

2022 NYS Statewide GHG Emissions Report

Appendix: Emission Factors for Use by State Agencies and Applicants

The following tables provide information on the greenhouse gas emissions associated with different types of fuels. This information can be used by any entity to estimate emissions that result from the use of fuels following the same CLCPA-compliant accounting used in this report and in the adoption of 6 NYCRR Part 496. These emission factors can be applied to generic (not source-specific) fossil fuels at the high heating content (see High Heating Values). The emission factors included in this document are derived from the same analyses described in the accompanying “*Sectoral Report #1: Energy*” for calculating Imported Fossil Fuels and Fugitive Emissions. The emission factors presented in this document are a work in progress, subject to future stakeholder comment, and will be subject to a continual improvement process as additional information becomes available. These factors do not include the direct emissions resulting from the combustion of the fuel.

Current Upstream and Out-of-State Emission Factors for Imported Fossil Fuels

Emission factors in Table A1 reflect greenhouse gas emissions associated with the extraction, production, and transmission of fossil fuels imported into New York State for the most recent year available, or 2019. This does not include extraction, production, or transmission of fuels within New York State (see below). Users may wish to adjust the specified emission factors for blended fuels. The gasoline emission factors represent 100% fossil fuel content gasoline, equivalent to gasoline blend stock, if evaluating blends with oxygenates (e.g., ethanol) these blends can be apportioned to the fraction of emissions associated with the energy fraction of the blend that is from fossil fuels (e.g., E85 is a blend of ethanol and gasoline estimated here to have the energy content of approximately 28% gasoline and 72% ethanol). Finally, units in grams can be converted to pounds by dividing by 453.6.

Table A1: 2020 Emission Rates for Upstream Out-of-State Sources (g/mmbtu)

Fuel Type	CO₂	CH₄	N₂O	Total CO₂e
Natural Gas	12,206	350	0.14	41,671
Diesel/ Distillate Fuel	14,599	119	0.25	24,638
Coal	3,297	401	0.10	37,029
Kerosene/Jet Fuel	9,449	106	0.16	18,413
Gasoline (E85)	4,915	33	0.08	7,671
Gasoline	18,902	125	0.32	29,504
LPG	16,582	119	0.26	26,648
Petroleum Coke	11,030	110	0.20	20,342
Residual Fuel	11,183	109	0.19	20,423

Note: Total CO₂e conversion uses GWP20 per 6 NYCRR Part 496

Current Emission Factors for Non-Energy Fuel Use

Emission factors in Table A2 reflect the upstream out of state emissions associated with fossil fuel derived products that are not primary combustion fuels but have other consumption uses within the state.

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Table A2: 2019 Emission Rates for Fossil Fuel Products (g/mmbtu)

Fuel Type	CO ₂	CH ₄	N ₂ O	Total CO _{2e}
Asphalt and Road Oil	7,961	103	0.12	16,663
Lubricants	19,402	114	0.37	29,063
Waxes	18,743	113	0.36	28,336
Miscellaneous Petroleum Products	10,142	107	0.17	19,208
Special Naphthas	13,795	115	0.25	23,521

Note: Total CO_{2e} conversion uses GWP20 per 6 NYCRR Part 496

Current Downstream and In-State Emission Factors for Fossil Fuels

Emission factors in Table A3 reflect fugitive emissions within New York State associated with fuel throughput for the most recent year available, or 2019. Emission factors were generated by summing emissions from natural gas distribution, or downstream infrastructure and dividing by the instate consumption of natural gas in industry, commercial, residential, transportation sectors.

Table A3: 2019 Emission Rates for Downstream In-State Sources (g/mmbtu)

Fuel Type	CO ₂	CH ₄	N ₂ O	Total CO _{2e}
Natural Gas and Renewable Natural Gas (RNG/biogas)	2.17	73	n/a	6,145

Note: Total CO_{2e} conversion uses GWP20 per 6 NYCRR Part 496

High Heating Value

The following table is reproduced from the Energy Information Administration (EIA) State Energy Data System (SEDS), with btu values divided by physical units. Renewable Natural Gas is assumed to be pipeline quality with equivalent energy content. Raw landfill gas has substantially different energy content per standard cubic foot. E85 is assumed to have the energy content of 28% gasoline and 72% ethanol.

Table A4: High Heating Value of Select Fuels (mmbtu)

Fuel Type	High Heating Value	Unit of volume or mass
Natural Gas/RNG	0.001034	Standard cubic foot
Diesel/Distillate Fuel	0.137	U.S. gallon
Coal	25.53	Short Ton
Kerosene/Jet Fuel	0.135	U.S. gallon
Gasoline E85	0.094	U.S. gallon
Gasoline	0.125	U.S. gallon
LPG	0.120	U.S. gallon
Petroleum Coke	0.083	U.S. gallon
Residual Fuel	0.091	U.S. gallon
Asphalt and Road Oil	0.136	U.S. gallon
Lubricants	0.150	U.S. gallon
Waxes	0.158	U.S. gallon
Misc. Petroleum Products	0.144	U.S. gallon
Special Naphthas	0.131	U.S. gallon
Biodiesel	0.138	U.S. gallon