



# LOUISVILLE

## GREENHOUSE GAS INVENTORY OVERVIEW

### BACKGROUND

Cities are centers of communication, commerce, and culture. There also are a significant and growing source of energy consumption and greenhouse gas (GHG) emissions. Globally, cities are major players in GHG emissions: ***Cities are responsible for more than 70% of global energy-related carbon dioxide emissions.***



GHGs trap heat in our atmosphere causing global temperatures to rise. The impacts of climate change result in damage to roads and bridges, higher energy costs, more extreme weather events and negative economic consequences. Louisville Metro Government has already begun working to address community-wide GHG emissions and the impacts of rising temperatures with the adoption of Sustain Louisville in 2013. To demonstrate a commitment to climate action, ***Mayor Greg Fischer signed the Global Covenant of Mayors for Climate and Energy in April 2016, pledging to report and reduce Louisville's GHG emissions,*** and identify and mitigate risks from climate change. The first step was to complete a GHG inventory, the results of which are summarized in this document.

### OVERVIEW

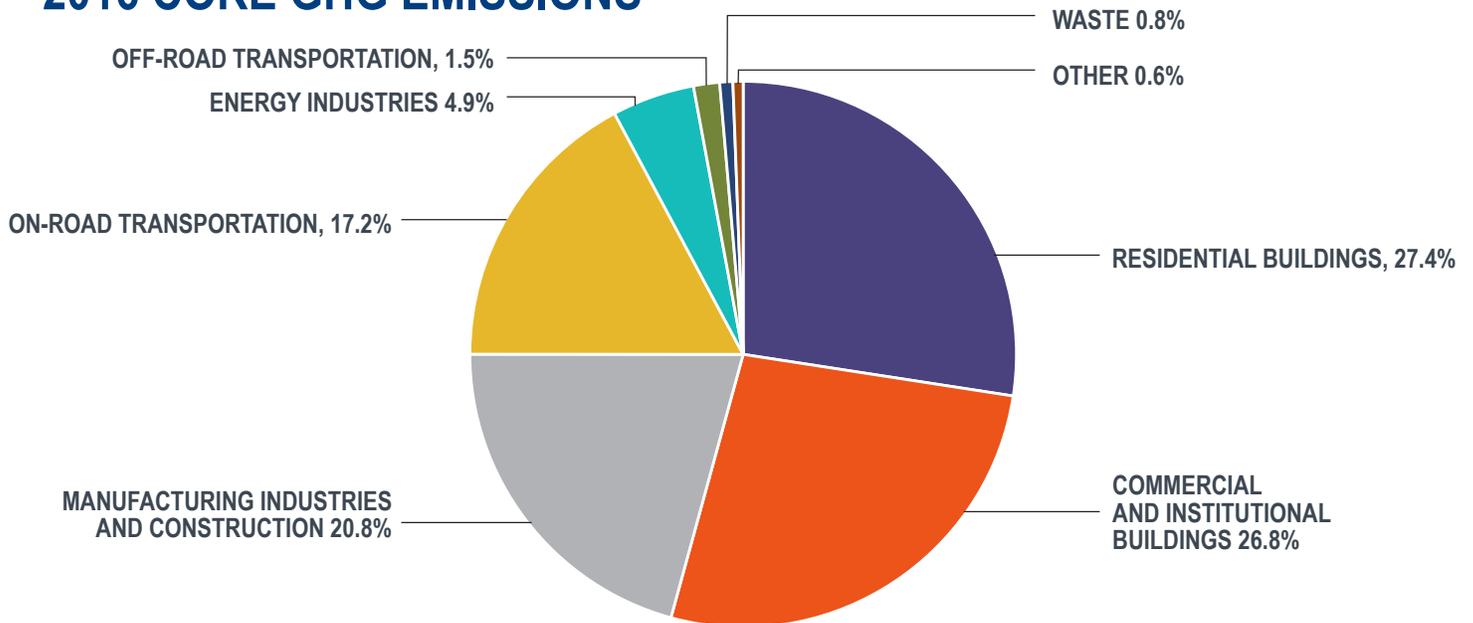
A GHG inventory was completed for 2010 and 2016 using the methodology published in the Global Protocol for Community Scale Greenhouse Gas Emissions Inventory (GPC Protocol). The 2010 data will be used as a baseline for target setting. Under the GPC Protocol, GHG emissions are split between Core and Expanded emissions:

- Core emissions are those which Louisville Metro has the greatest opportunity to influence. The Core GHG emissions sources include building energy use, fugitive, energy industries, on-road and off-road transportation and waste (includes solid waste, composting and wastewater treatment). The Core emissions will be the focus of the emissions reduction plan and to which Louisville's reduction target will be set. In 2016, the Core GHG emissions were 16,000,537 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e), which represents a 10.1% of reduction from 2010.
- Expanded emissions are the additional sources not included as the Core emissions. They include transboundary transportation, industrial process and product use (IPPU), and agriculture, forestry, and other land-use (AFOLU). These sources typically serve regional and state demands, many have federal regulations and reporting standards, and thus are not as easy for Louisville Metro to influence. The 2016 Expanded GHG emissions were 21,554,911 tCO<sub>2</sub>e. Through future GHG inventories, Louisville Metro will continue to monitor trends and identify opportunities where actions can have an impact on reducing the Expanded GHG emissions. Specific reduction targets, or actions, will not be identified for the Expanded GHG emissions.



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## 2016 CORE GHG EMISSIONS



## GHG CONTRIBUTIONS BY SECTOR

**80.5%**

### ENERGY

Approximately 80.5% of Louisville’s GHG emissions result from the use of electricity and other fuels like natural gas and propane to heat, cool, and power buildings.

**18.7%**

### TRANSPORTATION

About 18.7% of Louisville’s GHG emissions comes from using fossil fuels in vehicles including gasoline, diesel, and propane. The inventory includes vehicles registered in Louisville Metro as well as marine and aviation sources.

**0.8%**

### WASTE AND WASTEWATER

A portion of community emissions comes from waste that goes to landfills where it decomposes and releases methane gas, a potent greenhouse gas. The inventory includes emissions from solid waste, compost and wastewater generated in Louisville.

Nationally, 45% of GHG emissions are from commercial and residential sectors, 35% from industry, and 20% are from transportation-related sources.



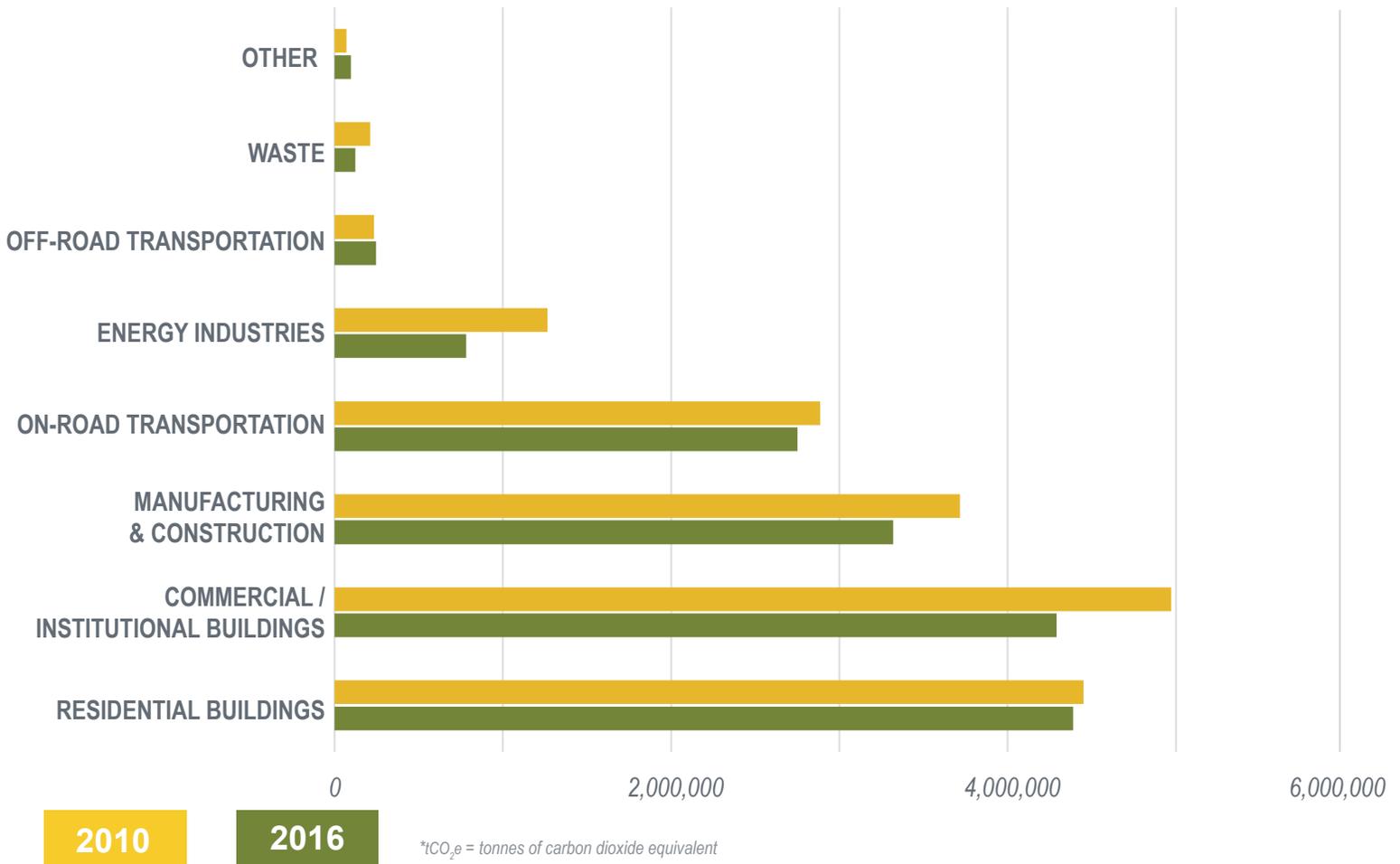
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## CHANGE IN CORE GHG EMISSIONS FROM 2010 TO 2016

Louisville Metro established 2010 as its baseline against which future GHG reduction targets will be set. Since 2010, Louisville has already achieved a reduction of 1.8 million tCO<sub>2</sub>e, which represents a 10.1% decline in Core GHG emissions over this period. This reduction in GHG emissions was due in part to 2010 being a high-energy demand year compared to 2016 as well as the transition to natural gas within LG&E’s electricity generating fleet (2015).

Other initiatives contributed to the Core GHG emission reduction, as well. Relative to the 2010 baseline, on-road transportation GHG emissions decreased 4.7%, which is due to improvements in vehicle engine emission controls/efficiency and fuel formulation. It should be noted that not all sources achieved emission reductions between 2010 and 2016. There was a 5.5% increase in GHG emissions from off-road transportation which includes trains, airplanes and water craft.

## 2010 AND 2016 GHG EMISSIONS (tCO<sub>2</sub>e)





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## COMPARING TO OTHER CITIES

Louisville’s per capita GHG emissions exceed the national average when compared to other US cities that report publicly for the Global Covenant of Mayors, as seen in the table below.

## PER CAPITA EMISSIONS

Columbus, OH	13.2 tCO <sub>2</sub> e
Austin, TX	15.5 tCO <sub>2</sub> e
Nashville, TN	20.1 tCO <sub>2</sub> e
<b>Louisville, KY</b>	<b>20.9 tCO<sub>2</sub>e</b>
Knoxville, TN	21.7 tCO <sub>2</sub> e
Memphis, TN	22.0 tCO <sub>2</sub> e
St. Louis, MO	22.9 tCO <sub>2</sub> e
<b>US National Average</b>	<b>16.5 tCO<sub>2</sub>e</b>

\* tCO<sub>2</sub>e = tonnes of carbon dioxide equivalent

These peer cities are similar to Louisville in size, climate, and geography. Comparing per capita emissions among cities may be of limited value for many reasons. These include the availability of relevant data, differing calculation methodologies and study area boundaries (county, city, region) and differences in the cities’ economic drivers and energy sources (hydroelectric, coal, natural gas).

## SUMMARY AND NEXT STEPS

Louisville’s 2016 GHG emissions were 10.1% lower than 2010 the emissions. The 2016 data was used to form a business-as-usual (BAU Core GHG emission forecast. The forecast is based on the assumption that Louisville’s population and commercial growth will continue as predicted and that the current electricity mix will not change. The BAU forecast shows Louisville’s GHG emissions are predicted to increase 17% from 2016 to 2050.

To proactively address climate change impacts, a GHG reduction target and action plan will be established in 2019. The strategies outlined in the plan will be based on public input and conversations with community members.

## HOW TO LEARN MORE

If you have questions or comments on the GHG inventory, please contact the Louisville Metro Office of Sustainability at [sustainability@louisvilleky.gov](mailto:sustainability@louisvilleky.gov) or 502-574-1976. To stay involved in the efforts to reduce GHG emissions, subscribe to the Office of Sustainability’s e-newsletter at [www.louisvilleky.gov/sustainability](http://www.louisvilleky.gov/sustainability).

Submitted to:



OFFICE OF  
**SUSTAINABILITY**  
A Division of Develop Louisville

Prepared by:

