



Local Governments  
for Sustainability



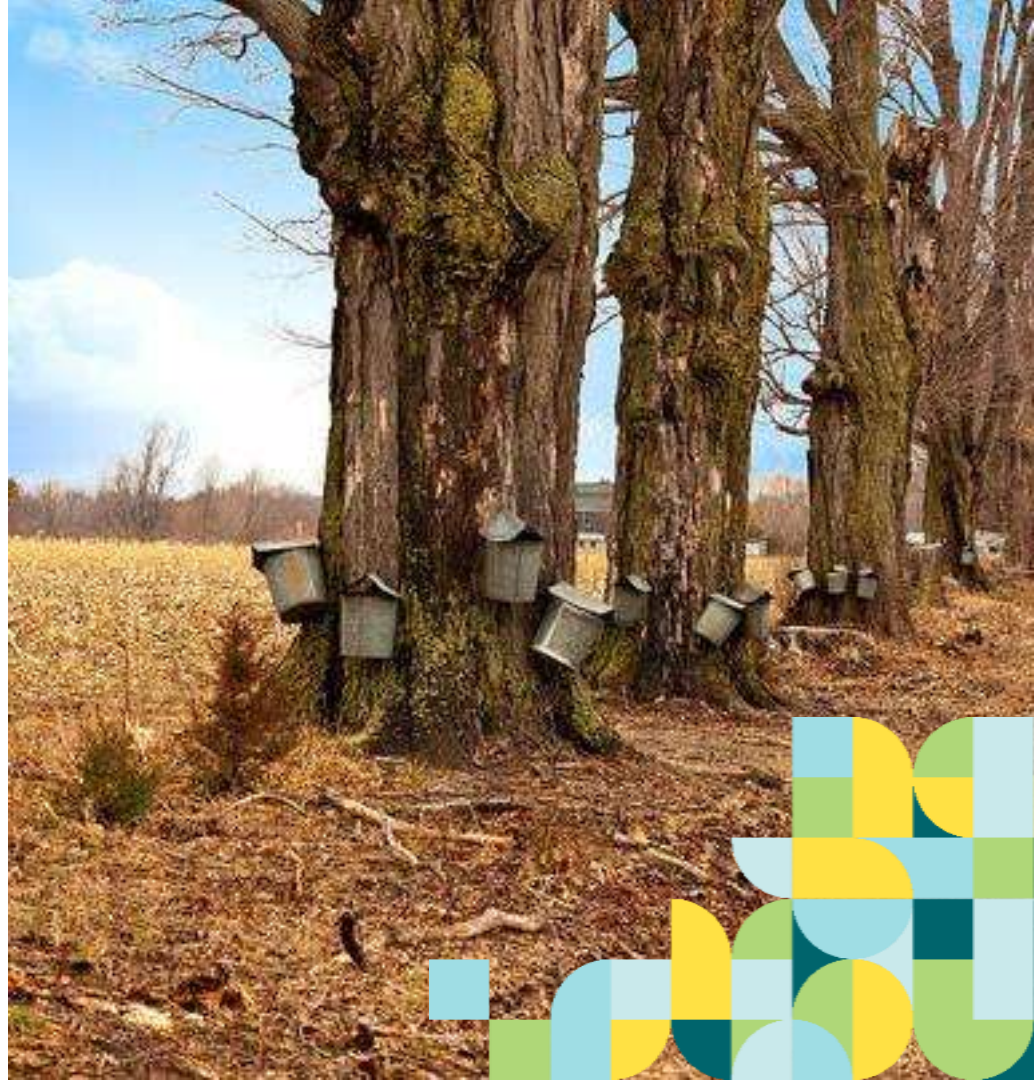
# Climate Action Planning Institute Dutchess County

Session 3: Government  
Operations GHG Inventories:  
Data Collection, Part 2

March 15, 2023



CAPI Dutchess is funded by the NYS Department of Environmental Conservation and the and is a partnership between Dutchess County, HVRC, and ICLEI.



# Agenda

Data collection  
GHG Inventory Showcase  
Visualizing data  
Troubleshooting and Q&A

# The Data Workbook



**The GHG Inventory is a chapter in  
your community's climate story.**



# Communication Goals



## Science Communication:

- **A**wareness
- **E**njoyment
- **I**nterest
- **O**pinion-forming
- **U**nderstanding

## Climate & Sustainability Communication:

- **A**wareness
- **U**nderstanding
- **P**ersuading
- **C**are
- **A**ct

**Climate and sustainability communications are specifically geared towards engaging, informing, advocating, and mobilizing sustainability and climate change initiatives.**

**Remember to keep your overall goal in mind when creating communication plans and content.**

# The Communications Equation



Objective

Audience

Unique Value  
Proposition

Channels

Facts

= good communications

(effective, interesting, funny, thought-provoking, life-changing)

# Who is Your Audience?

- Location
- Level of engagement
  - Alarmed, concerned, cautious, disengaged, doubtful, or dismissive
- Direct or indirect
- Language
- Accessibility



# Climate & Sustainability Storytelling

## *"Protect and serve" messaging*

Embrace	Replace	Because...
<b>Local/locally made clean energy, home-grown energy, clean energy, made right at home</b>	Renewable energy, green energy, domestic energy	"Local" folds in community empowerment without directly stating it. "Homegrown" implies accessible wind and solar energy. "Clean" reinforces health benefits and positions fossil fuels as "dirty."
<b>Attract new business</b>	Good for the economy	Attracting new businesses implies the promise of new jobs and opportunities, as well as of putting more dollars in the pockets of residents in your community.
<b>Good for [city or state], good for the people</b>	Good for the country	Americans are more personally attuned to their local communities and personal well-being these days. They are less satisfied with how things are going in our country and thus do not respond as strongly to "good for the country" messages.

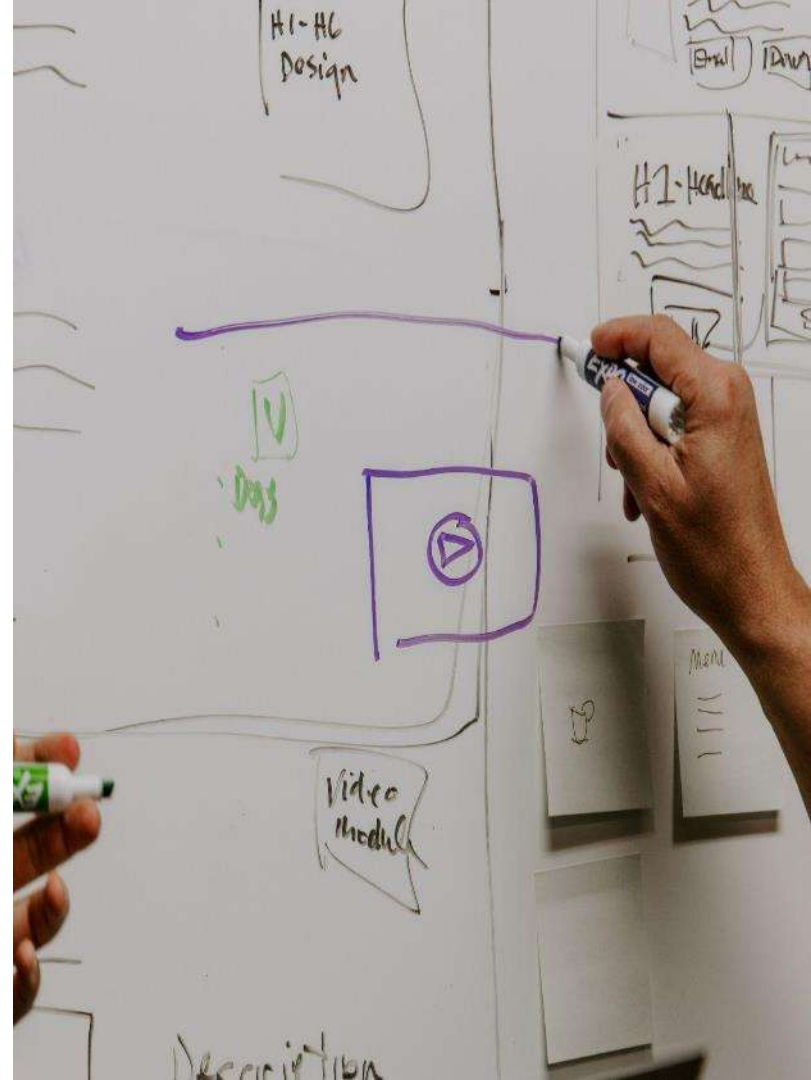


[Let's Talk Communities](#) [ecoAmerica + ICLEI USA, 2016]



# Defining Success

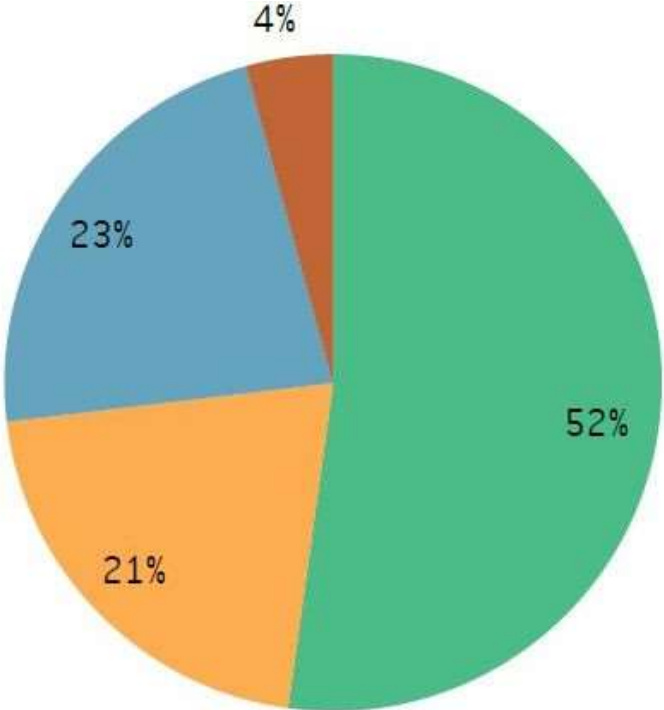
- What is your desired outcome for a specific audience?
  - SMART goals
    - Specific
    - Measurable
    - Attainable
    - Relevant
    - Time-based
- Is it active vs. passive?
  - Is it *increasing awareness* or *X number of residents signing up* for a program?
- How will you adapt your communications strategy to reach your goal?
  - Flexibility is key!



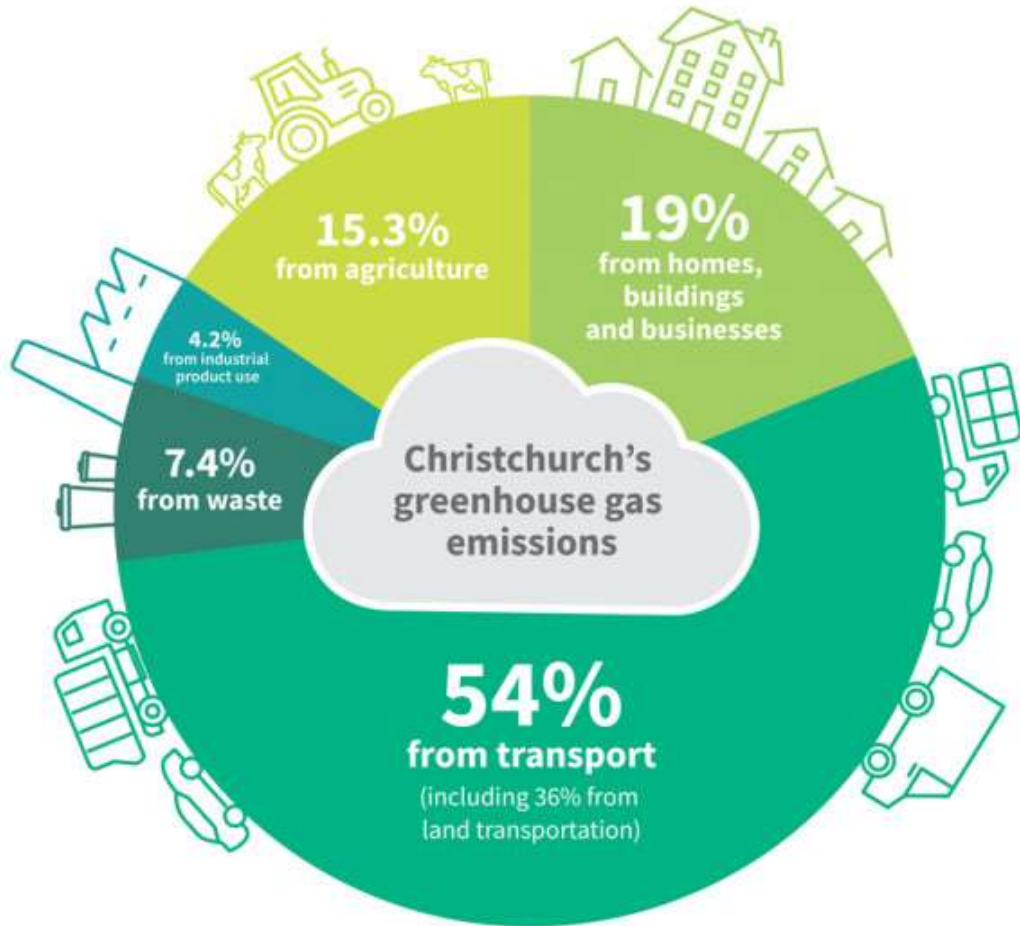
# Data Visualizations

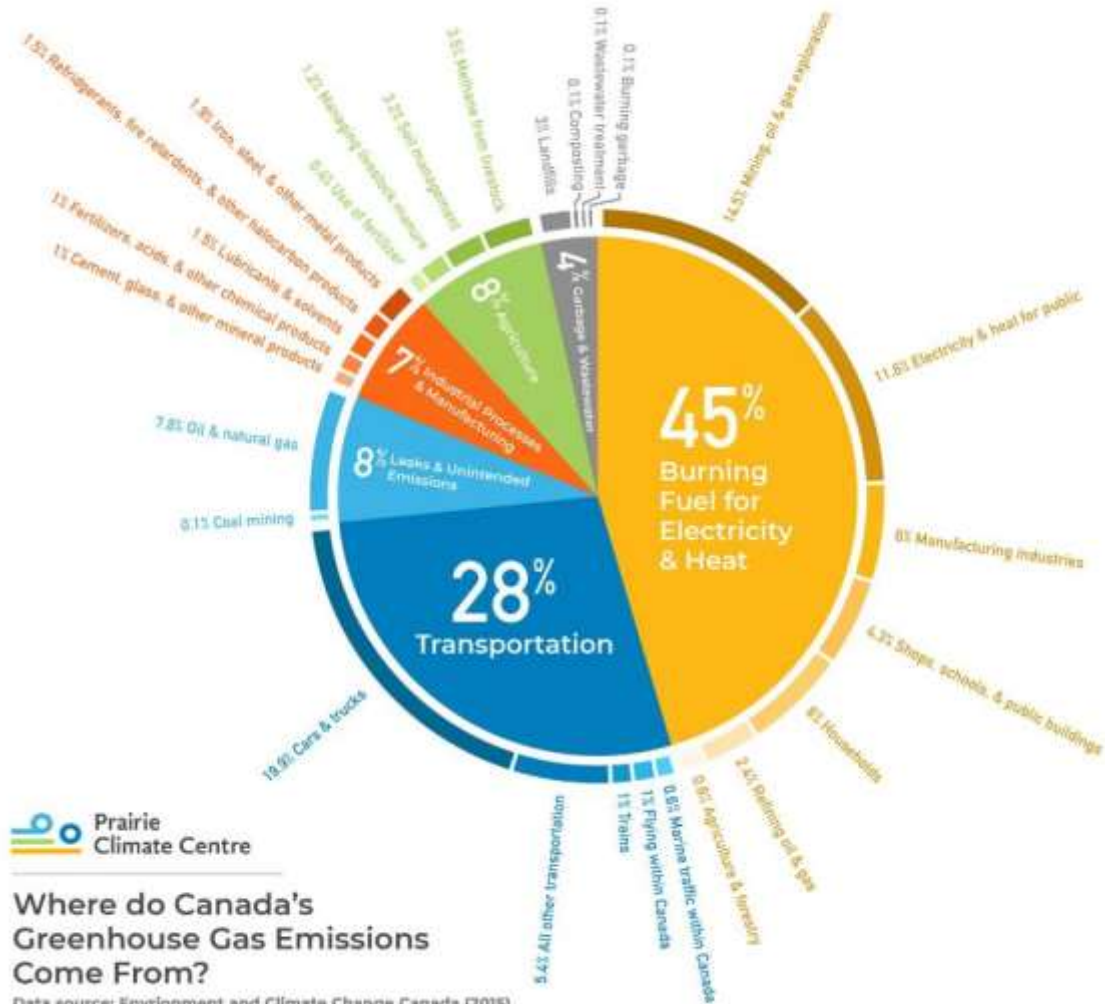


***Common format example from City of Hoboken***



- Buildings & Facilities
- Street Lights & Traffic Signals
- Vehicle Fleet
- Transit Fleet

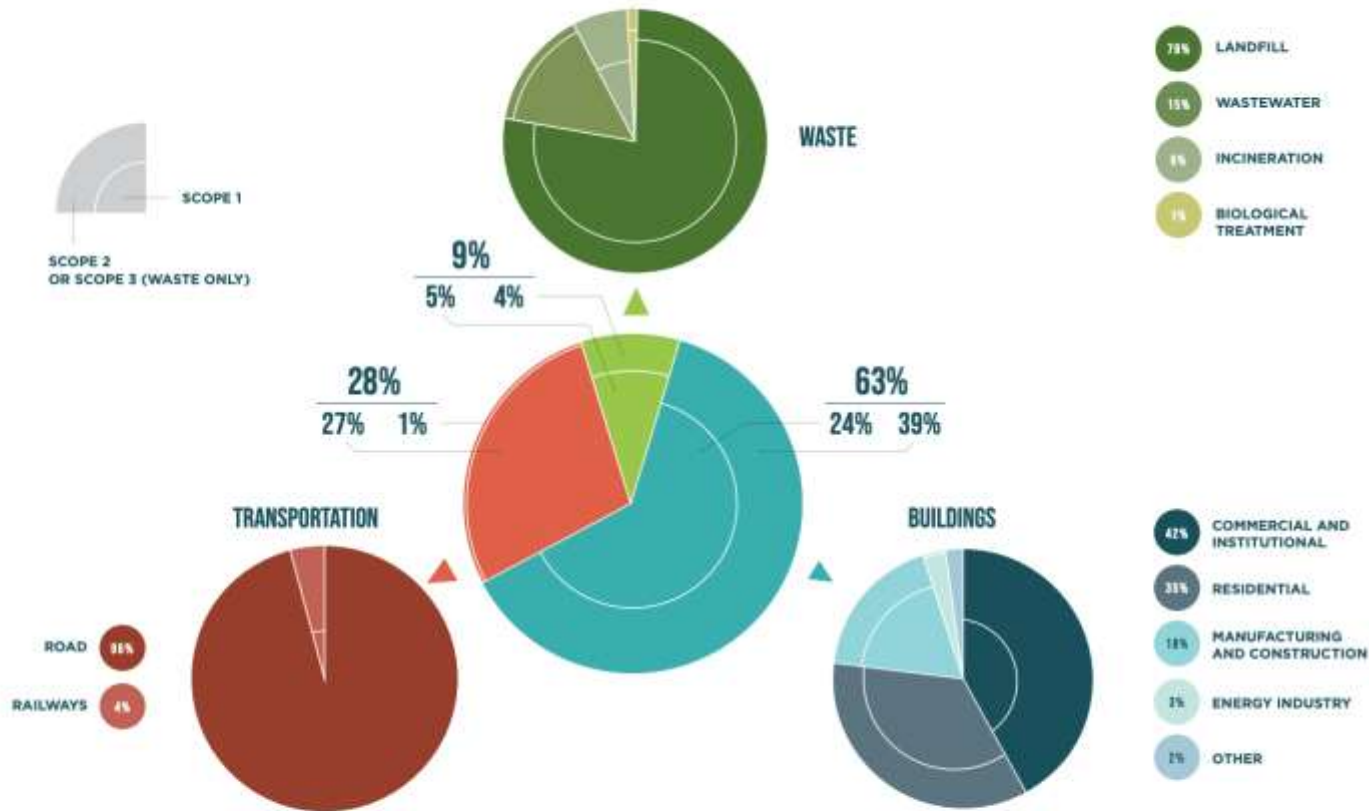




## Where do Canada's Greenhouse Gas Emissions Come From?

Data source: Environment and Climate Change Canada (2015)

# City-wide GHG emission inventories help us understand where a city's GHG emissions come from

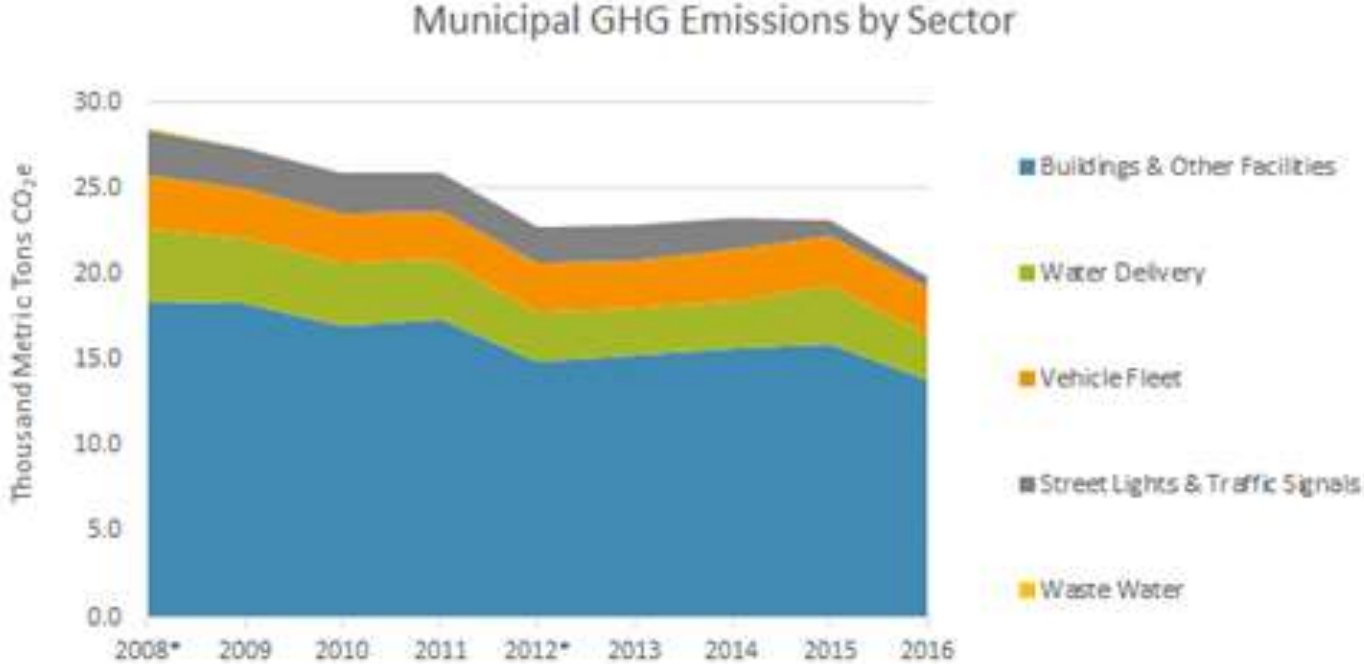


Scope 1: GHG emissions from sources located within city boundary, e.g. direct fuel combustion  
 Scope 2: GHG emissions from the use of grid-supplied energy  
 Scope 3 (Waste only): GHG emissions that occur outside city boundary as a result of city activity, e.g. waste exported

Where incineration is used to generate energy, emissions are captured under buildings scope 2

Emissions from airborne and waterborne journeys that both originate and terminate within city boundaries are negligible. Trans-boundary air and water travel are not captured at GPC BASIC level

# Common format example from City of Cambridge



# Ulster County shows comparisons through the years

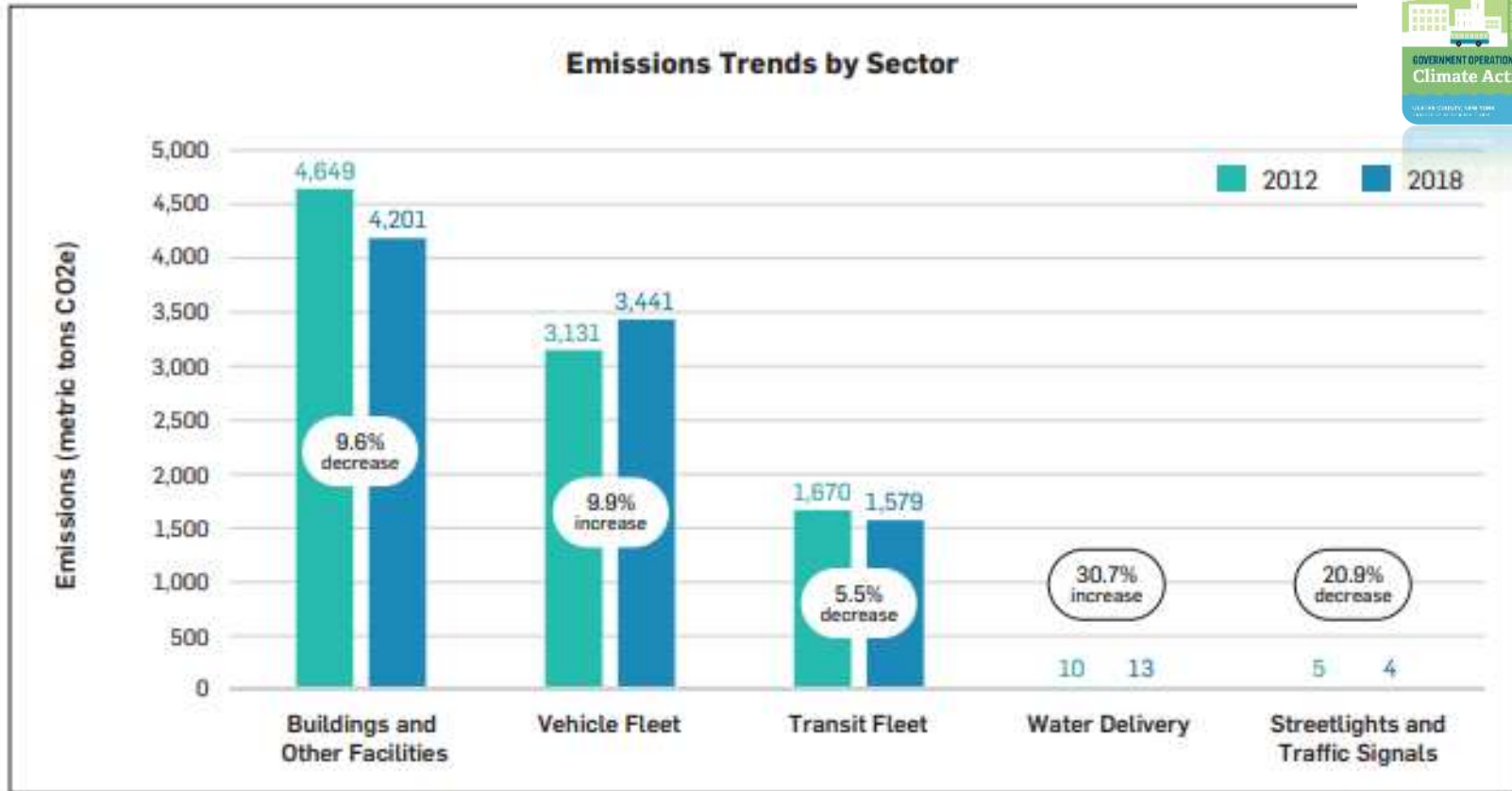


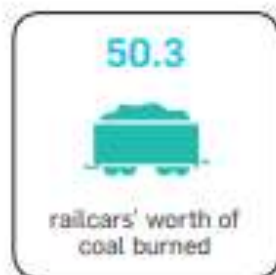
Figure 7.





## Progress towards Goals

In 2018, Ulster County government operations emitted 9,238 metric tons of CO<sub>2</sub>e.<sup>1</sup>  
This is the equivalent to:



Between the baseline year of 2012 and the most recent GHG inventory for 2018, Ulster County's actual emissions from government operations decreased by 2.4%.

# The Ulster County Carbon Neutral Government Strategy



## ASSESS

Monitor all energy use in order to identify energy savings opportunities, benchmark performance and monitor/verify any actions taken.

## AVOID

Through operational and programmatic management, avoid unnecessary use of vehicles, equipment, buildings and space. Improve facilities to limit amount of energy necessary (e.g. envelope improvements, daylight).

## CONSERVE

Use technology (e.g. electric vehicles, LED lighting, HVAC) to make energy use more efficient.

## GENERATE

Utilize local, renewable energy sources (e.g. PV electricity generation, solar thermal, biofuels) to meet operational needs.

## OFFSET

Measure emissions and offset remaining Scope 1 and 2 emissions with RECs and Carbon Credits.

**Figure 3.** The Five Elements of the Strategy

## How Many Trees is That?



*Hudson River Estuary Program's Trees for Tribes volunteer. Photo by Beth Roessler.*

One common way that communities use to offset carbon is to start a tree planting program. There are many reasons to plant more trees, only one of which is their ability to remove carbon dioxide from the atmosphere, but that is what we will narrowly focus on here.

An average mature tree can sequester up to 48 pounds (0.02 MT) of CO<sub>2</sub> per year.<sup>18</sup> Absorbing all 66,382 MT CO<sub>2</sub>e generated by New Paltz (not counting the Thruway) would therefore take planting 3,048,906 trees. That's 218 trees per person.

As mentioned in Chapter 1, the UN's International Panel on Climate Change (IPCC) has unequivocally stated that we need to cut global emissions 45% by 2030 to stay below two degrees C of warming. **To meet the IPCC's 45% reduction target with trees alone, New Paltz would need 1,372,008 new (mature) trees. At \$400 per tree (McPherson, 2007), it would cost \$548,803,080.00 worth of trees to capture 45% of New Paltz's emissions (not counting I-87).**

## How Many Solar Panels Would It Take?



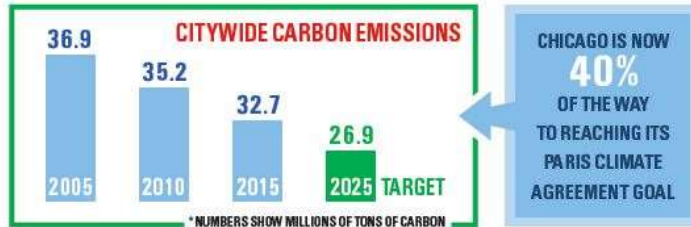
*Water Street Market.  
Photo by Lighthouse Solar*

Like planting trees, there are many reasons to go solar even if climate change were not an issue. However, any source of clean energy will reduce emissions, so how many solar panels would it take to eliminate New Paltz's 66,382 MT CO<sub>2</sub>e (without the Thruway)? 66,382 MT CO<sub>2</sub>e is equal to about 157,886,515 KWh of electricity. 142 MW worth of solar panels are needed to generate about 157 million kilowatt hours of electricity. **At approximately \$1 million per megawatt, New Paltz would need to install \$64 million worth of solar to offset the IPCC's goal of 45% of our carbon footprint (not counting I-87). That's roughly 160,000 solar panels, or 11 panels per person.**

# THE CITY OF CHICAGO

## REDUCED CARBON EMISSIONS BY

**11%** FROM **2005** TO **2015**  
WHILE JOBS INCREASED BY **7%**



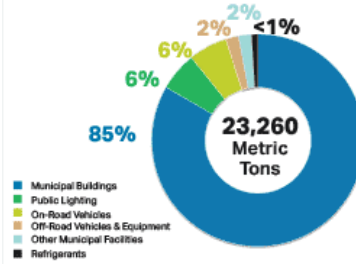
EMISSION REDUCTIONS ARE EQUAL TO SHUTTING DOWN A COAL-FIRED POWER PLANT FOR **14 MONTHS** OR THE ENERGY USED TO POWER OVER **425,000** HOMES IN A YEAR.



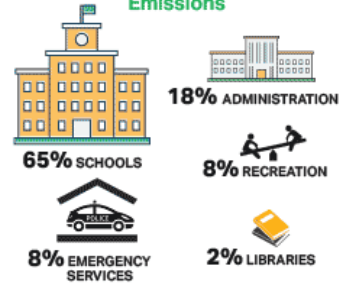
# Somerville, MA

## Local Government Inventory

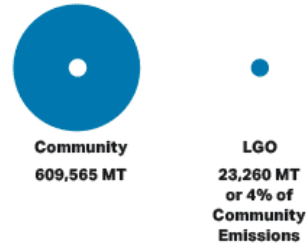
### Greenhouse Gas Emissions Profile



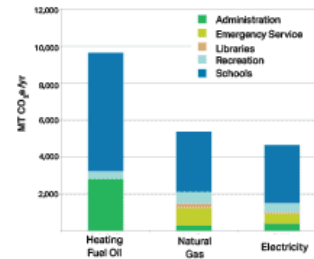
### Split of Municipal Building Emissions



### Comparison of 2014 Base Year Community and LGO Emissions



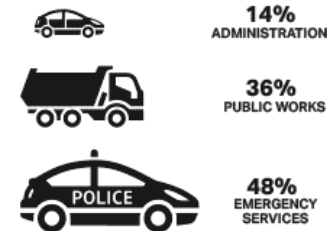
### Municipal Building Emissions by Energy Type

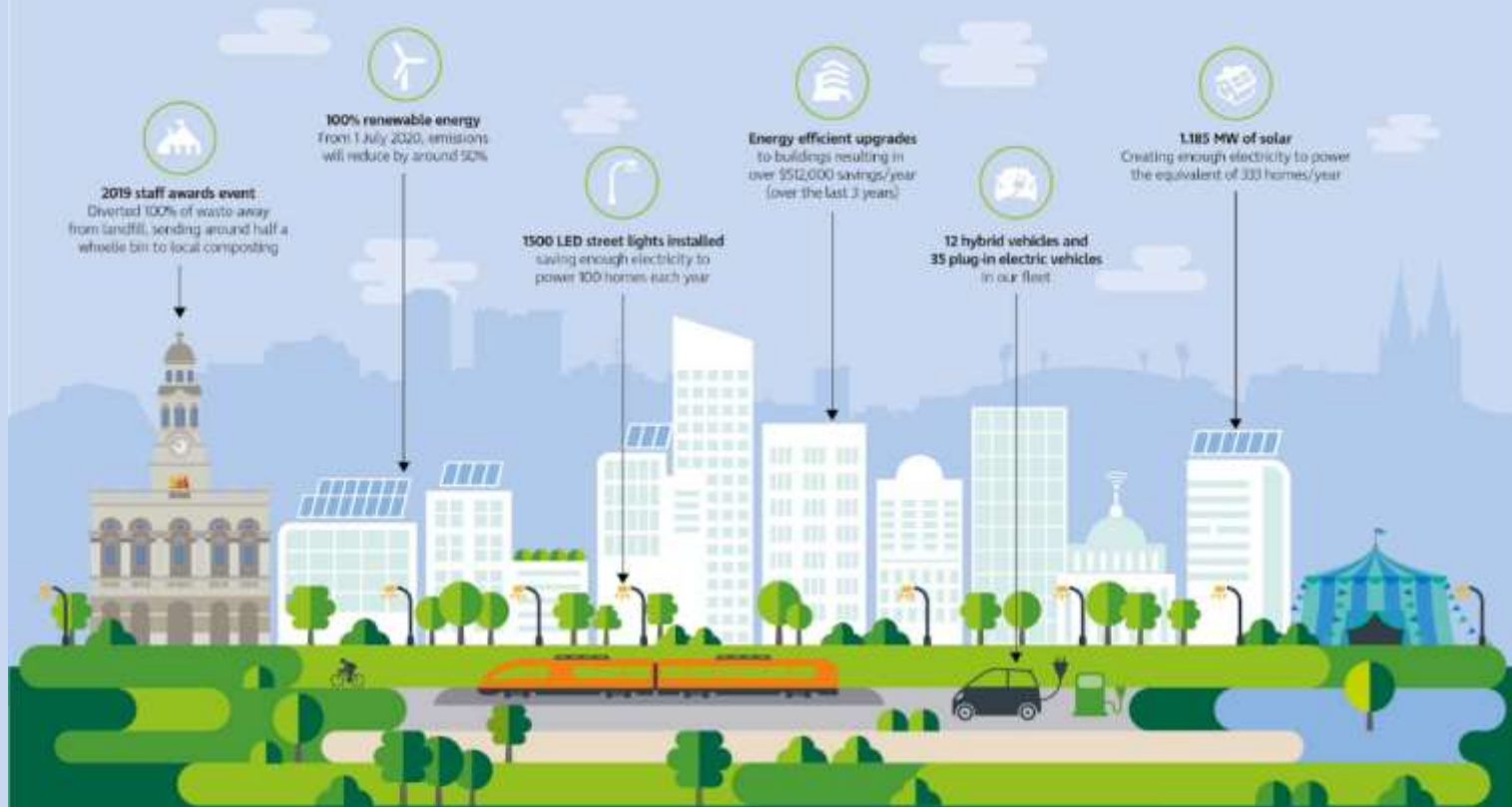


### What is in the Inventory?

- SCOPE 1** What we combust (e.g., heating oil, transport fuel)
- SCOPE 2** Purchased emissions from energy we consume (e.g., grid supplied electricity and natural gas)
- SCOPE 3** Other indirect emission (e.g., waste disposal, wastewater treatment losses from energy transmission)

### Split of On-Road Vehicle Transportation Emissions





**Taking Climate Action: CoA's progress so far** As at January 2020



1/7

## Smart Energy

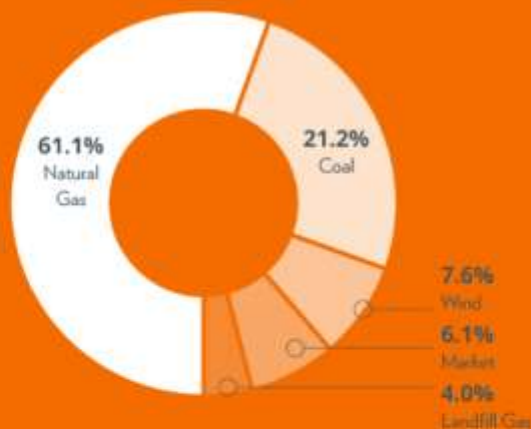
Our way of living requires a stream of energy to operate personal and infrastructure devices. We know that energy is produced with scarce resources and the byproducts impact our environment. We need to use both conservation and efficiency measures to manage the resources we have to provide access to reliable and cost effective energy.



NEXT



### ELECTRICAL MAKEUP IN 2015



Source: ENR

### HOLLAND ENERGY FUND

# \$1 million

in loans through the On-Bill Loan Program, which allows city homes for energy improvements.

Source:

### ENERGY LABELS (2015)

# 74

Homes with Deep Energy Retrofit: \$19,240 average project cost. \$1. invested in Energy Conservation and Home Improvements.

### HOLLAND BOARD OF PUBLIC WORKS KILOWATT HOURS SAVED THROUGH EFFICIENCY PROGRAMS IN 2015 (RESIDENTIAL AND BUSINESS SECTORS)

# 10,449,063

The equivalent of what more than 1,400 homes use per year.

Source: City of Holland

Source: ENR

### AVG. SAVINGS 2014

\$17.60 saved on average per household vs 2013 for electric service.

### AVG. SAVINGS 2015

\$14.63 saved on average per household vs 2014 for electric service.

### ENERGY STAR CERTIFIED BUILDINGS IN HOLLAND

# 4

Source: City of Holland



2020

# Sustainability Report

### ELECTRICAL LOAD (2015)





## Transportation

The movement of people, goods, and services within the city is an essential system. We interact with other regional, national and international elements to create a total network. The City of Holland will have a safe, connected transportation system that serves multiple modes.



### COMMITTEES IN HOLLAND BY MODE OF TRANSPORTATION (2015)



### Public Transit

#### 2 OF PUBLIC CAR CHARGING SYSTEMS

Sixteen



#### Current Sidewalk Coverage

6+ miles

100 miles of being too dark at night: the pavement and sidewalks are covered approximately 500,000 square feet of heated sidewalks and streets.

#### Current Sidewalk Condition

"The town's heated sidewalks make it a winter riding paradise."

#### Current

#### GREEN COMMITTEE (2015)

20,623 miles

of green infrastructure

18,368 pounds

of CO2 saved

### INCREASE IN INFRASTRUCTURE OVER THE PAST DECADE



### INFRASTRUCTURE ACROSS THE CITY

Although we have a historic grid pattern with 150 miles of streets and 300 lane miles, our 100 miles of sidewalks were recently supplemented by over eight miles of heated sidewalks, blue paths, and blue lanes (22%, 3%, and 100% increases respectively over the last decade). The historic street grid pattern allows residents to be well-connected and safe, especially when supplemented with blue paths and lanes.

The City is a partner with a full-service mass transit transportation agency (MATA) that serves 50% of the 100 square mile region with fixed routes and on-demand services.

### Current Sidewalk Condition by Neighborhood

### Current Sidewalk Coverage

### BICYCLE AND PEDESTRIAN PATHWAYS IN THE CITY OF HOLLAND (2015)

Zero

### HOLLAND'S BIKE NETWORK AS OF SUMMER 2015



21.34 total miles

OF DEDICATED BIKE INFRASTRUCTURE IN THE CITY OF HOLLAND

15.40 MILES ON-STREET LANES AND OFF-STREET ROUTES

5.94 MILES MULTI-USE PATHS AND SIDEWALKS

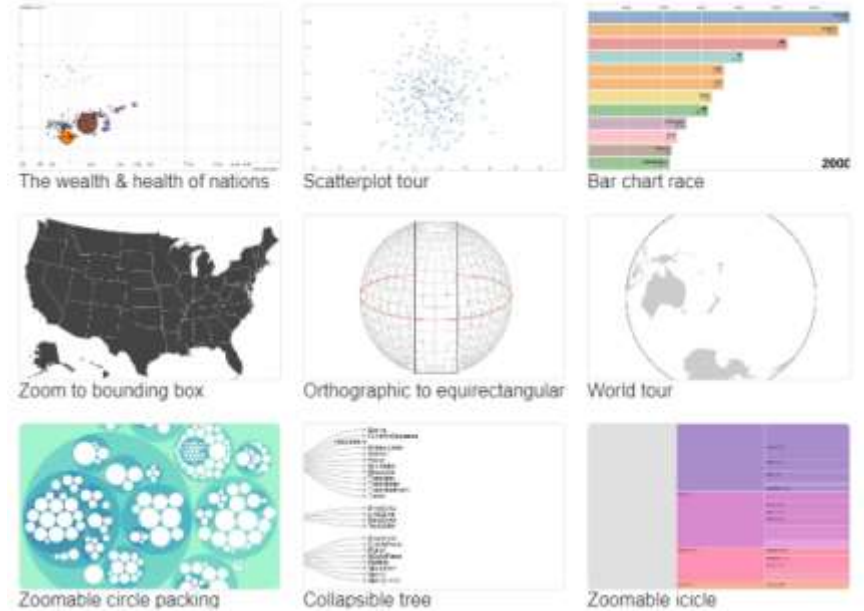


# RawGraphs



<https://www.rawgraphs.io/gallery>

# D3



<https://observablehq.com/@d3>

**Canva** <https://www.canva.com/posters/templates/infographic/>

**Vista** <https://create.vista.com/templates/infographic/>

**Visme** <https://www.visme.co/templates/infographics/>

**Helping each other is simpler than you think**  
Remember that the hardest people are not those getting more, but those giving more.  
- H. Jackson Brown Jr.

**Volunteering for Pet Shelters**  
400M  
15%

**Nature Conservation Volunteering**  
200K  
60%

**Volunteering with seniors**  
45%  
80%

**BeActive**

**GAS EMISSION**  
The impact on the earth and a viable climate

29%  
16%  
25%

**Increase in temperature**

Year	1990	2000	2010	2020
1990	1.4	1.5	1.6	1.7
2000	1.5	1.6	1.7	1.8
2010	1.6	1.7	1.8	1.9
2020	1.7	1.8	1.9	2.0

**Greenhouses emitted**

Year	1990	2000	2010	2020
1990	70%	75%	80%	85%
2000	75%	80%	85%	90%
2010	80%	85%	90%	95%
2020	85%	90%	95%	100%

**MUSINA.FR**

**OIL PRODUCTION WORLDWIDE**

Financial indicators

Indicator	Value
Oil production	977 billion
Oil reserves	28.4 billion
Oil consumption	94.6 billion
Oil exports	21.8 billion

**44%** **4 factors** **\$100/b**

**Australia bushfires**

**2,5K Homes**

**100K Livestock**

**500K Wild animals**

**20K Birds**

**27M Acres**

**Butterfly life cycle**

**Egg**

**Caterpillar**

**Pupa**

**Butterfly**

**Adult butterfly**

**beauty couture**

Tanning lotions, gels and mousse

**FOR FACE AND WHOLE BODY SELF TANNING**

light dark medium

You need to tan everywhere, includes under the eyes, over eyelids, on the tips of the ears.

lotions gels mousses

# Climate & Sustainability Communications Resources



[Climate & Sustainability Communications Member Toolkit](#)

FROM THE COMMUNITY / GOVERNMENT INNOVATION AND LEADERSHIP

7 min read

## 6 tips to make climate communication less awful

If you want to stop climate change, it's time to start mewing



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*This article is written by Dr. Michael Shank, communications director for the Carbon Neutral Cities Alliance and adjunct faculty at New York University's Centre for Global Affairs.*

Recommended for you

Tap into your global government community

[6 tips to make climate communication less awful](#)

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