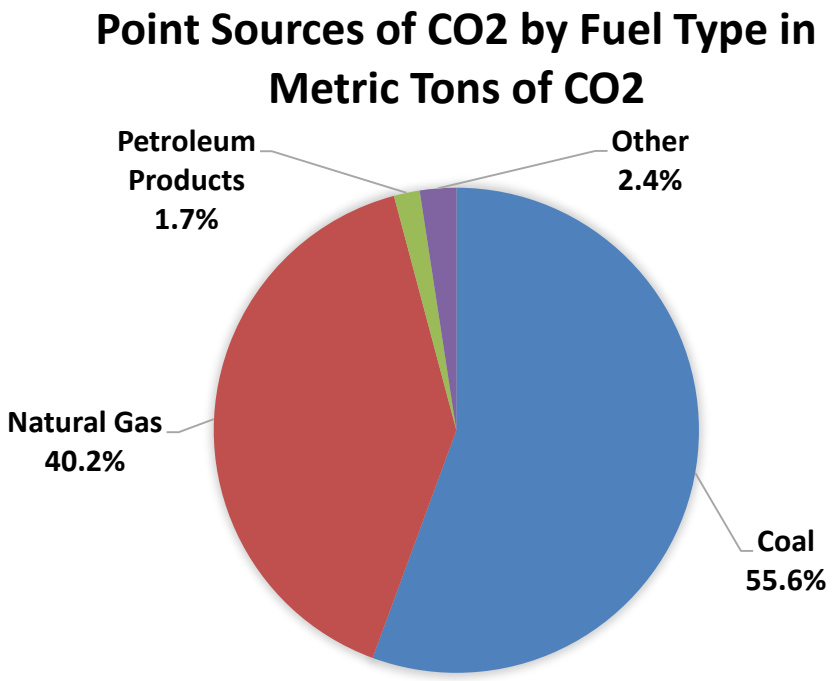
Percentages represent the percent of the total power plant CO2 emissions reported to EPA in 2018.

All other power plants contribute less than 5% of the total power plant CO2 emissions in Maryland.

SOURCE FUELS

Fuel Combustion represents approximately **89%** of Maryland's CO2 emissions.

Fuel Type	Emissions (Metric Tons CO2)
Coal	10,520,224
Natural Gas	7,612,319
Petroleum Products	326,751
Other	457,803



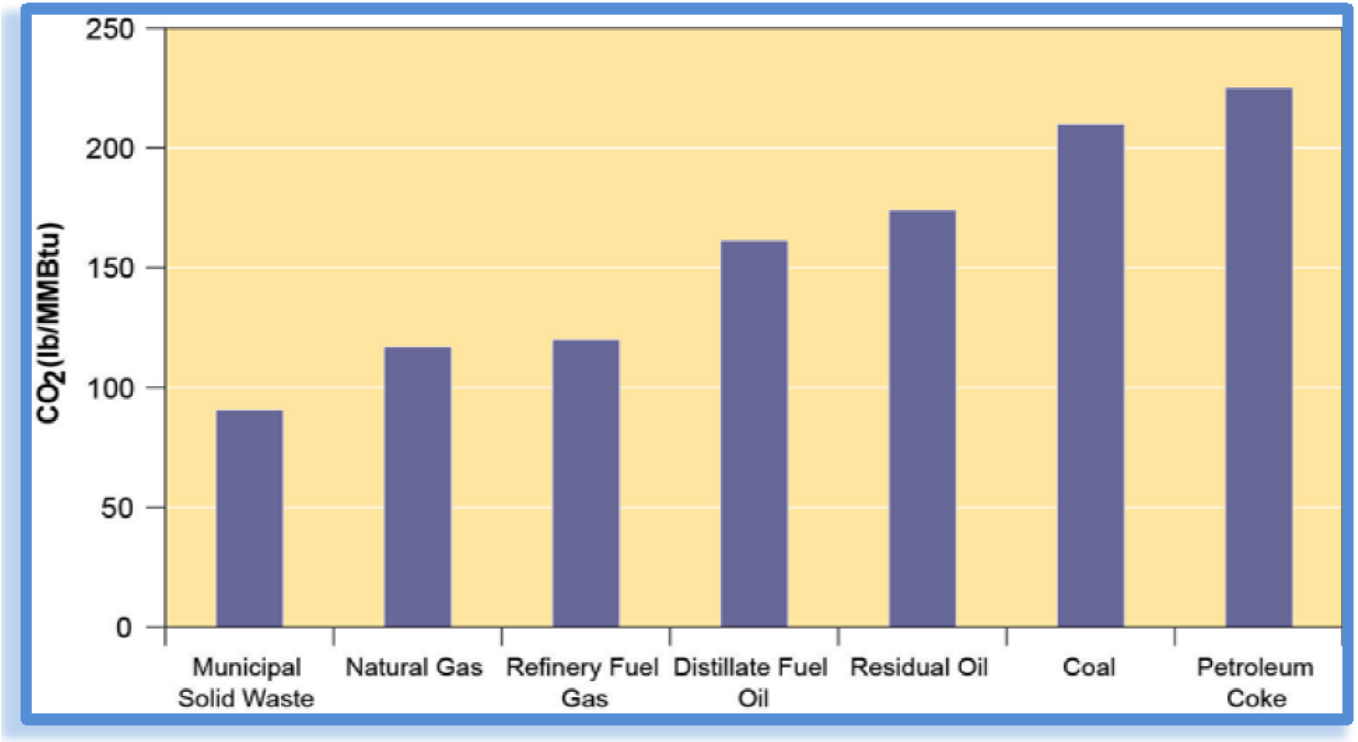
Other sources of CO2 emissions not included in Fuel Type data are process emissions – primarily from cement manufacturing.

Data Source: EPA's GHG Reporting Program Emissions by Fuel Type Data Set

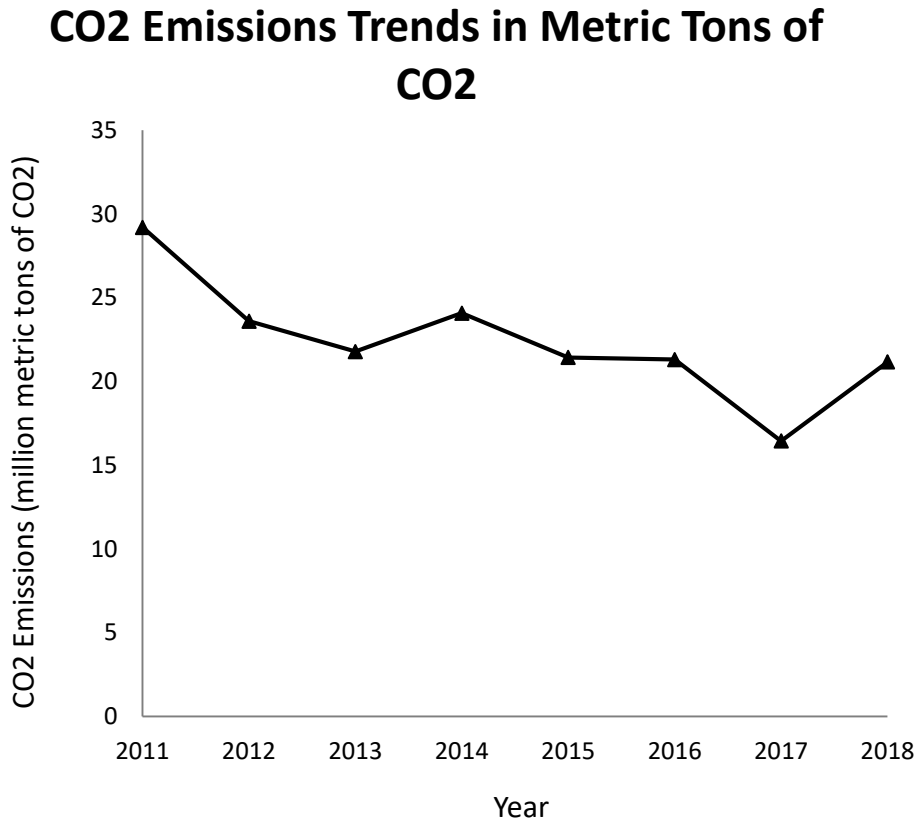
Fuel Types

Energy conversion from fossil fuel combustion varies by fuel type.

Impacts from natural gas combustion are approx. 1/2 the impact of traditional coal combustion.



TRENDS



2018 CO2 emissions were below all previous years' emissions with the exception of 2017.

Data Source: EPA FLIGHT database

MDE VS. EPA DATA

EPA 2017 CO_2 Point Source Emissions: 16,450,390 metric tons of CO_2
MDE 2017 CO_2 Point Source Emissions: 28,402,072 metric tons of CO_2

EPA reports approximately **58%** of the emissions reported to MDE. MDE data includes all sources types that are permitted and required to submitted annual emissions certifications.

EPA's database only includes facilities above the GHG reporting threshold, which would not include residential or some industrial/commercial facilities. EPA database also does not include all emergency units.

MDE groups residential, commercial, and industrial fuel use together, which may account for the difference between MDE and EPA's data.

SUMMARY

- CO_2 makes up nearly 95% of the Maryland GHG emissions reported to EPA
- Power Plants contribute approximately 75% of all CO_2 emissions in Maryland
- Sources are located throughout the state of Maryland, with Baltimore City having the largest number of sources and Anne Arundel county having the highest emissions
- The burning of coal and natural gas make up about 85% of total CO_2 emissions in Maryland
- Reported emissions decreased by 25% from 2011 to 2013 but emissions are fairly consistent over the last 5 years