

Post-Meter Emissions

POST-METER – BACKGROUND

- GHGI does not currently estimate post-meter emissions.
- Post-meter emission sources include leak emissions from residential and commercial appliances, industrial facilities and power plants, and natural gas fueled vehicles.

IPCC Post-meter categories	Emission Source Details
Appliances in Commercial & Residential Sectors	Leakage from house piping and appliances, including home heating, water heating, stoves, BBQ/grills
Leakage at Industrial Plants and Power Stations	Leakage from internal piping
Natural gas-fueled vehicles	Leakage from vehicles with alternative fuels produced from natural gas e.g., LNG, CNG, RNG

POST-METER – EMISSION FACTOR CONSIDERATIONS

Residential

Data Source	CH ₄ EF	EF Units	Includes App Leaks?	Includes Passive House Leaks?
IPCC (2019)	4.0	Kg/appliance	Yes	Unspecified
Fischer et al. (2018)/CARB	2.54	Kg/NG House	Yes	Yes
Merrin and Francisco (2019)	0.43	Kg/NG House	Yes	No
Lebel et al. (2020)	1.42	Kg/NG water heater	Water heaters only	No

POST-METER – EMISSION FACTOR CONSIDERATIONS (CONT.)

Commercial

Data Source	CH ₄ EF	EF Units
IPCC (2019)	4.0	Kg/appliance

Industrial Plants and EGUs

Data Source	CH ₄ EF	EF Units
IPCC (2019)	11,326.7	Kg/BCF
2021 Germany GHGI	7,702.2	Kg/BCF

NG Vehicles

Data Source	CH ₄ EF	EF Units
IPCC (2019)	0.33	Kg/vehicle

POST-METER – RESIDENTIAL ACTIVITY DATA CONSIDERATIONS

- Data available from American Housing Survey (AHS, U.S. Census Bureau) and Residential Energy Consumption Survey (RECS, EIA).
 - AHS national summary data are reported biennially (starting in 1973).
 - RECS data are only available for 7 years in the 1990-2020 time-series (i.e., 1990, 1993, 1997, 2001, 2005, 2009, and 2015).
- Both datasets contain - number of housing units using NG for specific end use purposes (e.g., space heating, water heating, cooking).
- Natural gas appliance counts are not available in the AHS and RECS data.

POST-METER – COMMERCIAL ACTIVITY DATA CONSIDERATIONS

- Data available from Commercial Buildings Energy Consumption Survey (CBECS, EIA).
 - CBECS data are only available for 5 years in the 1990-2020 time-series (i.e., 1992, 1995, 1999, 2003, and 2012).
- CBECS data contain - number of commercial buildings using NG for specific end use purposes (i.e., space heating, water heating, and cooking).
- Natural gas appliance counts are not available in the CBECS data.
- National count of commercial NG meters are available in the GHGI (used for other emission sources).

POST-METER – INDUSTRIAL PLANTS AND EGUS ACTIVITY DATA CONSIDERATIONS

- Annual national natural gas consumption data for industrial and electricity generation sectors are available from EIA’s Monthly Energy Review.

Natural Gas Consumption (BCF)

Year	Industrial	Electric Power
1990	8,255	3,245
1995	9,384	4,237
2000	9,293	5,206
2005	7,713	5,869
2010	8,112	7,387
2015	9,098	9,613
2018	10,112	10,590
2019	10,268	11,288
2020	10,086	11,616

POST-METER – NG VEHICLES ACTIVITY DATA CONSIDERATIONS

- Vehicle population estimates are available from EPA's Motor Vehicle Emission Simulator model (MOVES) and EIA's Alternate Fuel Data Center contains the Alternate Fuel Vehicle Inventory (AFVI).
 - MOVES3 counts are available for 1990 and 1999-2020.
 - AFVI covers 2004-2019.
- MOVES3 CNG vehicle counts include – buses, refuse trucks, single-unit and combination trucks (i.e., heavy-duty trucks). DOES NOT include passenger vehicle counts.
- AFVI contains annual vehicle counts for CNG, LNG, and RNG vehicles.
 - Data are only available for cities participating in DOE's Clean Cities Coalition Network

POST-METER – PRELIMINARY ESTIMATES (METRIC TONS CH₄)

Year	Residential	Commercial	Industrial Plants & EGUs	Natural Gas Vehicles
1990	164,784	16,945	130,251	0.002
2000	185,705	20,043	164,232	3.9
2010	198,253	21,206	175,553	9.2
2015	203,986	21,815	211,942	18.0
2018	213,121	22,073	234,483	26.7
2019	215,119	22,187	244,160	29.6

POST-METER – STAKEHOLDER QUESTIONS

1. EPA seeks information on additional emission factor and activity data sources to be considered for post-meter emissions.
2. EPA seeks stakeholder feedback on time series data for post-meter emission sources. Are data available that would allow the GHGI to reflect changes over time in average emissions per emission source for post-meter?