City of Asheville

Carbon Footprint Annual Report

Greenhouse Gas Emissions from Municipal Operations

CITY OF ASHEVILLE NORTH CAROLINA

{ FY 2013 }

Cover photos include:

(Top left) New LED street light installation
(Top right) CNG sanitation truck
(Bottom left) APD Chevy Volt charging at Brightfield solar-powered EV charging station
(Bottom right) Hybrid ART bus

City of Asheville
City Manager's Office

P.O. Box 7148
Asheville, NC 28802
828-259-5604
Fax 828-259-5499
www.ashevillenc.gov

December 11, 2013

Dear Mayor and City Council,

Council's FY 2014 Strategic Plan incorporates a triple bottom line approach to policy development. The City strives to take impacts to ***economic systems, social systems and environmental systems*** into account with every action that the government undertakes. The City's annual carbon footprint report is a shining example of this philosophy, as the services that the City provides are inextricably linked to the consequences of the energy that fuels them. The pollution released from the burning of fossil fuels has health consequences for people, broad climate change impacts on the planet, and also directly affects the City's budget, particularly as electric rates and fuel prices continue to escalate.

Because of the desire to address these impacts, Council established a carbon footprint reduction goal for municipal operations. First established in 2008, then fortified in 2011 by doubling the goal to 4% per year until a total reduction of 80% is achieved in the year 2030. This bold policy leadership coupled with dedication from over 1,000 public servants has generated a ***22.6% reduction in the municipal carbon footprint since 2008***.

These carbon reductions come in many forms from energy conservation to new technology to changing the way we look at our work. Sustainability has become part of our culture as public servants. You can witness glimmers of this culture on the first day on the job when our sustainability goals are discussed during new hire training, or when an employee goes above and beyond to save energy and earns a Quality of Service Award. The City of Asheville has taken great strides towards a more sustainable future for our community and is dedicated to continuous improvement. The Annual Carbon Footprint Report is intended to evaluate how we have done and support our ability to look forward.

After review of the FY 2013 Annual Carbon Footprint Report, it is my pleasure to share our progress with the community. I am proud of staff for their achievements in carbon footprint reduction. My gratitude extends to individuals and teams across all departments who worked hard to learn, to think creatively and to achieve tremendous success in sustainability. As we look forward I am certain we will make greater progress as the momentum continues to build.

Sincerely,

Gary W. Jackson
City Manager

The City of Asheville is committed to delivering an excellent quality of service to enhance your quality of life

Executive Summary

Key Highlights from this Report:

- Total municipal carbon footprint reductions over the past six years total 22.6%
- FY13 reduction was 5.88%, the largest annual reduction to date
- Installation of 4,000 new LED street lights was the major source of carbon reduction this year, accounting for 1,171 tons, 2/3 of the total reduction

Key Spending Considerations:

- Total energy spending decreased for the first time since 2010, despite rising electricity costs and steady fuel costs
- Total energy spending went down $186,000 from previous year

Carbon footprint reduction in FY13 was 1,711 MT CO2e which equals:

- Emissions from burning 3,979 barrels of oil
- Emissions from burning 7.4 railcars full of coal
- Emissions from the electricity used to power 235 homes

Looking Forward: Strategies for FY14

- Increase of City's biodiesel blend from B5 to B20
- Building HVAC automation in City Hall, Municipal Building, and Public Works
- Phase IV of LED Street Lights to include 1,600 new fixtures

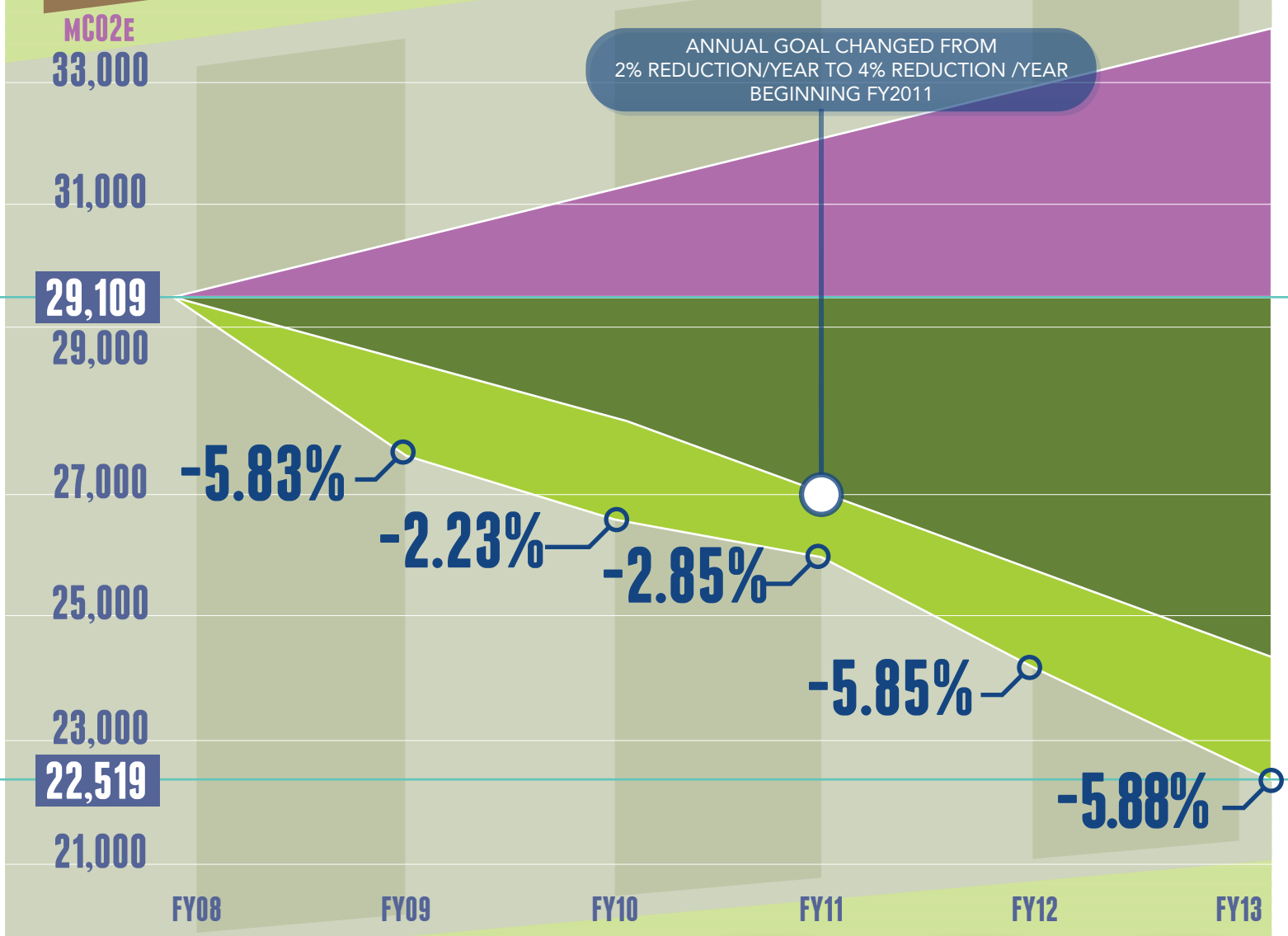
howlowcanavlgo?

raise the bar. lower the carbon.

CARBON FOOTPRINT REDUCTIONS

How is Your Government Doing?

After consecutive years of achieving carbon footprint reductions above and beyond stated goals the Asheville City Council increased their commitment to municipal sustainability. In April 2011, Council doubled the goal for municipal carbon reductions to 4% each year in order to reduce the overall footprint 80% by the year 2030. A carbon footprint is the total set of greenhouse gas (GHG) emissions including carbon dioxide caused by an organization, event, product or person.
The graph below shows the reductions each year since inception of the program in 2008. Note that last year was the best year to date!



ELEPHANT IN THE ROOM

An average african elephant weighs 6 metric tons. Current annual reduction rates of CO2e emissions are currently equivalent to 315 elephants...annually

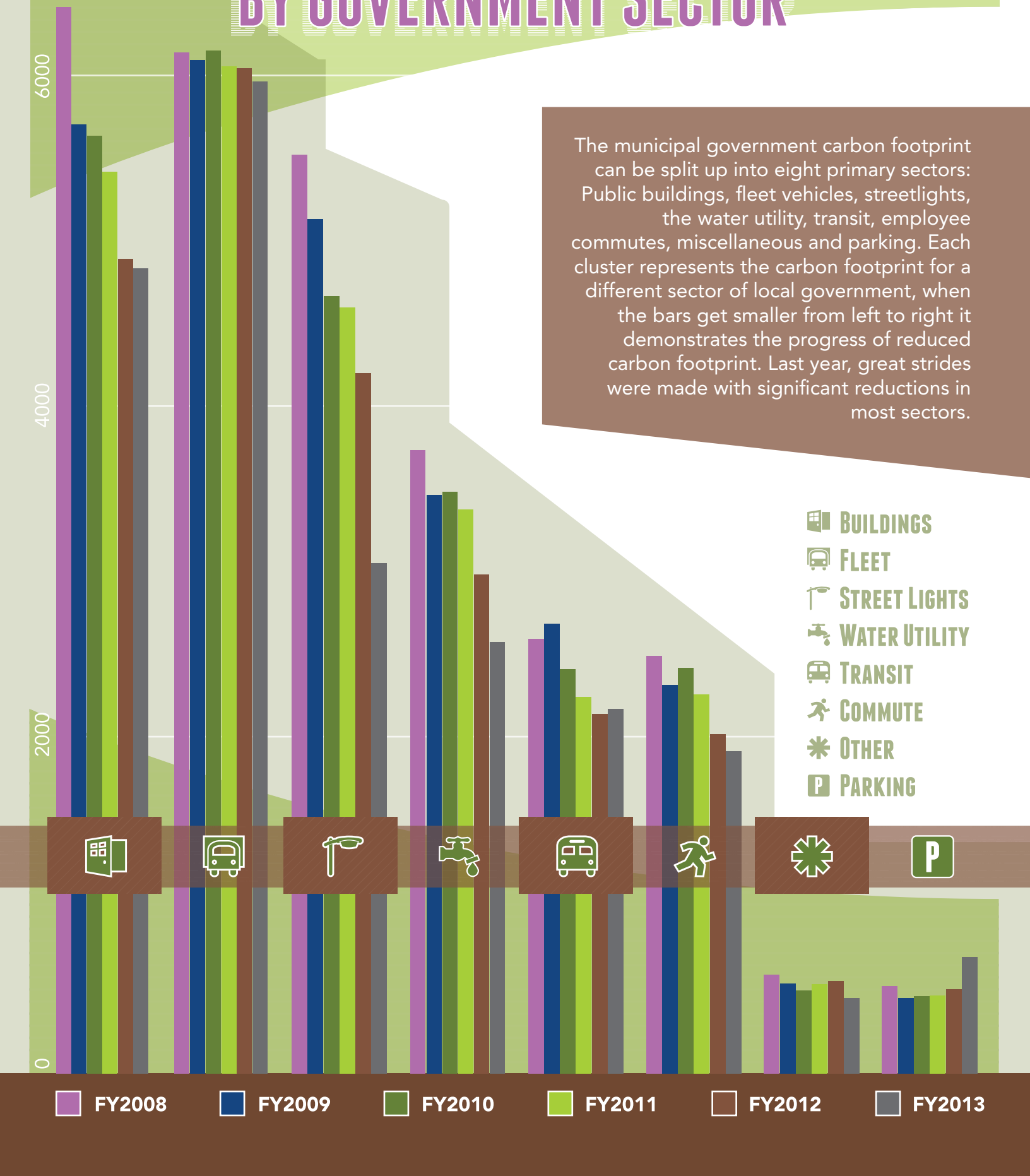
BUSINESS AS USUAL

TARGET REDUCTIONS

ACTUAL REDUCTIONS

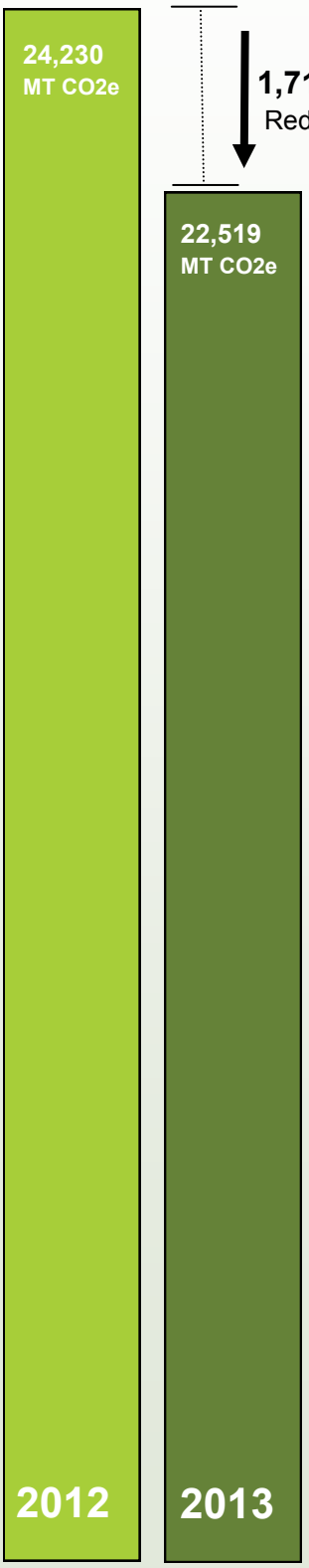
2013 CARBON FOOTPRINT REDUCTIONS BY GOVERNMENT SECTOR

The municipal government carbon footprint can be split up into eight primary sectors: Public buildings, fleet vehicles, streetlights, the water utility, transit, employee commutes, miscellaneous and parking. Each cluster represents the carbon footprint for a different sector of local government, when the bars get smaller from left to right it demonstrates the progress of reduced carbon footprint. Last year, great strides were made with significant reductions in most sectors.



Key Annual Reductions

Featured are the activities that made the biggest change in our carbon footprint this year



1,171 tons

LED STREET LIGHTS

An additional 4,000 street lights were replaced with LED fixtures in FY 2013, making the biggest single impact on the City's carbon footprint

173 tons

WATER PRODUCTION

Some water production was shifted from Mills River WTP to the other two, more efficient, plants.

146 tons

WATER DISTRIBUTION

Less water demand in first half of 2013 due to heavy rains

130 tons

FLEET

CNG replacing other fuels; Idling reduction education

129 tons

AREA LIGHTING

Turned over McCormick Field utilities to the Asheville Tourists

147 tons

OTHER

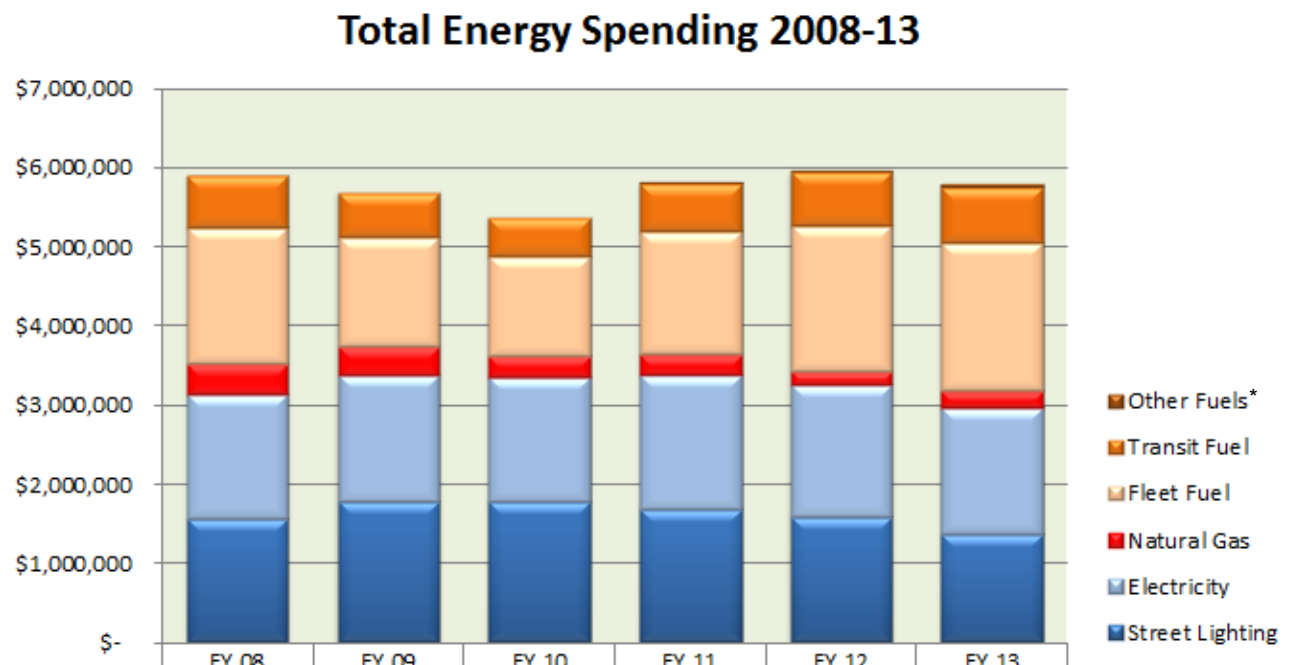
Includes modest reductions in commute, buildings, traffic signs, and other categories

185 tons

INCREASES

Parking (new parking facility at 51 Biltmore came online) and Transit (increased service led to increased fuel usage)

City-Wide Energy Spending Analysis

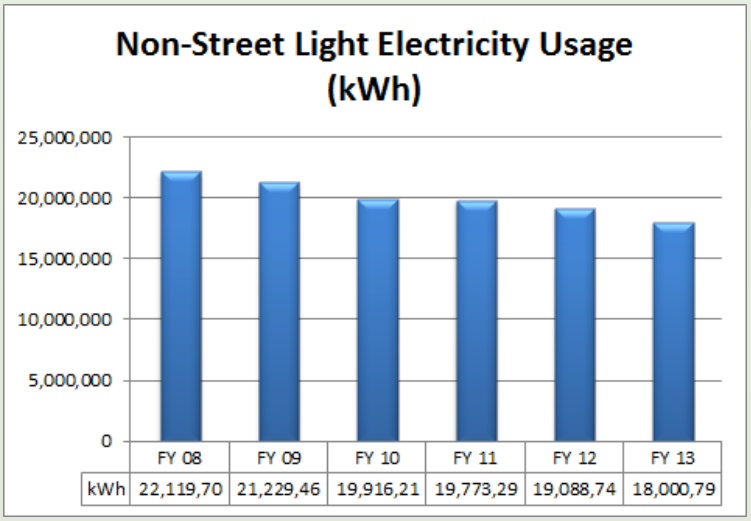


	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
Other Fuels	$-	$-	$-	$16,205	$27,872	$42,679
Transit Fuel	$669,606	$558,618	$486,435	$586,768	$687,102	$699,624
Fleet Fuel	$1,711,852	$1,375,904	$1,257,193	$1,561,667	$1,839,336	$1,870,531
Natural Gas	$384,934	$368,326	$279,477	$256,619	$177,137	$218,813
Electricity	$1,571,077	$1,600,424	$1,584,959	$1,703,841	$1,671,646	$1,590,755
Street Lighting	$1,567,730	$1,783,290	$1,767,209	$1,681,719	$1,574,068	$1,368,292
TOTAL	$5,905,199	$5,686,562	$5,375,274	$5,806,819	$5,977,161	$5,790,694

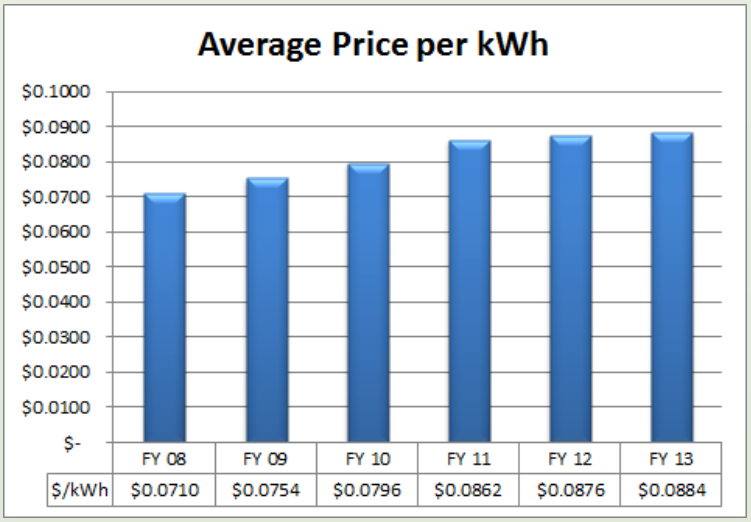
** Other Fuels includes fuel oil, propane, and fuel used for mowing equipment. Was not fully accounted for until FY13*

City energy spending totals $5,790,031
which equals 4.3% of the entire municipal budget

The City managed to bring energy spending down for the first time since 2010, due to savings from general electricity usage and from the LED street lighting replacement program.

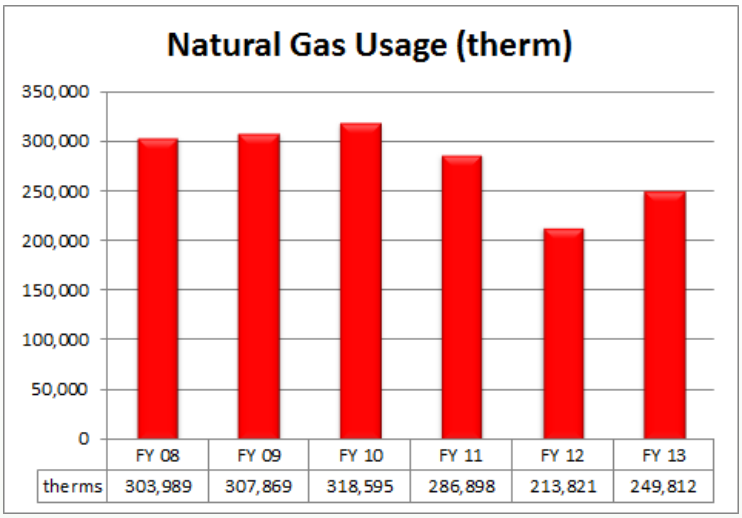


	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
kWh	22,119,70	21,229,46	19,916,21	19,773,29	19,088,74	18,000,79

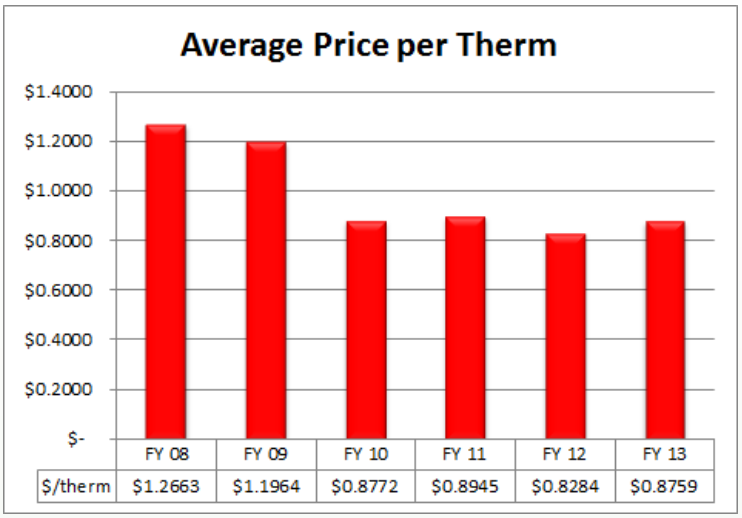


	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
$/kWh	$0.0710	$0.0754	$0.0796	$0.0862	$0.0876	$0.0884

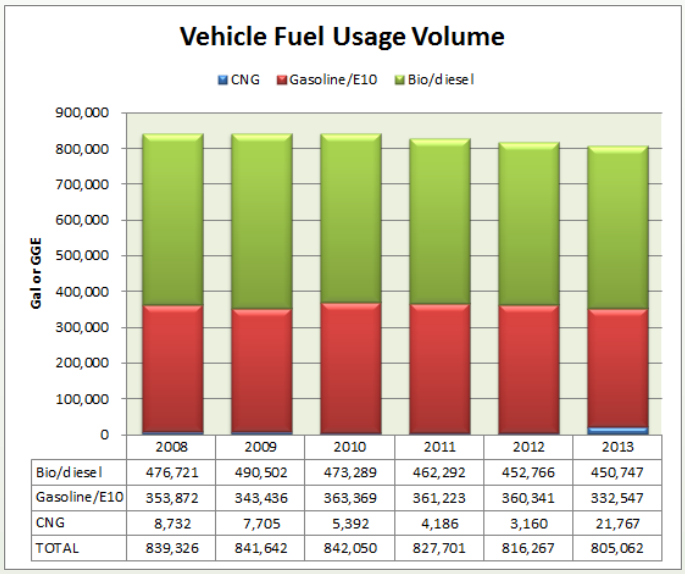
City-Wide Energy Spending Analysis (cont.)



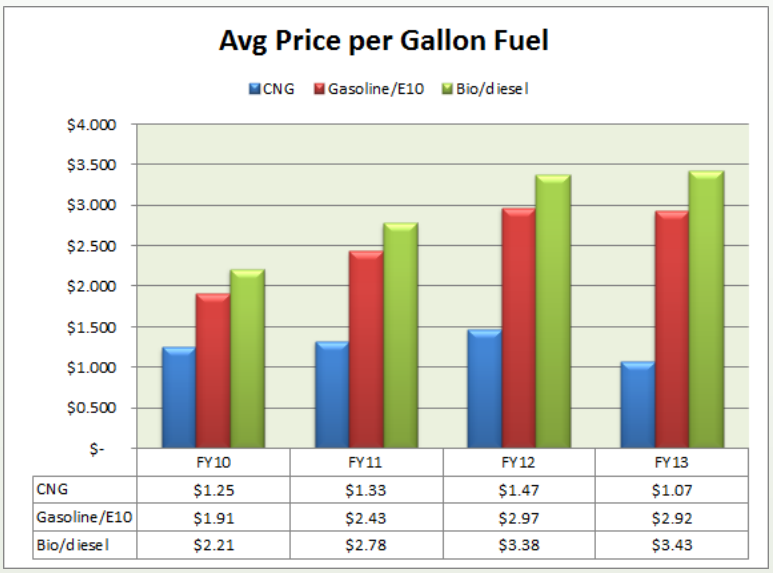
	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
therms	303,989	307,869	318,595	286,898	213,821	249,812



	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
$/therm	$1.2663	$1.1964	$0.8772	$0.8945	$0.8284	$0.8759



	2008	2009	2010	2011	2012	2013
Bio/diesel	476,721	490,502	473,289	462,292	452,766	450,747
Gasoline/E10	353,872	343,436	363,369	361,223	360,341	332,547
CNG	8,732	7,705	5,392	4,186	3,160	21,767
TOTAL	839,326	841,642	842,050	827,701	816,267	805,062



	FY10	FY11	FY12	FY13
CNG	$1.25	$1.33	$1.47	$1.07
Gasoline/E10	$1.91	$2.43	$2.97	$2.92
Bio/diesel	$2.21	$2.78	$3.38	$3.43

Spending Analysis Conclusions

- The LED street lighting program yielded $400k in avoided spending in FY13
- Reductions in non-street light electricity usage from conservation and technology efficiencies are out-pacing the increases in electricity costs
- City reduced fuel consumption overall but spending continues to rise
- 25 new CNG vehicles led to seven-fold increase in CNG usage, which helps keep costs down compared to gasoline and biodiesel
- Natural gas usage, primarily for building heating, is the most erratic and climate-variable source of energy

Carbon Footprint - General Fund

Energy Spending

↓ 5.6% from FY12

-$217,965

GHG Emissions

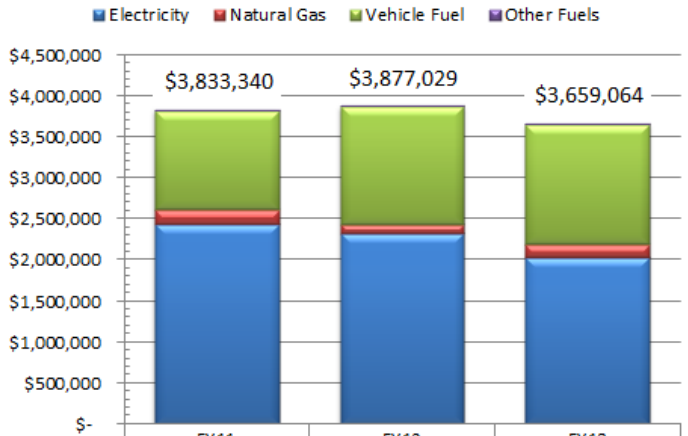
↓ 11.1% from FY12

- MT CO2e

% of Municipal Footprint

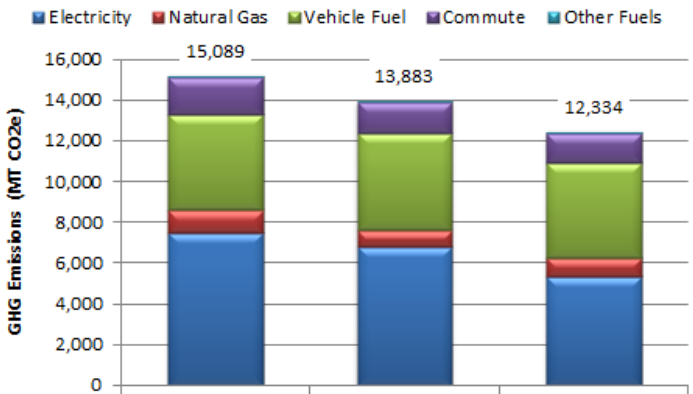
54.8%

General Fund Energy Costs 2011-12



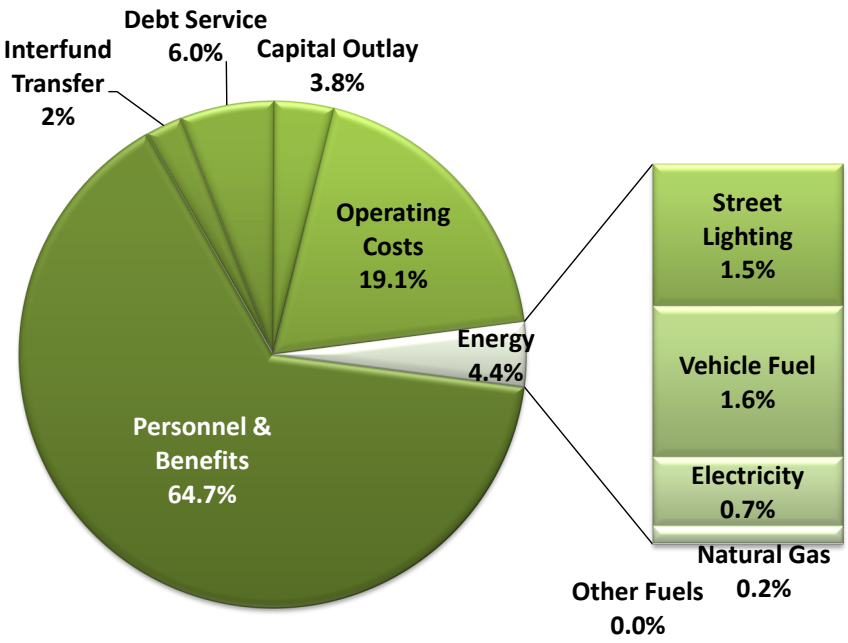
	FY11	FY12	FY13
Other Fuels	$11,318	$3,789	$11,195
Vehicle Fuel	$1,203,148	$1,433,679	$1,449,936
Natural Gas	$175,955	$119,565	$159,043
Electricity	$2,442,919	$2,319,996	$2,038,891
Total	$3,833,340	$3,877,029	$3,659,064

General Fund GHGs 2011-13



	FY11	FY12	FY13
Other Fuels	10	6	9
Commute	1,826	1,536	1,436
Vehicle Fuel	4,675	4,754	4,634
Natural Gas	1,099	782	955
Electricity	7,479	6,805	5,299
Total	15,089	13,883	12,334

General Fund Budget and Energy Expenses
FY13 Total Budget $89.9M



Highlights / Notes

- Installed over 7,000 LED street-lights over two years
- Increased use of CNG by 600%, displacing gasoline and diesel
- No longer over operational con-trol of McCormick Field utilities, nor golf course
- Facilities Maintenance upgraded building automation software in several major buildings, enabling greater control of chillers and boilers and night and weekend set backs

* Energy expenses are paid out of operating costs, but are presented separately for the purposes of this report.

Carbon Footprint - Water Resources Fund

Energy Spending

↓ 4.1% from FY12

-$39,541

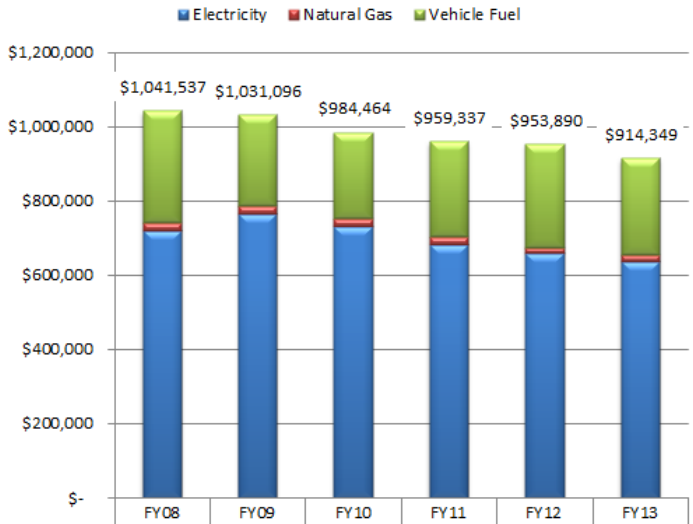
GHG Emissions

↓ 5.6% from FY12

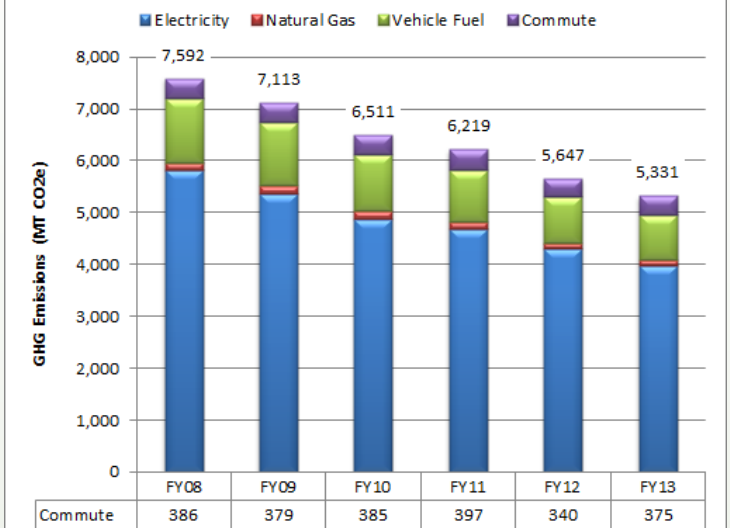
-316 MT CO2e

% of Municipal Footprint

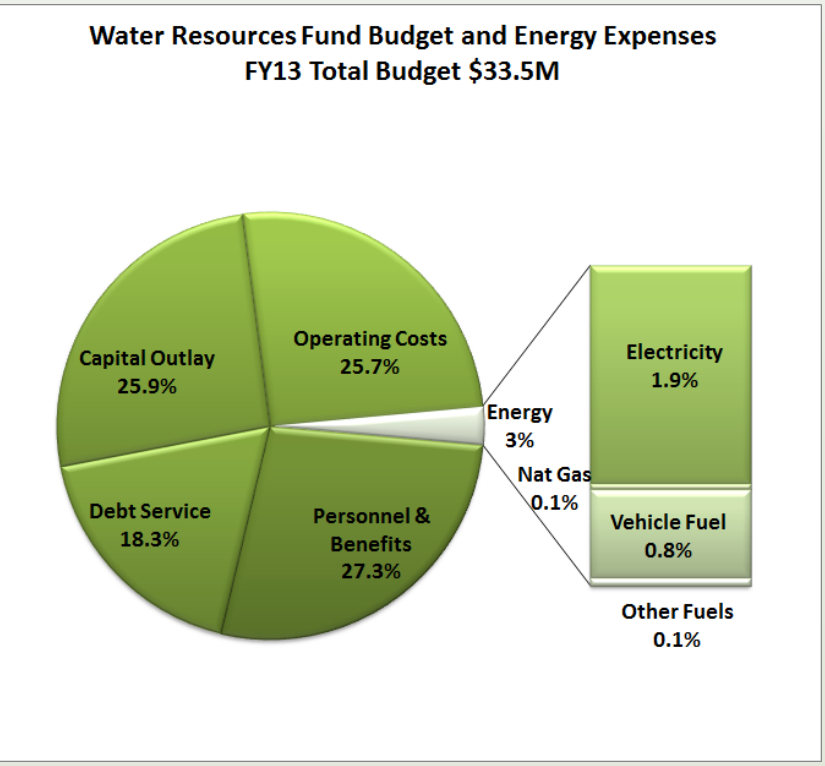
23.7%



	FY08	FY09	FY10	FY11	FY12	FY13
Vehicle Fuel	$300,079	$245,631	$232,741	$255,833	$279,152	$258,775
Natural Gas	$21,133	$22,446	$20,167	$20,484	$15,140	$18,205
Electricity	$720,325	$763,019	$731,556	$683,020	$659,598	$637,369
Total	$1,041,53	$1,031,09	$984,464	$959,337	$953,890	$914,349



	FY08	FY09	FY10	FY11	FY12	FY13
Commute	386	379	385	397	340	375
Vehicle Fuel	1,237	1,203	1,103	992	898	864
Natural Gas	158	163	161	150	113	116
Electricity	5,812	5,368	4,863	4,681	4,296	3,977
Total	7,592	7,113	6,511	6,219	5,647	5,331



Highlights / Notes

- ISO 14001 environmental management system has led to several vehicle policy changes
  - Anti idling policy
  - Revised take home fleet vehicle policy
  - Drive-by meter reading
- Some water production shifted from Mills River WTP to the other, more efficient plants

* Energy expenses are paid out of operating costs, but are presented separately for the purposes of this report.

Carbon Footprint - Transit Services Fund

Energy Spending

↑ 2.2% from FY12

+$15,365

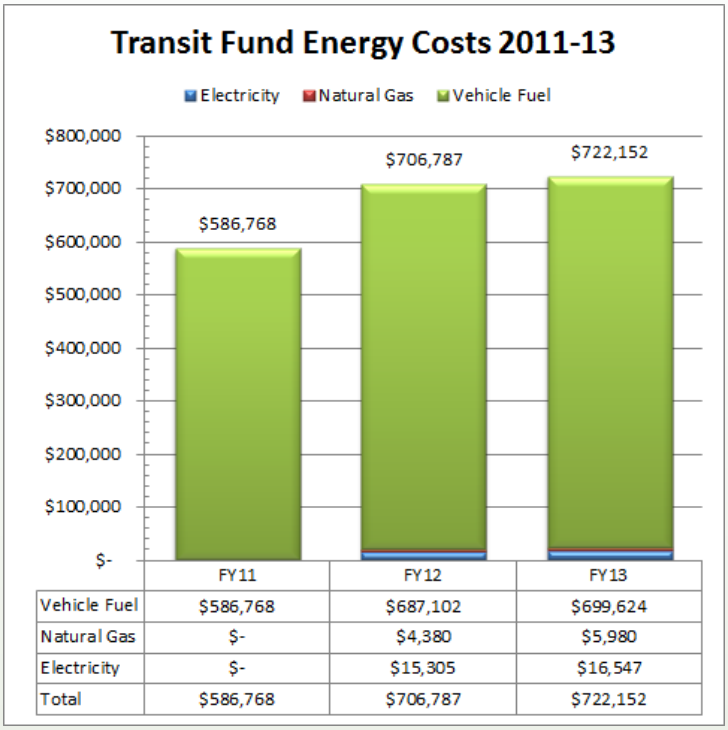
GHG Emissions

↑ 1.7% from FY12

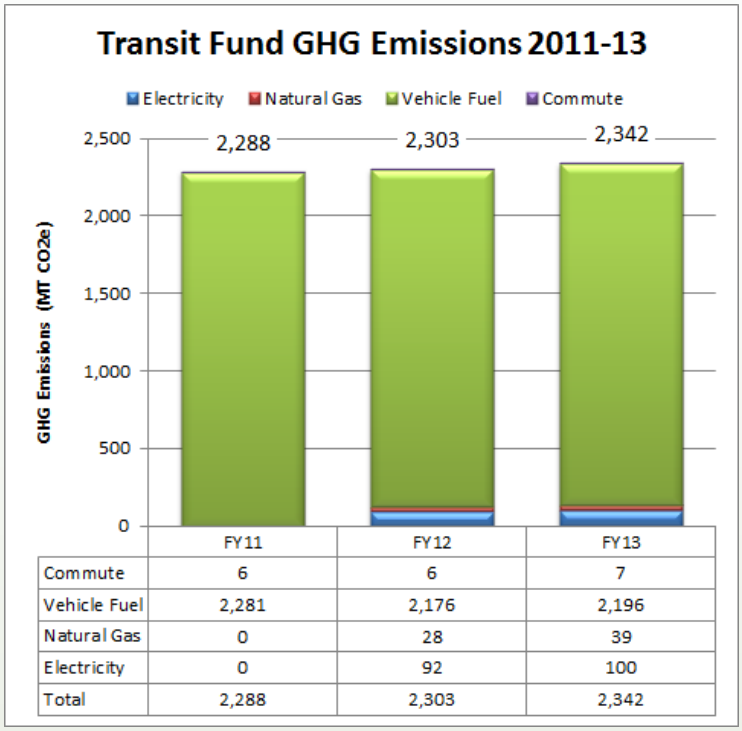
+39 MT CO2e

% of Municipal Footprint

10.4%

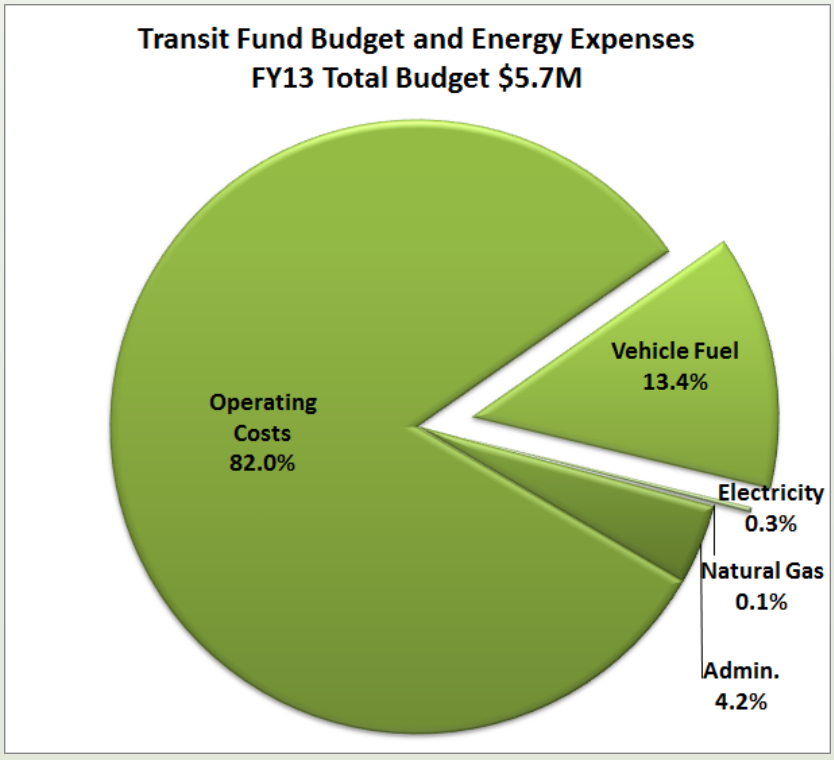


	FY11	FY12	FY13
Vehicle Fuel	$586,768	$687,102	$699,624
Natural Gas	$-	$4,380	$5,980
Electricity	$-	$15,305	$16,547
Total	$586,768	$706,787	$722,152



	FY11	FY12	FY13
Commute	6	6	7
Vehicle Fuel	2,281	2,176	2,196
Natural Gas	0	28	39
Electricity	0	92	100
Total	2,288	2,303	2,342

* Began tracking Transit electricity and natural gas in FY12



Highlights / Notes

- First complete year of new ART system
- ART buses drove 7.9% more miles in FY13 than previous year, due to new routes and higher frequency

* Energy expenses are paid out of operating costs, but are presented separately for the purposes of this report.

Carbon Footprint - US Cellular Center Fund

Energy Spending

↓ 1.3% from FY12

-$2,762

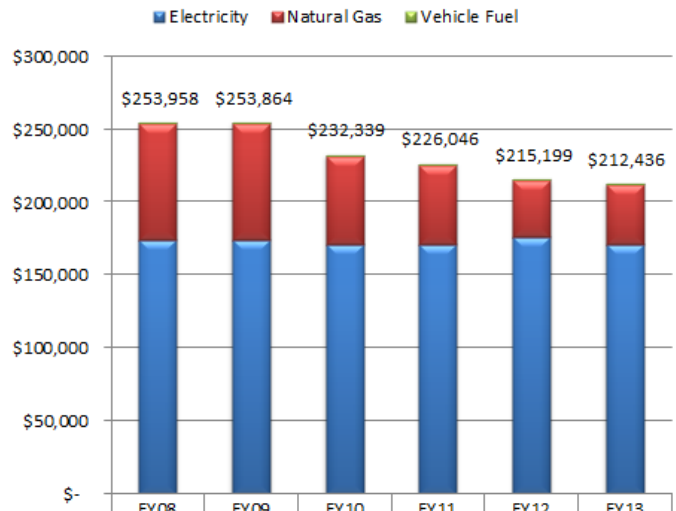
GHG Emissions

↑ 0.9% from FY12

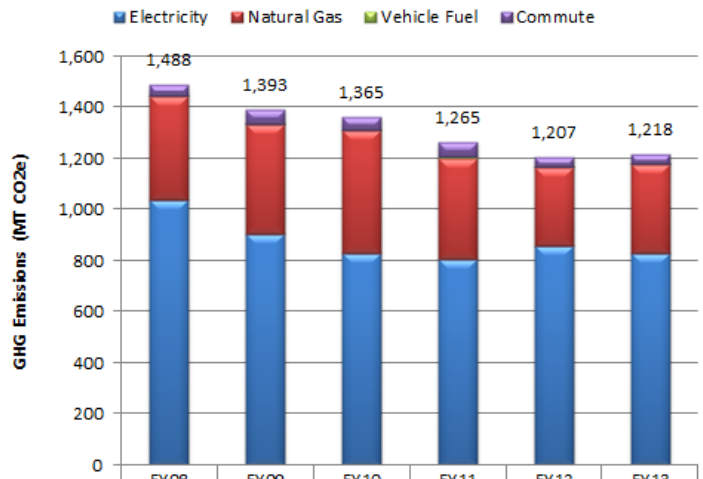
+11 MT CO2e

% of Municipal Footprint

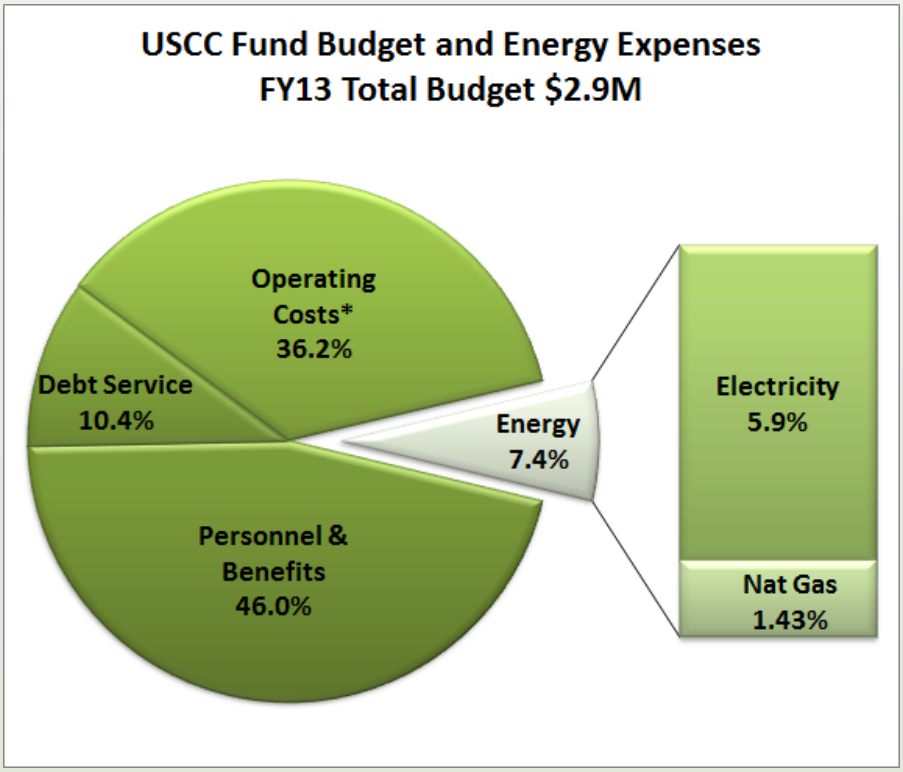
5.4%



	FY08	FY09	FY10	FY11	FY12	FY13
Vehicle Fuel	$315	$213	$244	$241	$234	$233
Natural Gas	$79,073	$78,886	$60,564	$54,282	$38,955	$41,194
Electricity	$174,570	$174,766	$171,531	$171,523	$176,009	$171,009
Total	$253,958	$253,864	$232,339	$226,046	$215,199	$212,436



	FY08	FY09	FY10	FY11	FY12	FY13
Commute	44	58	53	60	39	38
Vehicle Fuel	1	1	1	1	1	1
Natural Gas	405	428	482	396	308	351
Electricity	1,038	905	828	808	859	828
Total	1,488	1,393	1,365	1,265	1,207	1,218



Highlights / Notes

- First full year since major renovations took place
- Electricity consumption was reduced significantly, however offset by natural gas needed for the colder winter

* Energy expenses are paid out of operating costs, but are presented separately for the purposes of this report.

Carbon Footprint - Parking Services Fund

Energy Spending

↑ 32.3% from FY12

+28,670

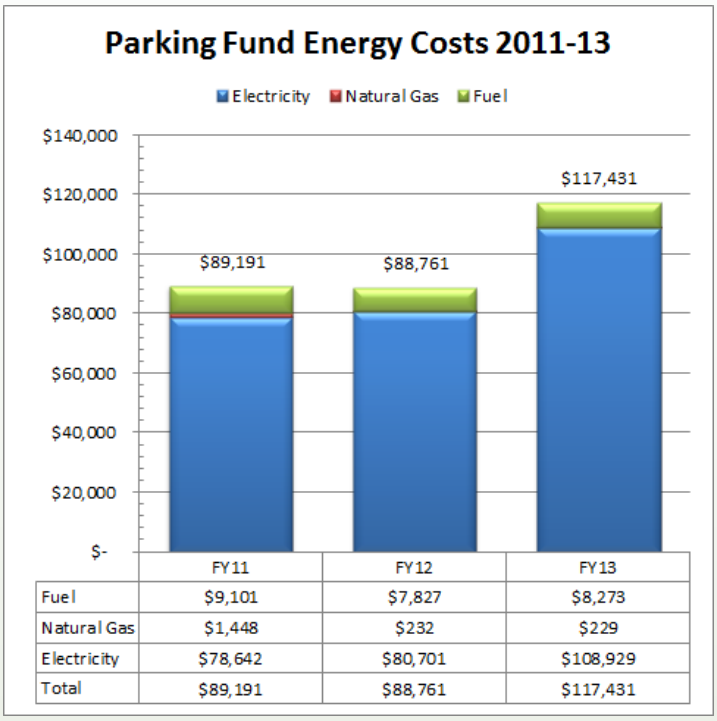
GHG Emissions

↑ 29.0% from FY12

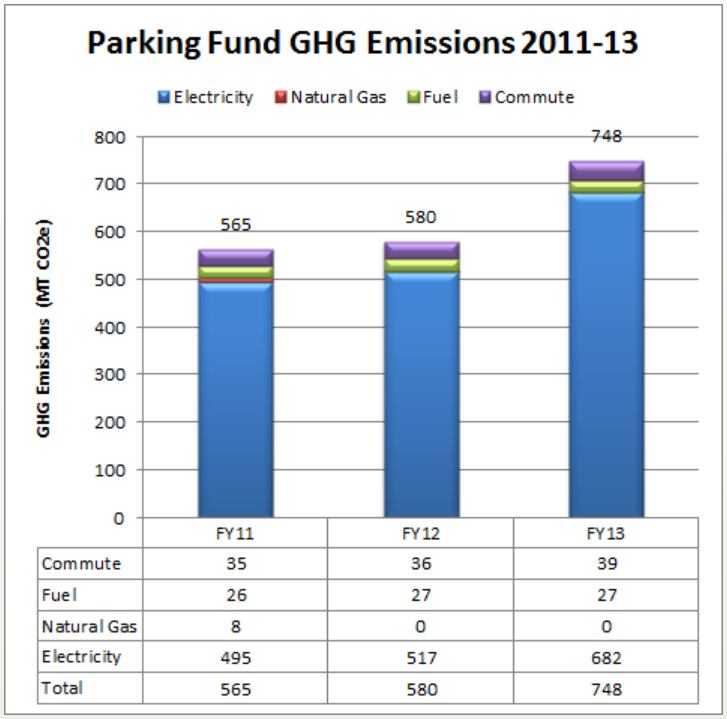
+168 MT CO2e

% of Municipal Footprint

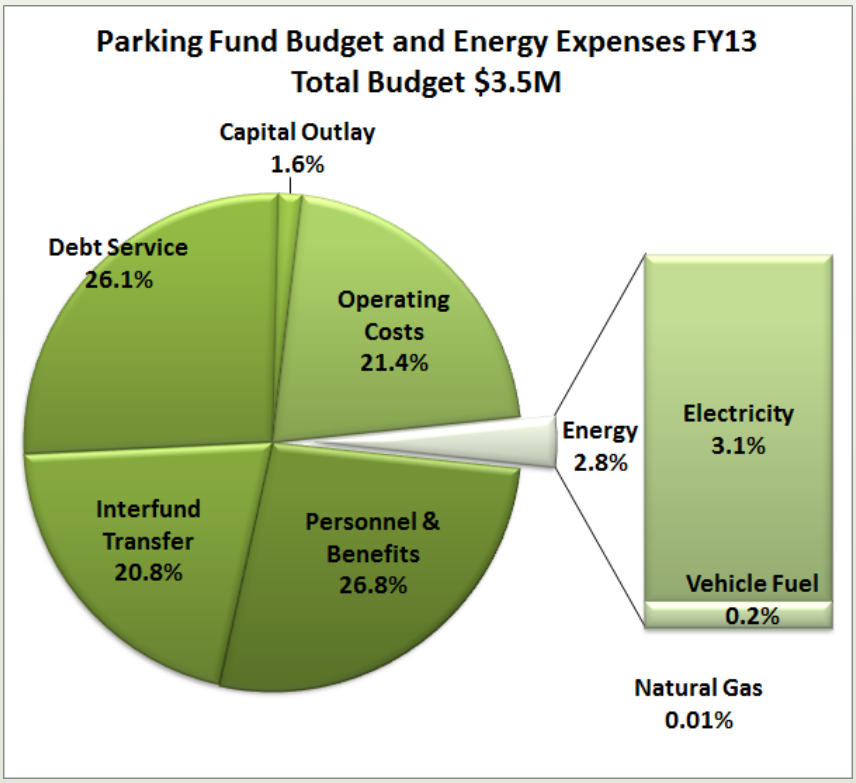
3.3%



	FY11	FY12	FY13
Fuel	$9,101	$7,827	$8,273
Natural Gas	$1,448	$232	$229
Electricity	$78,642	$80,701	$108,929
Total	$89,191	$88,761	$117,431



	FY11	FY12	FY13
Commute	35	36	39
Fuel	26	27	27
Natural Gas	8	0	0
Electricity	495	517	682
Total	565	580	748



Highlights / Notes

- Increases due to new parking garage at 51 Biltmore

* Energy expenses are paid out of operating costs, but are presented separately for the purposes of this report.

Carbon Footprint - Stormwater & Street Cut Utility

Energy Spending

↑ 9.2% from FY12

+$11,692

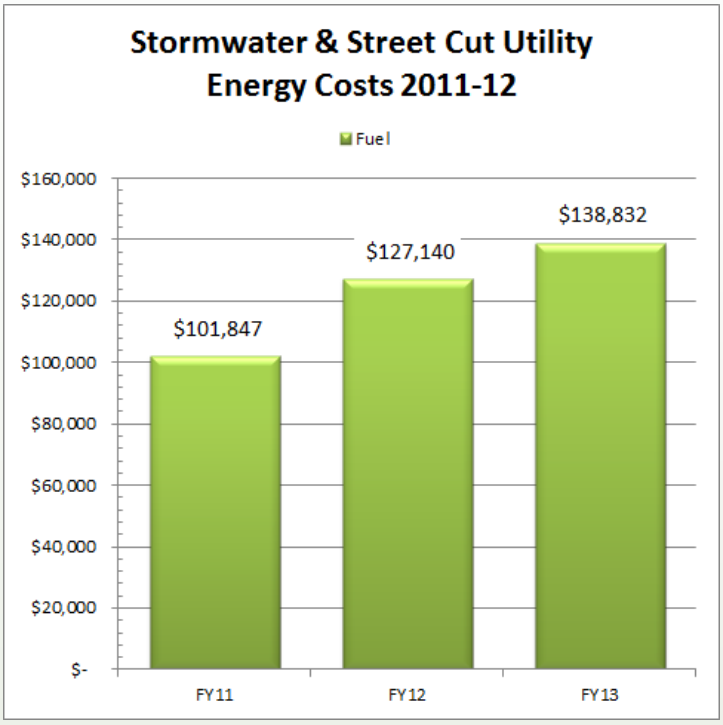
GHG Emissions

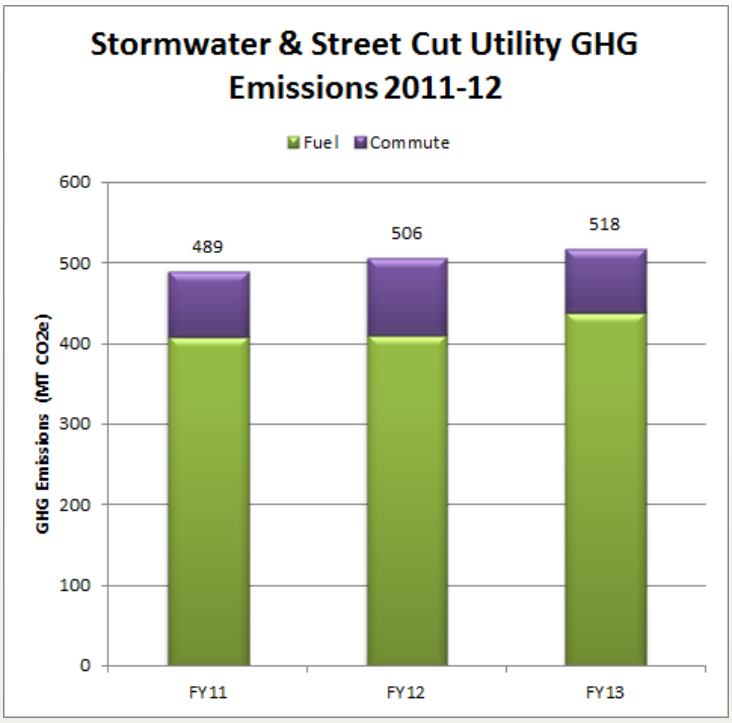
↑ 2.3% from FY12

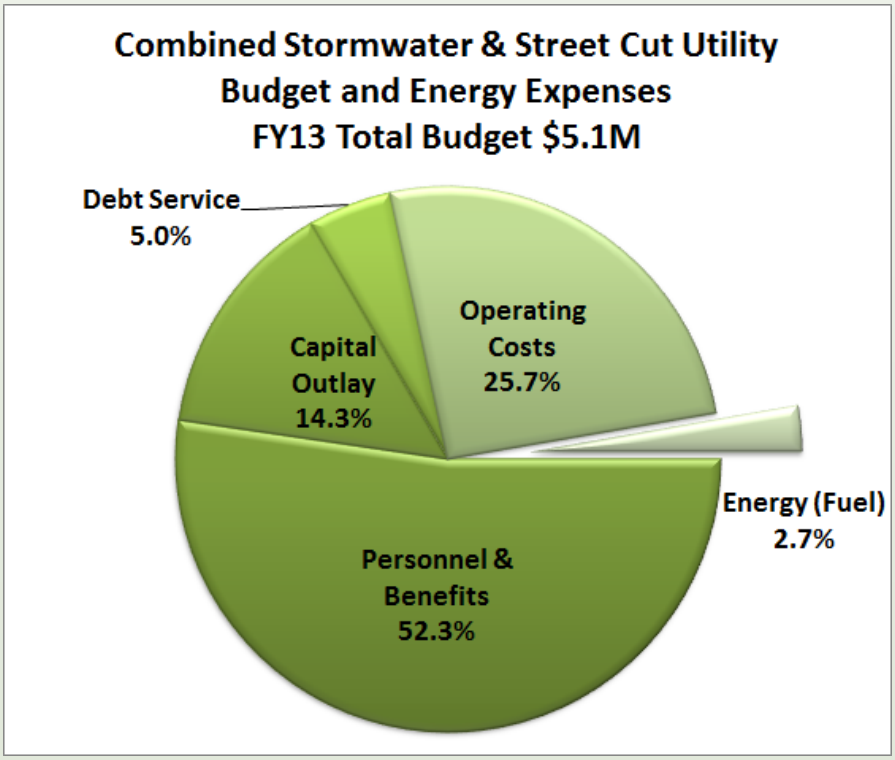
+11 MT CO2e

% of Municipal Footprint

2.3%







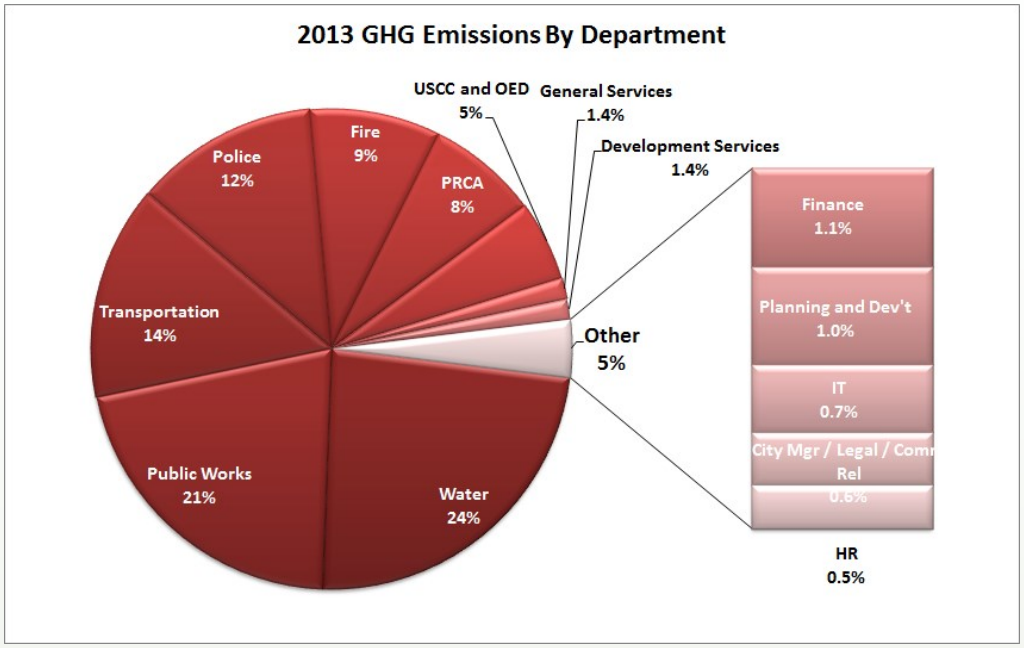
Highlights / Notes

- Carbon footprint increased slightly, however productivity also increased in a number of areas
  - Installation of new storm drains increased by 10% over previous year
  - Solids collected from City streets and drainage structures increased 4.5%

* Energy expenses are paid out of operating costs, but are presented separately for the purposes of this report.

Carbon Footprint By Department

Another way to break apart the City's carbon footprint is on a departmental basis. The following analysis shows how each department is performing over time and where its emissions are coming from.

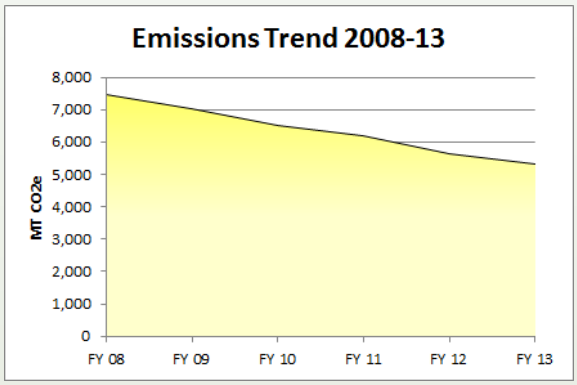


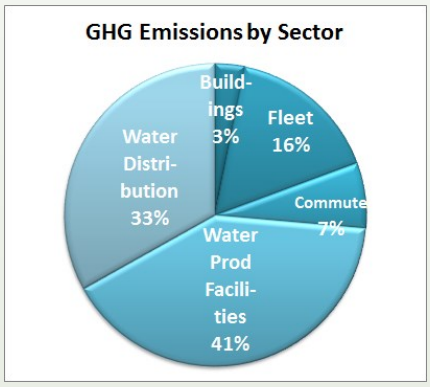
Water Department

FY13 Emissions: 5,331 MT CO2e

Percent change: -5.6%

Significant change factor: System efficiencies



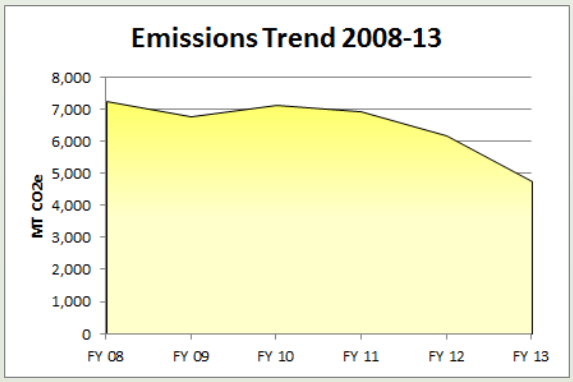


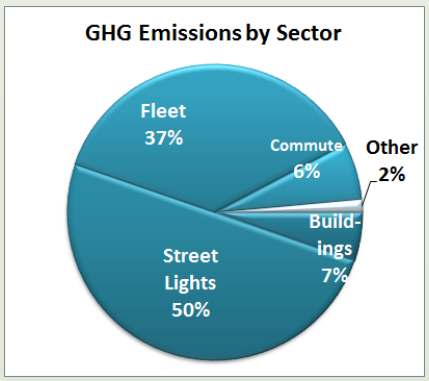
Public Works Dept

FY13 Emissions: 4,763 MT CO2e

Percent change: -23.1%

Significant change factor: Led Streetlights; Transferred Fleet maintenance to General Services Department



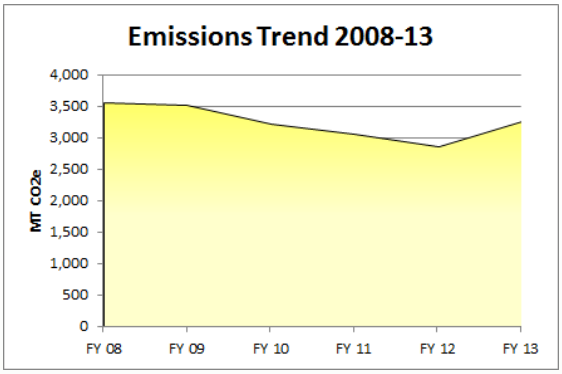


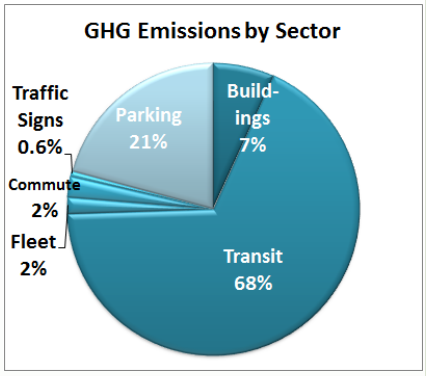
Transportation Dept

FY13 Emissions: 3,241 MT CO2e

Percent change: +13.6%

Significant change factor: Transit service increase



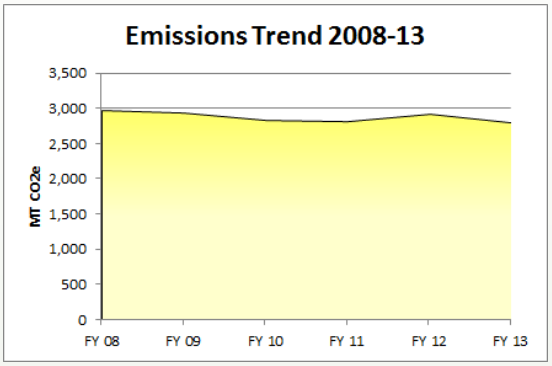


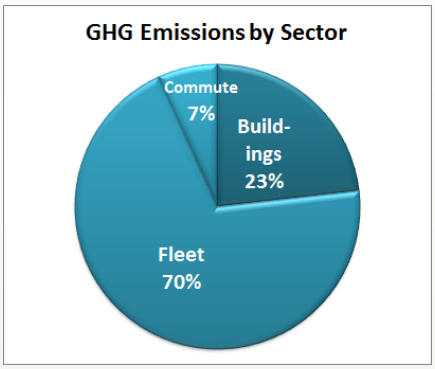
Police Department

FY13 Emissions: 2,793 MT CO2e

Percent change: -4.4%

Significant change factor: General improvement



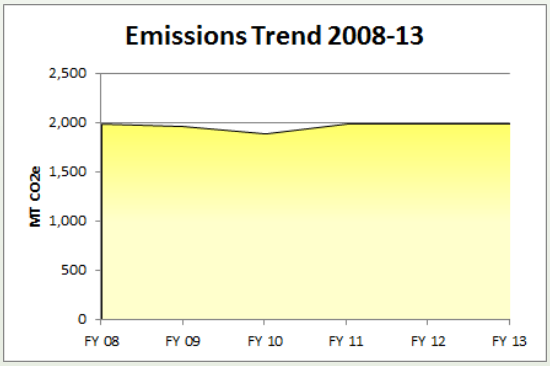


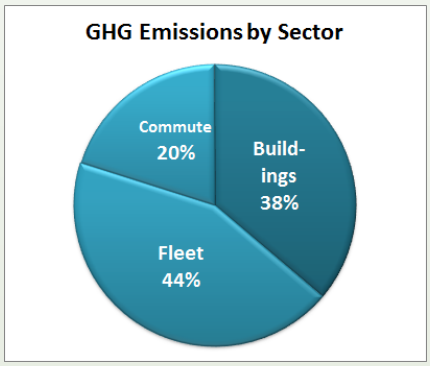
Fire Department

FY13 Emissions: 1,988 MT CO2e

Percent change: -0.2%

Significant change factor: Steady



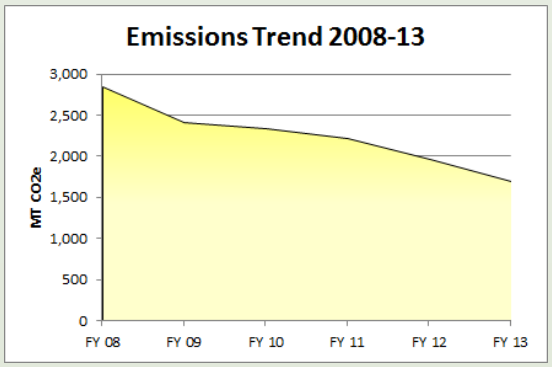


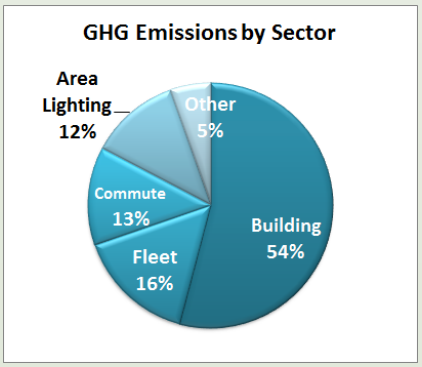
PRCA Department

FY13 Emissions: 1,690 MT CO2e

Percent change: -13.7%

Significant change factor: Loss of golf course & McCormick Field operations



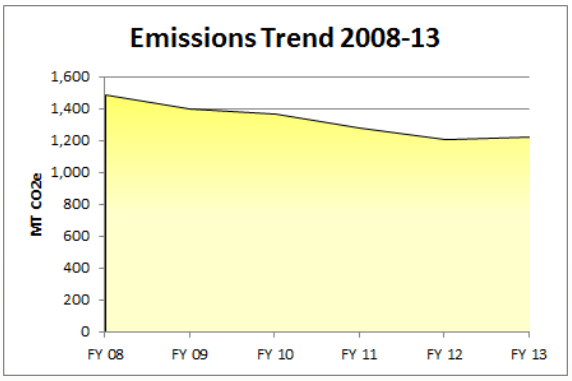


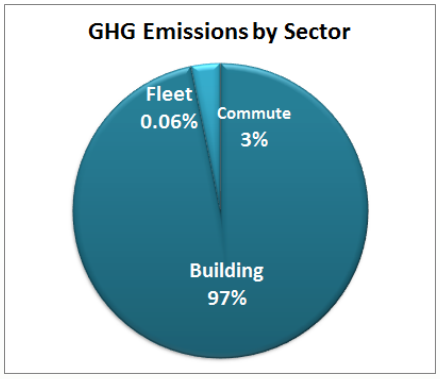
US Cellular Center & Office of Econ Dev't

FY13 Emissions: 1,218 MT CO2e

Percent change: +1.0%

Significant change factor: Steady



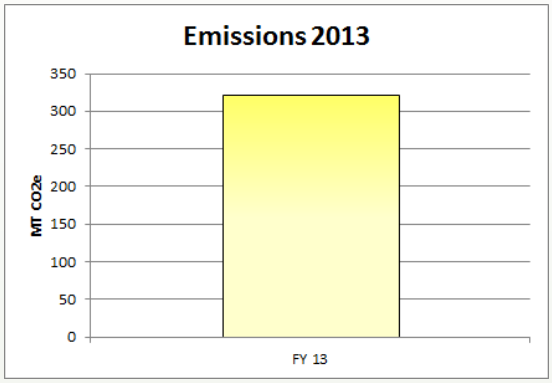


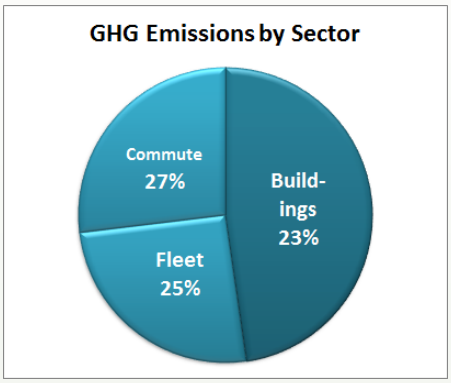
General Services

FY13 Emissions: 321 MT CO2e

Percent change: n/a

Significant change factor: New department this year



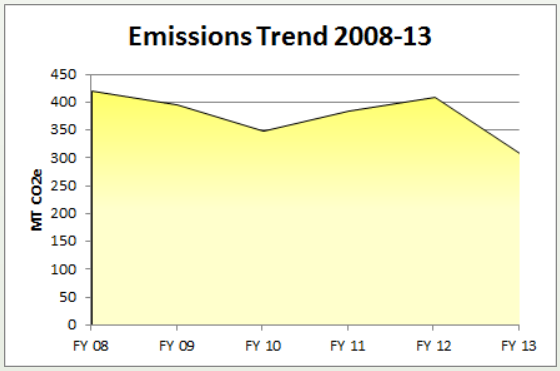


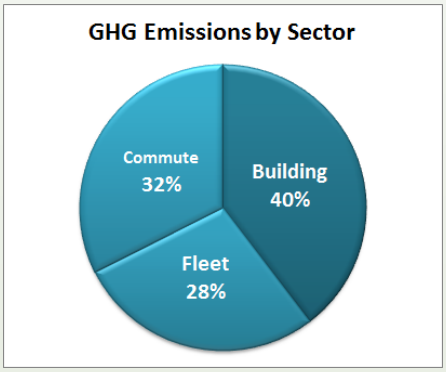
Development Services

FY13 Emissions: 307 MT CO2e

Percent change: -24.6%

Significant change factor: Transferred facilities maintenance to General Services



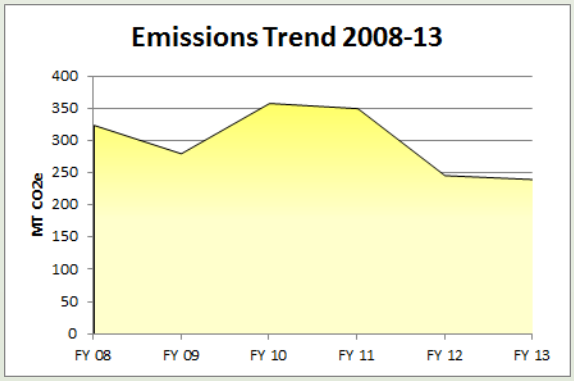


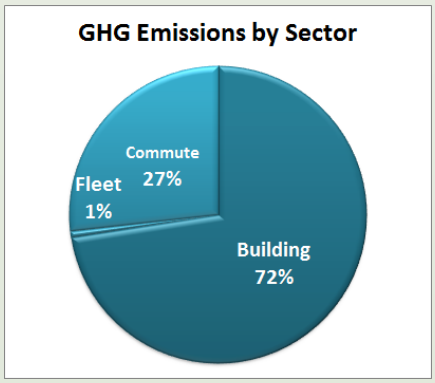
Finance Department

FY13 Emissions: 238 MT CO2e

Percent change: -2.7%

Significant change factor: Transferred City Hall Operations to General Services



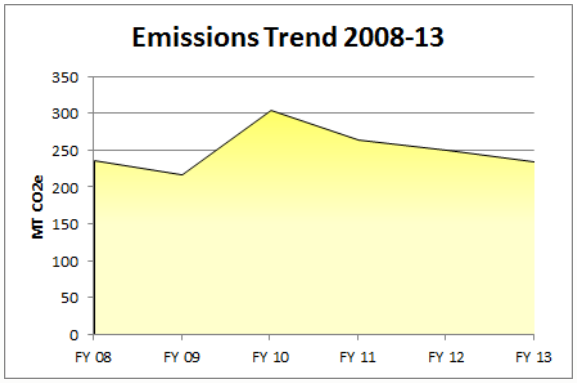


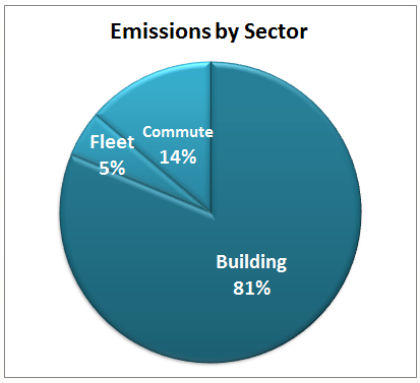
Planning and Development

FY13 Emissions: 235 MT CO2e

Percent change: -6.2%

Significant change factor: Lower employee count



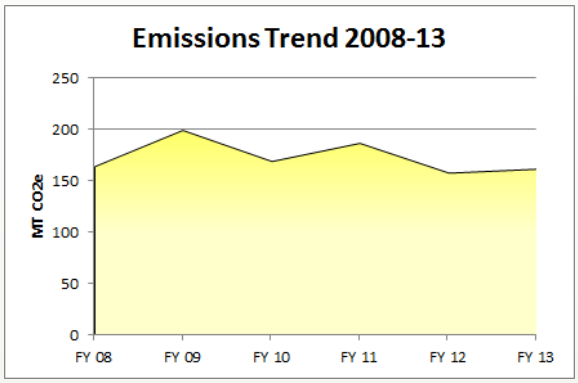


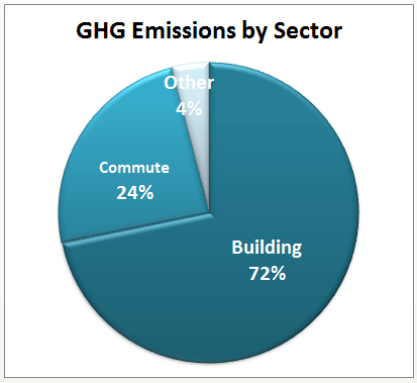
Information Technology

FY13 Emissions: 161 MT CO2e

Percent change: +2.3%

Significant change factor: Steady



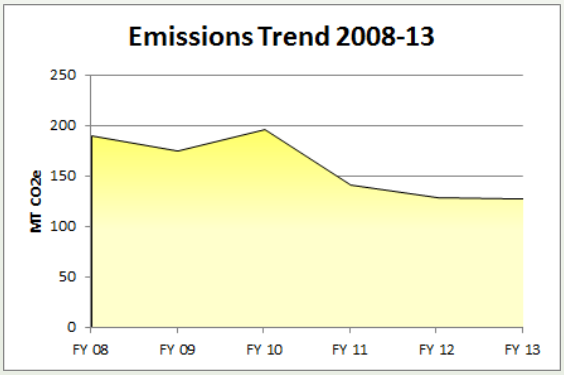


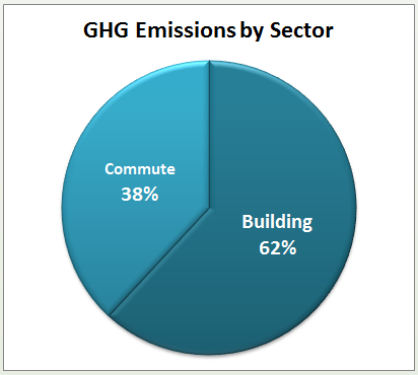
City Manager's Office / Communications / Legal

FY13 Emissions: 127 MT CO2e

Percent change: -1.0%

Significant change factor: Steady



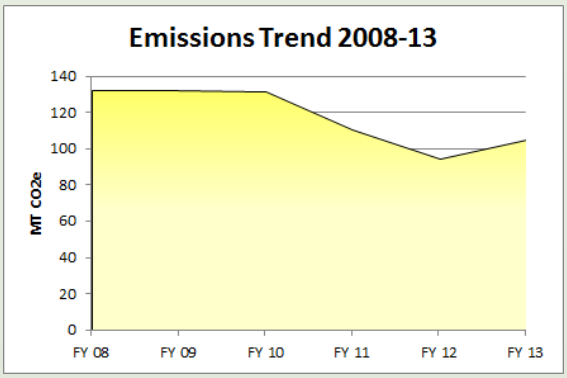


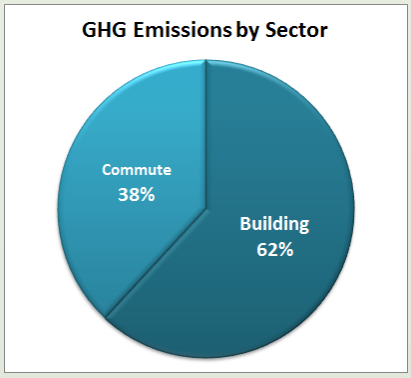
Human Resources

FY13 Emissions: 104 MT CO2e

Percent change: 10.5%

Significant change factor: Colder winter affected health clinic and City Hall





* Note - In many cases the buildings sector emissions are allocated to multiple departments based on a fraction of department employees that use the building. For example, City Hall's emissions are apportioned among the 8 departments that work there.

Notes about this report

- City of Asheville's Fiscal Year (FY) runs from July 1 until June 30. Thus FY 2013 was from July 1, 2012—June 30, 2013.
- For the purposes of this report, the term "carbon footprint" is synonymous with greenhouse gas (GHG) emissions, which are measured in metric tons of carbon dioxide equivalent, abbreviated MT CO2e
- Only municipal government operations are included, and only those that are under operation control of City Government. City properties like the AVL airport, Grove Arcade, and McCormick Field are not included because they are not managed by COA, and COA does not pay for the utilities at these locations.
- Historic total carbon footprint numbers have changed from year to year as methodology has improved, emissions factors have been updated, and more impacts are captured. Numbers in this report are the most accurate information available for years 2008 - 2013.
- When City-wide annual reduction percentages are cited (e.g. pages 3-5), this refers to a percent of our baseline total. Thus an annual 4% reduction goal stays constant in absolute terms of carbon reduced.
- Emissions Factors used for 2013:

Electricity	0.4725207	MT CO2e/MWh
Natural Gas	0.0058489	MT CO2e/therm
Fuel Oil	0.0102434	MT CO2e/gal oil
Gasoline	0.0097059	MT CO2e/gal
Diesel	0.0111820	MT CO2e/gal
CNG	0.0072683	MT CO2e/gge
Propane	0.0063292	MT CO2e/gal
B-5	0.0106250	MT CO2e/gal
B-20	0.0089450	MT CO2e/gal

This report was produced by the City of Asheville Office of Sustainability.

For more information, please visit www.ashevillenc.gov/green

howlowcanavlgo?

raise the bar. lower the carbon.