

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

Part 1: How Thermally Efficient is Your Home?

Step 1: How much fuel do you use?

Find out how much fuel your home or a home you know well used over the last year. You can get this information from heating bills. *If you struggle to track down this information, use this [sample data](#).*

Fill in column B in the chart below based on your bills.

Step 2: How many BTUs do you use?

Convert the fuel quantities to BTUs. To do that, multiply column A by column B. Record that amount in column C. If you have more than one heat source, include data from all that apply; add all of column C together and put that number in the last row.

Fuel Type	A: Energy Density	B: Quantity of Fuel Used	C: Total Energy (BTUs) by Fuel
Oil	138,200 BTUs/gallon		
Kerosene	136,600 BTUs/gallon		
Propane	91,600 BTUs/gallon		
Electricity	3,412 BTUs/kWh		
Natural Gas	100,000 BTUs/Therm		
Wood	22,000,000 BTUs/cord		
Coal	24,000,000 BTUs/ton		
Wood Pellets	16,000,000 BTUs/ton		
		Total Energy (BTUs) Used	

**This worksheet was adapted from Efficiency Vermont*

Step 3: Find the square footage of your home.

If you don't know the square footage, you can measure from the outside (or inside for an apartment) with a long tape measure. Measure the width and depth of each side of your home.

Multiply the width of your home times the depth of your home times the number of floors of livable, heated space. (Basements do not usually count unless they are a heated part of your living space. Include rooms that are not being heated but are in the livable area). Record that below.

Step 4: Calculate the BTUs per square foot.

Divide the total BTUs used (from the chart in step 2) by the total amount of square feet of heated, livable space (from step 3).

If your home uses less than 40,000 BTUs of energy per square foot per year, you have an energy efficient space.

If you use over 40,000 BTUs per square foot, you probably have opportunities to improve your heating efficiency-such as improving the building shell (addressing insulation and leaks) and/or improving the efficiency of the heating system. Look at [VEEP/NHEEP](#)'s Home Weatherization poster for ideas.

Would your house be considered an energy efficient space?

Part 2: How much Carbon Dioxide is released from keeping your house warm?

Carbon dioxide equivalent emissions (CO₂e) 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. (See the notes in the [Heating VT Homes/Heating NH Homes](#) poster for further explanation.)

1. Look at your chart from Step 2 above, and see what types of fuel your house uses.
2. On average, each fuel releases the following when burned or used in home heating*:

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.

** MMBTU = 1,000,000 BTUs

3. Convert the BTUs you use to heat your house to MMBTUs for EACH of your heat sources by dividing the BTUs by 1,000,000.

Heat Source	BTUs	MMBTUs	Total CO ₂ e lbs emissions

TOTAL FOR HOME	x		
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4. Now, use the fuel type table to calculate out what your total CO₂e emissions are for your home heating. Multiply the MMBTUs by the lbs CO₂e for each fuel type, then add the CO₂e together to find your home's total in the last row.

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?

Part 3: 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 to reduce CO₂e emissions? 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 CO₂e emissions from heating/cooling. Use the table below or a blank calendar.

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 or facebook.com/VTEnergyEducation
 - instagram.com/vtenergyed or 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](#).