



CITY OF WORCESTER, MA COMMUNITY & MUNICIPAL GHG EMISSIONS INVENTORY 2009 & 2019

PRESENTATION TO THE GREEN WORCESTER ADVISORY COMMITTEE, APRIL 11, 2022

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INTRODUCTION

- **Project's purpose:** To advance toward the Green Worcester Plan's goal (III-1) of eliminating 100% of greenhouse gas emissions citywide, by developing and publishing the citywide greenhouse gas emissions inventory.
- KLA was hired by Worcester' Department of Sustainability & Resilience in Nov 2021 to **conduct a Greenhouse Gas Emissions Inventory** in a format compliant with the Local Government Operation Protocol, CDP and Global Covenant of Mayors.
- **GHG Emissions Scopes 1, 2 and partial 3** included.
- Years included:
 - 2009 – Baseline
 - 2019 – Last typical year before Covid-19 Pandemic affecting energy use and emissions
- Deliverables include an inventory template with properly documented data sources and screenshots, allowing for easy inventory updates by City staff moving forward.



COMMUNITY
ACTIVITIES GHG
EMISSIONS

2019 COMMUNITY GHG EMISSIONS INVENTORY - SUMMARY

By Sector



Commercial Buildings
704,799 MTCO_{2e} 39%



On-Road Transportation
482,658 MTCO_{2e} 27%



Residential Buildings
456,990 MTCO_{2e} 26%



Solid Waste
137,456 MTCO_{2e} 8%

By Source



Natural Gas
588,963 MTCO_{2e} 31%

Fugitive Natural Gas
166,513 MTCO_{2e} 9%

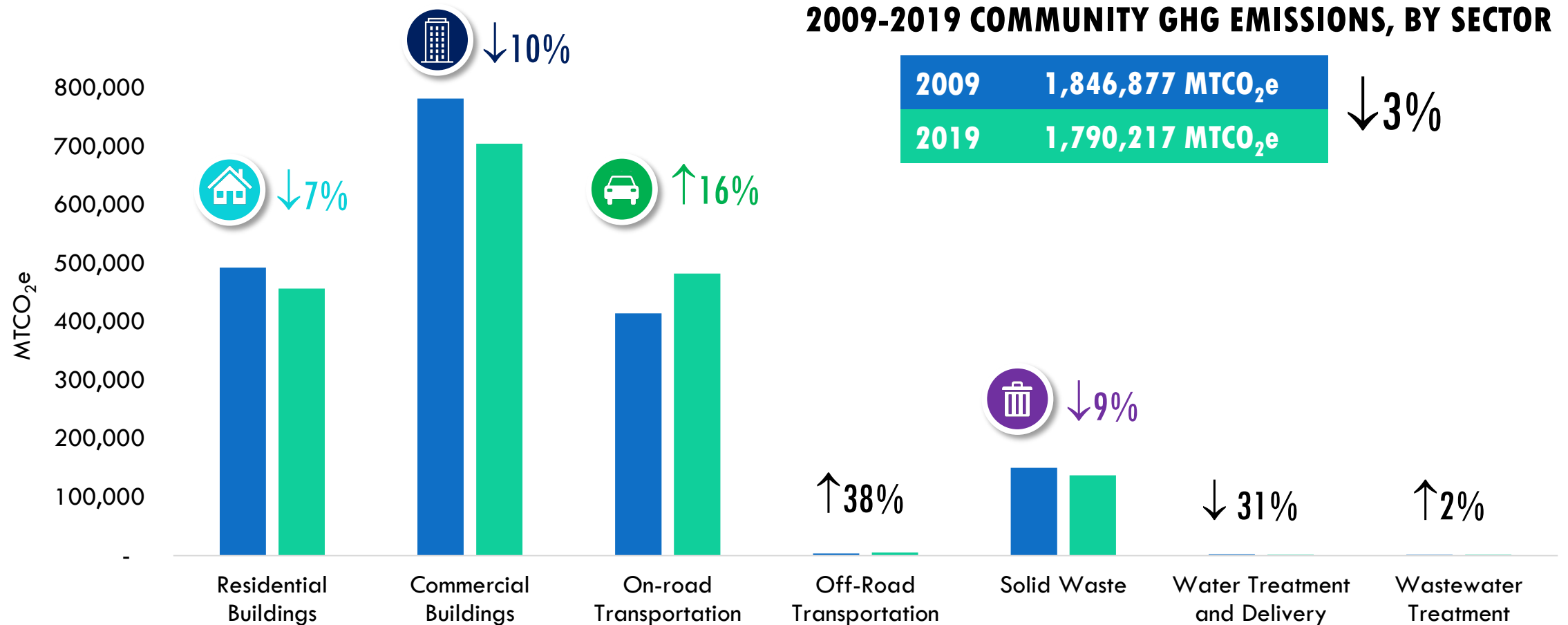
Gasoline
385,582 MTCO_{2e} 22%

Diesel
90,720 MTCO_{2e} 5%

Purchased Electricity
360,947 MTCO_{2e} 20%

MSW Incinerated
107,049 MTCO_{2e} 6%

2009-2019 COMMUNITY GHG EMISSIONS TRENDS BY SECTOR



2009-2019 COMMUNITY GHG EMISSIONS TRENDS BY SOURCE

Natural Gas



**Commercial Use
(Therms)**

2009	56,017,923
2019	65,823,323

↑18%



**Residential Use
(Therms)**

2009	36,291,405
2019	39,414,006

↑9%

Purchased Electricity



**Commercial Use
(MWh)**

2009	1,014,230
2019	823,743

↓19%



**Residential Use
(MWh)**

2009	426,880
2019	414,245

↓3%

Transportation



**WRTA
(Passenger Miles)**

2009	9,611,835
2019	14,111,090

↑47%

Electric (VMT)

2009	0
2019	13,914,905

**Passenger
Vehicles (VMT)**

2009	847,621,170
2019	1,001,586,270

↑18%

**MBTA (Passenger
Miles)**

2009	10,963,368
2019	14,916,616

↑36%

2009-2019 COMMUNITY GHG EMISSIONS METRICS



Population

Source: U.S. Census Bureau

2009	181,045
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2019	185,428
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↑2%

Residential Energy Use (MMBTU) per Home



2009	91
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2019	87
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↓4%

Light-Duty Vehicle Miles Traveled per Capita



2009	4,429
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2019	5,181
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↑17%

Commercial Energy Use (Million MMBTU)

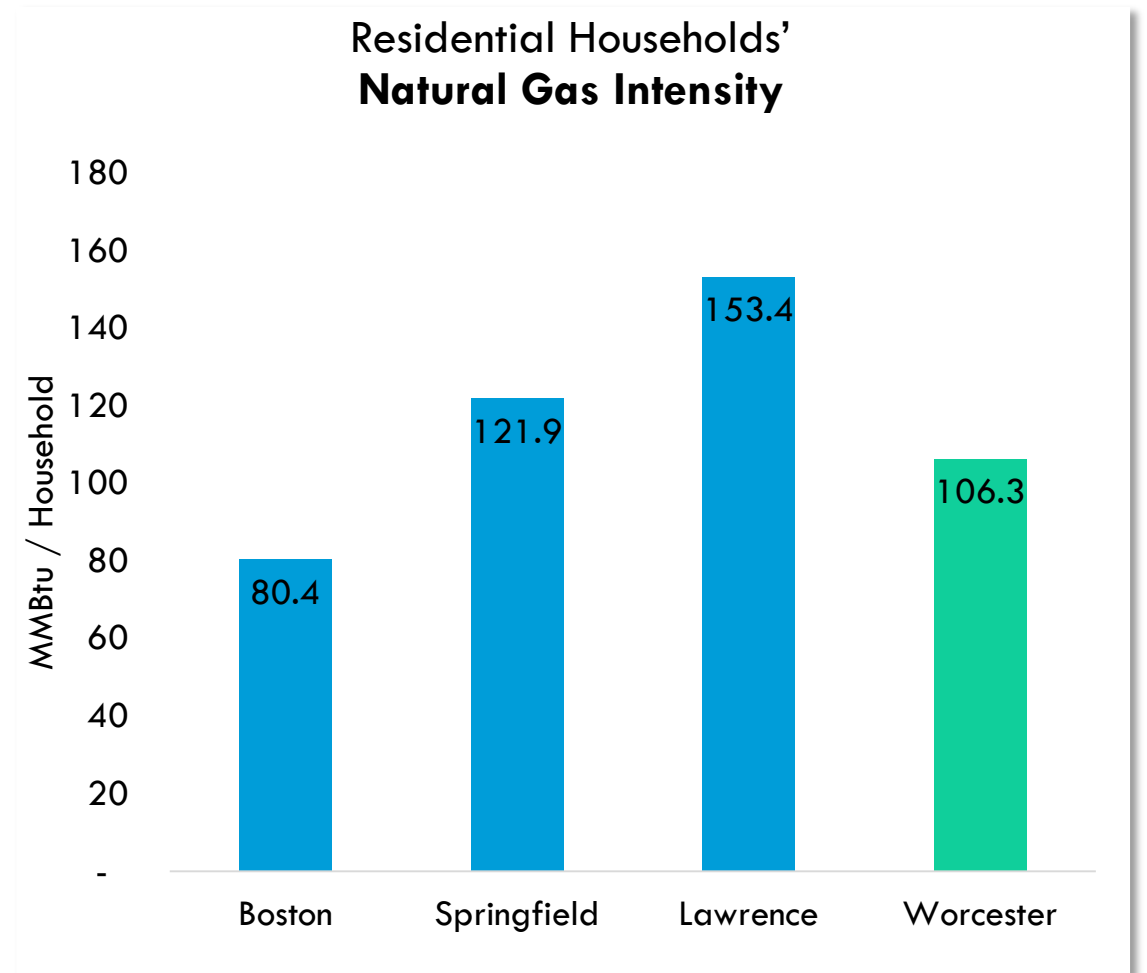
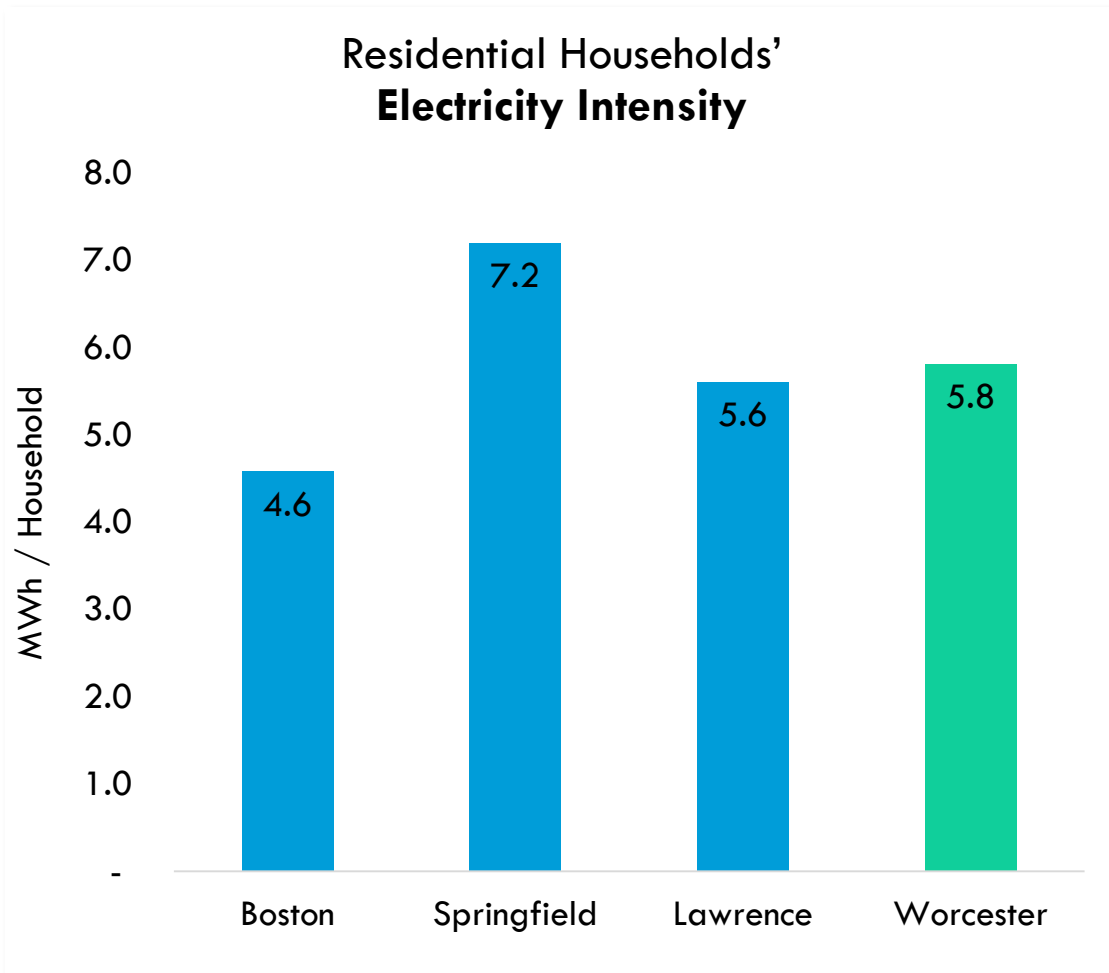


2009	9.2
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2019	9.6
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↑4%

2019 COMMUNITY GHG EMISSIONS BENCHMARKS





MUNICIPAL
FACILITIES/OPERATIONS
GHG EMISSIONS

2019 MUNICIPAL GHG EMISSIONS INVENTORY

By Sector



Facilities & Infrastructure

33,205 MTCO_{2e}

76%



Vehicle Fleet

6,923 MTCO_{2e}

16%



Employee Commuting

3,111 MTCO_{2e}

7%



Solid Waste

373 MTCO_{2e}

1%

By Source



Natural Gas

13,916 MTCO_{2e}

32%

Fugitive Natural Gas

4,146 MTCO_{2e}

10%



Purchased Electricity

14,602 MTCO_{2e}

33%



Gasoline

7,860 MTCO_{2e}

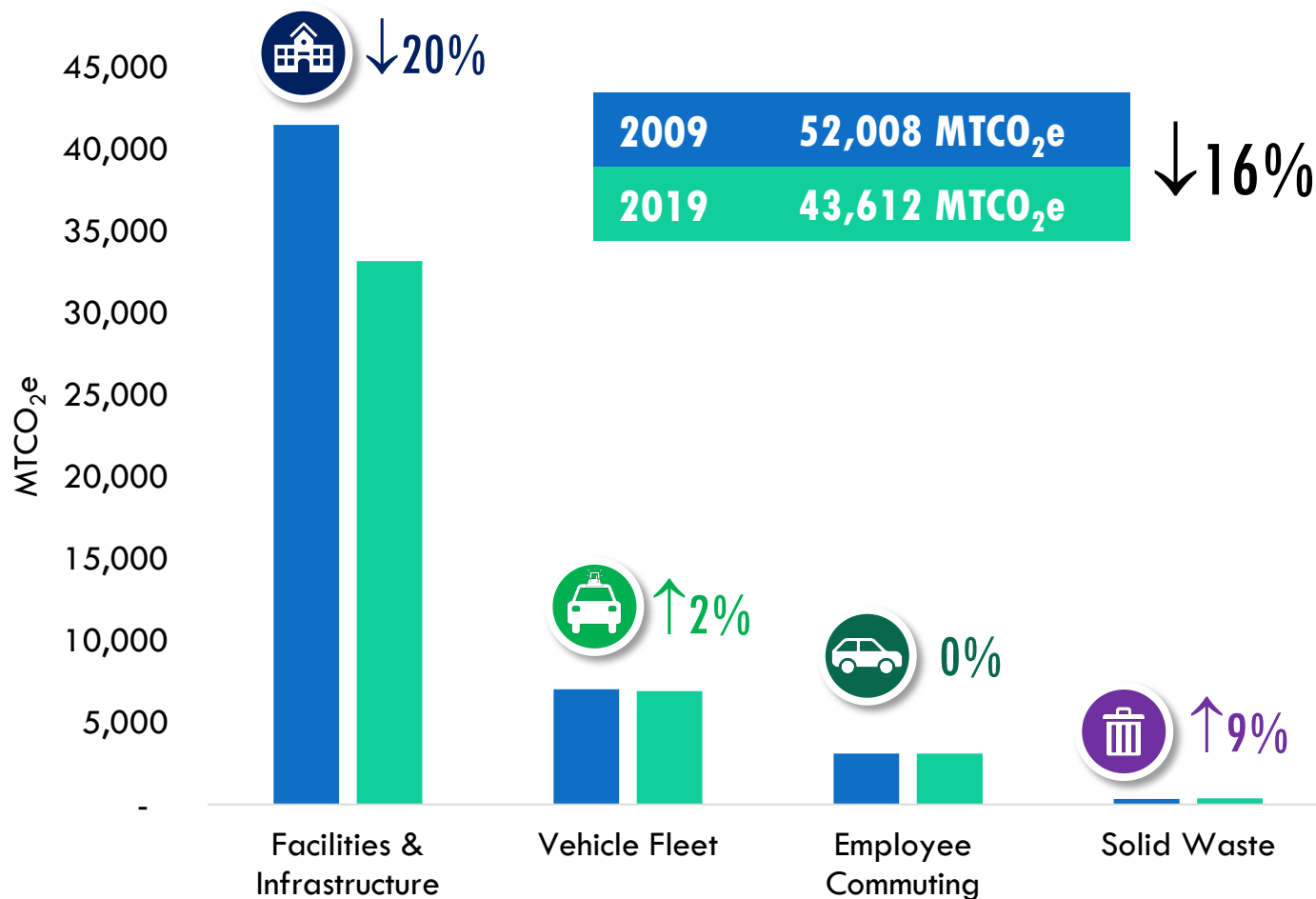
22%

Diesel

2,177 MTCO_{2e}

5%

2009-2019 MUNICIPAL GHG EMISSIONS TRENDS BY SECTOR



2009	52,008 MTCO ₂ e	↓16%
2019	43,612 MTCO ₂ e	

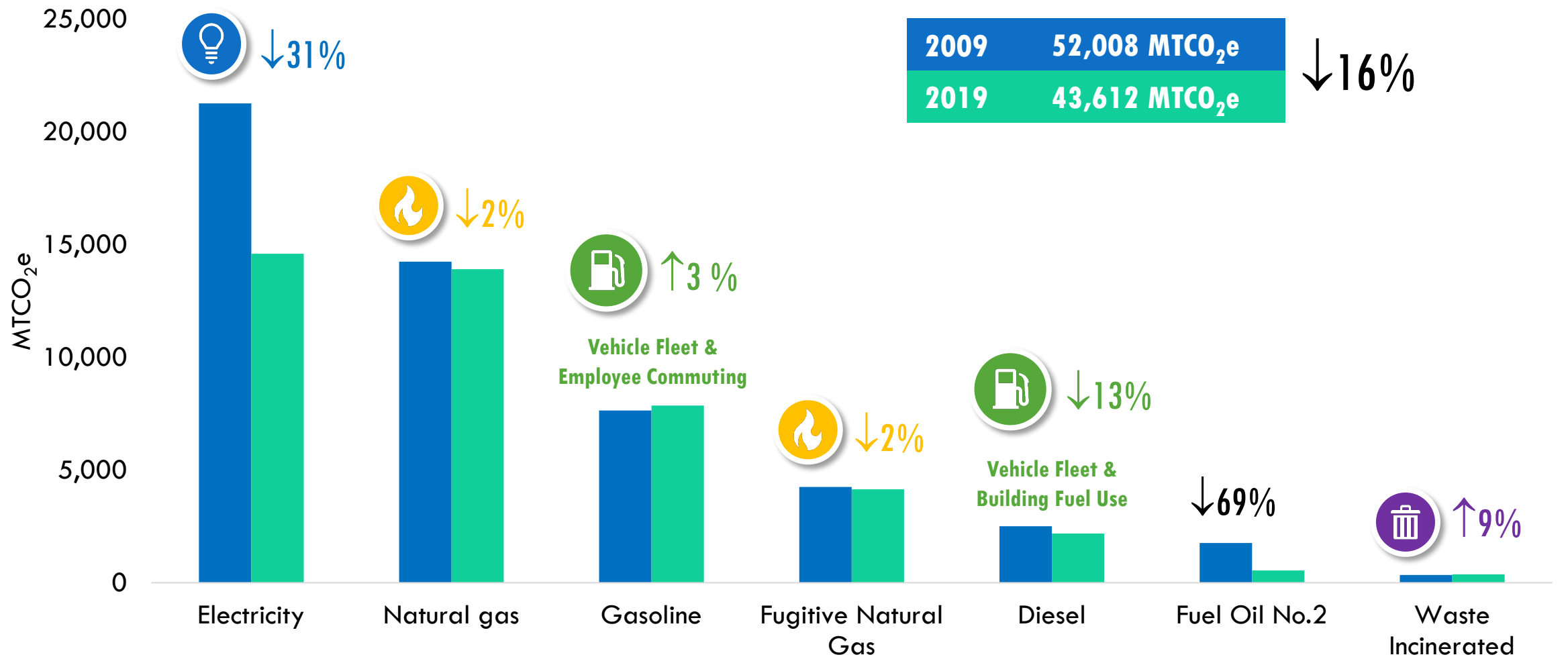
Facilities & Infrastructure



This sector can be further categorized by property type within the City's built portfolio

Sector	2009 MTCO ₂ e	2019 MTCO ₂ e	% Change
Municipal Buildings	32,444	26,668	↓18%
Water & Sewer	4,491	3,914	↓13%
Streetlights & Traffic Signals	3,441	1,362	↓60%
Open Space	1,153	1,261	↑9%

2009-2019 MUNICIPAL GHG EMISSIONS TRENDS BY SOURCE



SUMMARY OF FINDINGS

- **Transportation demand is rising** in Worcester (and everywhere) and those trends are clear.
- **Natural gas use has grown**, possibly from fuel oil replacement, but data is limiting to say for sure.
- **Electricity use has declined** indicating some efficiency gains in the past decade.

- Going forward we should expect **rising electricity demand** as our actions shift usage patterns.
- **Worcester Community Choice** (electricity aggregation program) is working to drive down electricity emissions faster.

- City of Worcester is building the **in-house capacity to track impact** on an ongoing basis as it implements the **Green Worcester Plan**.
- GHG Performance will likely be an increasing consideration for **funding opportunities** of all kinds and Worcester is well prepared to capture its share.

