Executive Summary

This report provides an overview and analysis of the results of the City’s annual Community Wide Greenhouse Gas Emissions Inventory and the City’s annual Government Greenhouse Gas Emissions Inventory. The 2014 Community Wide Greenhouse Gas Emissions Inventory and 2014 Government Greenhouse Gas Emissions Inventory were used as baseline inventories. The 2014 community wide inventory was submitted in December 2016 to the Compact of Mayors, the second step within a four step process for a city to become compliant. The Compact, which recently became the Global Covenant of Mayors for Climate & Energy, is an alliance of mayors and city officials that have committed to reduce local greenhouse gas emissions. The Global Covenant provides a consistent and robust platform for cities to report their greenhouse gas emissions and requires cities to complete four steps to become compliant.

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% of all emissions. Additionally, it was found that the largest source of emissions came from electricity; which produced 69% 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 65.8% 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. There is an increase in emissions between 2014 and 2015 by 3.3% community wide and by 3.7% for government operations. The City is committed to reducing its greenhouse gas emissions. It plans to set a reduction target in line with that of Miami Dade County and the state of Florida.

Two greenhouse gas emissions inventories will be compiled annually; a community wide inventory and a government inventory. There will be 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

• In the fall of 2015, 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.
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.
In 2015, 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 Global Covenant of Mayors

- The Compact of Mayors and the European Covenant of Mayors joined together in 2016 to become the Global Covenant of Mayors for Climate & Energy, the largest global coalition dedicated to climate leadership.

- The Covenant 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.

- 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

- 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.
The 2014 Community Wide GHG Inventory and Government Operations GHG Inventory are the City’s baseline GHG emissions inventories. Annual inventories can be compared to the baseline and help create actionable goals. The baseline and consequent inventories 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.
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.
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.
# 2015 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
- CO₂ lbs released/MWh of electricity produced
- CH₄ lbs released/GWh of electricity produced
- N₂O lbs released/GWh of electricity produced
2015 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 within 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
2015 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.
All cities reporting to the Global Covenant 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).

The results of both inventories are reported through CDP, an international organization through which companies, cities, states and regions disclose their environmental risks, opportunities and impacts.
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
2015 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
2015 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 appropriate designation.
2015 Community Inventory: Data Gathered

TRANSPORTATION
- Total Miles Travelled Within City Boundary (2014, VMT, FDOT)
- Compound annual growth rate (MDC, 2025 population projection)

WATER AND WASTEWATER
- Emissions from the Combustion of Digester Gas (MT CO$_2$e, population-based ICLEI calculator)
- Emissions for Process N$_2$O 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.
## 2015 Community Inventory: Results

<table>
<thead>
<tr>
<th>Residential Energy</th>
<th>Usage</th>
<th>Units</th>
<th>CO2e (MT)</th>
<th>% of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Natural Gas</td>
<td>2,163,381</td>
<td>Therms</td>
<td>11,503.74</td>
<td>0.92%</td>
</tr>
<tr>
<td>Residential Electricity</td>
<td>613,366,809</td>
<td>kWh</td>
<td>303,219.71</td>
<td>24.31%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commercial Energy</th>
<th>Usage</th>
<th>Units</th>
<th>CO2e (MT)</th>
<th>% of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Natural Gas</td>
<td>12,929,242</td>
<td>Therms</td>
<td>68,750.99</td>
<td>5.51%</td>
</tr>
<tr>
<td>Commercial Electricity</td>
<td>1,113,323,891</td>
<td>kWh</td>
<td>550,374.99</td>
<td>44.13%</td>
</tr>
<tr>
<td>Public Streets &amp; Highway Lighting</td>
<td>10,369,923</td>
<td>kWh</td>
<td>5,126.40</td>
<td>0.41%</td>
</tr>
<tr>
<td>Other Sales</td>
<td>160,686</td>
<td>kWh</td>
<td>79.44</td>
<td>0.01%</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Industrial Energy</th>
<th>Usage</th>
<th>Units</th>
<th>CO2e (MT)</th>
<th>% of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Electricity</td>
<td>4,549,221</td>
<td>kWh</td>
<td>2,248.92</td>
<td>0.18%</td>
</tr>
</tbody>
</table>

**Transportation & Mobile Sources**

<table>
<thead>
<tr>
<th></th>
<th>Usage</th>
<th>Units</th>
<th>CO2e (MT)</th>
<th>% of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel Vehicles</td>
<td>456,914,972</td>
<td>VMT</td>
<td>38,055.77</td>
<td>3.05%</td>
</tr>
<tr>
<td>Gasoline Vehicles</td>
<td>456,914,972</td>
<td>VMT</td>
<td>182,323.55</td>
<td>14.62%</td>
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</tbody>
</table>

**Water & Wastewater**

<table>
<thead>
<tr>
<th></th>
<th>Usage</th>
<th>Units</th>
<th>CO2e (MT)</th>
<th>% of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion of Digester Gas</td>
<td>92,312</td>
<td>People</td>
<td>6.03</td>
<td>0.00%</td>
</tr>
<tr>
<td>Process N2O from Effluent Discharge</td>
<td>92,312</td>
<td>People</td>
<td>1,863.51</td>
<td>0.15%</td>
</tr>
</tbody>
</table>

**Solid Waste**

<table>
<thead>
<tr>
<th></th>
<th>Usage</th>
<th>Units</th>
<th>CO2e (MT)</th>
<th>% of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Waste Generation</td>
<td>92,312</td>
<td>People</td>
<td>83,657.85</td>
<td>6.71%</td>
</tr>
</tbody>
</table>

**2014 Community Wide**

<table>
<thead>
<tr>
<th></th>
<th>Usage</th>
<th>Units</th>
<th>CO2e (MT)</th>
<th>% of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Emissions</td>
<td></td>
<td></td>
<td>1,247,210.90</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

*2015 VMT estimated using 2014 VMT and the estimated compound annual growth rate for Miami-Dade County. It is assumed that VMT increased proportionally to Miami-Dade County population.*

*Based on the most current data available.*
2015 Community Inventory: Results

- In 2015, there were 1,247,211 MT CO$_2$e released community-wide.

- **Commercial energy** use created 50% of GHG emissions in the community.

- Emissions from **electricity** use accounted for 69% 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 EMISSIONS

Emissions by Sector

- **50%** Commercial Energy 624,332 MT CO2e*
- **25%** Residential Energy 314,723 MT CO2e*
- **18%** Transportation & Mobile Sources Energy 220,379 MT CO2e*
- **7%** Solid Waste Energy 83,658 MT CO2e*
- **0.18%** Industrial Energy 2,249 MT CO2e*
- **0.15%** Water & Wastewater Energy 1,870 MT CO2e*

Total emissions in the community: 1,247,211 MT CO2e*

Emissions by Source

- **69%** Electricity 861,049 MT CO2e*
- **18%** Gasoline and Diesel 220,379 MT CO2e*
- **6%** Natural Gas 80,255 MT CO2e*
- **7%** Waste Water & Solid Waste 85,527 MT CO2e*

*MT CO2e = metric tons of CO2 equivalent

GHG Emissions = greenhouse gas emissions

Based on the most current data available.
**Community INVENTORY**

**Scope 1**
- Total: 300,634 MT CO2e*
  - Commercial Natural Gas: 68,751 MT CO2e*
  - Residential Natural Gas: 11,504 MT CO2e*
  - On Road Transportation Gasoline Vehicles: 182,324 MT CO2e*
  - On Road Transportation Diesel Vehicles: 38,056 MT CO2e*

**Scope 2**
- Total: 861,049 MT CO2e*
  - Commercial Electricity: 550,375 MT CO2e*
  - Residential Electricity: 303,220 MT CO2e*
  - Other Sales (Electricity): 95 MT CO2e*
  - Industrial Electricity: 2,249 MT CO2e*
  - Public Streets & Highway Lighting: 5,206 MT CO2e*

**Scope 3**
- Total: 85,527 MT CO2e*
  - Community Waste Generation: 83,658 MT CO2e*
  - Process N2O from Effluent Discharge: 1,864 MT CO2e*
  - Combustion of Digester Gas from Wastewater Treatment: 6.03 MT CO2e*

*MT CO2e = metric tons of CO2 equivalent*
1,247,211 metric tons of carbon dioxide

Greenhouse gas emissions from 2,989,135,001 miles driven by an average passenger vehicle

CO₂ emissions from 140,341,049 gallons of gasoline consumed

CO₂ emissions absorbed by 1,330,892,638 pounds of coal burned

91.6% of the Everglades in one year
Trend by Sector: 2014 to 2015

*2015 Emissions from Transportation & Mobile Sources were calculated based on 2014 Emissions and estimated compound annual growth rate.
## Trend by Sector: 2014 to 2015

<table>
<thead>
<tr>
<th>COMMUNITY INVENTORY</th>
<th>2014 Emissions (MT CO2e)</th>
<th>2015 Emissions (MT CO2e)</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Energy</td>
<td>596,040.51</td>
<td>624,331.82</td>
<td>4.75%</td>
</tr>
<tr>
<td>Residential Energy</td>
<td>303,165.11</td>
<td>314,723.45</td>
<td>3.81%</td>
</tr>
<tr>
<td>*Transportation &amp; Mobile Sources</td>
<td>217,766.15</td>
<td>220,379.32</td>
<td>1.20%</td>
</tr>
<tr>
<td>Solid Waste</td>
<td>87,128.22</td>
<td>83,657.85</td>
<td>-3.98%</td>
</tr>
<tr>
<td>Industrial Energy</td>
<td>1,417.60</td>
<td>2,248.92</td>
<td>58.64%</td>
</tr>
<tr>
<td>Water &amp; Wastewater</td>
<td>1,846.43</td>
<td>1,869.54</td>
<td>1.25%</td>
</tr>
<tr>
<td><strong>Total Emissions</strong></td>
<td><strong>1,207,364.02</strong></td>
<td><strong>1,247,210.90</strong></td>
<td><strong>3.30%</strong></td>
</tr>
</tbody>
</table>

*2015 Emissions from Transportation & Mobile Sources were calculated based on 2014 Emissions and the estimated compound annual growth rate for the county population.

- There has been a 3.3% increase in GHG emissions between 2014 and 2015.
- The commercial sector has a 4.75% increase in emissions from energy.
- There was a 3.98% decrease in emissions from solid waste due to less solid waste sent to the landfill countywide in 2015.
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.
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**
- CO₂ lbs released/MWh of electricity produced
- CH₄ lbs released/GWh of electricity produced
- N₂O lbs released/GWh of electricity produced
FY 2015 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 2015 Government Inventory: Data Gathered

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 2015 Government Inventory: Results

<table>
<thead>
<tr>
<th>Buildings, Facilities &amp; Operations</th>
<th>Usage</th>
<th>Units</th>
<th>CO2e (MT)</th>
<th>% of Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings Electricity</td>
<td>46,117,521 kWh</td>
<td>22,798.33</td>
<td>64.70%</td>
<td></td>
</tr>
<tr>
<td>Buildings Natural Gas</td>
<td>72,714 Therms</td>
<td>386.52</td>
<td>1.10%</td>
<td></td>
</tr>
<tr>
<td>Public Street &amp; Highway Lighting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Street Lighting Electricity</td>
<td>8,438,928 kWh</td>
<td>4,171.81</td>
<td>11.84%</td>
<td></td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diesel Vehicles</td>
<td>133,541 Gallons</td>
<td>1,363.50</td>
<td>3.87%</td>
<td></td>
</tr>
<tr>
<td>Gasoline Vehicles</td>
<td>716,710 Gallons</td>
<td>6,292.70</td>
<td>17.86%</td>
<td></td>
</tr>
<tr>
<td>Transit Fleet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Trolley - NBT</td>
<td>25,610 Gallons</td>
<td>224.86</td>
<td>0.64%</td>
<td></td>
</tr>
<tr>
<td>2015 Government Operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Emissions</td>
<td></td>
<td></td>
<td>35,237.72</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

*Based on the most current data available*
In FY 2015, there were 35,238 MT CO$_2$e released through government operations and city-owned buildings and facilities which represents 2.8% of the community wide emissions.

Buildings and facilities accounted for 65.8% 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 Emissions

Emissions by Sector

- **65.8%** Buildings & Facilities: 23,185 MT CO₂e*
- **11.84%** Public Street & Highway Lightning: 4,172 MT CO₂e*
- **0.64%** Transit Fleet: 225 MT CO₂e*
- **21.73%** Vehicle Fleet: 7,656 MT CO₂e*

Total emissions: **35,238 MT CO₂e***

Emissions by Source

- **77%** Electricity: 26,970 MT CO₂e*
- **22%** Transportation: 7,881 MT CO₂e*
- **1%** Natural Gas: 387 MT CO₂e*

*MT CO₂e = metric tons of CO₂ equivalent

GHG Emissions = greenhouse gas emissions

Based on the most current data available.
**Scope 1**

Total: 8,267.6 MT CO2e*

- City Operations Gasoline Vehicle Fleet Emissions: 6,292.7 MT CO2e*
- City Operations Diesel Vehicle Fleet Emissions: 1,363.5 MT CO2e*

**Scope 2**

Total: 26,970.1 MT CO2e*

- Government Natural Gas Usage: 386.5 MT CO2e*
- Government Electricity Usage: 22,798.3 MT CO2e*
- Public Streets & Highway Lighting: 4,171.8 MT CO2e*

*MT CO2e = metric tons of CO2 equivalent*
35,238 Metric Tons of Carbon Dioxide

Greenhouse gas emissions from 84,452,679 Miles driven by an average passenger vehicle

CO₂ emissions from 3,965,086 Gallons of gasoline consumed

Carbon sequestered by 37,601,998 Pounds of coal burned

33,356 Acres of U.S. forests storing carbon in one year
Trend by Sector: FY 2014 to FY 2015

- Buildings, Facilities & Operations
- Vehicle Fleet
- Public Street & Highway Lighting
- Transit Fleet

Comparison of 2014 and 2015 emissions (MT CO2e).
### Trend by Sector: FY 2014 to FY 2015

<table>
<thead>
<tr>
<th>GOVERNMENT INVENTORY</th>
<th>2014 Emissions (MT CO2e)</th>
<th>2015 Emissions (MT CO2e)</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings, Facilities &amp; Operations</td>
<td>22,140</td>
<td>23,185</td>
<td>4.72%</td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td>7,619</td>
<td>7,656</td>
<td>0.49%</td>
</tr>
<tr>
<td>Public Street &amp; Highway Lighting</td>
<td>4,172</td>
<td>4,172</td>
<td>0.00%</td>
</tr>
<tr>
<td>Transit Fleet</td>
<td>42</td>
<td>225</td>
<td>431.32%</td>
</tr>
<tr>
<td>Total Emissions</td>
<td>33,972</td>
<td>35,238</td>
<td>3.72%</td>
</tr>
</tbody>
</table>

- There has been a 3.7% increase in GHG emissions between 2014 and 2015.
- Emissions from the transit fleet increased by 431% because new trolley routes were added in 2015.
- There has been a 4.7% increase in emissions from buildings, facilities & operations.
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 a Climate Action Plan is created.
## Discussion: SE Florida Regional Compact Partners

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. The baseline used also has an effect on target setting.

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

Based on the most current data available.
Discussion: Case Study

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

<table>
<thead>
<tr>
<th></th>
<th>Total Emissions (MT CO2e)</th>
<th>Emissions per capita</th>
<th>Electricity &amp; Stationary Energy</th>
<th>Transportation</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlando</td>
<td>5,803,851</td>
<td>24.6</td>
<td>76%</td>
<td>24%</td>
<td>0%</td>
</tr>
<tr>
<td>Miami Beach</td>
<td>1,117,850</td>
<td>12.2</td>
<td>75%</td>
<td>18%</td>
<td>7%</td>
</tr>
</tbody>
</table>

- 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.
• The average CMB resident releases 13.69 MT CO\textsubscript{2}e per year compared to the average American resident that releases 16.4 MT CO\textsubscript{2}e per year.

• Using daily average population, the average emissions per capita are 5.69 MT CO\textsubscript{2}e per person per year.

• Each resident emits 3.52 MT CO\textsubscript{2}e per year related to their household energy use only.
Conclusion

This inventory is a great resource for information. It provides us with an overview of GHG emissions sources throughout the community and government operations. As we create emission reduction target, we will focus on our biggest contributors. Based on the results of the inventory, we need to focus our attention on electricity and transportation. We will create targets that are:

- Aspirational
- Challenging
- Attainable
- Inclusive

Co-benefits: Resiliency, Efficiency
Glossary

- **CH₄**: methane. It is a greenhouse gas with a GWP between 28-36.
- **CO₂**: 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 CO₂ 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 CO₂e**: metric ton of carbon dioxide equivalents. This unit is a standard used to represent the GWP of various greenhouse gases.
- **N₂O**: 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

• 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