



Harnessing GHG Inventories for Local Sustainability Initiatives

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What is a GHG Inventory?

Community & LGO Inventories, Scope 1-3 Emissions

Goal of a GHG Inventory



Two Types of Inventories

Community

Evaluates emissions arising from all activities within a local jurisdiction.

Local Government

Evaluates emissions arising from local government activities.

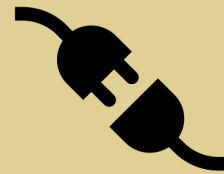


Scope 1, 2, and 3 Emissions

Scope 1



Scope 2



Electricity usage

Scope 3



An aerial photograph of an industrial city, overlaid with a semi-transparent green filter. A prominent feature is a tall, striped smokestack on the right side, emitting a thick plume of dark smoke that drifts towards the left. The city below is a dense collection of industrial buildings, some with large roofs and others with more complex structures. The overall scene is hazy, suggesting a smoggy or overcast day.

City Overviews

Defining the Project Context

Two Cities, Three Inventories



Scope 1



Scope 2



Our Motivations



**Quantify GHG
emissions.**



**Provide
foundation for
future
sustainability
planning.**



**Aid other
municipalities
in creating
inventories.**



Methods & Process

Data Identification, Collection, & More

Overall Process



Boundary Setting



Data Identification



Data Collection



Inputs and Calculations



Finalization



Comparing Tools



Technical support

No technical support

More data capabilities

Less data capabilities

\$1-8K annual membership

Free

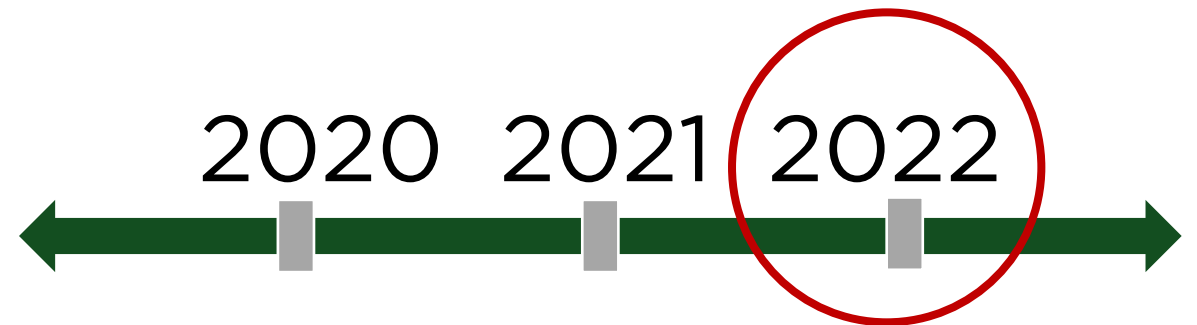
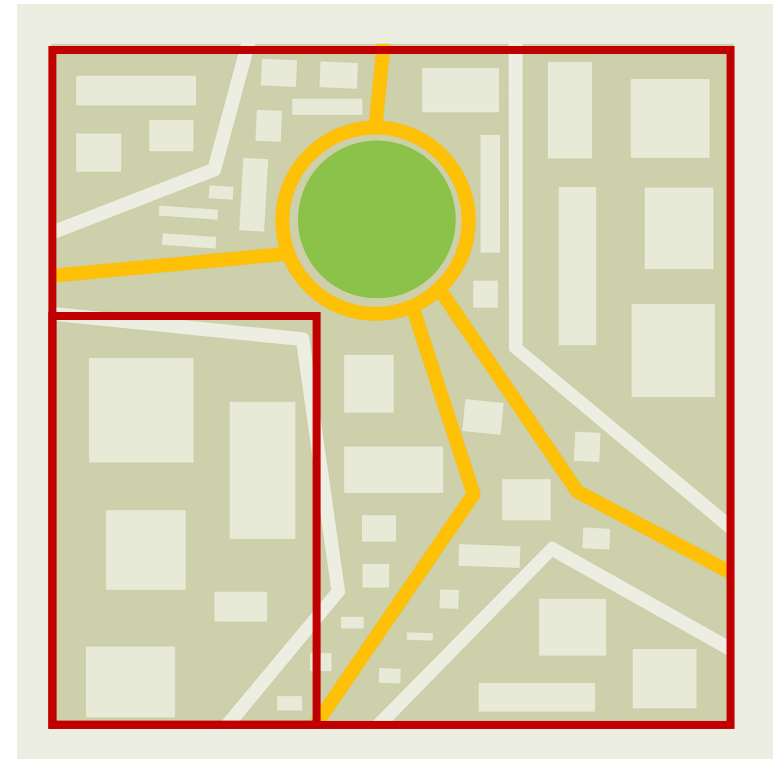
Boundary Setting



Physical



Temporal



Data Identification & Collection



Electric Utilities



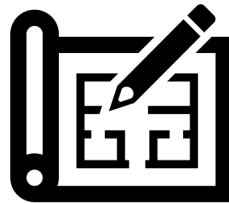
**Natural Gas
Supplier**



**Local
Departments**



Waste Haulers



**Regional
Planning Bodies**



Transit Systems

Inputs & Calculations

Solid Waste Data



Federal Sources

County Sources

Local Sources

Finalization

Rockford Community [Edit Parameters](#)

Residential Energy	Commercial Energy	Industrial Energy	Transportation & Mobile Sources	Solid Waste	Water & Wastewater	AFOLU	Process & Fugitive Emissions	Upstream Impacts of Activities	Consumption Based
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Available Calculators
Pick a calculator to enter a new record.

- [Emissions from Grid Electricity \(USCP Required\) ?](#)
- [Emissions from Stationary Fuel Combustion \(USCP Required\) ?](#)
- [Notation Keys for Residential Energy ?](#)
- [Emissions from Stationary Fuel Combustion \(User Supplied Emissions Factors\) ?](#)

Inventory Records For Residential Energy

Electricity Usage	Edit Delete
Natural Gas Estimate	Edit Delete

CO2e By Record

Record	CO2e (metric tons)
Electricity Usage	~65,000
Natural Gas Estimate	~10,000

Mobile Units - Entry

[Return to Table of Contents](#) Check if you have completed this sheet.

1a) Describe the vehicle(s) you are entering

ID#	Vehicle or vehicle group description	Sector
11	Annual VMT (Diesel Heavy Vehicles)	Industrial

Vehicle Year	Vehicle Type	Vehicle Model (optional)	Fuel type
2007	Heavy-Duty Vehicle	Truck	Diesel

1b) Enter the activity data for the year 2022

Entries	Fuel consumed (Gallons):	Vehicle miles traveled (VMT)*:
	206,976	2,682,413

* Helpful Hint: If you do not know the VMT for this entry, you can multiply the fuel consumed by the MPG of the vehicle/vehicle group. Use your own efficiency data or see the table below for average MPG by vehicle type and fuel. → $Vehicle\ Miles = Gallons \times Miles/Gallon$

Vehicle Type	Average MPG	
	Gasoline & Other Fuels	Diesel & Biodiesel
Passenger Car	24.1	32.4
Light Truck	18.5	22.1
Heavy-Duty Vehicle	10.13	12.96
Motorcycle	50	N/A

Buttons: Add/Update Record, Reset Form, Edit Record, Delete Record, Update Calculations

2) Once you have completed data entry, hit the button below to update the calculations.

Local GHG Inventory Tool: Community Module



Please use the drop-down menu in the Scope 2 Emissions Selection box to determine which scope 2 emissions methodology is used in the summary tables below.

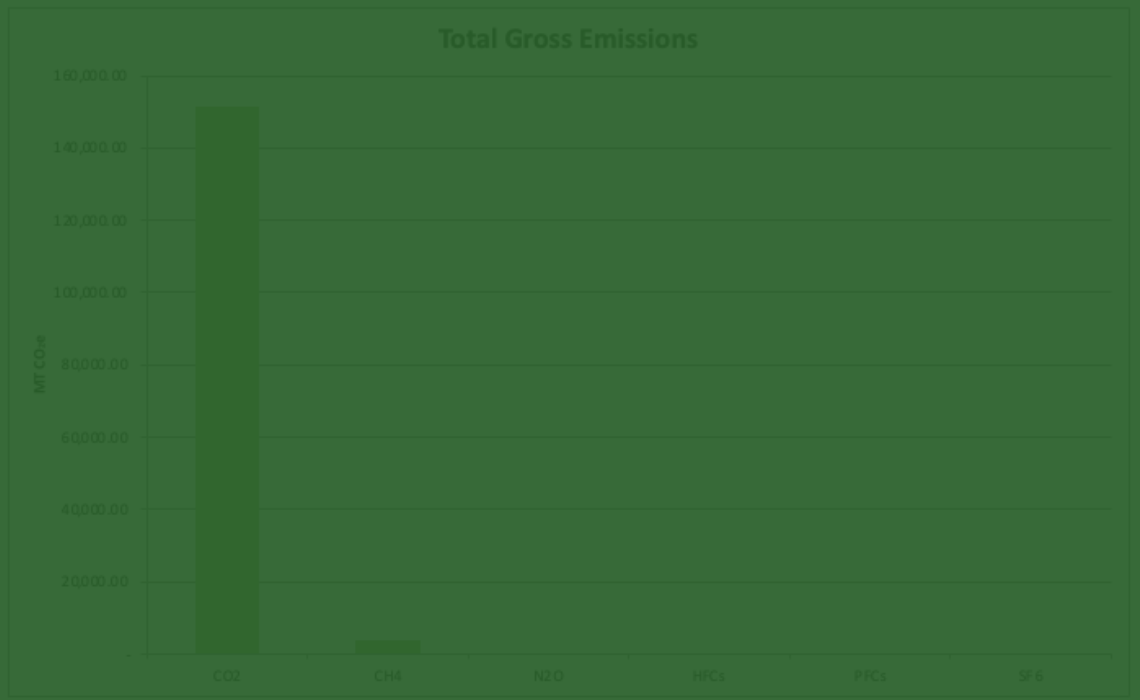


Scope 2 Emissions Selection: Location Based

14.19 Per capita Emissions for Grand Haven, MI (MT CO2e/person)

Total Grand Haven, MI Emissions (MT CO2e)								
	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Total MT CO ₂ e	Percent of Total
Scope 1	93,395.35	225.80	217.83	-	-	-	93,838.98	60%
Scope 2 - Location Based	57,968.81	126.94	209.74	-	-	-	58,305.49	37%
Scope 2 - Market Based <i>(for informational purposes only)</i>	57,968.81	126.94	209.74	-	-	-	58,305.49	
Scope 3	-	-	-	-	-	-	-	0%
Total Gross Emissions	151,364.16	4,004.74	427.58	-	-	-	155,796.48	98%
Total Net Emissions	146,043.58	4,004.74	427.58	-	-	-	150,475.90	98%

Emissions by Source (MT CO2e)								
Source	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Total	Percent of Total
Stationary Combustion	70,507.46	156.59	39.71	-	-	-	70,703.76	45%
Mobile Combustion	22,887.90	-	-	-	-	-	22,887.90	15%
Solid Waste	-	-	-	-	-	-	-	0%
Wastewater Treatment	-	24.65	42.81	-	-	-	67.46	0%
Electricity - Location Based	57,968.81	126.94	209.74	-	-	-	58,305.49	37%
Electricity - Market Based <i>(for informational purposes only)</i>	57,968.81	126.94	209.74	-	-	-	58,305.49	
Water	-	-	-	-	-	-	-	0%
Ag & Land Management	-	-	-	-	-	-	-	0%
Urban Forestry	(5,320.58)	-	-	-	-	-	(5,320.58)	-3%
Waste Generation	-	3,652.00	-	-	-	-	3,652.00	2%
Other	-	44.55	135.31	-	-	-	179.86	0%
Total (Gross Emissions)	151,364.16	4,004.74	427.58	-	-	-	155,796.48	100%
Total (Net Emissions)	146,043.58	4,004.74	427.58	-	-	-	150,475.90	97%



Inventory Results

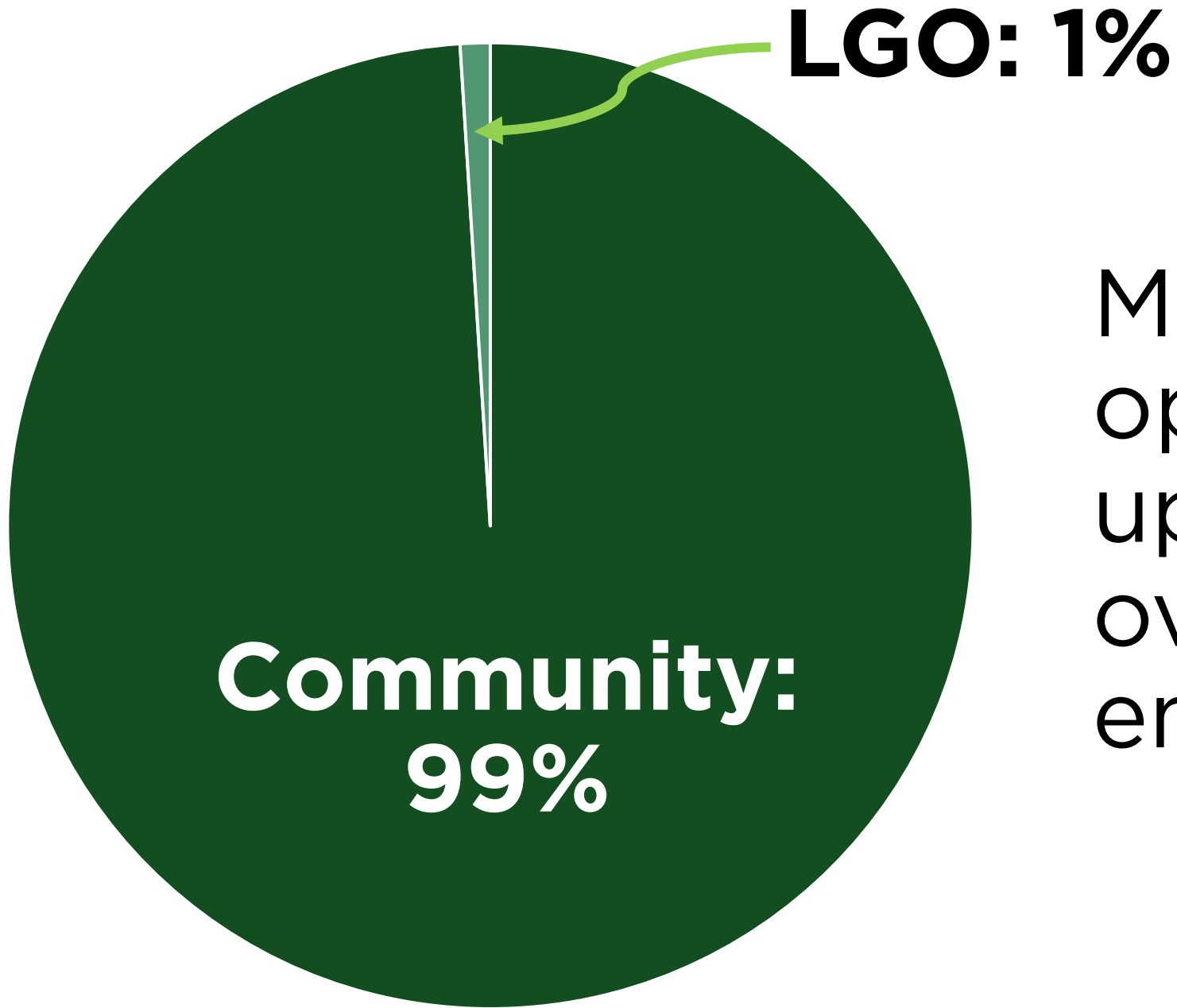
Rockford and Grand Haven

Gross Emissions by Sector		
Sector	Total (MT CO ₂ e)	Percent of Total
Commercial/Institutional	44,179.18	28%
Industrial	43,236.14	28%
Energy Generation	-	0%
Total	155,616.62	100%

In both, most emissions are produced by electricity and natural gas use.

Sources	Grand Haven	Rockford
Electricity	37.0%	62.5%
Natural Gas	45.0%	33.0%*
Transportation	15.0%*	3.0%*
Wastewater	1.0%	0.5%
Water	0.0%	0.0%
Waste Generation	2.0%*	1.0%*
Gross Total	100.0%	100.0%
Urban Forestry	-3.0%*	-1.0%*
Net Total	97.0%	99.0%

* Estimated data



Municipal operations make up a fraction of overall emissions.



Future Planning

Connecting Data to Sustainability Initiatives

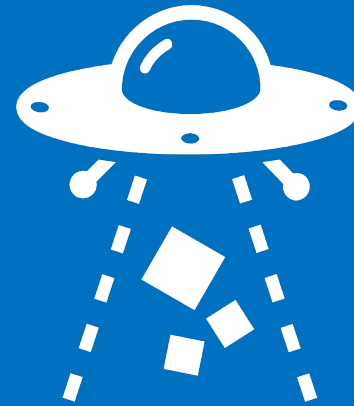
Updating Inventory Data



**Fill in Data
Gaps**



**Refine
Models**

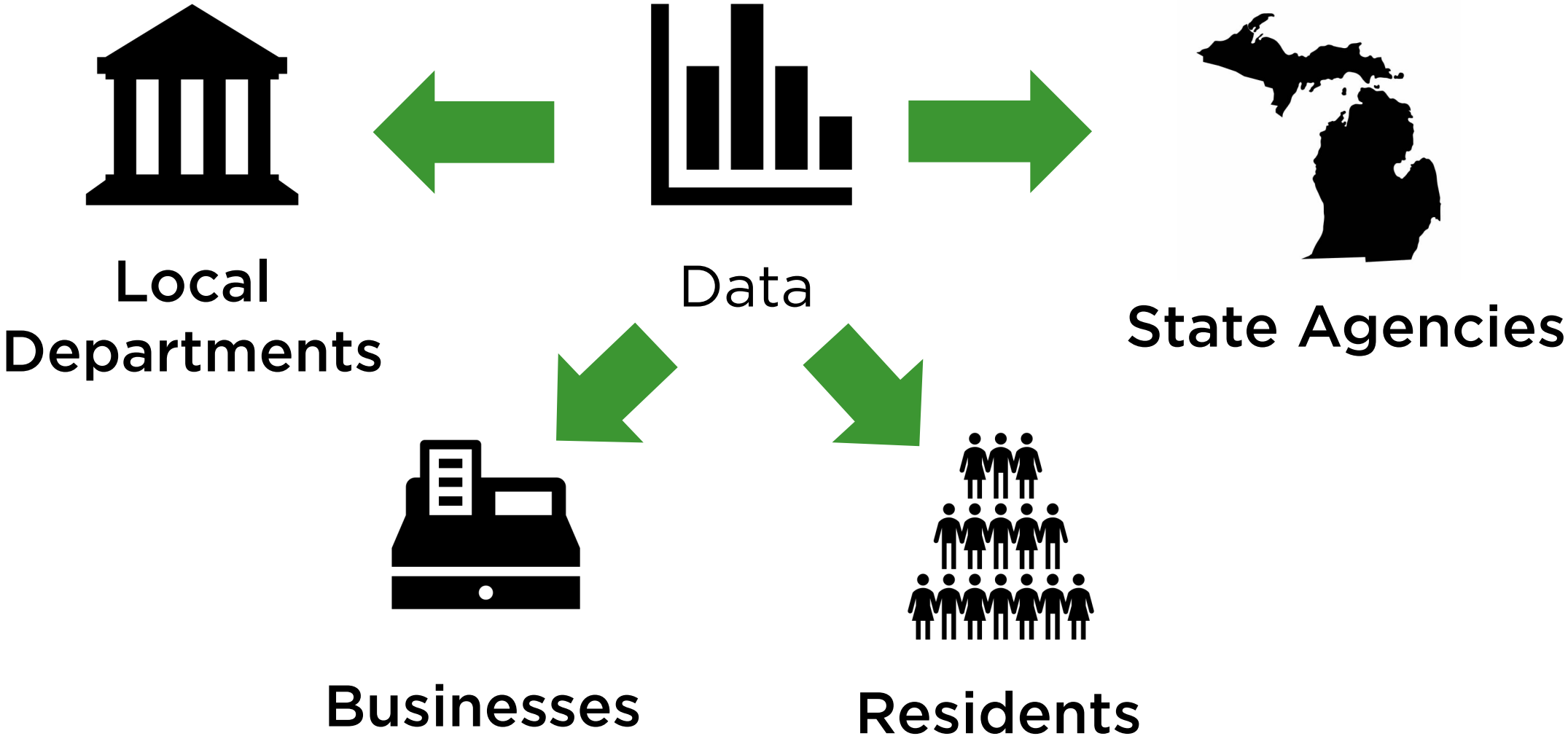


**Streamline
Collection**



**Further
Connection**

Engaging with Stakeholders



Developing a Sustainability Plan

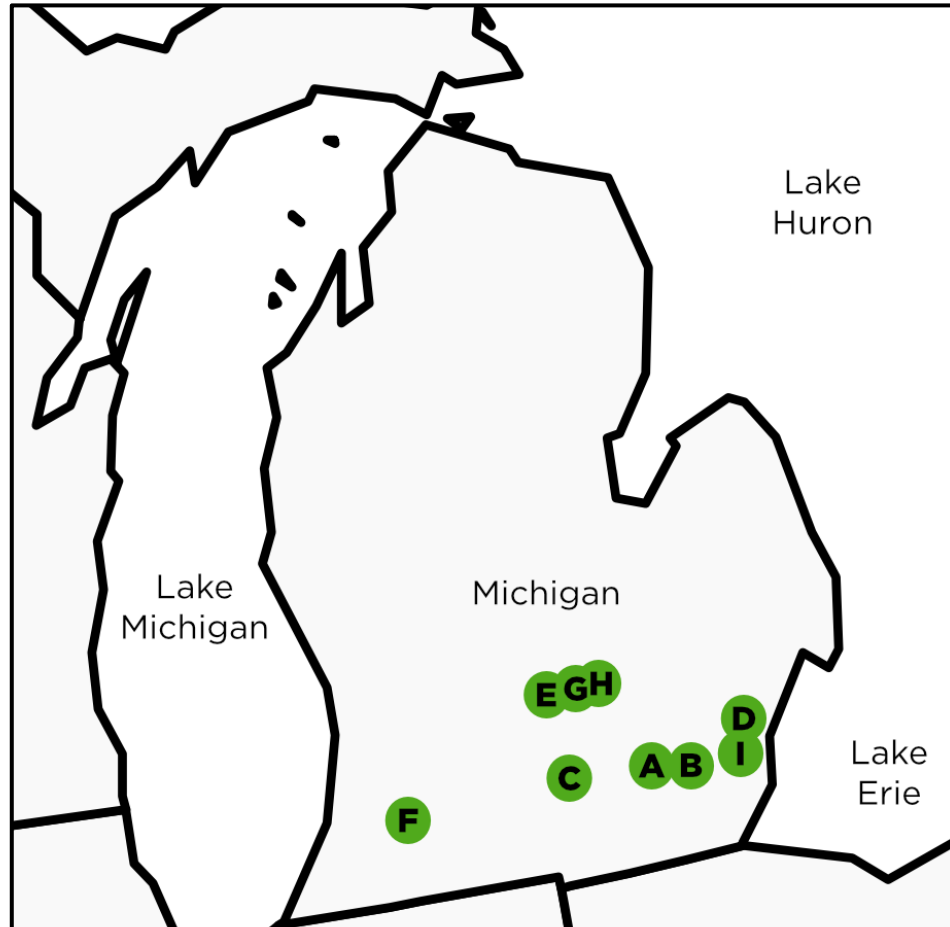


Figure 1. Map of Community-Level Municipal Climate Plans in Michigan

- Based on results, use data to target strategies that reduce GHG emissions:
 - Increasing walkability
 - Energy efficiency
 - Renewable energy expansion

Potential Actions

- Promote Energy Efficiency
- Encourage Renewable Energy Adoption
- Install Community and Municipal Solar
- Energy Performance Contracts
- Smart Metering
- Promote Educational Awareness
- Green Building Certification
- Promote Active Transportation
- Support Electric Vehicle Infrastructure
- Invest in Public Transportation

Additional Resources





Thank you!

Questions?