DEARNESS
ENVIRONMENTAL
SOCIETY

Calculating Your School's Avoided Carbon Dioxide (CO_2) Emissions

Electricity Use

1. Use your school's Energy Report to determine the T**otal Annual Electricity Consumption** (TAEC) in kilowatt-hours (kWh) for your school.

2. Calculate the **Energy Savings** (ES) (to date) using the formula:

$$EnergySavings = 1 - \frac{TAEC}{BaselineTAEC}$$

3. **Annual Electricity Savings** (AES): Multiply the Total Annual Electricity Consumption (TAEC) by the Energy Savings (ES) to obtain Annual Electricity Savings (AES) in kilowatt-hours (kWh).

$$AES(kWh) = TAEC(kWh) \times ES$$

4. **Avoided Carbon Dioxide Equivalent Emissions**: Take the answer from the above calculation (AES) and multiply by the Carbon Dioxide Emissions conversion factor (0.32 kg/kWh). This will give you avoided Carbon Dioxide Equivalent Emissions in kilograms.

$$CO_2(kg) = AES(kWh) \times \frac{0.32kg}{kWh}$$

5. To convert kg of CO_2 to tonnes, divide your answer about by 1000.

$$CO_2(tonnes) = CO_2(kg) \times \frac{1tonne}{1000kg}$$

Natural Gas/Propane/Fuel Oil Use

6. Use your school's Energy Report to determine the **Total Annual Fuel Consumption** (TAFC) for your school. Use m^3 for Natural Gas, Litres for propane or fuel oil. If your natural gas usage is given in gigajoules (Gj), multiply the number by 26.8 to get m^3

$$1m^3 ofNaturalGas = 1gigajoule(Gj)ofNaturalGas \times 26.8$$

7. Calculate the **Energy Savings (ES)** (to date) using the formula:

$$EnergySavings = 1 - \frac{TAFC}{BaselineTAFC}$$

8. **Annual Fuel Savings (AFS):** Multiply the Total Annual Fuel Consumption (TAFC) by the Energy Savings (ES) to obtain Annual Fuel Savings (AFS).

$$AFS = TAFC \times ES$$

9. **Avoided Carbon Dioxide Equivalent Emissions**: Take the answer from the above calculation (AFS) and multiply by the Carbon Dioxide Emissions conversion factor (see table below). This will give you avoided Carbon Dioxide Equivalent Emissions in kilograms.

$$CO_2(kg) = AFS \times conversionfactor$$

10. To convert kg of CO_2 to tonnes, divide your answer about by 1000.

$$CO_2(tonnes) = CO_2(kg) \times \frac{1tonne}{1000kg}$$

11. Add up the Avoided CO_2 Equivalent Emissions (tonnes) from the electricity and fuel calculations. Plot the answer on the carbon dioxide graph on your DC poster.

Table of kg of CO_2 equivalent emissions for Ontario

Resource	**Conversion Factor for kg CO_2 equivalent emissions**
Electricity	0.32 kg of CO_2/kWh
Natural Gas	0.18291 kg of CO_2/m3
Propane	0.21262 kg of CO_2/L
Fuel Oil	0.263285 kg of CO_2/L

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