

Greenhouse Gas (GHG) Footprint Guide for Families

Goal

Track Greenhouse Gas (GHG) usage based on household activities, purchased electricity, and in purchased goods.

Key Terms

CO2 equivalent: The amount of CO2 estimated after all other GHG types have been converted into CO2 (see cheatsheet)

Scope 1: Emissions from your family's direct activities, such as vehicle use, gas cooking, and heating systems.

Scope 2: Emissions from the electricity you buy to power household appliances and lights.

Scope 3: Emissions from other indirect activities, such as goods and services you buy, which may contribute to your household's carbon footprint.

GHG Inventory (A list of your family's usage):

Monthly Utility Bills: Collect electricity, gas, and water bills monthly, and keep records of kWh used, gas consumed, and water consumption.

Vehicle Fuel: Track vehicle fuel purchases and mileage to calculate fuel consumption and CO2 emissions.

Purchases: Maintain receipts for significant household purchases (appliances, electronics) to estimate indirect Scope 3 emissions from production and supply chain.

Calculations

Scope 1: Multiply consumption of fuel type by its emission factor.

Scope 2: Multiply the kWh of electricity consumed by its emission factor.

Scope 3 Tracking Strategies: Difficult to track currently. Depends on a company's transparency in their supply chain and operations. May be able to get rough estimates.

Emission Factors: Check out the cheat sheet below for conversion factors.

Optional Information: Families can include additional information such as uncertainties, and reduction activities to provide comprehensive context.

Emission Factor Cheat Sheet

- Natural Gas
 - .408 lbs CO₂ per kWh
 - Primarily made up of Methane (CH₄)
 - Propane
 - 12.65 lbs CO₂ per gallon
 - Chemical make up of hydrocarbon (C₃H₈)
 - Gasoline
 - 19.59 lbs CO₂ per gallon
 - It is high due to chemical make up of gasoline including octane (C₈H₁₈)
 - Purchased Electricity (Scope 2)
 - Can vary by region: <https://www.epa.gov/egrid/power-profiler#/>
 - US National Average: .823 lb CO₂ per kWh
 - Renewable Energy: nearly zero for wind, solar, or hydro
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Others:

- Nitrous Oxide
 - Primary sources at home are fertilizer, soil management, and manure
 - Workable Ratio: ~1 lb N₂O is equal to 298 lbs of CO₂
- Hydrofluorocarbons (HFCs)
 - Found in refrigeration, freezers, and aerosols used as cleaning agents and deodorants
 - Workable Ratio: ~1 lb of HFC is equal to 124 lbs CO₂ (aerosol based)
 - Workable Ratio: ~1 lb of HFC is equal to 1,430 lbs CO₂ (refrigerant)
 - Workable Ratio: ~1 lb of HFC is equal to 2,088 lbs of CO₂ (air conditioners)
- Perfluorocarbons (PFCs)
 - Found in electronics or household products
 - There are several kinds
 - Workable Ratio: ~1 lb of PFCs is equal to 7,390 lbs of CO₂ (average)
- Sulfur Hexafluoride (SF₆)
 - Often used in household electrical equipment such as circuit breakers and switches

- Workable Ratio: ~1 lb of SF6 is equal to 23,500 lbs of CO2
- Nitrogen Trifluoride (NF3)
 - Workable Ratio: ~1 lb NF3 is equal to 16,100 lbs of CO2
 - May be a contributor in production and cleaning of electronics, including solar panels

GHG Inventory

Use the spaces below to estimate your household activity based on the Emissions Factor Cheat Sheet. In the Other spaces, feel free to add in approximates for the “Others” Gases listed on the Cheat Sheet. If you’re determined then attempt the Scope 3 section.

Scope 1 (Household Activities)		
Household Activity	Estimated Use	CO2 Conversion
Heating Systems (Gas, Wood Burning)		
Cooking (Natural Gas, Propane, Wood-fire)		
Transportation (Gas)		
Outdoor equipment (Gas lawnmower, heater, gas grill)		
Recreational activities (Camping stove, RVs, ATVs)		
Other (Gas powered home improvement tools)		
Other:		
Other:		
Other:		
Scope 2(Purchased Electricity)		

Purchased Electricity		
Scope 3 (Purchased Goods)		

A Word of Wisdom

It doesn't have to be perfect. Once you get started it will be easier. This will help you get started on the journey.

Individual Target Estimates

To keep warming below 2 degrees Celsius, then each person globally could emit 4,600 lbs CO2 equivalent per year.

Reduction Strategies:

Energy Efficiency: Upgrade to energy-efficient appliances, improve insulation, and switch to LED lighting.

Renewable Energy: Consider installing solar panels or opting for green energy from your utility provider.

Transportation: Use public transport, carpool, or switch to an electric vehicle to reduce Scope 1 emissions.

Permaculture: Grow your own fruits and vegetables, or support local farmers to reduce emissions associated with food transportation.

5 R's Language: Reduce, Reuse, Recycle, Repurpose, and Refuse to minimize waste and its associated emissions.

Smart Shopping: Choose durable goods over disposable ones to cut down on production emissions, and opt for eco-friendly packaging.

Track Your Progress

Base year: Keep track of your comparison year. For example, first year accounted or most recent year.

Annual Summary: Summarize your yearly GHG emissions, reduction strategies, and progress toward goals.

Communication: Share your progress with family and community to encourage environmental awareness.

Regularly revisit and refine your GHG accounting methods, targets, and strategies in response to new information or changes in household activities.