## Measuring Greenhouse Gas Emissions from Composting in Canada

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# What type of composting facility do you work in or have you visited

 $(\mathbf{j})$  Start presenting to display the poll results on this slide.

## **Global Warming and Climate Change**



# Composting, a Climate Mitigation Strategy?





- Diversion of MOW from landfill
- Nutrient-rich soil amendments
- Carbon sequestration

- NDCs and policies
- Environmental Impacts
- GHG emissions





#### **TYPE OF WASTE COMPOSTED**



7





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Are greenhouse gases measured at the composting facility you work in or where you visited?

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### "A Part of a Whole" (Carbon MOWS)



# Justification of the Study



#### Data Scarcity

Address the paucity of Canadian data on greenhouse gases from composting.

#### 2 UNFCCC Reporting

Contribute to inventory-based reports for the United Nations Framework Convention on Climate Change.

#### **Policy Development**

3

Support inventory and data-driven policies for waste management initiatives.

### **Research Goals**



### **Research Goals**



### **Research Goals**



## **Research Objectives**



#### **Objective 3**



### Estimation of GHG emissions from composting in Canada.

1. Total cumulative GHGs -  $CO_2e$ 

- 2. Total solids, volatile solids
- 3. Mass of waste composted
- 4. Generate emission factors
- 5. Excel spreadsheet model

#### **GHG EMISSIONS DATA FROM COMPOSTING IN CANADA**

### **Direct Emission Measurement Challenges**



# **Our Approach**

- Adoption of a smart measuring system
- Modification of the smart chamber for use in field-scale composting



a) LI-8200 Smart chamber, b) LI-7810 portable gas analyzer

## Construction of measurement system



## **Composting Facility**

Study site



CEC, Terrebonne, QC. (45.726930, -73.528720)

## Sampling Methodology



#### **Compost windrow**

## Sampling Methodology



#### **Compost stockpile & curing piles**

## **Field Sampling**





### **Results – Compost Parameters**







### **Results – Compost Parameters**





CO<sub>2</sub> Emission Flux (Stockpile)

78





### Conclusion

#### • Data Contribution:

This study provides crucial Canadianspecific GHG emission data from composting.

#### • Policy Impact:

Results will inform future waste management policies and climate change mitigation strategies.



## Next Steps

#### **EMISSIONS TRACKING MATERIAL ANALYSIS** 02 01 How much GHGs in CO<sub>2</sub> e are emitted per tonne of organic waste composted **DATA ANALYSIS MODELLING & ESTIMATIONS** in Canada 04 03

## Acknowledgement





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#### **For collaborations**

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#### Questions



### Scan me



CH4 Fluxes Over Time by Sampling Point



CO2 Fluxes Over Time by Sampling Point

