



All Things Considered: Non-Energy Benefits for Different Customer Segments

Municipal Sector

2018 Midwest Energy Solutions Conference

February 7, 2018

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Sustainable Cleveland - Mission

Sustainable Cleveland is a 10-year initiative that engages people from all walks of life, working together to design and develop a thriving and resilient Cleveland region that leverages its wealth of assets to build economic, social and environmental well-being for all.



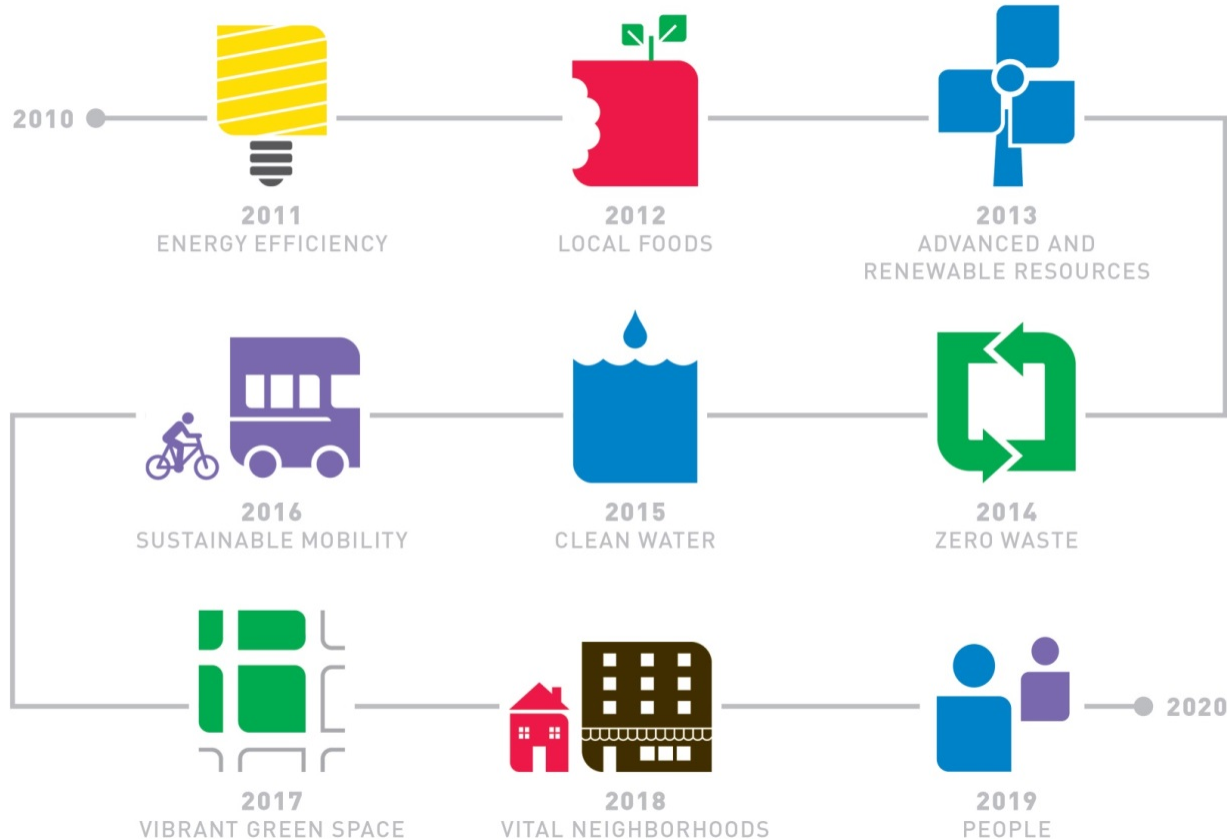
1969



50 Years Later We Will Surprise and Amaze with our Transformation



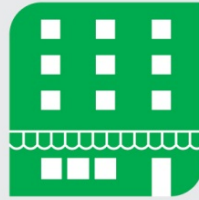
Celebration Years



Taking Action



at **HOME**



at **WORK**



in your **COMMUNITY**



Climate Resilience & Urban Opportunity Initiative

OBSERVED CHANGES IN NEO:

Rising average temps -----

2.4

Longer freeze-free season -

20

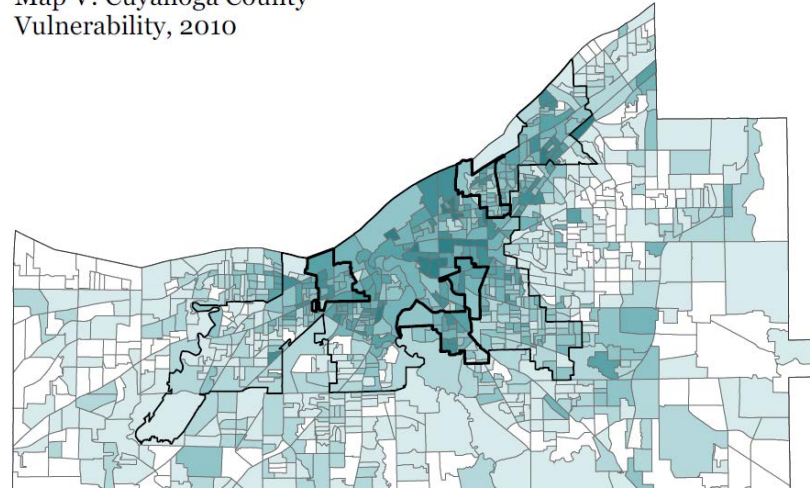
More precipitation -----

26

More heavy precipitation --

22

Map V: Cuyahoga County
Vulnerability, 2010



*Climate Vulnerability
by Neighborhood*

Health

Health

When we create a sustainable community, we create a place where people can be healthier. For this reason, many of the actions in the [Cleveland Climate Action Plan](#) were prioritized for improving health outcomes. This indicator tracks life expectancy, adults reporting poor/fair health, obesity, population in food deserts, and asthma.

Source: Compiled by Cuyahoga County – more info at www.healthdatamatters.org/health-overview

	U.S	OH	CLE
Life expectancy, years	76.3	75.2	visit link below*
Adults reporting poor/fair health, %	17	17	29
Adults considered obese, %	30	30	35
Currently have asthma, %	9	10	15

(All data from Cuyahoga BRFSS)

[BRFSS](#)- Behavioral Risk Factor Surveillance System

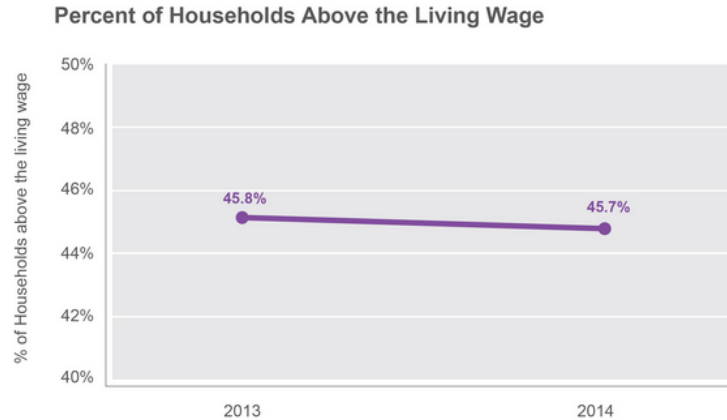
"*The [Center on Society and Health](#) an academic research center that studies the connections between social factors and health out of Virginia Commonwealth University, put together a Cleveland Life Expectancy Methodology and Data Table by zipcode. This chart breaks down average life expectancy across Cleveland communities to showcase a meaningful connection between zip code and health outcomes."

Living Wages

Living Wages

In many American communities, workers in low-wage jobs do not earn sufficient income to provide basic needs, such as shelter, clothing, and nutritious food, given the local cost of living. This Indicator measures the percentage of households that meet or exceed the Living Wage Standard.

Source: US Census, American Community Survey; STAR Communities



*In Cleveland, the living wage annual income per household is \$30,915

Climate Action More Urgent Than Ever



33 Actions



33 Climate Actions



Focus Area	# of Actions
Energy Efficiency & Green Building	7
Advanced & Renewable Energy	8
Sustainable Mobility	6
Waste Reduction & Resource Conservation	3
Land Use & Clean Water	6
Community Engagement & Public Health	3

GOALS: Reduce Emissions 16% by 2020, 40% by 2030, 80% by 2050

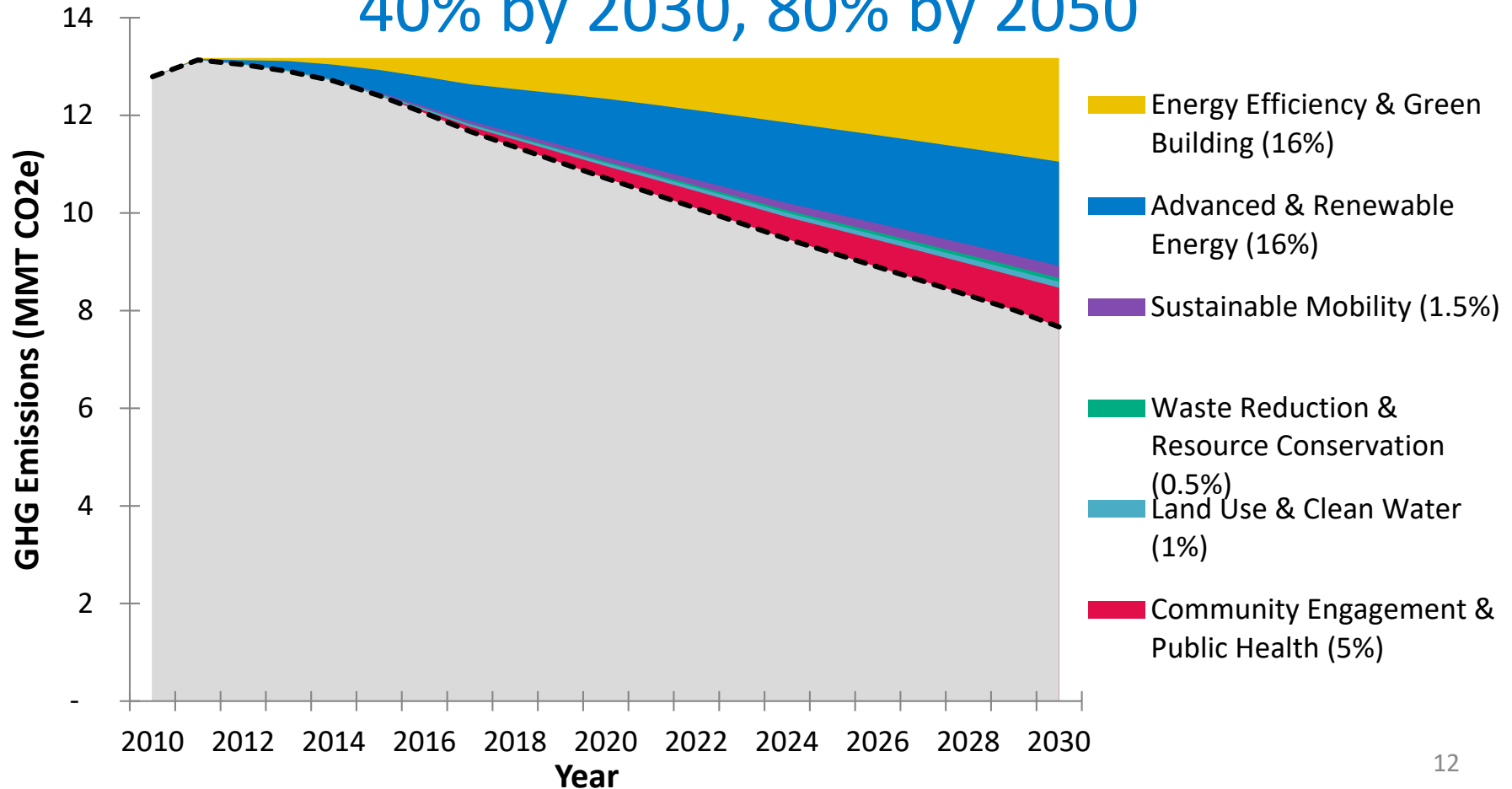


















Table 1: Cleveland's Climate Action Plan at a Glance

Focus Area	Objective	Sectors	Climate Change Impact	Action	Annual Reduction Potential by 2030 (MT CO ₂ e/yr)
ENERGY EFFICIENCY & GREEN BUILDING Annual Emissions Reduction by 2030 = 2,100,000 MT CO ₂ e (39% of total GHG reduction)	Retrofit and renovate existing buildings		M A	Action 1. Support programs and policies to retrofit residential buildings	430,000 8%
			M	Action 2. Support programs and policies to retrofit commercial and industrial buildings	1,300,000 24%
	Make green building the standard for all new construction		M A	Action 3. Incentivize new construction to exceed existing building codes	1,500 0.03%
	Implement neighborhood-level solutions		M	Action 4. Make utility data easily accessible for residents and businesses	n/a
			M	Action 5. Expand use of smart grid and advanced meter technologies	120,000 2%
			M	Action 6. Expand energy and green building challenges	290,000 5%
			M A	Action 7. Build on existing green school initiatives in the City	n/a
ADVANCED & RENEWABLE ENERGY Annual Emissions Reduction by 2030 = 2,100,000 MT CO ₂ e (38% of total GHG reduction)	Accelerate renewable energy use by Cleveland's residents and small businesses		M A	Action 8. Increase distributed energy installations	35,000 0.6%
			M	Action 9. Incorporate renewable energy into municipal aggregation	340,000 6%
	Use local projects to help meet or exceed the utility renewable energy standards		M	Action 10. Become national leader in reusing vacant land for renewable energy projects	23,000 0.4%
			M	Action 11. Develop a pilot offshore wind farm	67,000 1%
			M	Action 12. Utilities invest in additional projects to meet renewable energy standards	1,100,000 20%
	Implement advanced energy technologies		M	Action 13. Accelerate conversion of organic waste to energy using anaerobic digestion	52,000 1%
			M	Action 14. Switch to low-carbon fuel sources for district heating and cooling systems	120,000 2%
		 	M	Action 15. Support Cleveland businesses to reduce industrial process emissions	390,000 7%

City of Cleveland's
Community Reinvestment Area Program
Residential Tax Abatement
Single and Two Family Structures

The City of Cleveland's Residential Tax Abatement Policy is designed to stimulate private investment through job creation, neighborhood stabilization and residential development



CITY OF CLEVELAND
Mayor, Frank G. Jackson

Daryl P. Rush, Director
James Greene, Acting Commissioner & Housing Officer
Cecilia Rodriguez, Program Manager
(216) 664-3442
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Department of Community Development
601 Lakeside Avenue - Room 320
Cleveland, Ohio 44114

Revised 6/1/2016

Building Category*	New Construction	Substantial Rehab	Moderate Rehab
Single Family And Multifamily Low-Rise (Affordable)	A. EGC Certified Through Enterprise C. LEED Silver D. NGBS Silver	A. EGC Certified Through Enterprise B. LEED Silver D. NGBS Silver	A. EGC Certified Through Enterprise D. NGBS Silver
Single Family And Multifamily Low-Rise (Market Rate)**	B. EGC Compliant And Energy Requirements C. LEED Silver D. NGBS Silver	B. EGC Compliant And Energy Requirements C. LEED Silver D. NGBS Silver	B. EGC Compliant And Energy Requirements D. NGBS Silver
Multifamily Mid/High Rise (Affordable)	A. EGC Certified Through Enterprise C. LEED Silver D. NGBS Silver	A. EGC Certified Through Enterprise C. LEED Silver D. NGBS Silver	A. EGC Certified Through Enterprise D. NGBS Silver
Multifamily Mid/High Rise (Marketrate)**	B. EGC Compliant And Energy Requirements C. LEED Silver D. NGBS Silver	B. EGC Compliant And Energy Requirements C. LEED Silver D. NGBS Silver	B. EGC Compliant And Energy Requirements D. NGBS Silver

NOTE: In the above chart, "Enterprise Green Communities Compliant & Energy Requirements" indicates that some projects are able to verify requirements with assistance of a City-Approved Verifier (HLMS Sustainability Solutions is a City-Approved Verifier). The City-Approved Verifier is a third-party verification entity confirming that a project meets the Enterprise Green Communities v2015 Standard and will qualify for tax abatement without official Enterprise Green Communities certification. A City-Approved Verifier is necessary in these instances because Enterprise Green Communities is a rating system designed for low-income and affordable housing only and is not applicable to market rate projects.

Energy & Testing & Ventilation

Single Family - Midrise

- HERS Rating
 - LEED Homes: 70 or better OR LEED Energy Budget
 - EGC: 85 or better
 - 100 for pre-1980 bldgs
 - NGBS: ~ 75
- Energy Star v.3 (New Const)
- Pre-Drywall (New & Sub)
- Blower door (all)


Midrise - Highrise

- Whole Building Energy Model
 - LEED: v.4 ASHRAE 2010
 - Multi-family midrise: 5% improvement
 - Highrise: 5% new 3% rehab
 - EGC New: 15% better
 - EGC Rehab: Even
- EGC Certified or Compliance & LEED Midrise:
 - Commissioning + Blower Door
 - + Energy Star High Rise (New)
 - More stringent Ventilation Requirements (EGC)
- LEED High Rise: Commissioning only



Key Factors
• HVAC & DWH Selections
• New v. Reno & # floors
• Historic






We identify projects, programs, policies, engagement strategies, and future research to lessen overall demand for energy, anticipate and prepare for climate changes and shocks, and foster social cohesion.

Weatherize My Home & More

+

https://chnhousingpartners.org/housing-and-community-serv

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- »Major Plumbing Repairs
- »Lighting
- »Carbon Monoxide Detector

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program runs from
October 15 to April 15.
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press 2.


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"I received a new furnace, new insulation, and a reduction on my water bill, but most of all they helped save my home."
- Mildred

Are you paying too much to heat and cool your home? Do you have an old, energy-hog refrigerator? Are you experiencing water or sewer leaks? Whether you rent or own your home, you may be eligible for free home insulation, energy-efficient appliances, plumbing repairs, furnace or hot water tank and more!

For Weatherization, Energy Efficient
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Measuring Progress

1 CHOOSE AN ENVIRONMENT



Business



Personal/
Social



Built

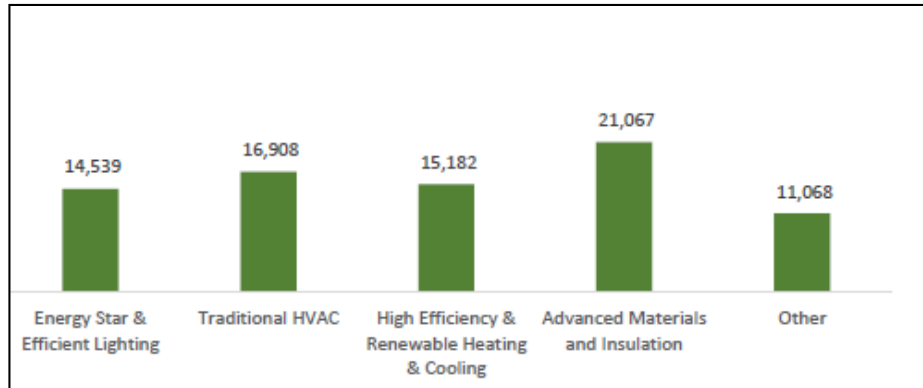


Natural

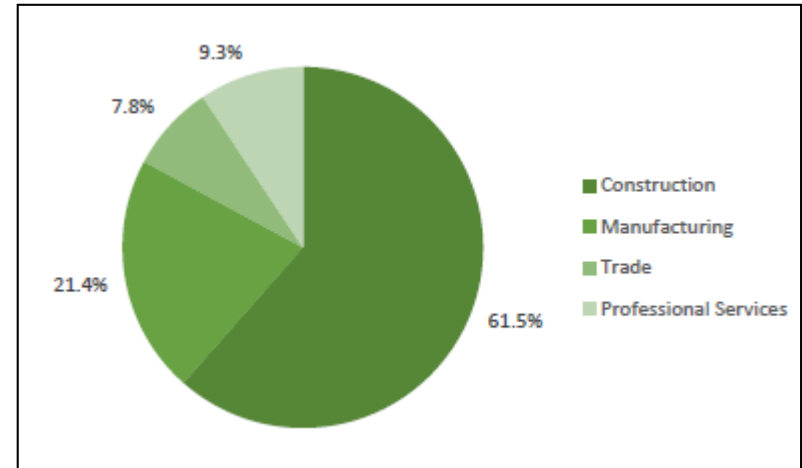
www.sustainablecleveland.org/dashboard

Energy Efficiency & Jobs

The 78,764 energy efficiency jobs in **Ohio** represents 3.6% of all energy efficiency jobs nationally. The largest number of these employees work in advanced materials and insulation firms, followed by traditional HVAC. Energy Efficiency employment is found in the construction industry.



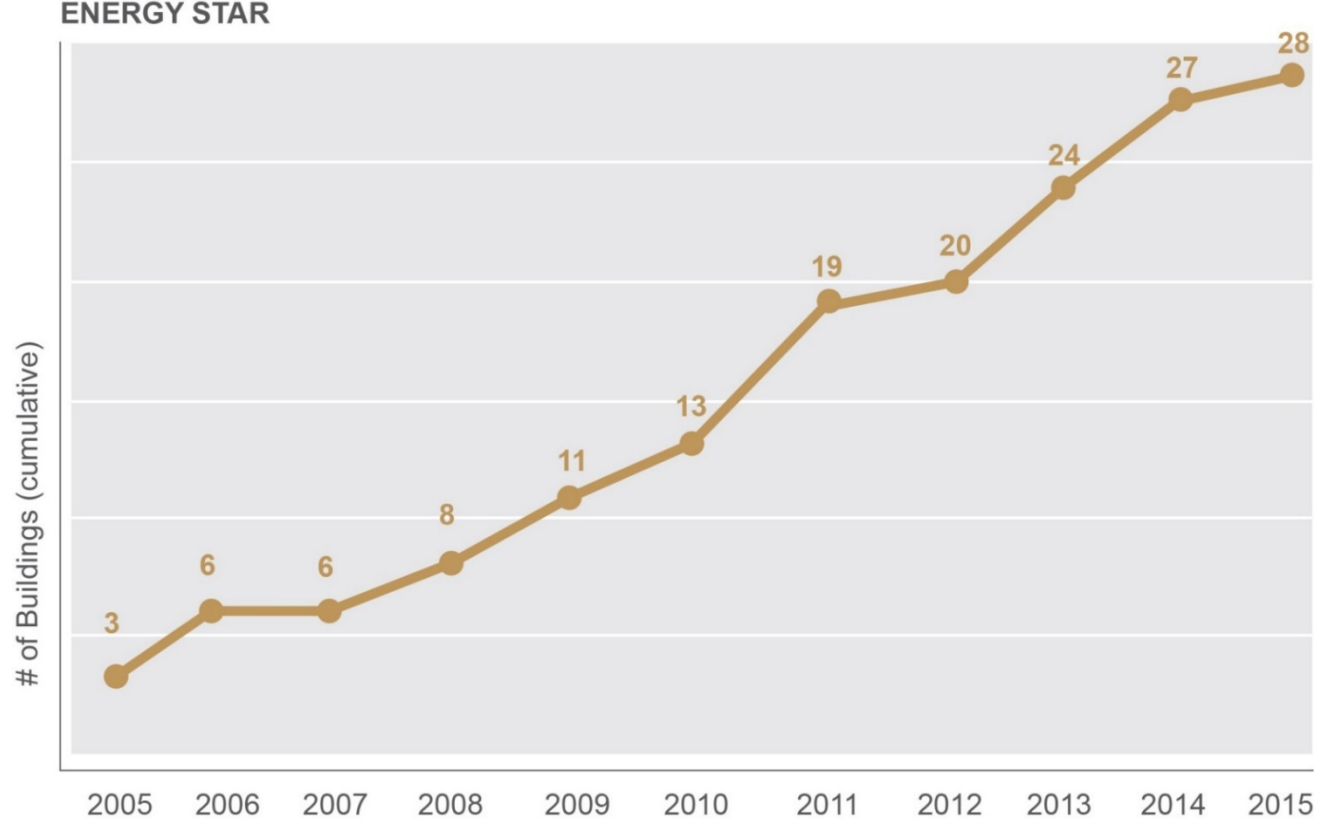
Energy Efficiency Employment by Sub Technology



Energy Efficiency Employment by Industry Sectors

Source: 2017 Data - <https://energy.gov/downloads/2017-us-energy-and-employment-report>

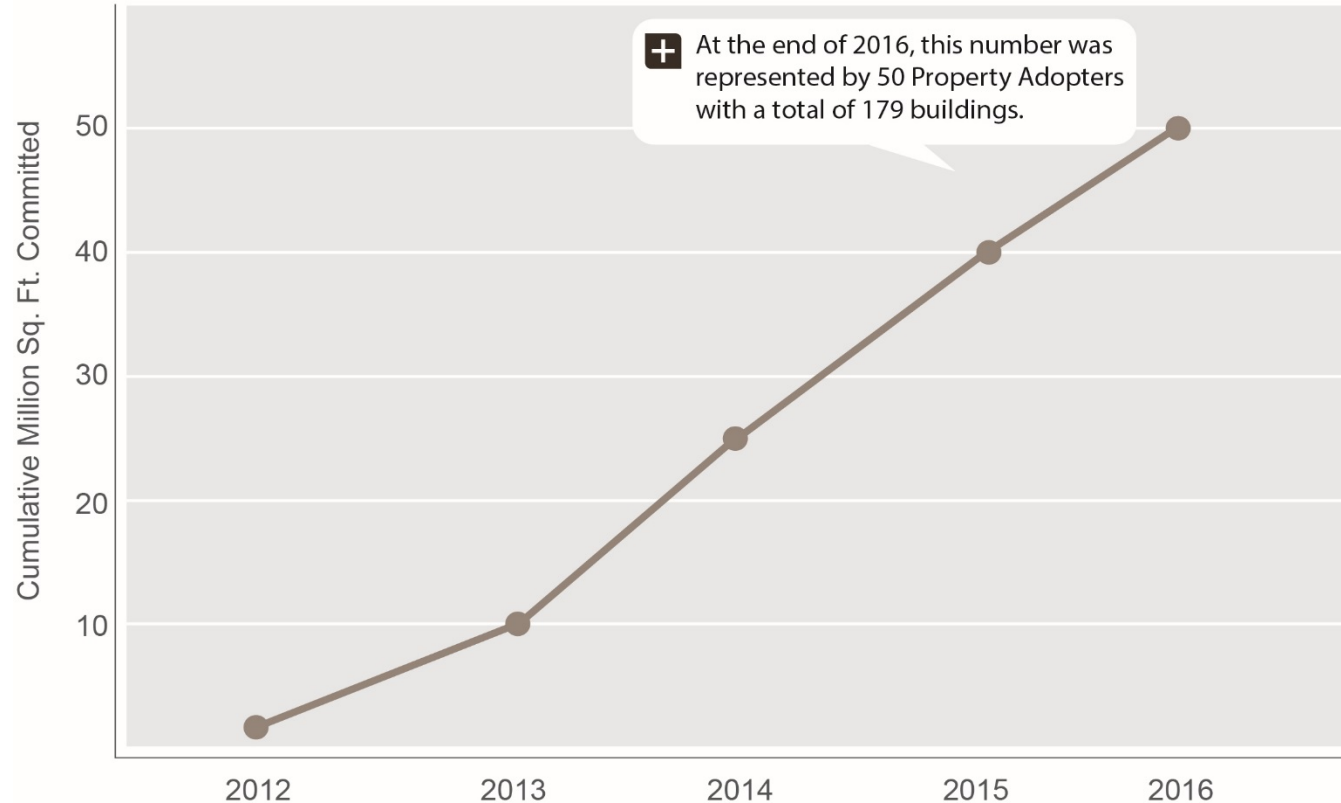
Green Buildings and Energy Efficiency



Non-Energy Benefits: Competitiveness, ROI

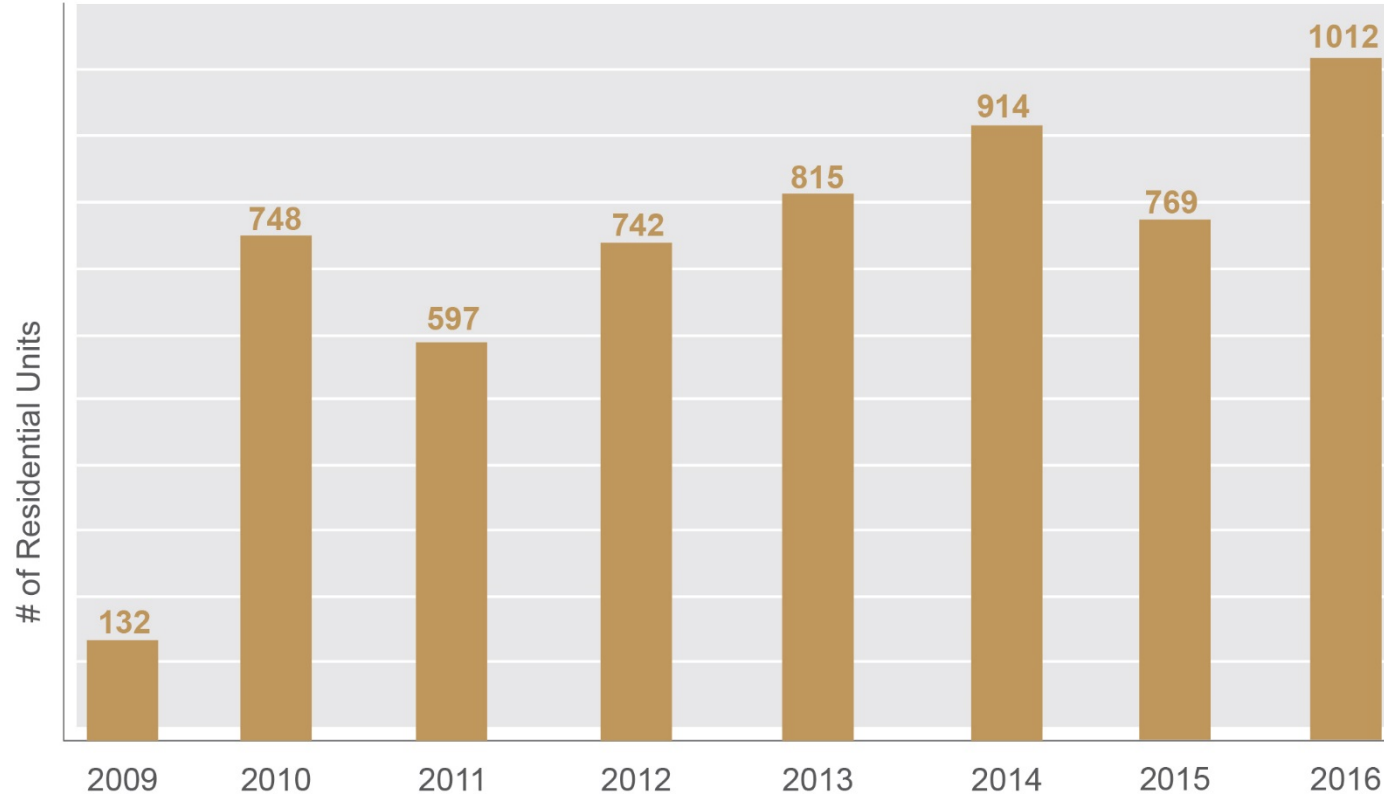
Green Buildings and Energy Efficiency

Cleveland 2030 District

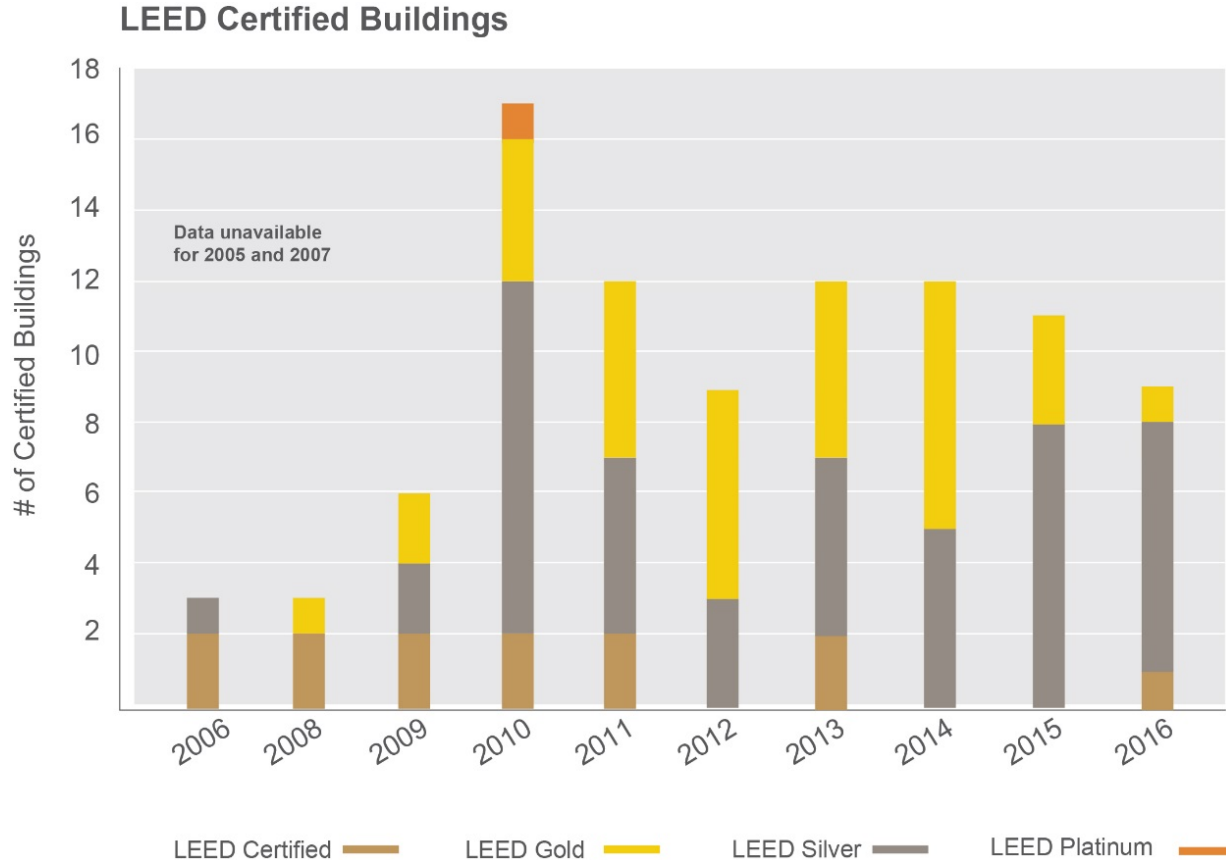


Green Buildings and Energy Efficiency

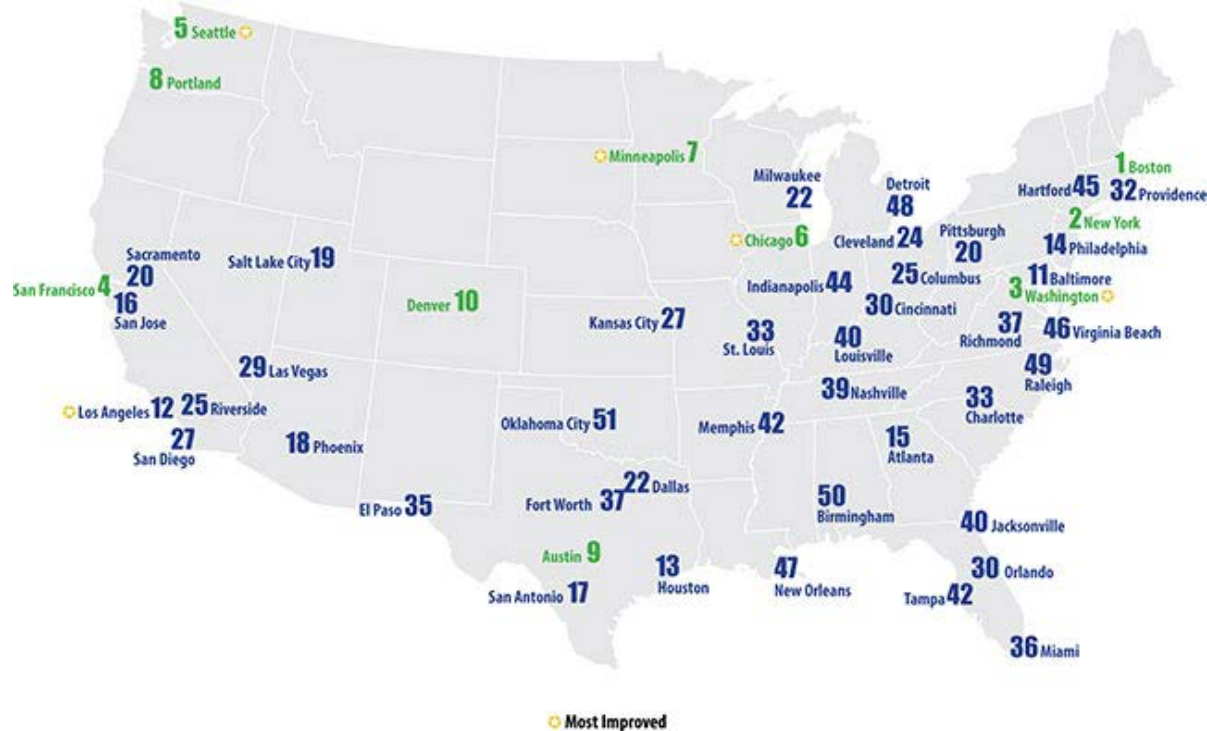
Enterprise Green Communities



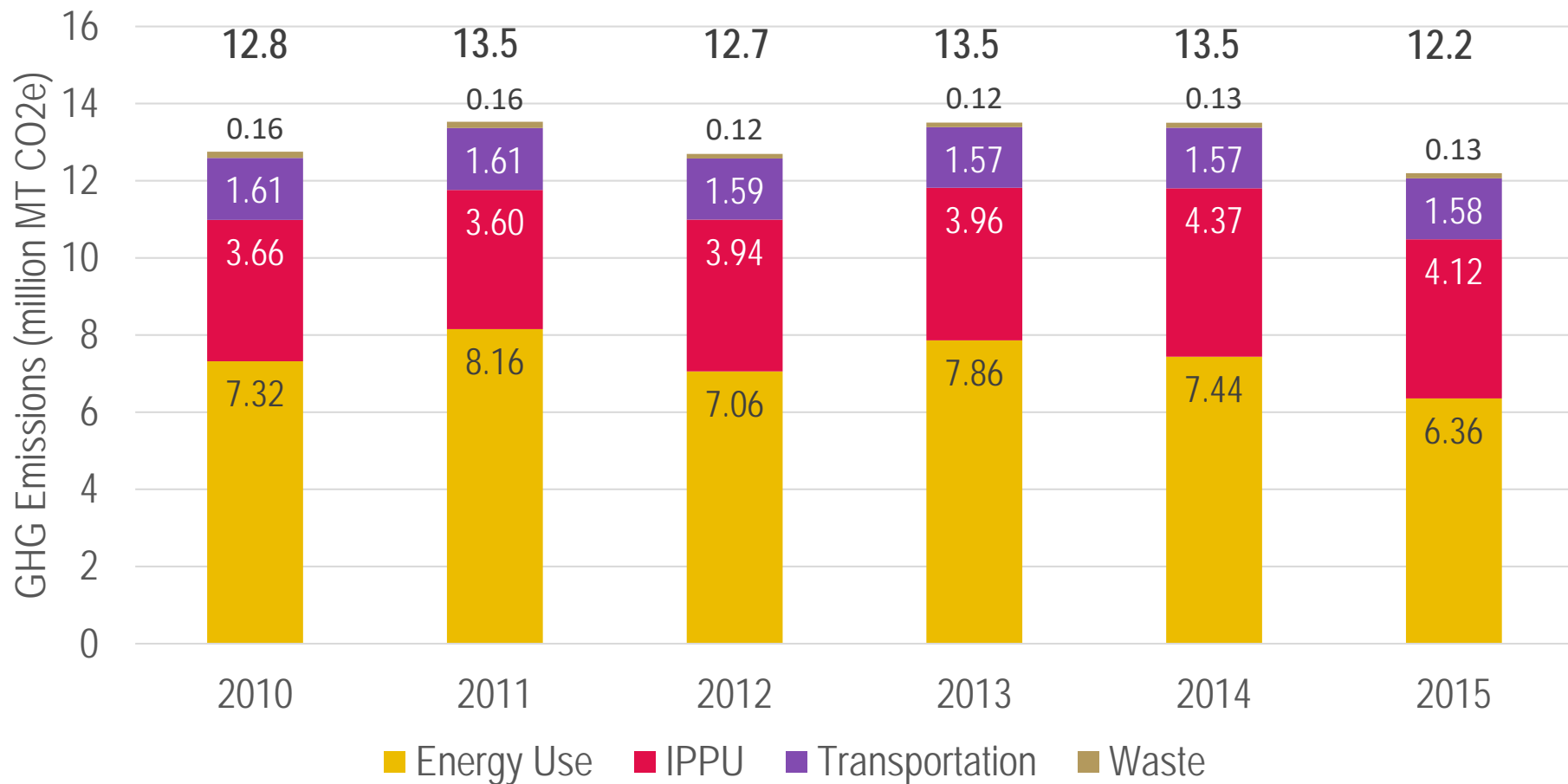
Green Buildings and Energy Efficiency



Green Buildings and Energy Efficiency



Cleveland's Carbon Footprint



SUSTAINABLE CLEVELAND MUNICIPAL ACTION PLAN

EXECUTIVE SUMMARY

October 2013



CITY OF CLEVELAND
Mayor Frank G. Jackson



**SUSTAINABLE
CLEVELAND 2019**

5 Focus Areas - 25 Actions

20% reduction in GHG emissions by 2020 (45% by 2030)

Goals	Actions	Descriptions	Leads
Design, Construction, and Maintenance			
Goal 1: Sustainable Building policy implemented across all departments <ul style="list-style-type: none"> 2013: LEED Silver for New Construction and Major Renovations 2016: LEED Gold 2020: BBC goals 2030: Cleveland 2030 District targets 	DCM-1: Green Building for New Construction and Major Renovations	Adopt and implement a Sustainable Building Policy.	Capital Projects, DPM, Sustainability
	DCM-2: Capital Improvement Project Sustainability Review	Incorporate sustainability and a systems thinking approach into the planning, decision-making, and design process for capital improvement projects, expanding upon the City's current efforts in sustainable building.	Capital Projects, Operations, Sustainability
	DCM-3: Preventative Maintenance	Establish a City-wide preventative maintenance program to better evaluate replacement/maintenance options.	DPM, Enterprise Funds

Goals	Actions	Descriptions	Leads
Energy			
Goal 1: Total energy reduction below 2010 baseline <ul style="list-style-type: none"> 2016: 5% 2020: 10% 2030: 20% Goal 2: Building energy reduction below 2010 baseline <ul style="list-style-type: none"> 2016: 10% 2020: 20% 2030: 50% Goal 3: Percent of City total energy use by on-site renewable energy <ul style="list-style-type: none"> 2016: 1% 2020: 2% 2030: 5% Goal 4: Meet CPP's Advanced Energy Portfolio Standard (AEPS) goals <ul style="list-style-type: none"> 2015: 15% 2020: 20% 2025: 25% 	E-1: Energy Efficiency in Existing Buildings	Significantly reduce energy consumption, demand and cost across all City departments through energy efficiency.	Sustainability, DPU, DPC, DPW, Finance
	E-2: Energy Conservation in Existing Buildings	Reduce energy use in City buildings through no- and low-cost conservation measures.	Sustainability
	E-3: Building Automation System	Install new Building Automation Systems (BAS) for City buildings with high energy use or complex systems, and fully utilize existing systems.	Div. of Architecture, DPM
	E-4: Re-Commissioning Tune-Up	Establish a building re-commissioning and tune-up program.	DPM
	E-5: Cleveland Division of Water (CWD) System Pumping and Treatment Optimization	Finalize and implement an Energy Management Plan to reduce energy consumption and costs for CWD.	CWD Energy Task Force
	E-6: Streetlight Upgrades	Replace streetlights with LED lights, thereby saving the City money through reduced energy and maintenance costs.	CPP
	E-7: Renewable Energy	Install a variety of renewable energy systems at City facilities and on City lands.	Sustainability, DPU, DPC, DPW
	E-8: Cleveland Public Power's Advanced Energy Portfolio Standard	Increase the amount of advanced and renewable energy in the electricity supply portfolio that serves City facilities.	CPP
	E-9: Smart Savings	Maximize cost savings for the City by utilizing various strategies, including energy demand curtailment, utility bill analysis, rate negotiation, etc.	Sustainability, DPU, DPW

LED Streetlights



Sodium Vapor and LED Pilot Streetlights comparison – Cleveland Public Power/City of Cleveland

Benefits: Efficiency, Cost and GHG Savings

Non-Energy Benefits: Outages monitoring & Overall safety

Sustainable Municipal Building Policy

“The City of Cleveland shall incorporate green building practices into the **siting, design, construction, remodeling, repair, maintenance, operation, and deconstruction** of all City facilities.”

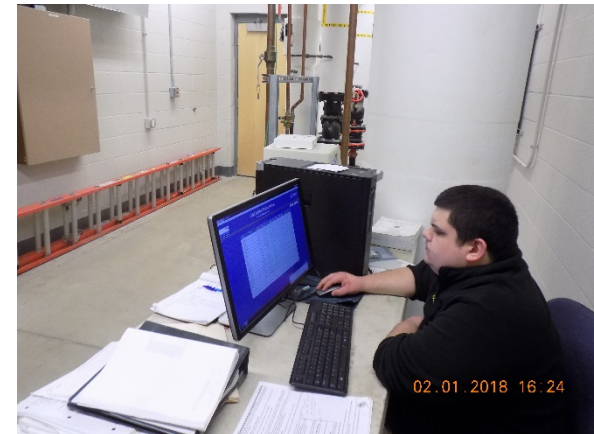
- **New Construction and Major Renovations:** LEED Silver Certification minimum + energy requirements.
- **Tenant and Leased Spaces:** Preference for certification under ENERGY STAR, LEED, and/or an equivalent standard.
- **“Fix it First” Projects:** Capital repairs to City facilities will use Energy Star and Water Sense products...

Collinwood Recreation Center (2011) – LEED Gold Certified



Non-Energy Benefits: Occupant Comfort, Better Lighting, More Productive, Longer Equipment Life

3rd District Police Headquarters (2015) – Built to LEED Certified standards; Importance of ongoing maintenance





PERSPECTIVE



NORTH ELEVATION



New City of Cleveland Kennel

David Greene, President/Owner

Project Manager



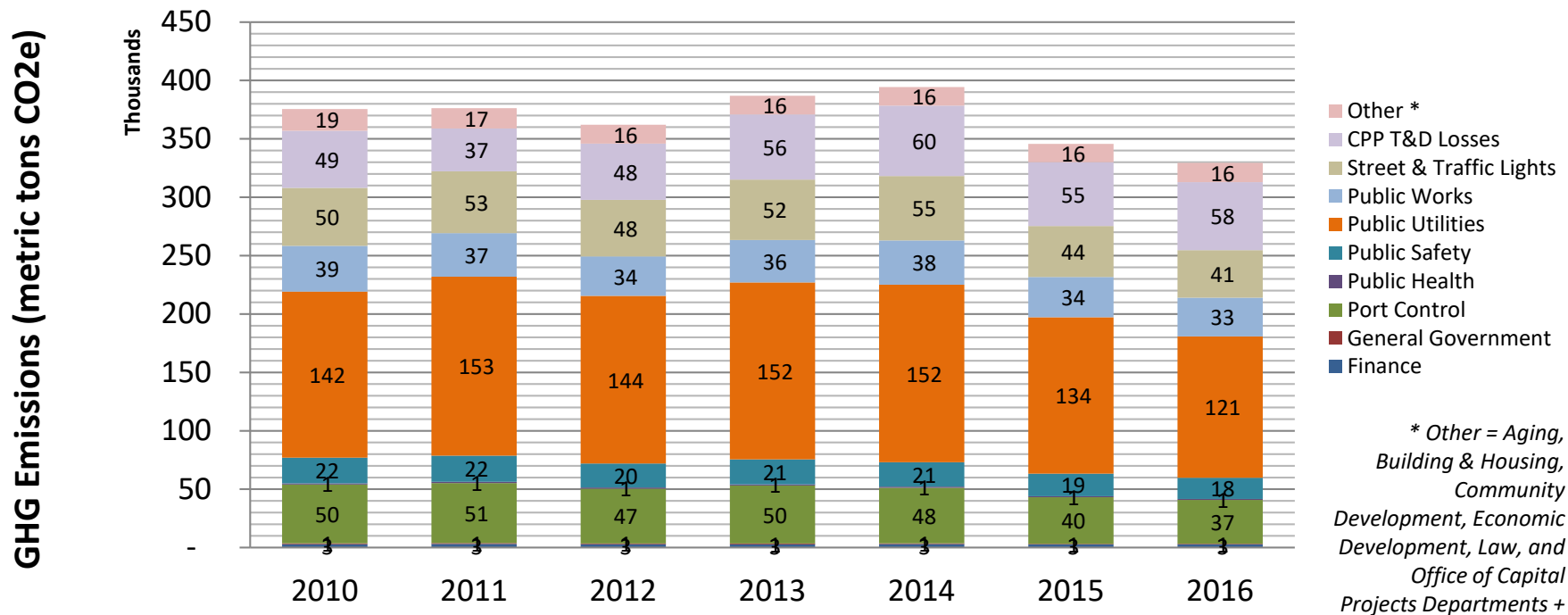
New City of Cleveland Kennel – Late 2018 open

Goal: LEED Silver (v3)

Occupant comfort includes animals



Annual GHG Emissions by Department, 2010-2016 (DRAFT)



(PENDING VALIDATION): Annual emissions have decreased from 375,570 MTCO₂e (**revised**) in 2010 to 329,360 MTCO₂e in 2016 (**12% reduction**)

Thank you!

Anand Natarajan

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A wide-angle photograph of the Cleveland skyline under a clear blue sky. In the foreground, a green lawn and a body of water (Lake Erie) are visible. The skyline features several prominent buildings, including the modern, white, angular Cleveland Museum of Art in the center, and the tall, dark, glass skyscraper of the Key Tower to the right. Other buildings of various architectural styles fill the rest of the skyline.

Sustainable Cleveland

Together, We're Building a Thriving Green City on a Blue Lake