

Georgia Energy Programs and Energy Efficiency Conservation Block Grants (EECBG)

Bill Hosken

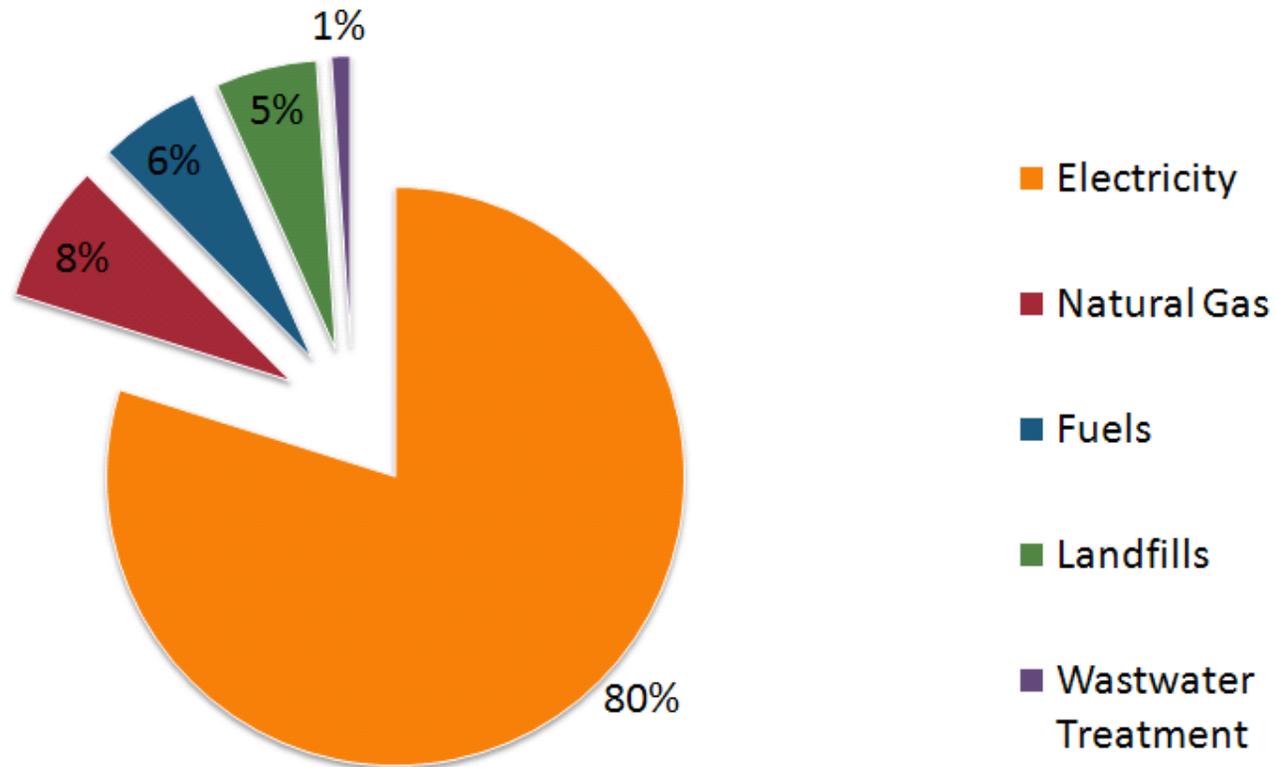
City of Atlanta

Division of Sustainability

City of Atlanta Division of Sustainability

Leading Projects under Development

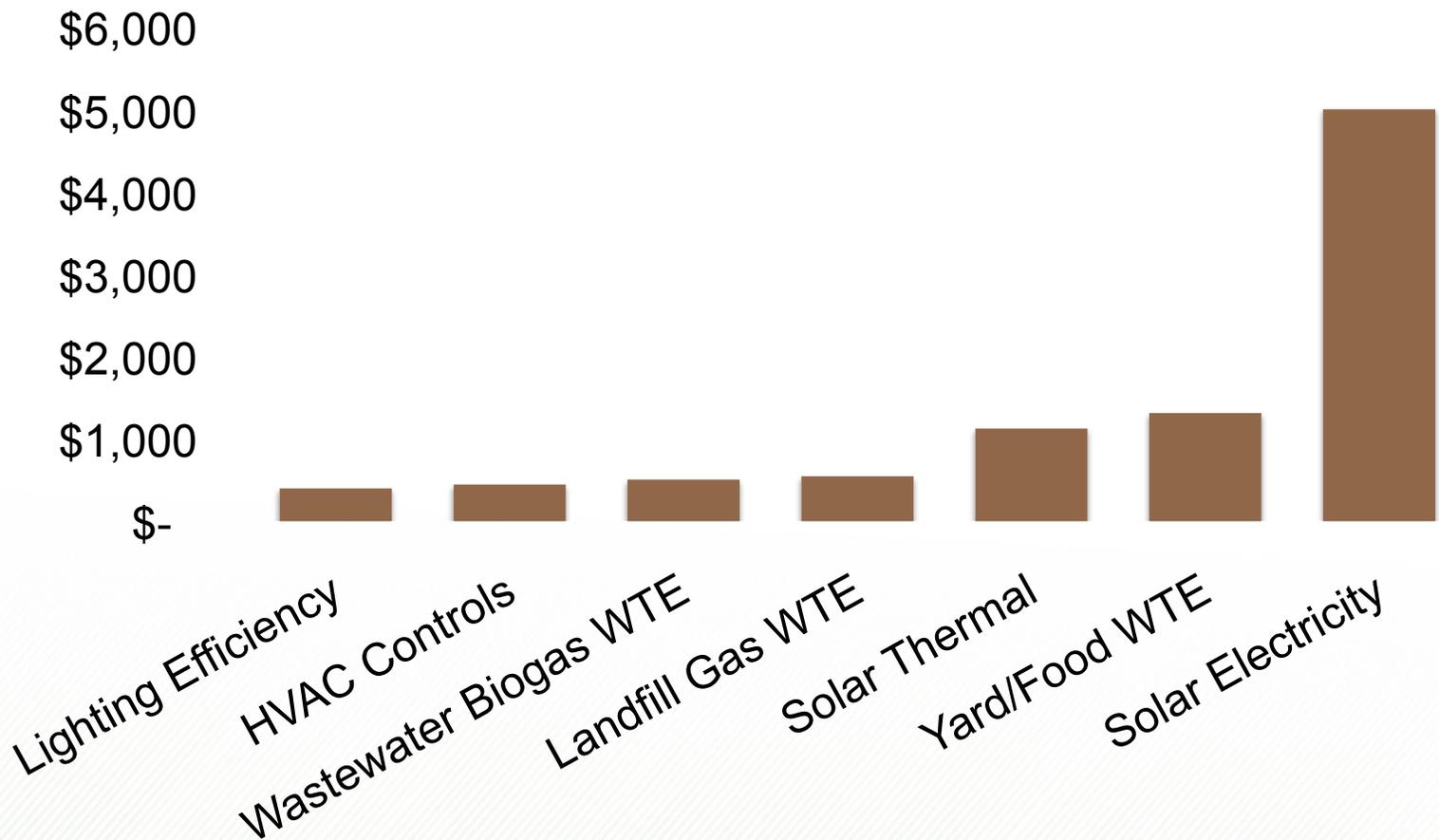
City of Atlanta Municipal Operations – 2008 Carbon Footprint by Source



Emissions Reductions, Life-Cycle Costs, & Jobs

Project Metrics

Capital Costs per Annual Avoided Ton CO₂

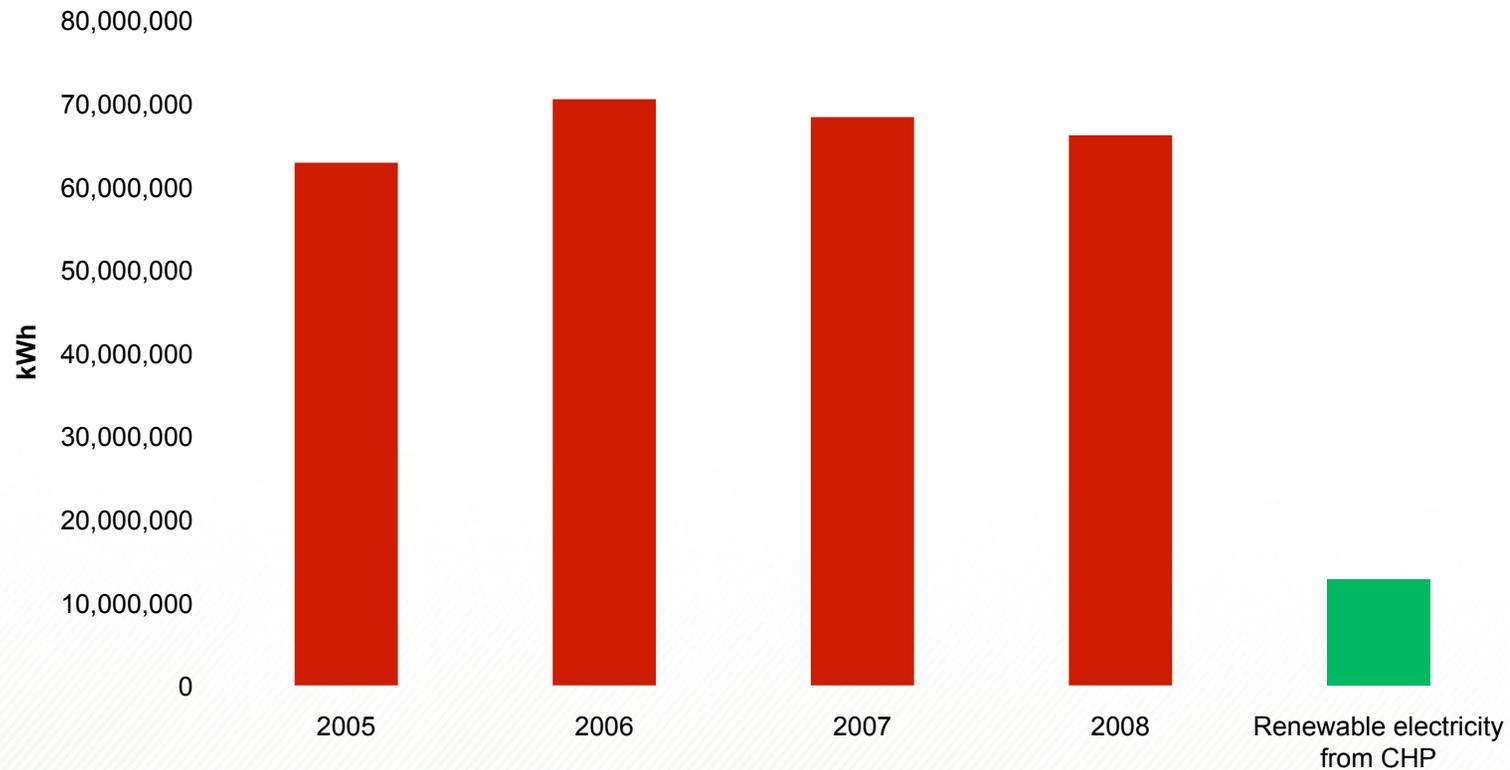


Combined Heat & Power

RM Clayton Wastewater Treatment Plant

RM Clayton Is Second Largest Municipal User of Electricity after Airport

RM Clayton Wastewater Treatment Plant Annual Electricity Consumption



RM Clayton CHP Benefits

Operating Costs

- Reduce annual operating costs of RM Clayton WWTP by \$1.5 million per year.

Jobs

- Create or retain 82 jobs through the construction period.
- Create or retain 3 permanent jobs for at least 20 years.

CO₂ Emissions

- Reduce the city's greenhouse gas emissions by 17 thousand metric tons per year, or 3% of 2008 total emissions from municipal operations.

Power Generation

- Natural gas and electricity savings correspond to total source fossil energy savings of 0.3 trillion Btu per year.

Cutting Edge

- The proposed CHP system will be a model for future systems in Georgia and the Southeast.

Improvements through AGL's Georgia Sustainable Environmental Economic Development (SEED) Program

Atlanta Civic Center

Civic Center Upgrades

- New high-efficiency variable-air-volume rooftop HVAC systems serving the exhibit hall.
- Web-based building automation controls of space temperatures, shutdown/startup, and demand-controlled ventilation would allow 24-hour access from any computer to control schedules and set points. New building automation controls will eliminate climbing 50-foot ladders daily to turn exhibit hall units on and off.
- High-efficiency domestic water heating systems.
- Variable-frequency drives for cooling tower and chilled-water system.
- New chiller to replace unit out of service.
- Existing plumbing fixtures would be replaced with low-flow units that use at least 50% less water.
- Replacement of existing inefficient lighting with high-efficiency lighting and controls to prevent operation during unoccupied periods.

Expected Project Outcomes

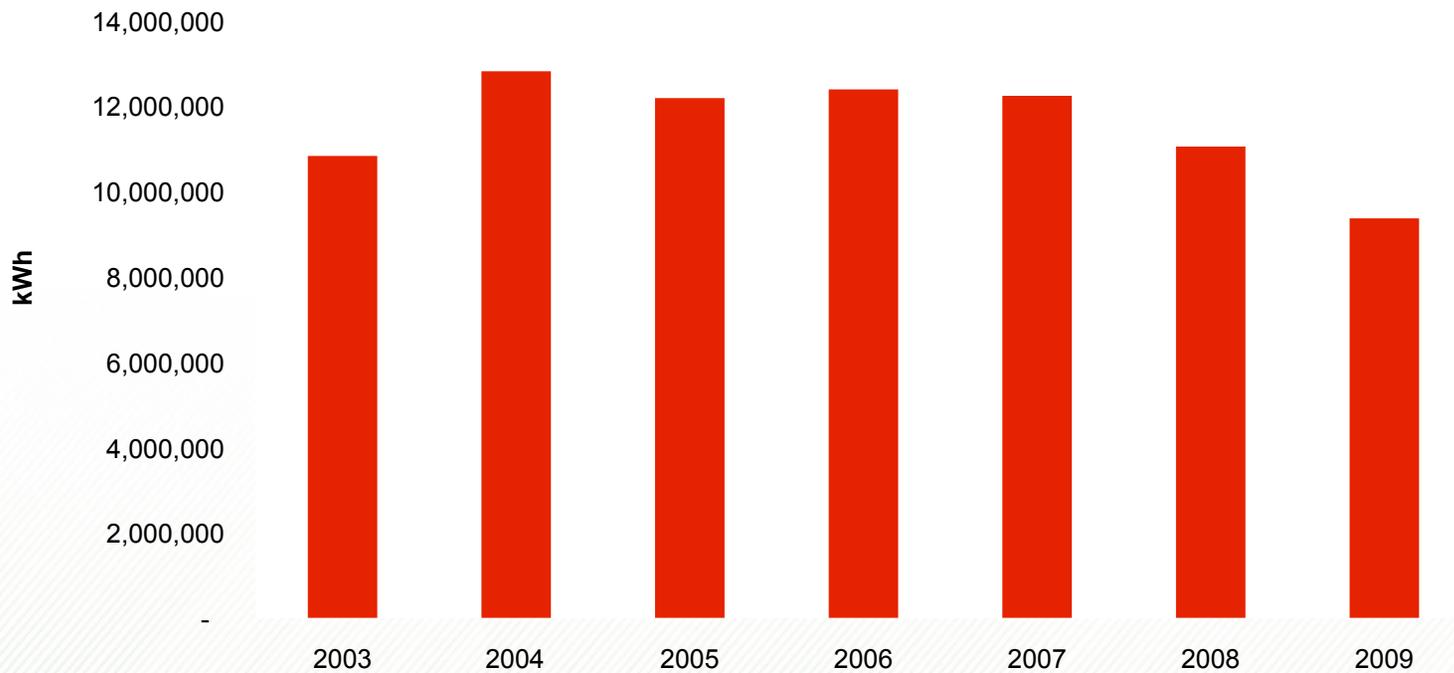
- **\$1.9 million** in construction costs with financing through AGL's *Georgia Sustainable Environmental Economic Development (SEED)* program
- Annual electricity savings of over **1.2 million kWh** per year. This project reduces the Civic Center's carbon footprint by over **765 tons** per year of CO₂, or a savings of over **20%**
- Annual water savings of over **1 million gallons** per year
- Avoided equipment rental costs of **\$162,000 per year**
- Total estimated annual costs savings of over **\$317,000 per year**

Efficiency Upgrades & LEED EB: O&M Certification

City Hall

23% Energy Savings in 2009 over 2007 through Conservation

City Hall Electricity Consumption, 2003-2009



Proposed Efficiency Upgrades

- Replacement of mechanical inlet vanes in air-handling systems with variable-frequency drives.
- High-efficiency motors.
- Building automation system upgrades.
- Replacement of 1980s R-11 chillers.
- Installation of smaller chiller for off-peak loads.
- Lighting controls throughout.
- Low-flow plumbing fixtures.
- Window upgrades.

Pilot Projects

Outdoor Lighting & Traffic Signals

Overview

Economics

- The City of Atlanta spends approximately:
 - **\$7.5 million** annually in payments to Georgia Power for nearly 51,000 leased and city-owned outdoor light fixtures, and
 - Over **\$500,000 annually** for traffic signals.

Emissions

- Related emissions correspond to about **39,000 metric tons** per year of CO₂, or about **7.6 percent** of the city's total carbon footprint.

Twenty-eight 48-Watt LEDs Installed in the Glenwood Tunnel



Outdoor Lighting & Traffic Signals

Partnership with Georgia Power

- Completed installation of four 105-Watt LED fixtures to replace 150-Watt nominal (186-Watt actual) high-pressure sodium fixtures on 8th Street between Juniper and Piedmont.
- A second phase will include replacement of post-top outdoor light fixtures at one of the city's recreation centers. The location for this pilot is to be determined in early March 2010.

Internal Loan Fund for Municipal Operations

Green Loan Fund

Green Loan Fund Projects

- \$1.5 million for high-impact projects with simple payback periods under five years
- Replacement of inefficient lighting
- Installation of lighting controls
- Installation of HVAC controls
- Low-flow plumbing fixture retrofits
- Other projects meeting program criteria

Sustainable Home Initiative for the New Economy

SHINE

SHINE

\$2.1mm ARRA Funding Allocated



Partner with Georgia Power Home Performance with Energy Star Program

- Utilize existing qualified contractor base
- Provide additional rebates to homeowners to undertake qualified energy efficiency improvements



Phase I: Stimulate demand for energy efficiency retrofit work through homeowner rebates

- % of total qualified improvement work
- Currently capped at \$1,000



Phase II: Launch a residential energy efficiency improvement financing program

- Currently under development

In-vessel Composting of Yard Waste & Perishable Organics

Yard & Food Waste-to-Energy

Pilot Project Objectives

Utilize City industrial property for the operation of a waste-to-energy plant and the City's proposed Eco-Industrial Park

Waste Diversion

- Reallocate 30,000 tons per year of community yard waste.

Jobs

- Create or retain 165 jobs through construction.
- Create or retain 8 permanent jobs for at least 20 years.

Emissions

- Reduce the city's greenhouse gas emissions by 2% of 2008 total emissions from municipal operations.

Power Generation

- Replace 10.6 million kWh of purchased electricity with renewable electricity from biogas.

Cutting Edge

- The proposed yard/food-waste-to-energy CHP system will be a model for future biomass systems, and could be expanded in the future to accept organic municipal waste

Energy Potential

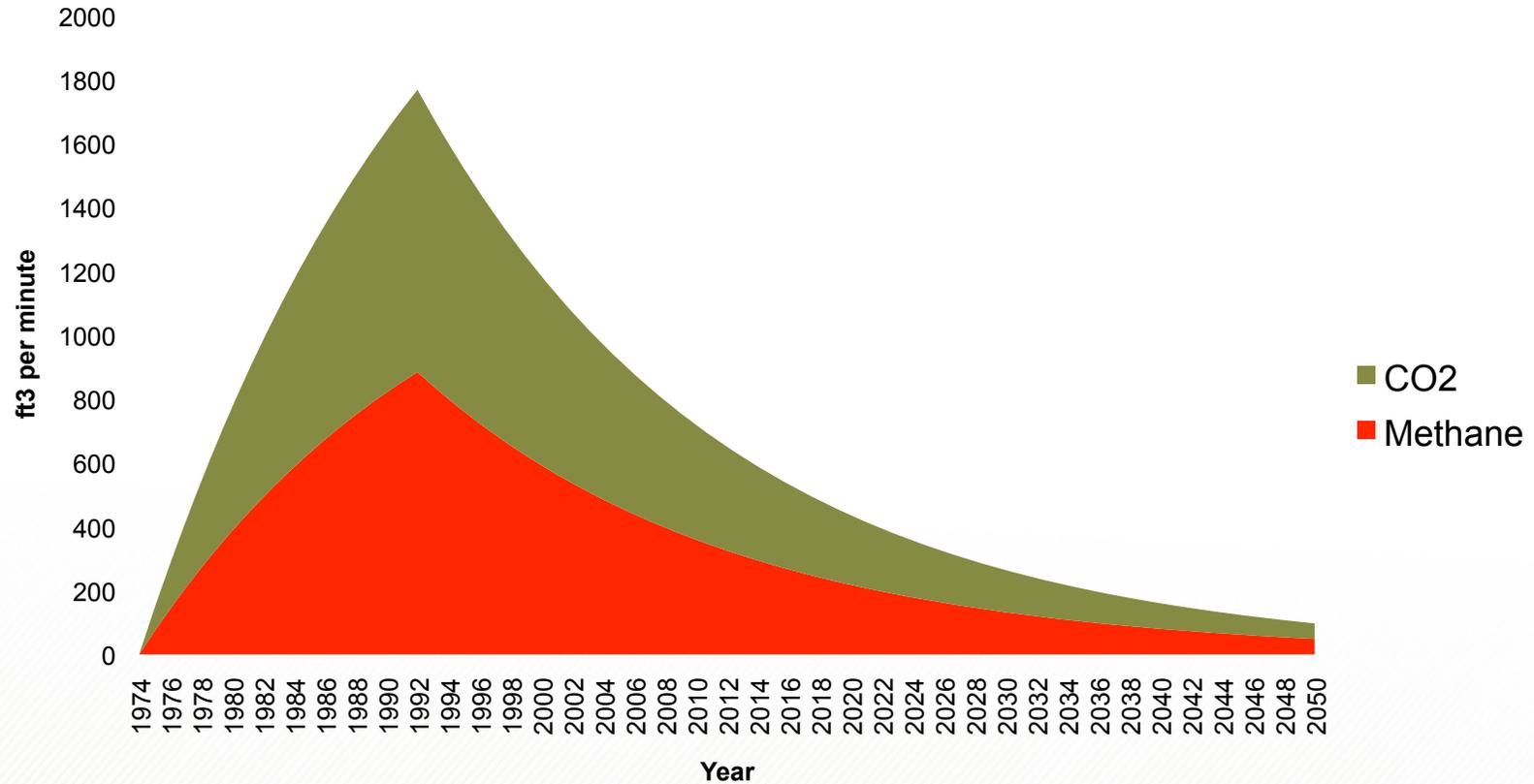
Project Scope	Food & Yard Waste Disposed, Annual Tons	Potential Renewable Electricity, kWh per Year	Potential Waste Heat Recovery, Million Btu per Year	Total Energy from Food & Yard Waste, Million Btus (Site) per Year
Pilot Project for City of Atlanta	30,000	10,641,768	38,232	74,552
Atlanta Regional Commission – Potential	464,202	164,665,753	591,583	1,153,588
State of Georgia – Potential	978,209	346,995,777	1,246,777	2,430,925
United States -- Potential	21,710,000	7,701,092,822	27,667,189	53,951,019

Waste-to-Energy from City's Closed Landfills

Landfill Gas

Theoretical Gas Production

Key Rd. Landfill Theoretical Gas Production Estimates



Potential **2.5 MW of renewable electricity** (based on theoretical production)

Goal: 95% diversion by 2020

Zero Waste

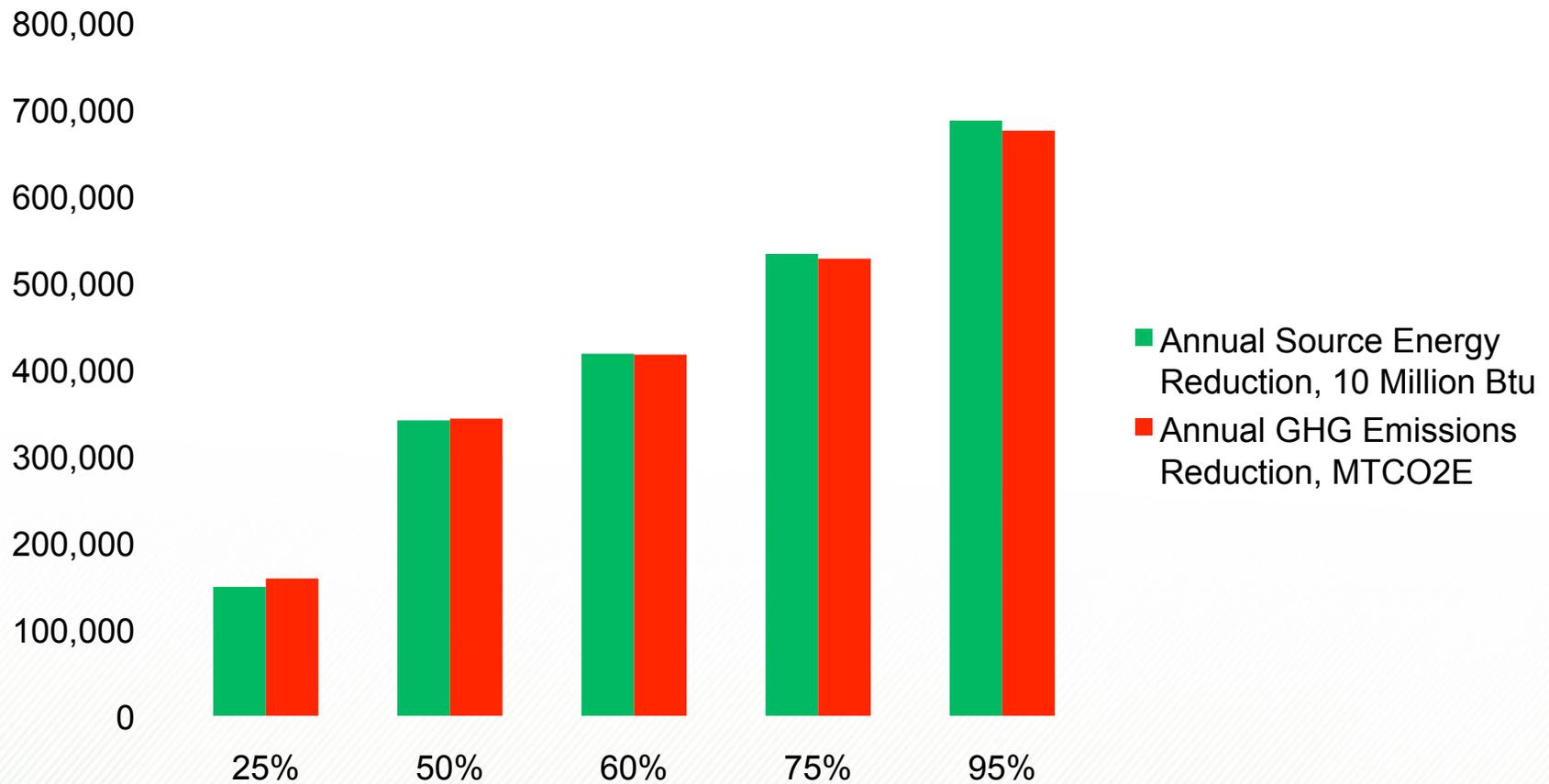
Materials Management Jobs



For Every 10,000 tons of material discarded, the following jobs are created:

- 1 job at a landfill, or
- 4 jobs at a compost facility, or
- 10 jobs at a recycling facility, or
- 25 jobs at a recycling-based manufacturer, or
- **75-250** jobs at a reuse facility

Benefits of Residential MSW Reduction Programs



Zero Waste – Phase I

- City-wide residential program with **75%** Phase I diversion goal
- **\$35 million** investment for rolling carts and waste-to-energy facility
- Includes providing two 95-gallon rolling carts: one for recyclables and one for mixed food residuals and yard trimmings
- Program management fees include data collection, monitoring, and incentives.
- Develop policies and support source reduction strategies to meet zero-waste goal



Preliminary Results Estimates

Project Scope: Assumes 75% Diversion	Food & Yard Residuals Composted Using AD, tons/ year	Potential Renewable Electricity, kWh per Year	Recyclables Diverted, tons/ year	Avoided GHG Emissions, MTCO2E/year Based on 75% Diversion	Permanent Jobs Created
Pilot Project for City of Atlanta - Residential Only	69,791	18,734,776	97,467	547,014	107
City of Atlanta, including All Sources	139,904	37,556,040	192,002	1,078,271	211
Atlanta Regional Commission - Potential	619,419	166,277,497	1,689,756	9,313,072	1,689

Other projects

Other Projects under Review

- Solar thermal pool-heating systems for city natatoriums and fire stations
- Potential for 200 MW of photovoltaics on city roofs and vacant properties
- Pilot urban agriculture project at old honor farm site.
- 2.1-kW wind turbine at water plant