How to Measure, Track, and Report Your Impact

Who are we?

Deniz Ergun – Research Policy Analyst, Town of Oakville

Michael Dean – Senior Climate Change and Energy Planner, Town of Halton Hills

How do you calculate GHG emissions?

GHG Emissions

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Activity x Energy Intensity x Emission Factor

What is an Activity?

- Quantity of GHG producing behaviour
- Examples:
  - Driving x distance
  - Using a lightbulb for y amount of time
  - Eating z quantity of food

What is an Activity?

Some activities are easier to quantify than others. Think about how you will quantify your activity before you decide what to do.

What is Energy Intensity?

Amount of energy or fuel used during a duration or distance or size for a particular activity

Examples

Litres per km (L/km)

Kilowatt per hour (kWh)

Cubic meter per hour (m3/h)

Giga Joule per square meter (GJ/m2)

British thermal unit per square meter (BTU/m2)

Power vs energy

Energy = Power x Time

Energy is total quantity of work done.

Power is how fast you can get the work done.

Example

Lifting a box will require a specific amount of energy.

If you lift it faster than you will require more power, but not change the amount of energy.

Working faster = more power

What is an Emission Factor?

- GHG produced by one unit of fuel/energy

Examples

Electricity – 20 gCO^2e/kWh

Natural Gas - 1899 $gCO2e/m^3$

Gasoline Vehicle – 2317 gCO^2e/L

Diesel Vehicle – 2748 gCO^2e/L

GHG Emissions

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Activity x Energy Intensity x Emission Factor

Let’s look at some examples

Activity	Energy intensity	Carbon Intensity
Driving a car 100 kilometers (km)	0.9 litres of gas per km	2317 grams of CO^2 per litre
Turning on ten lights for ten hours	0.05 kilowatt hours (kWh) per light per hour	40 grams of CO^2 per kWh
Heating a 180 square meter (m^2) house	16 cubic meters (m^3) of gas per m^2	1899 grams of CO^2 per m^3

Consumption Based Activities

GHG emissions

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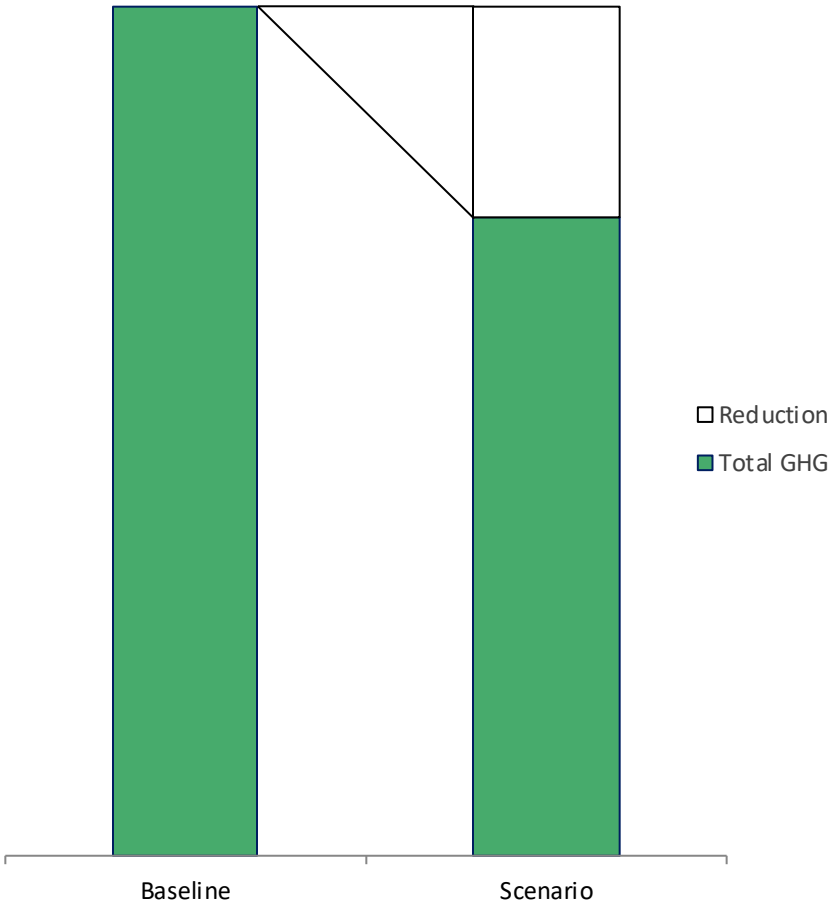
Quantity x Carbon Intensity

consumption based activities x2

Consumption based activities present some unique challenges.

How do you calculate the impact of your program?

Quantifying Impact



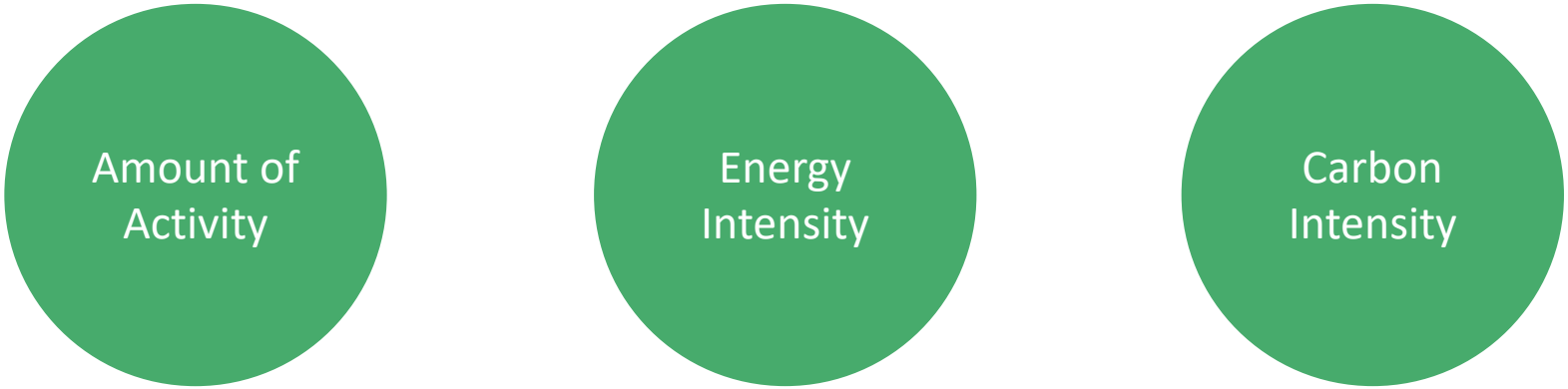
Calculate Baseline GHG

Calculate Program GHG

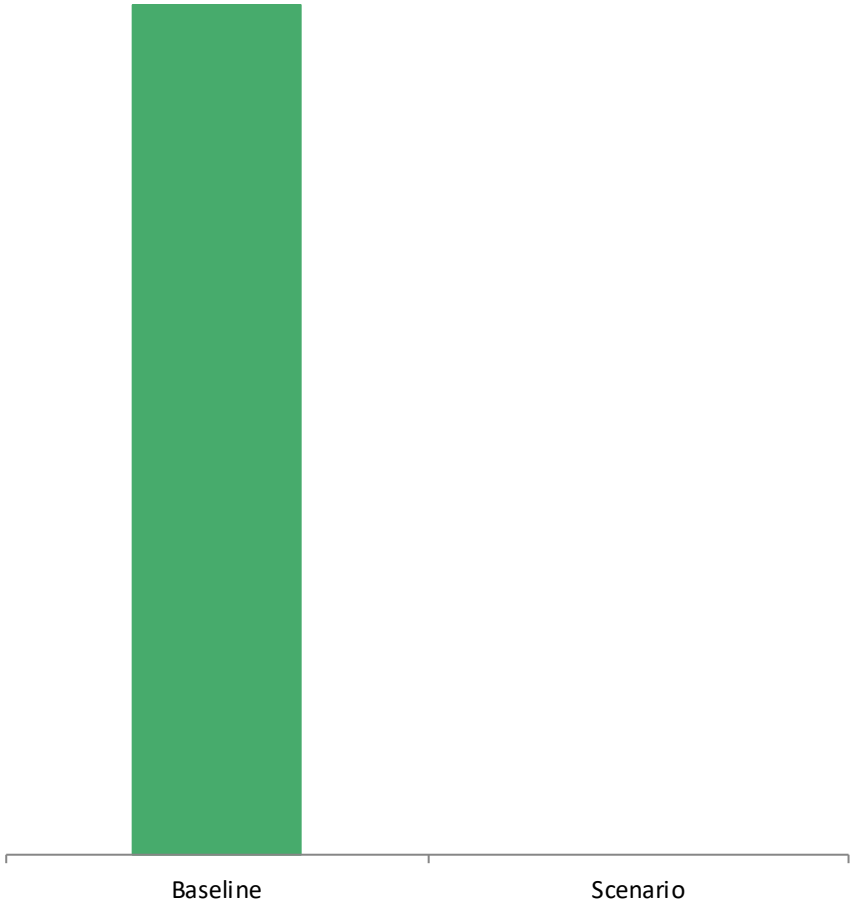
Impact = Baseline GHG minus Program GHG

Choosing a program

Typically a GHG reduction program will change one or more of these three things:

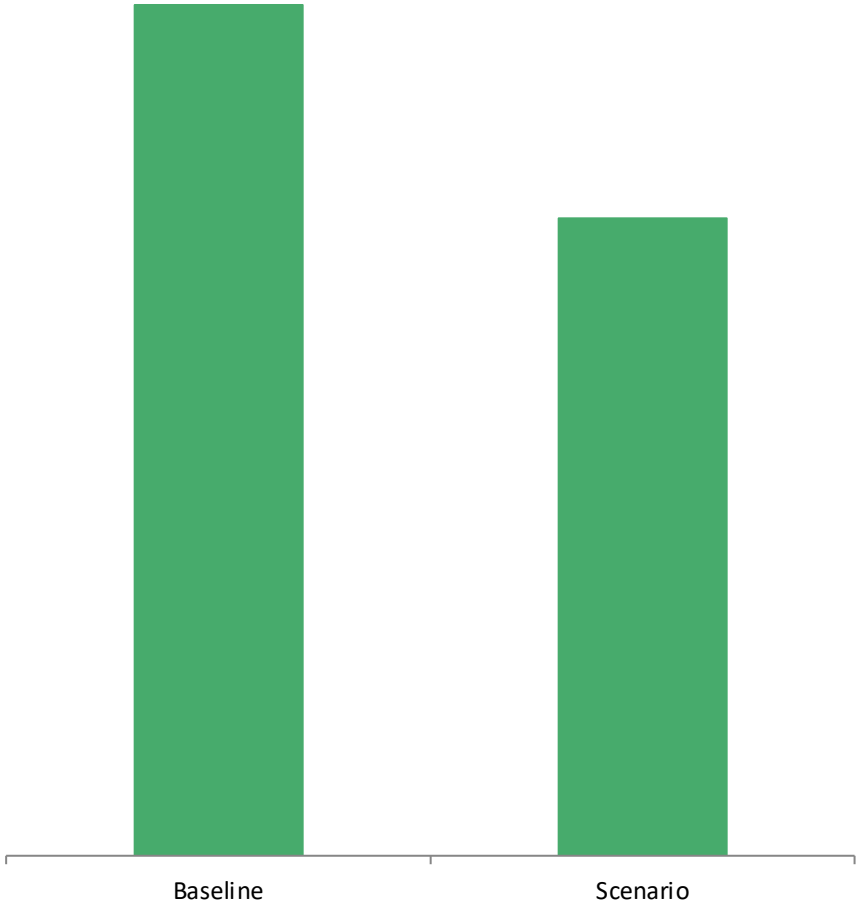


Calculating a baseline



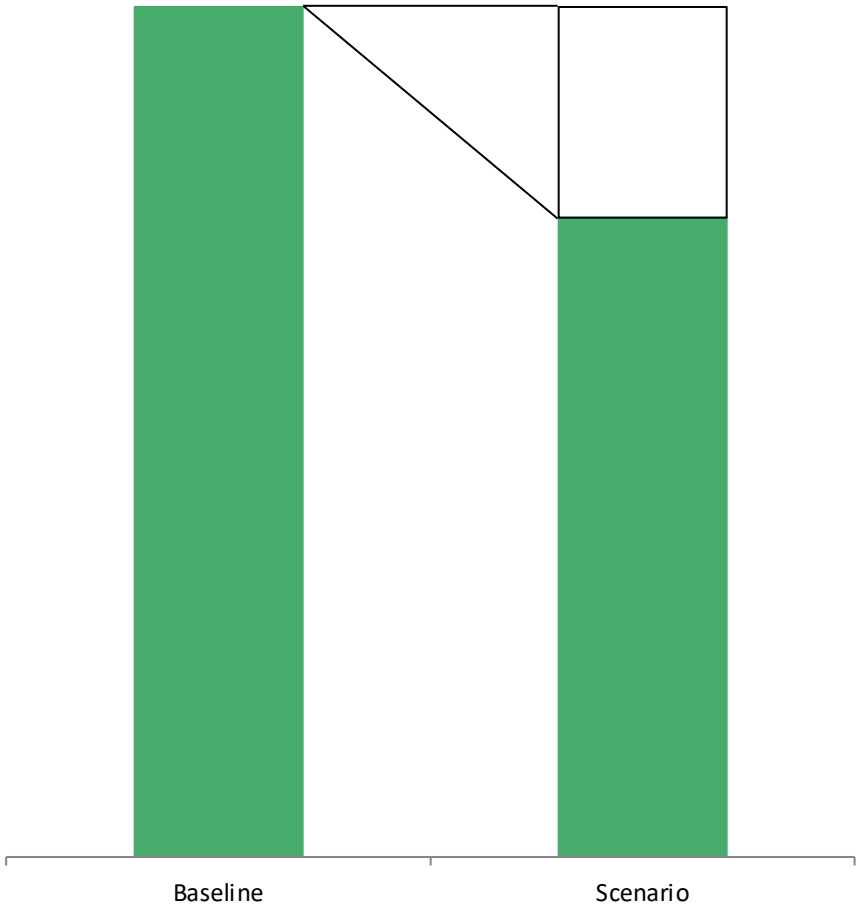
If you made no change to your behaviour, how much GHG would you produce?

Calculating a scenario



When you implement your program, how much GHG will you produce?

Quantifying Impact



What is the difference between the baseline and the program GHG totals?

Let’s look at some examples

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Tracking and Measuring

- How did your program actually perform?
- How to track the program results
- Get the data you need!

Tracking and Measuring

- Troubleshooting
- Incomplete data
- Verifying Calculations

GHG Emissions

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Activity x Energy Intensity x Emission Factor

Activity

- Get into groups of 10
- Calculate a mock GHG reduction program
- Discuss your approach