

School Energy Audit

Energy Revealed Backgrounder



How to Calculate GHG Emissions

To calculate GHG emissions of your electricity consumption, we need to know the 'electricity intensity' or the 'emission factor'. These numbers estimate the rate of release of CO₂ equivalents due to electricity consumption. Because each province produces electricity in different ways, the emissions factors vary. The higher the factor, the higher the GHG emitted through electricity generation.

To calculate GHGs emitted through a certain-powered action, use the formula below. **Note**, for Alberta you can use the emission factor of 0.82.

$$a \text{ kWh} \times b \text{ kg CO}_2 \text{ e/kWh} = c \text{ kg CO}_2 \text{ e}$$

a = Electricity Used

b = Emission Factor

c = GHGs Produced

How to Calculate Your Monthly Electricity Usage

If you have the energy metering technology installed in your school, you may choose to focus the audit on the area being monitored.

If you don't have the energy metering technology installed, or you do but want to get an idea of the total energy usage in the school, you can ask your school board for the information; some may even have the information available online. All schools should be able to contact their board Facility Services for access to the utility bill.

Alternatively, you could ask your school facilities manager or principal to gain access to the school electricity meter. Record the time and meter reading. Then return at the same time the next week to record the meter reading again. From that you can determine the amount of electricity used in a week.

Comparing GHGs to Trees

Comparing GHGs produced or saved to the number of trees needed to absorb that CO₂ in a year will help learners to tangibly comprehend the GHGs caused by their electricity consumption.

According to New York State University, the average tree absorbs 48 pounds (approximately 21 kg) of CO₂ per year. We can therefore calculate the number of trees it would take to balance those emissions with the following calculations:

$$D \text{ kg CO}_2 / 21 \text{ kg CO}_2 = \# \text{ trees needed to balance CO}_2 \text{ emissions within one year}$$

Example:

Using GreenLearning's Electrical Energy Calculator for Alberta or Ontario, or through your energy metering software you were able to determine your school produced 13,714.2 kg CO₂ in January 2019.

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To calculate how many trees, they would need to balance this amount use the following calculation:

$D \text{ kg CO}_2 / 21 \text{ kg CO}_2$
 $d = 13,714.2 \text{ kg CO}_2e$

$13,714.2 \text{ kg CO}_2e / 21 \text{ kg CO}_2 = 653$ trees needed to balance your schools November 2018 CO₂ emissions within one year.

Summary statement: 653 trees breathing for one year are needed to absorb the emissions produced in November 2018 by your school.