

How Much CO₂e* does heating a home emit into the atmosphere?

TERMS:

Annual heating load is the amount of heat energy that needs to be added to a specific space to keep the air temperature within an acceptable range.

*Carbon dioxide equivalent emissions (CO₂e emissions) refers to the amount of CO₂ emitted from burning the fuel plus the equivalent CO₂ being emitted in the process of exploration, extraction, transport, refinement, and distribution of the fuel.

BTU/MMBtu British Thermal Unit-a measurement of energy/1 million BTUs

Step 1: Annual Heating Load

Analyze the *Annual Heating Load* table below, and look at [VEEP/NHEEP's Home Weatherization poster](#). Think about your home or a home you know well. Is it old, weatherized, or net-zero ready? Mark the one that best applies. Then move to the right and circle the number under the applicable category (single family, apt/condo, mobile). This is your home's average annual heating load in MMBtu.

Annual Heating Load, MMBtu

| | Types of Homes | | |
|----------------|----------------|-----------------|-------------|
| | Single Family | Apartment/Condo | Mobile Home |
| Old | 120 | 72 | 135 |
| Weatherized | 68 | 41 | 106 |
| Net Zero Ready | 25 | 18 | 25 |

Step 2: Fuel Type

Find out which type of fuel is used to heat this home and circle that fuel in the table below. Ask someone or find a heating bill to determine fuel used to heat your home. If using more than one fuel type (e.g. wood and propane), circle each type used. *If you struggle to track down this information, use [this sample data](#).*

| Energy Source (Fuel Type) | CO ₂ e emissions per MMBtu of heat delivered |
|---|---|
| Fuel Oil or Kerosene | 240 lbs. |
| Propane | 210 lbs. |
| Natural Gas | 260 lbs. |
| Cord Wood | 30 - 300 lbs. |
| Wood Pellets | 23 - 230 lbs. |
| Electricity from the Grid with resistance heat | 360 lbs. |
| Electricity from the grid with air source heat pump | 160 lbs. |
| Electricity from solar with air source heat pump | 8 lbs. |

Step 3: CO₂ from Home Heating

Use the numbers you circled above to calculate approximately how many pounds (lbs.) of CO₂e are emitted into the atmosphere to keep this home acceptably warm each year. If you use more than one type of fuel, calculate for each, then average the results (assuming you use them equally).

Example (Old home, Propane only): Annual heating load 120 MMBtu per year X 210 lbs CO₂e per MMBtu delivered= 25,200 lbs CO₂e emissions per year

Example (finding an average): 25,200 (Old Home, Propane) +18,000 lbs CO₂e (Old Home, Cord Wood) = 43,200/2 = 21, 600 lbs CO₂e per year

Average VT home: 13,900 lbs CO₂e per year per family

Average NH home: 11,600 lbs CO₂e per year per family

How does your home compare? Are you lower than average? Higher? Why do you think that is?

Step 4: CO₂ Tons

One ton (2000 lbs.) of CO₂ would fill a sphere 33 feet in diameter. Watch this [video](#) to see what emissions in NY City over a year would look like in 33' spheres.

Below, calculate how many of these 33 foot spheres would be filled by the CO₂e emissions resulting from heating this home for a year.

Example: 21,600 lbs CO₂e/2000= 10.8 spheres

Step 5: Take Action

Use these links to assess what you can do in your home to lower your heating emissions. Then come back to this document to make an action plan.

Click [Here](#) to look for air leaks in your home (can be done on your own).

Click [Here](#) to look at your attic and wall insulation (must be done with an adult).

How can you lessen your home's heating fuel use? List some ideas here.

How does home heating efficiency relate to cooling your home? What heating efficiency improvements would also help keep your home cool in summer?

Action Plan

After analyzing your household’s heating/cooling habits, where can you make change? Where can you choose to use less heat or lower your emissions impact? Talk with your family and design an action plan to help change your habits to reduce heating/cooling impacts. Check out “A Smarter, Warmer Home” and our [VEEP/NHEEP](#) 2020 poster for ideas.

| Actions | When/Timeline | How |
|---------|---------------|-----|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

For the next month, log any actions daily that are working towards your goal of reducing CO₂ emissions from heating/cooling.

| | | | | | |
|-----|-----|-----|-----|-----|-----|
| 1) | 2) | 3) | 4) | 5) | 6) |
| 7) | 8) | 9) | 10) | 11) | 12) |
| 13) | 14) | 15) | 16) | 17) | 18) |
| 19) | 20) | 21) | 22) | 23) | 24) |
| 25) | 26) | 27) | 28) | 29) | 30) |

After 1 month, reflect:

1. Explain how successful you were with your goal. Do you feel like your habits changed?

2. Which actions will you continue to reduce heating/cooling emissions? Explain why.

Extend Your Reach

- Share your emissions-reducing actions, reflections, or ideas on our social media!
 - [facebook.com/NHenergyed](https://www.facebook.com/NHenergyed) or [facebook.com/VTEnergyEducation](https://www.facebook.com/VTEnergyEducation)
 - [instagram.com/vtenergyed](https://www.instagram.com/vtenergyed) or [instagram.com/nhenergyed](https://www.instagram.com/nhenergyed)
- Share what you did to reduce emissions from your heating/cooling habits with others. Talk with friends, classmates, and/or family. Encourage them to make action plans, too.
- Sign up for our Action Programs: [Vermont/New Hampshire](#)
- In NH, check out our NHSaves Education Challenge: a literacy challenge where you can create and submit individual or group projects with a written component answering questions about energy and energy efficiency. Prizes for winners!
 - www.nheep.org/nhsaves-education-challenge

For next steps and ideas on how to take action to reduce heating/cooling emissions in your school, community, or state, check out our website.

Vermont: <https://veep.org/poster-2020>

New Hampshire: <https://nheep.org/poster-2020-21>

For more information on how to reduce heating energy and costs in your home, check out [Efficiency Vermont](#) or [NHSaves](#).