MIAMIBEACH

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NO. LTC # **412-2016**

LETTER TO COMMISSION

TO: Mayor Philip Levine and Members of the City Commission

FROM: Jimmy L. Morales, City Manager

DATE: October 11, 2016

SUBJECT: The City's First Community-Wide And Government Greenhouse Gas Emissions Inventories

I am pleased to provide this Letter to Commission on the City's first community-wide and government greenhouse gas (GHG) emissions inventory.

The Compact of Mayors and the European Covenant of Mayors have recently joined together to become the Global Covenant of Mayors for Climate & Energy, the largest global coalition dedicated to climate leadership. To ensure a consistent and transparent way to measure emissions which conforms to the IPCC (Intergovernmental Panel on Climate Change) national guidelines, the Compact of Mayors uses the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories, the world's most widely-endorsed GHG accounting and reporting standard for cities.

On October 14, 2015, the City Commission adopted a resolution endorsing the Compact of Mayors pledge, where the City committed to reduce local GHG emissions; measure the community emissions inventory using a consistent and robust standard; identify climate-related hazards; set data-based targets for the future; and develop a climate action plan.

Over the last year, the Environment & Sustainability (E&S) Department completed the City's first community-wide and government GHG inventories. Both inventories used 2014 as the baseline year for the upcoming inventories and emissions' targets. This baseline will provide the foundation to understand the sources of existing emissions and benchmark against future emissions, allowing the City to evaluate mitigation options, assess the effectiveness of policies, make long-term emission projections and monitor progress in climate change mitigation and adaptation.

The City used the ClearPath platform from ICLEI to develop and report and the GHG emissions inventory. ICLEI is a network of local governments pursuing deep reductions in carbon pollution and tangible improvements in sustainability and resilience. Through ICLEI, the City was able to have its inventories verified by a third party organization that is nationally recognized by local governments.

COMMUNITY-WIDE INVENTORY

For the 2014 community-wide inventory, the commercial sector was responsible for the majority of the emissions, accounting for over 50% of all emissions community-wide. Additionally, **the largest source of emissions out of the total community-wide inventory came from electricity, producing 70% of all emissions community-wide.** In 2014, there were 1,223,848 MT CO_2e released community-wide which is equivalent to 138,638,461 gallons of gasoline consumed. Government operations were responsible for 2.8% of the community-wide inventory.

GOVERNMENT OPERATIONS INVENTORY

In order to better understand the sources of these emissions, an inventory was specifically compiled for city government operations. For the 2014 government operations inventory, city-owned buildings and facilities produced 65.7% of the emissions. The City's vehicle fleet emitted 21.7% of the greenhouse gases from the government inventory. Similar to the community wide inventory, electricity was the largest source of emissions, accounting for 77% of emissions. In 2014, there was a total of 34,902 MT CO_2e released through government operations and city-owned buildings and facilities, equivalent to 37,243,753 pounds of burned coal.

NEXT STEPS

As part of the City of Miami Beach Rising Above Resiliency Strategy, the E&S Department is collaborating with operational departments to develop appropriate targets to reduce the City's emissions for the upcoming years. The first area that will be addressed is our fleet operations improvements. The E&S and Fleet Departments' staff are working with each City's Department to assess the City's fleet, analyzing the City's fleet usage, GHG emissions and fuel-efficiency to determine potential substitutions, such as electrical vehicles (EV) or hybrids or other alternatives that would reduce the GHG emissions. The City is also increasing its EV networks across the City to encourage the use of EVs community-wide and potentially reduce GHG emissions.

In order to further mitigate for the City's GHG emissions, the City recently adopted the Sustainability and Resiliency ordinance which will provide a new generation of efficient, environmentally responsible, healthy and resilient buildings. In addition, the E&S Department will be working together with Property Management Department to compile its municipal buildings' electricity data for an energy assessment, looking at inefficiencies and improvements to assist the City's emissions reduction. The City is also establishing a Sustainable and Resilient Procurement Policy which will further institutionalize procurement approaches in a balanced sustainable manner and assist the City to reduce GHG emissions.

By establishing targets for the upcoming years, the City will be able to reduce GHG emissions to combat climate change, track progress, and enhance resilience to climate change. These efforts will assist the City in bouncing back from shocks and stressors in the face of climate change.

I want to thank and recognize Sustainability Manager Flavia Tonioli and Office Associate Alyssia Berthoumieux who crunched the data and developed this easy to read and use guide. This is an important step in our resiliency planning process.

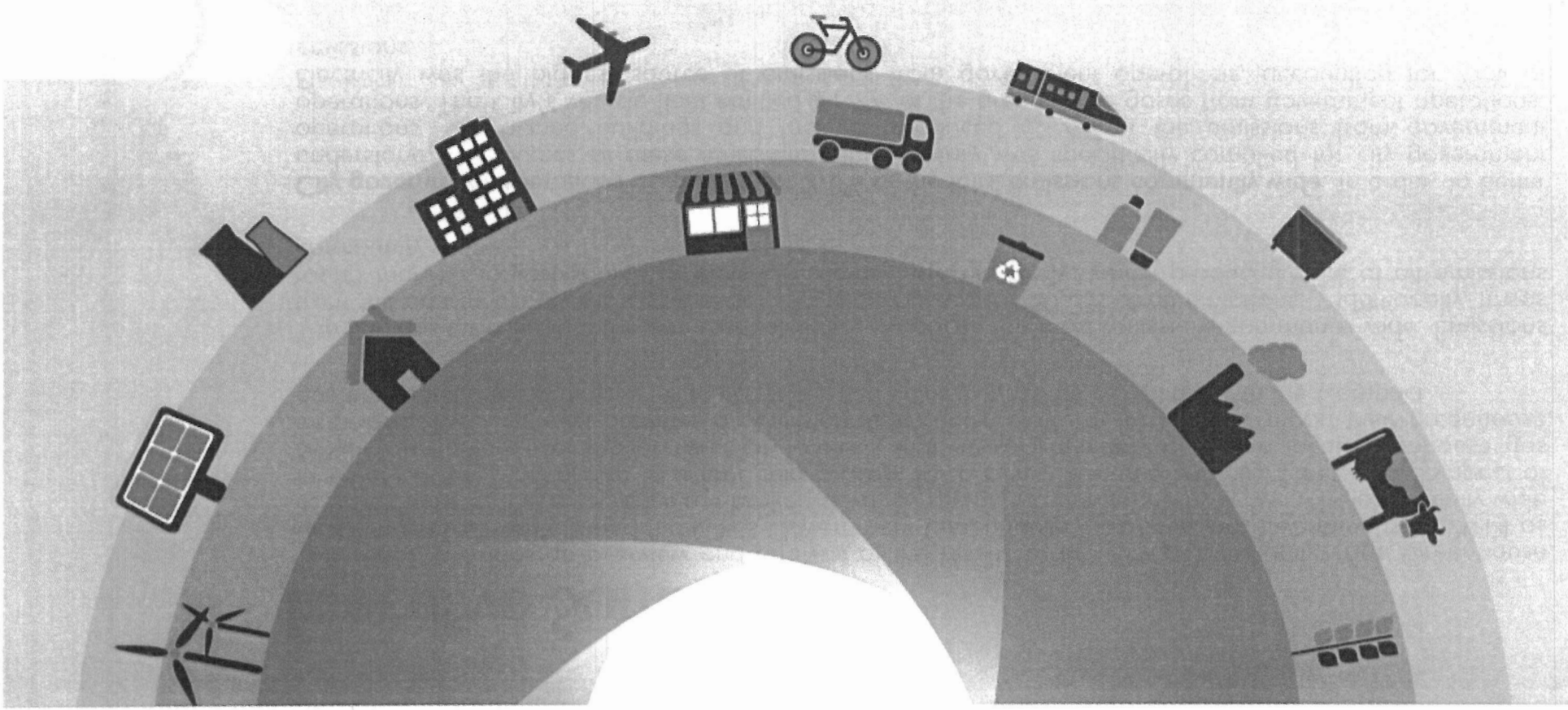
Please do not hesitate to contact me if you have any questions.

Attachment: 2014 Community-wide and Government Greenhouse Gas emissions inventories

SMT/ESW/FCT

GREENHOUSE GAS EMISSIONS INVENTORY

2014 Community Wide and Government Operations



Executive Summary

This report provides an overview and analysis of the results of the City's Community Wide Greenhouse Gas Emissions Inventory and the City's Government Greenhouse Gas Emissions Inventory using 2014 as its baseline year. The inventories are broken down by sector, by source and by scope. The community wide inventory is the second step in a four step process for a city to become compliant with the Compact of Mayors, an alliance of mayors and city officials that have committed to reduce local greenhouse gas emissions. The Compact provides a consistent and robust platform for cities to report their greenhouse gas emissions and requires cities to complete four steps to become compliant with the Compact.

The findings indicate that the commercial sector produced the most emissions community wide. Emissions from the energy use by the commercial sector accounted for 50.3% of all emissions. Additionally, it was found that the largest source of emissions came from electricity; which produced 70% of all emissions community wide.

City government operations accounted for 2.8% of the total emissions community wide. In order to better understand the sources of these emissions, an inventory was specifically compiled for city government operations. City-owned buildings and facilities produced 65.7% of the emissions from government operations. The City's vehicle fleet emitted 21.7% of the greenhouse gases from government operations. Electricity was the biggest source of emissions from government operations, accounting for 77% of emissions.

The report finds that **emissions from electricity use account for the majority of greenhouse gas emissions community wide and in government operations**. Target setting is the next step in the process of becoming compliant with the Compact of Mayors. This inventory is being considered the baseline for the emissions reduction targets being created. Additionally, the efforts of neighboring cities are being studied and considered in the target setting process.

Two greenhouse gas emissions inventories will be compiled annually; a community wide inventory and a government inventory. The 2015 inventories are near completion. There is a lag time between the end of the year and the completion of a greenhouse gas emissions inventory because organizations release their data at different times during the year and there is varying waiting time between the request for data and the receipt of data. The Environment and Sustainability Department has created a Guidance document for developing a greenhouse gas emissions inventory. This document includes the contact information for all entities that compile and possess the necessary data for future inventories.

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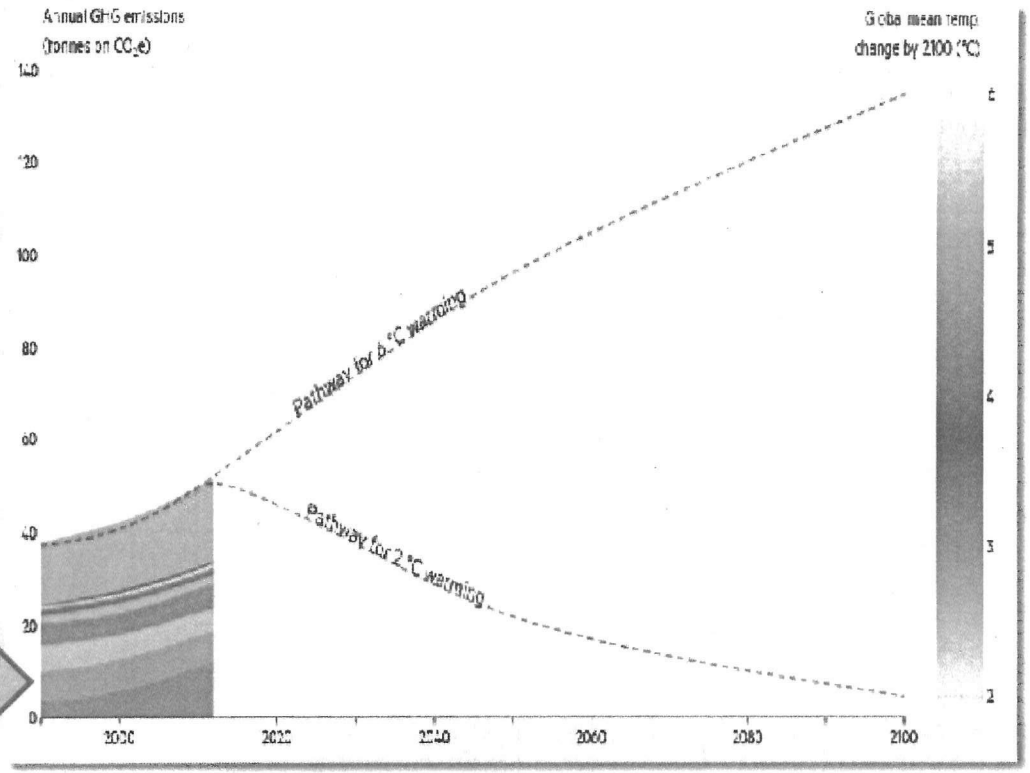
COP21: Paris Climate Conference

- Last fall, the 21st annual "Conference of the Parties" (COP21) met in Paris where 195 nations committed to lowering their Greenhouse Gas (GHG) emissions with the aim of minimizing the negative effects of climate change.

- An international climate pact, the Paris Agreement, was adopted. The main goal of this agreement is to limit temperature rise to below 2°C between now and 2100.

- Countries have agreed to meet every five years to assess implementation and submit updated national climate plans.

COP21: Paris Climate Conference

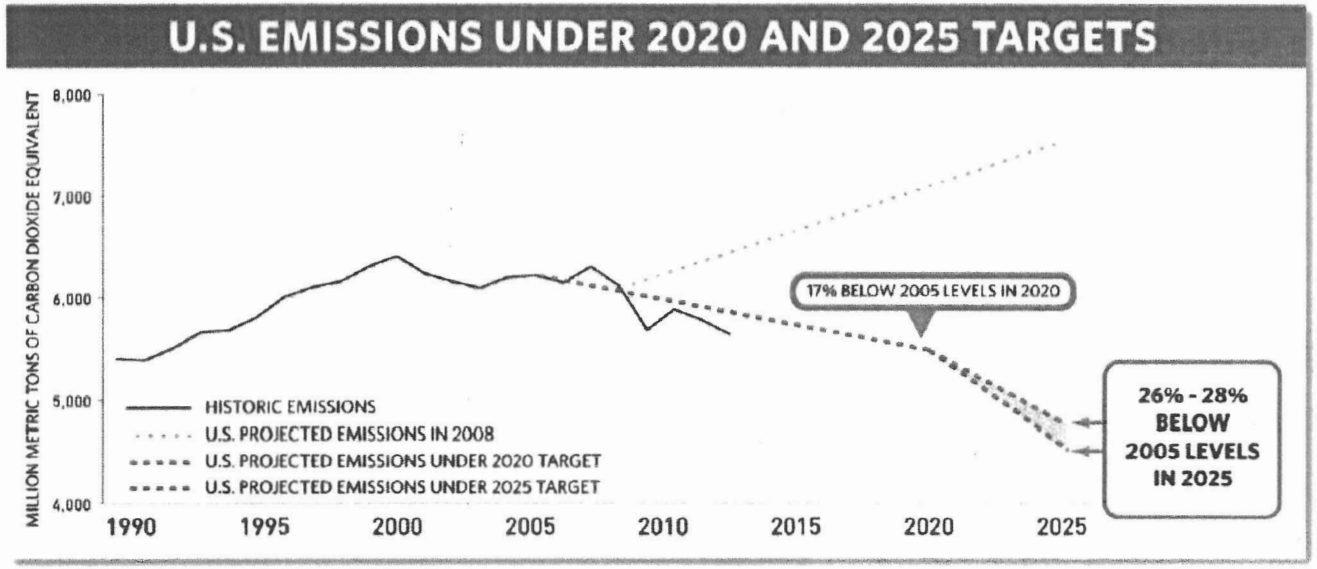


http://ig.ft.com/sites/climate-change-calculator/

UNITED STATES

- The current pathway indicates that we could experience up to 6°C of warming by 2100. In order to keep temperature rise to below 2°C, all nations must work to reduce their GHG emissions drastically. The area in the purple indicates the GHG emissions produced by the United States.

U.S. Greenhouse Gas Reduction Targets



http://www4.unfccc.int/submissions/INDC/Submission%20Pages/submissions.aspx

Last March, the United States committed as an entire country to reduce its total GHG emission levels by 26-28% by 2025 compared to the baseline year of 2005, and to make "best efforts" to reduce emissions by 28%.

In addition, since 2008 the United States has reduced GHG emissions from Federal Government operations by 17%. Under Executive Order 13693 issued on March 25th 2015, the US Federal Government has set a new target to reduce their government operations GHG emissions by 40% by 2025 compared to the baseline 2005 levels.

The Compact of Mayors

- The Compact of Mayors is an agreement by city networks to take a transparent approach to reduce emissions, reduce vulnerability, and enhance resilience to climate change and compliments the national approach.
- The Compact of Mayors and the European Covenant of Mayors have recently joined together to become the Global Covenant of Mayors for Climate & Energy, the largest global coalition dedicated to climate leadership.
- Mayor Philip Levine signed on to the Compact in September 2015.
- Four steps must be completed within three years for a city to become compliant:

The first step, is to sign the pledge and make a commitment to reduce greenhouse gas emissions.

Completed Oct 2015

The second step is to compile a community-wide greenhouse gases inventory.

Completed July 2016

The third step is to create targets for emissions reduction and establish a system of measurement.

To be completed by June 2017

The fourth step is to establish an action plan to meet the targets.

To be completed by September 2017

ICLEI – Local Governments for Sustainability

- The Compact of Mayors was launched by UN Secretary-General Ban Ki-moon and his Special Envoy for Cities and Climate Change, Michael R. Bloomberg, under the leadership of the world's global city networks – C40 Cities Climate Leadership Group (C40), ICLEI – Local Governments for Sustainability (ICLEI) and the United Cities and Local Governments (UCLG) –with support from UN-Habitat, the UN's lead agency on urban issues at the 2014 United Nations Climate Summit.

- ICLEI is a global sustainability network with the participation of more than 1,500 local and regional governments worldwide.

- This non-profit membership network provides access to software and tools, trainings, events, case studies and peer networks to its members.

- ClearPath, an online software platform created by ICLEI, was used to complete the GHG inventories. Through ICLEI, the City was able to have its inventories verified by a third party organization that is nationally recognized by local governments.

Importance of GHG Inventory

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Baseline

Goals

Targets

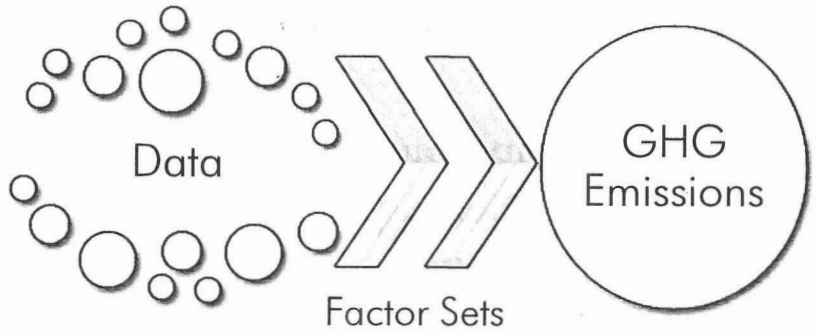
Actions

The 2014 Community Wide GHG Inventory and Government Operations GHG Inventory are the City's first GHG emissions inventories and will be used as the baseline going forward. They will guide us as we **establish emissions reduction targets.**

This is an important component of our **Miami Beach Rising Above Resiliency Strategy**- we are committed to integrating resiliency with sustainability.

Actions will be identified and assembled into an Action Plan in order to help us reach our goals and targets.

GHG Inventory: The Process



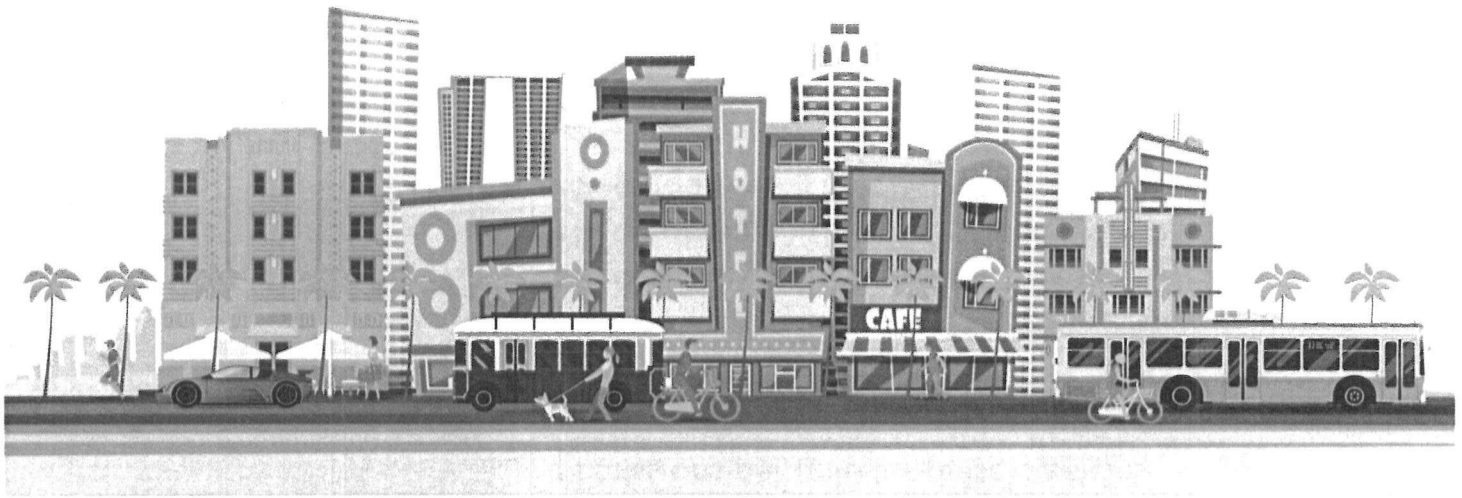
The ICLEI ClearPath software was used to compile the GHG emissions inventory.

Data was collected from various city departments and outside organizations.

Factor sets were then created for Transportation, Waste Characterization and Grid Electricity.

The data was input into ClearPath, where the factor sets converted the input data into the output of GHG emissions through various calculations.

Community Wide GHG Inventory



- The community wide GHG inventory is the second step to compliance with the Compact. The community wide inventory is also an important account of the activities and sources of emissions in the community.

2014 Community Inventory: Factor Sets

The factor sets for Transportation, Waste Characterization and Grid Electricity were created using the following data.

Transportation

- Average passenger vehicle fuel economy (MPG)
- Average light truck fuel economy (MPG)
- Average heavy truck fuel economy (MPG)
- Emissions per mile for gas vehicles
- Emissions per mile for diesel vehicles

Waste Characterization

- % newspaper
- % office paper
- % cardboard
- % magazines
- % food scraps
- % grass
- % leaves
- % branches

Grid Electricity

- CO_2 lbs released/MWh of electricity produced
- CH_4 lbs released/GWh of electricity produced
- N_2O lbs released/GWh of electricity produced

2014 Community Inventory: Scopes

- The Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC) separates all emissions into three scopes:
  - Scope 1: GHG emissions from sources, such as natural gas combustion, occurring within the city boundary
  - Scope 2: GHG emissions from grid-supplied electricity usage within the city but not created with the city boundary
  - Scope 3: all other GHG emissions that occur outside the city boundary due to a third-party service being provided to the city such as waste water treatment

2014 Community Inventory: Sectors

- The GPC categorizes GHG emissions into six key sectors:
  - **Stationary energy**: emissions from electricity and natural gas used by residential buildings, commercial buildings and institutional buildings and facilities.
  - **Transportation**: emissions from on-road transportation and off-road transportation.
  - **Waste**: emissions produced from solid waste disposal and the treatment of wastewater.
  - **Industrial processes and product use (IPPU)**: emissions from electricity, natural gas and other fuels used by the industrial sector.
  - **Agriculture, forestry, and other land use (AFOLU)**: emissions from livestock and land use.
  - **Any other emissions** occurring outside the geographic boundary as a result of city activities: these emissions are not covered in the GPC reporting.

2014 Community Inventory: Protocol

Sector		Total by scope (tCO_2e)				Total by city-induced reporting level (tCO_2e)	
		Scope 1 (Territorial)	Scope 2	Scope 3 included in BASIC/ BASIC+	Other Scope 3	BASIC	BASIC+
Stationary Energy	Energy use (all I emissions except I.4.4)	Included	Included	N/A	N/A		
	Energy generation supplied to the grid (I.4.4)	N/A					
Transportation (all II emissions)		Included	Not Occurring	N/A	N/A		
Waste	Generated in the city (all III.X.1 and III.X.2).	Not Occurring		Included	N/A		
	Generated outside city (all III.X.3)	N/A					
IPPU (all IV emissions)		Not Occurring			N/A		
AFOLU (all V emissions)		Not Occurring			N/A		
Total		(All territorial emissions)				(All BASIC emissions)	(All BASIC & BASIC+ emissions)

- Sources required for BASIC reporting
- + Sources required for BASIC+ reporting
- Sources included in Other Scope 3
- Sources required for territorial total but not for BASIC/BASIC+ reporting (*italics*)
- Non-applicable emissions

http://ghgprotocol.org/files/ghgp/GHGP_GPC.pdf

- All cities reporting to the Compact of Mayors must follow the GPC. This creates a uniform system of accounting.

- There are two options for GPC reporting: BASIC and BASIC+. The BASIC reporting option is the minimum requirement for the Compact and the sources required for BASIC+ do not occur in the City (industrial processes, agriculture, livestock, out-of-boundary transportation).

2014 Community Inventory: Sectors

- The GHG emissions produced in the City of Miami Beach can be classified into these three sectors:
  - **Stationary energy**
  - **Transportation**
  - **Waste**

- The data needed, in addition to the factor sets, to quantify the emissions from these sectors include:
  - Stationary energy: kWh usage, Therms usage
  - Transportation: Vehicle Miles Travelled (VMT) inside city limits
  - Waste: Pounds of solid waste generated inside city limits
  - Wastewater: Nitrogen load at treatment plant

2014 Community Inventory: Data Sources

- Florida Power & Light
- TECO Energy
- Florida Department of Transportation
- City of Miami Beach Sanitation Division
- Miami Dade County Water and Sewer Department
- ICLEI-USA ClearPath software

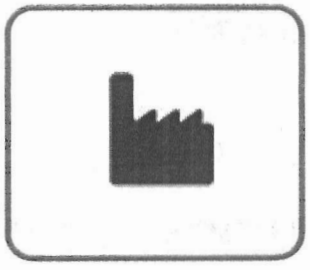
2014 Community Inventory: Data Gathered

RESIDENTIAL ENERGY

- Grid Electricity for Residential Use (kWh, FPL)
- Stationary Fuel Combustion for Residential Use (Therms, TECO)

COMMERCIAL ENERGY

- Grid Electricity for Commercial Use (kWh, FPL)
- Stationary Fuel Combustion for Commercial Use (Therms, TECO)
- Grid Electricity for Public Street & Highway Lighting (kWh, FPL)
- Grid Electricity from Other Sales (kWh, FPL)

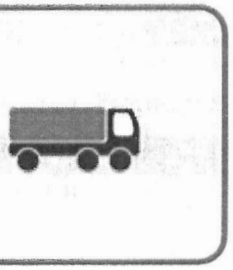


INDUSTRIAL ENERGY*

- Grid Electricity for Industrial Use (kWh, FPL)

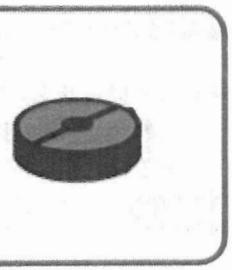
*FPL is working on changing the industrial designation to the commercial designation.

2014 Community Inventory: Data Gathered



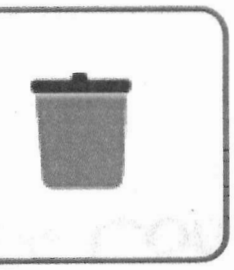
TRANSPORTATION

- Total Miles Travelled Within City Boundary (VMT, FDOT)
- On Road Transportation from Gasoline Vehicles (%, MDC)
- On Road Transportation from Diesel Vehicles (%, MDC)



WATER AND WASTEWATER

- Emissions from the Combustion of Digester Gas (MT CO_2e, population-based ICLEI calculator)
- Emissions for Process N_2O from Effluent Discharge (kg N/day, MDC WASD)



SOLID WASTE*

- Waste generation (tons, FDEP)

*Solid waste generation is a percentage of the Miami Dade County solid waste generation based on population breakdown for the City of Miami Beach compared to the County.

2014 Community Inventory: Results

Residential Energy	Usage	Units	CO2e (MT)	% of Emissions
Residential Natural Gas	2,601,016	Therms	13,826.00	1.13%
Residential Electricity	585,278,672	kWh	299,954.00	24.51%
Commercial Energy				
Commercial Natural Gas	11,466,008	Therms	60,949.00	4.98%
Commercial Electricity	1,072,088,072	kWh	549,444.00	44.89%
Public Streets & Highway Lighting	10,090,848	kWh	5,171.50	0.42%
Other Sales	185,819	kWh	95.23	0.01%
Industrial Energy				
Industrial Electricity	2,867,590	kWh	1,469.60	0.12%
Transportation & Mobile Sources				
Diesel Vehicles	451,497,008	VMT	37,604.64	3.07%
Gasoline Vehicles	451,497,008	VMT	180,226.00	14.73%
Water & Wastewater				
Combustion of Digester Gas	91,732	People	5.88	0.00%
Process N2O from Effluent Discharge	2,154	kg N/day	1,914.60	0.16%
Solid Waste				
Community Waste Generation	127,765	Tons	73,188.00	5.98%
2014 Community Wide				
Total Emissions			1,223,848.45	100.00%

Based on the most current data available

2014 Community Inventory: Results

- In 2014, there were **1,223,848 MT CO_2e** released community-wide.
- **Commercial energy** use created **50.3%** of GHG emissions in the community.
- Emissions from **electricity** use accounted for **70%** of the total GHG emissions in the community.
- Emissions from the combustion of **gasoline and diesel** for transportation accounted for **18%** of the emissions in the community.

Community
GHG EMISIONS

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Emissions by Sector

50.3%
Commercial Energy
615,660 MT CO_2e*

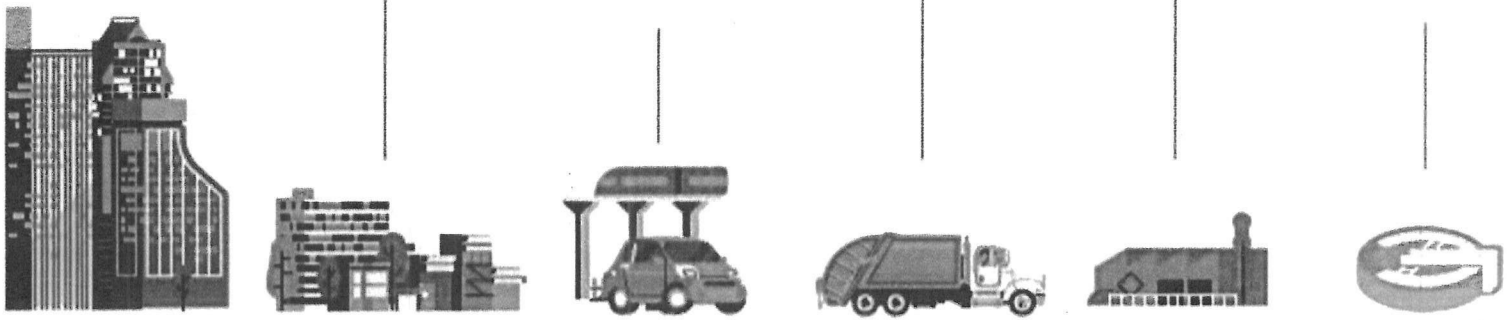
25.6%
Residential Energy
313,780 MT CO_2e*

17.8%
Transportation & Mobile Sources Energy
217,831 MT CO_2e*

5.94%
Solid Waste Energy
73,188 MT CO_2e*

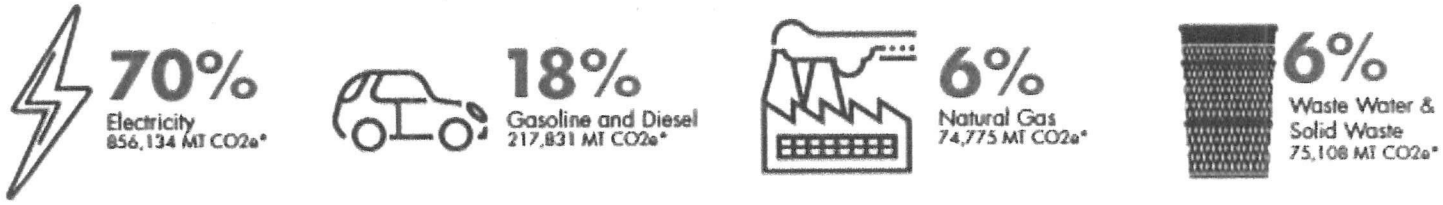
0.12%
Industrial Energy
1,470 MT CO_2e*

0.16%
Water & Wastewater Energy
1,920 MT CO_2e*



Total emissions in the community: 1,232,080 MT CO_2e*

Emissions by Source



70%
Electricity
856,134 MT CO_2e*

18%
Gasoline and Diesel
217,831 MT CO_2e*

6%
Natural Gas
74,775 MT CO_2e*

6%
Waste Water & Solid Waste
75,108 MT CO_2e*

*MT CO_2e = metric tons of CO_2 equivalent

GHG Emissions = greenhouse gas emissions

Based on the most current data available.

Community EQUIVALENCIES

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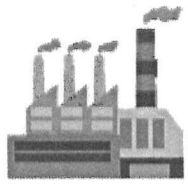
1,223,848
METRIC TONS
OF CARBON DIOXIDE

Greenhouse gas emissions from

2,933,142,176
Miles driven by an average passenger vehicle

CO_2 emissions from

137,712,164
Gallons of gasoline consumed



1,305,962,202
Pounds of coal burned

CO_2 emissions absorbed by

90%
of the Everglades in one year

Community INVENTORY

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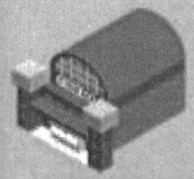
Scope 1

Total: 255,004.29 MT CO2e*

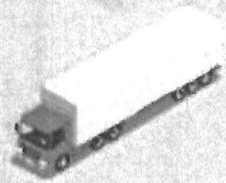
Commercial Natural Gas
60,949 MT CO2e*



Residential Natural Gas
13,826 MT CO2e*

On Road Transportation Gasoline Vehicles
180,226 MT CO2e*

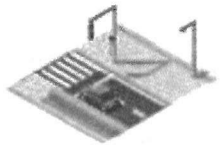
On Road Transportation Diesel Vehicles
3.29 MT CO2e*



Scope 2

Total: 856,134.33 MT CO2e*

Commercial Electricity
549,444 MT CO2e*



Public Streets & Highway Lighting
5,171 MT CO2e*

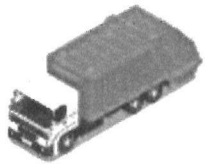
Residential Electricity
299,954 MT CO2e*

Industrial Electricity
1,469 MT CO2e*

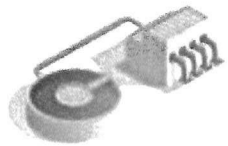
Other Sales (Electricity) 95 MT CO2e*

Scope 3

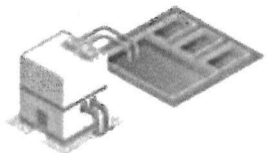
Total: 6711.0589 MT CO2e*



Community Waste Generation
73,188 MT CO2e*



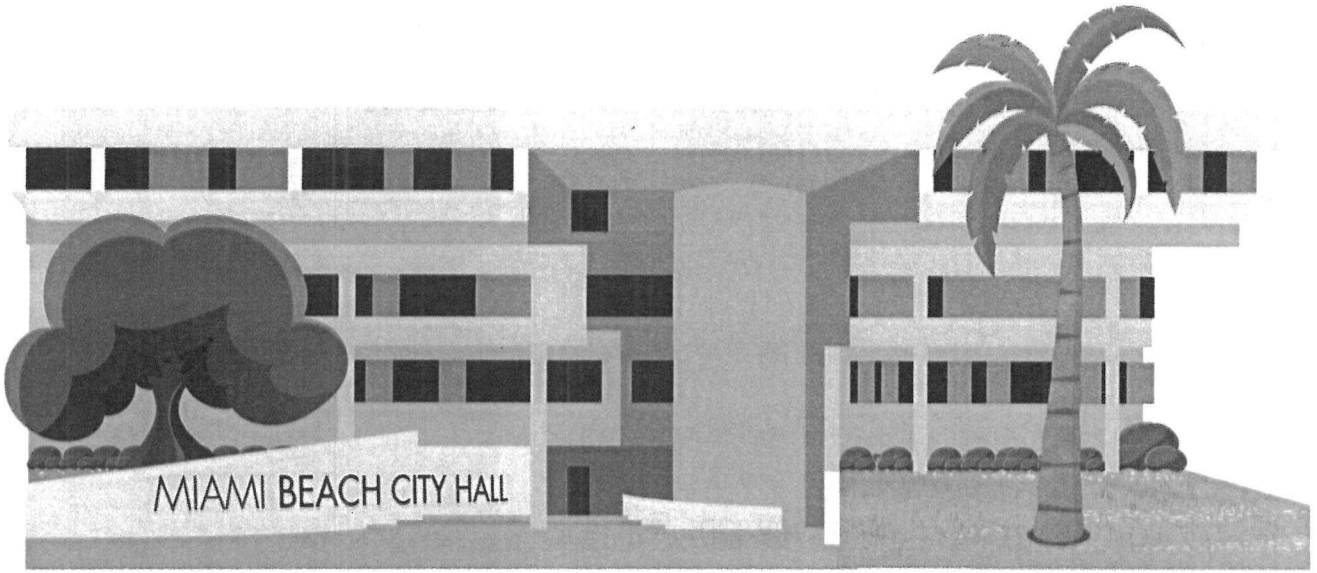
Process N2O from Effluent Discharge
10,146 MT CO2e*



Combustion of Digester Gas from Wastewater Treatment
5.8769 MT CO2e*

*MT CO2e = metric tons of CO2 equivalent

Government GHG Emissions Inventory



In addition to the required community wide GHG inventory, we have also completed an inventory of the GHG emissions produced by government operations and government-owned buildings and facilities. This inventory and consequent targets will empower the city to lead by example.

FY 2014 Government Inventory: Factor Sets

The factor sets for Transportation and Grid Electricity were created using the following data.

Transportation

- Average passenger vehicle fuel economy (MPG)
- Average light truck fuel economy (MPG)
- Trolley fuel economy (MPG)
- Emissions per mile for gas vehicles
- Emissions per mile for diesel vehicles

Grid Electricity

- CO_2 lbs released/MWh of electricity produced
- CH_4 lbs released/GWh of electricity produced
- N_2O lbs released/GWh of electricity produced

FY 2014 Government Inventory: Data Sources

- Florida Power & Light
- TECO Energy
- City of Miami Beach Transportation Department
- City of Miami Beach Fleet Management Division
- City of Miami Beach Property Management Department

FY 2014 Government Inventory: Data Gatherec

BUILDINGS AND FACILITIES

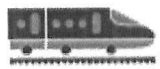
- Grid Electricity for Government Use (kWh, FPL)
- Stationary Fuel Combustion for Government Use (Therms, TECO)

STREET LIGHTS & TRAFFIC SIGNALS

- Grid Electricity for Street Lights Use (kWh, FPL)

VEHICLE FLEET

- Consumption of Gasoline (Gallons, CMB Fleet Management)
- Consumption of Diesel (Gallons, CMB Fleet Management)



TRANSIT FLEET

- Total Miles Travelled by Trolley (VMT, CMB Transportation)

FY 2014 Government Inventory: Results

Buildings, Facilities & Operations	Usage	Units	CO2e (MT)	% of Emissions
Buildings Electricity	43,996,054	kWh	22,548.00	**64.60%**
Buildings Natural Gas	73,343	Therms	389.86	**1.12%**
Public Street & Highway Lighting				
Street Lighting Electricity	8,438,928	kWh	4,324.90	**12.39%**
Vehicle Fleet				
Diesel Vehicles	124,454	Gallons	1,270.70	**3.64%**
Gasoline Vehicles	720,518	Gallons	6,326.10	**18.13%**
Transit Fleet				
City Trolley - NBT	4,820	Gallons	42.32	**0.12%**
2014 Government Operations				
Total Emissions			34,901.88	**100.00%**

Based on the most current data available

FY 2014 Government Inventory: Results

- In FY 2014, there were **34,902 MT CO_2e** released through government operations and city-owned buildings and facilities which represents **2.8% of the community wide emissions.**

- **Buildings and facilities** accounted for **65.7%** of the emissions from the government inventory.

- The greatest source of emissions was grid-supplied **electricity**. It emitted **77%** of the emissions from government building, facilities and operations.

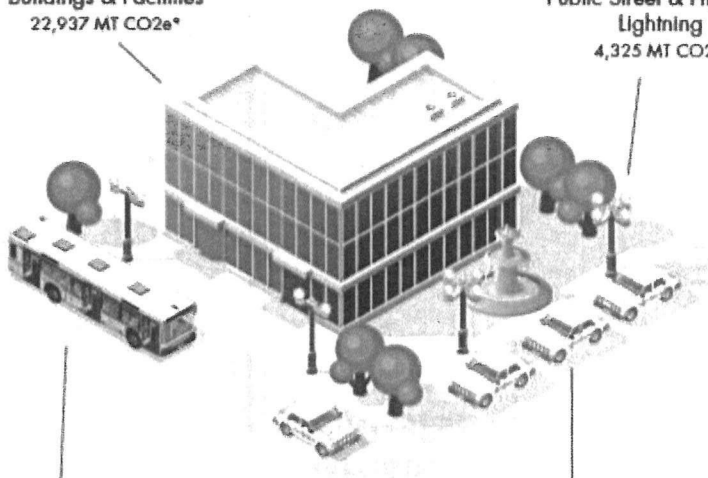
Government
GHG EMISIONS

MIAMIBEACH RISING ABOVE

Emissions by Sector

65.7%
Buildings & Facilities
22,937 MT CO2e*

12.3%
Public Street & Highway Lightning
4,325 MT CO2e*



0.12%
Transit Fleet
42 MT CO2e*

21.7%
Vehicle Fleet
7,597 MT CO2e*

Total emissions: 34,901.88 MT CO2e*

Emissions by Source

77%
Electricity
26,872 MT CO2e*

22%
Transportation
7,639 MT CO2e*

1%
Natural Gas
389 MT CO2e*

*MT CO2e = metric tons of CO2 equivalent

GHG Emissions = greenhouse gas emissions

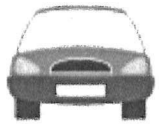
Based on the most current data available.

Government EQUIVALENCIES

MIAMIBEACH RISING ABOVE

34,902
METRIC TONS
OF CARBON DIOXIDE

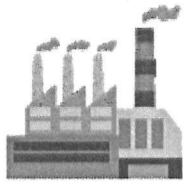
Greenhouse gas emissions from



83,648,074
Miles driven by an average passenger vehicle

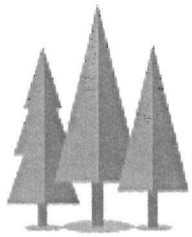
CO_2 emissions from

3,927,310
Gallons of gasoline consumed



37,243,753
Pounds of coal burned

Carbon sequestered by



33,038
Acres of U.S. forests storing carbon in one year

Government INVENTORY

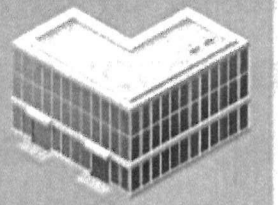
MIAMIBEACH RISING ABOVE

Scope 1 Total: 8,028.98 MT CO2e*

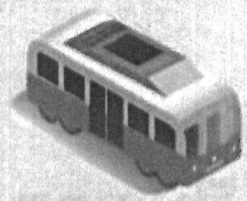
City Operations Gasoline Vehicle Fleet Emissions
6,326.10 MT CO2e*

City Operations Diesel Vehicle Fleet Emissions
1,270.70 MT CO2e*

Goverment Natural Gas Usage
389.86 MT CO2e*

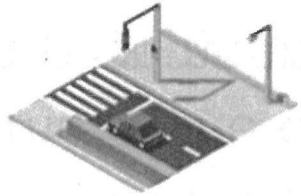


City Trolley Service - NBT
42.32 MT CO2e*



Scope 2 Total: 26,872.90 MT CO2e*

Government Electricity Usage
22,548.00 MT CO2e*



Public Streets & Highway Lighting
4,324.90 MT CO2e*

*MT CO2e = metric tons of CO2 equivalent

Discussion: Setting Targets

- We are studying the targets, actions and endeavors of other cities to understand some of the challenges that they have faced and accomplishments they have achieved in terms of reducing their GHG emissions. We will determine what is realistic for the City and adapt those actions into our goals.

- The targets will be used to set short-term and long-term goals. Additionally, they will be considered as actions are planned.

Discussion: SE Florida Regional Compact Partners

Based on the most current data available

Year	Municipality/ County	Total Emissions (MT CO2e)	Emissions per capita (MT CO2e/ person/year)	Electricity & Stationary Energy	Transportation	Other	Targets
2014	**Miami Beach**	**1,223,848**	**13.3**	**76%**	**18%**	**6%**	**TBD**
2008	**West Palm Beach**	**5,513,890**	**30.1**	**33%**	**27%**	**40%**	**37% reduction from 2008 levels by 2025**
2010	Fort Lauderdale	2,827,747	17.1				20% reduction from 2010 levels by 2020
2006	Miami	4,800,000	12.5	58%	39%	3%	25% reduction from 2006 levels
2005	Key West	399,593	16.8	66%	28%	6%	15% reduction from 2005 levels
2005	**Miami-Dade County**	**30,700,000**	**12.8**	**53%**	**43%**	**4%**	**80% reduction from 2008 levels by 2050**

The table shows the different breakdown of emissions in each municipality/county. Our research shows there is a great variety in target setting and actions, depending on the breakdown of emissions in a particular municipality.

Discussion: Case Study

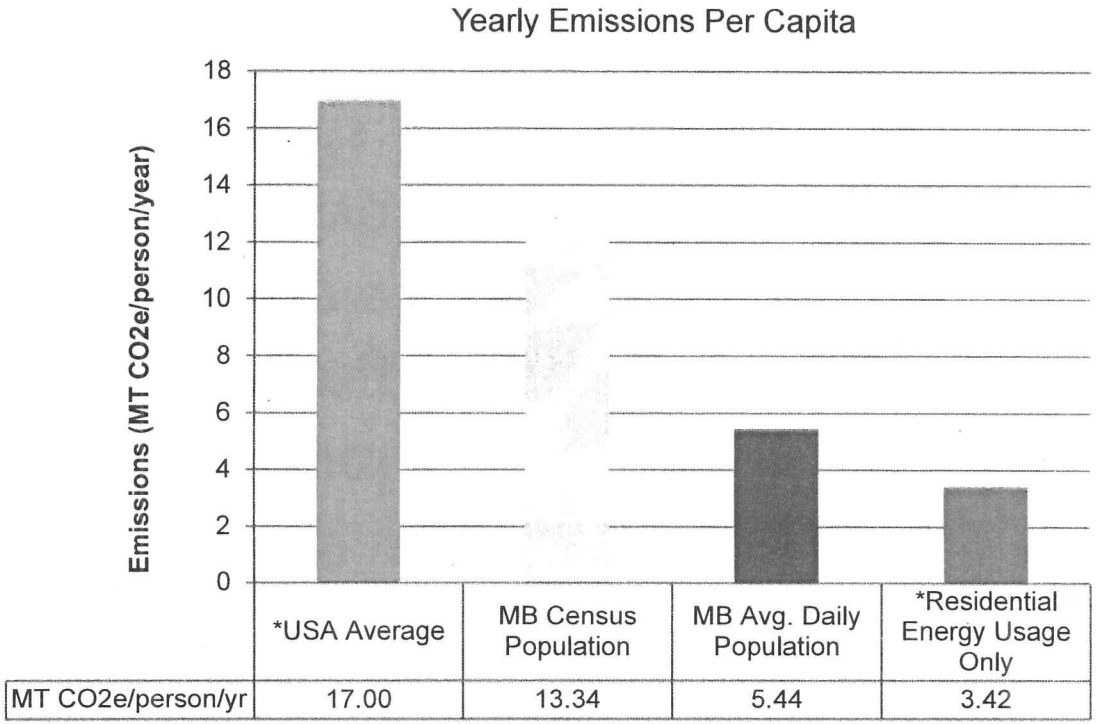
- Orlando was selected as a case study because is has been proactive in reducing their GHG emissions, focusing their efforts on energy.

	Total Emissions (MT CO2e)	Emissions per capita	Electricity & Stationary Energy	Transportation	Other
Orlando	5,803,851	24.6	76%	24%	0%
Miami Beach	1,117,850	12.2	75%	18%	7%

- The targets they have set are to:
  - Reduce GHG emissions 25% from 2007 levels by 2018.
  - Reduce GHG emissions 90% from 2007 levels by 2040.

- In 2013, the Mayor of Orlando reported that the City achieved more than $1 million in annual energy savings over the course of five years.

Discussion: Emissions per Capita

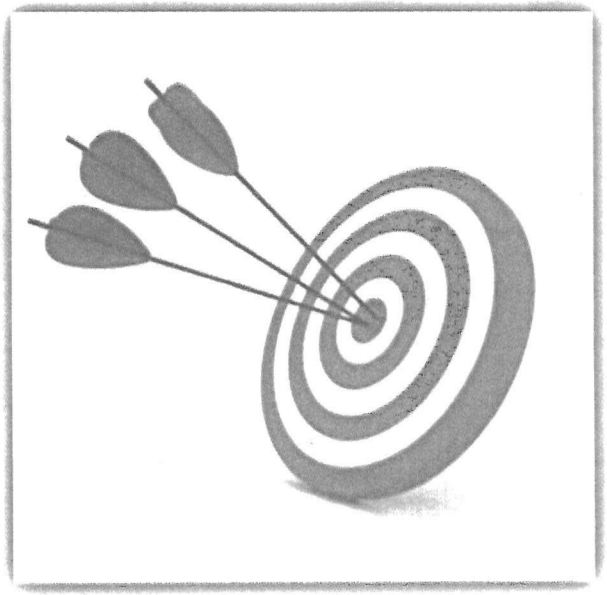


- The average CMB resident releases 13.34 MT CO_2e per year compared to the average American resident that releases 17.0 MT CO_2e per year .
- Using daily average population, the average emissions per capita are 5.44 MT CO_2e per person per year.
- Each resident emits 3.42 MT CO_2e per year related to their energy use only.

Conclusion

This inventory is a great resource for information. It provides us with an overview of GHG emissions and the biggest contributors. The next step is to create emissions reduction targets. Based on the results of the inventory, we need to focus our attention on electricity and transportation. We need to create targets that are:

Aspirational
Challenging
Attainable
Inclusive
Co-benefits:
Resiliency,
Efficiency



Glossary

- **CH_4**: methane. It is a greenhouse gas with a GWP between 28-36.
- **CO_2**: carbon dioxide. It is the principal greenhouse gas produced through human activities.
- **GHG**: greenhouse gases. These are gases that trap heat in the atmosphere and contribute to climate change.
- **GWh**: gigawatt-hour. This is a unit for energy. 1 GWh is equivalent to 1,000,000 kWh.
- **GWP**: global warming potential. A value given to gases depending on how much energy 1 ton of a gas will absorb over 100 years. These values can easily be compared to CO_2 which has a GWP of 1. The higher the GWP, the more that a gas warms the planet over time.
- **kWh**: kilowatt-hour. This is a unit for energy and is equivalent to one kilowatt of power consumed for one hour.
- **MWh**: megawatt-hour. This is a unit for energy. 1 MWh is equivalent to 1,000 kWh.
- **MT CO_2e**: metric ton of carbon dioxide equivalents. This unit is a standard used to represent the GWP of various greenhouse gases.
- **N_2O**: nitrous oxide. It is a greenhouse gas with a GWP between 265-298.

References

- ICLEI ClearPath: emissions management software
  - http://clearpath.icleiusa.org/
- Global Protocol for Community-Scale Greenhouse Gas Emission Inventories: An Accounting and Reporting Standard for Cities
  - http://ghgprotocol.org/files/ghgp/GHGP_GPC.pdf
- The Compact of Mayors guide to compliance
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- Executive Order: Planning for Federal Sustainability in the Next Decade
  - https://www.whitehouse.gov/the-press-office/2015/03/19/executive-order-planning-federal-sustainability-next-decade