



BUILDING ENERGY AND WATER EFFICIENCY STRATEGY

Policy Compliance and Impact Report
2018-2019



GREEN WORKS
ORLANDO





This work was funded and supported, in part, by the City Energy Project, Energy Foundation and Environmental Defense Fund. The views and opinions of authors expressed herein do not necessarily state or reflect those of these organizations.

Please cite the following document as:

Building Energy & Water Efficiency Strategy Policy Update and Compliance Report: 2018 - 2019

Organization: City of Orlando Office of Sustainability and Resilience

Address: 400 South Orange Avenue Orlando, FL 32801

Website: orlando.gov/greenworks

Contact: greenworks@orlando.gov

Authors: Brittany C. Sellers, Sandra Raymond, Benjamin Stacey, Chris Castro, Christa Philips

Graphic Designer: Erin Geib

TABLE OF CONTENTS

- FORWARD 7**
- EXECUTIVE SUMMARY 8**
- POLICY BACKGROUND10**
 - Policy Purpose.....10**
 - The Problem10
 - The Solution 11
 - The Pathway Forward in Orlando 11
 - Policy Development 12**
 - City Energy Project..... 12
 - Impact Study..... 13
 - Stakeholder Engagement..... 15
 - Policy Passage..... 16
- POLICY OVERVIEW..... 17**
 - Policy Requirements 17**
 - Policy Elements..... 18**
 - Benchmarking 18
 - Transparency.....20
 - Energy and Water Audits..... 21
 - Retro-Commissioning 23
 - Other Policy Details.....24**
 - Designated Benchmarker.....24
 - Data Quality.....24
 - Penalty for Non-Compliance24
 - Exemptions.....24
- SUCCESSES TO DATE 25**
 - Lead by Example..... 25

New Municipal Buildings are LEED Silver or Above.....	25
Energy Efficiency in Municipal Operations.....	25
Advanced BEWES Policy Requirements for Municipal Buildings	26
Engage Stakeholders and Develop Key Partnerships	27
Central Florida Battle of the Buildings.....	27
Clean Energy and Green Buildings Sub-Committee.....	28
Reduce Barriers and Enable Information	29
ENERGY STAR Training Workshops	29
Utility Developing Whole Building Data Aggregation	30
Utility Program Outreach.....	30
Spur Market Transformation.....	31
Workforce Development and Training Programs.....	31
Policy Support Resources Development.....	33
Policy Help Desk.....	33
POLICY COMPLIANCE REVIEW	34
Orlando Building ID.....	34
BEWES Analytics Tool.....	34
Compliance Trends	34
Key Terms for Energy Metrics	35
2017: Public Building Compliance and Preparation for Private Building Compliance	36
2017 Policy Compliance Timeline.....	36
2018: Private Building Compliance and Public Building Transparency.....	37
2018 Policy Compliance Timeline.....	37
2018 Policy Correspondence and Support.....	38
2018 Compliance Rates.....	39
2018 Performance Indicators.....	41
2018 Greenhouse Gas (GHG) Emissions from Reported Buildings.....	43
2018 Data Quality Overview.....	44
2019: Private Building Transparency and Second Year of Community-Wide Reporting.....	46
2019 Policy Compliance Timeline.....	46
2019 Compliance and Performance Indicators.....	48

2019 Policy Correspondence and Support.....	48
2019 Compliance Rates.....	48
2019 Performance Indicators.....	50
2019 Greenhouse Gas (GHG) Emissions from Reported Buildings.....	52
2019 Data Quality Overview	53
Policy Impact to Date.....	54
Increased Policy Correspondence and Targeted Support	54
Increased Compliance.....	55
Concurrent Trends Across Performance Indicators.....	56
Reduced Greenhouse Gas Emissions.....	56
Improved Data Quality	57
FUTURE RECOMMENDATIONS AND NEXT STEPS	58
Looking Ahead	58
2020: The Third Year of Community-Wide Compliance.....	58
Expanding Educational Opportunities and Outreach.....	58
Considering Best Practices from Leading Cities.....	59
Outsourcing Help Desk Assistance	59
Expanded Policy Requirements.....	60
Building Performance Standard	61
CONCLUDING REMARKS	62
PARTNERS AND SUPPORTING ORGANIZATIONS	63



GREEN WORKS ORLANDO GOALS BY 2040



Reduce city-wide energy use intensity by 20%



Reduce greenhouse gas emissions by 90%



Ensure 100% of new construction are green buildings



Ensure 100% of electricity is from renewable energy (by 2050)



FORWARD

This document serves as the first official update and compliance report for the City of Orlando’s Building Energy & Water Efficiency Strategy (BEWES). The scope of this document includes the initial recommendation of this policy by the Green Works Task Force in the city’s Community Sustainability Action Plan in 2013, from the city’s selection to participate and receive funding from the City Energy Project in early 2014, to stakeholder engagement throughout policy development and passage in December 2016, and into the first three years of policy implementation from 2017 – 2019.

In addition to providing a comprehensive background on the policy, the Building Energy & Water Efficiency Strategy Policy Compliance and Impact Report is intended to provide an update on the status of the policy and the current compliance and performance trends in order to inform internal and external stakeholder decision-making regarding the current progress of the policy and its role in achieving the climate and sustainability goals related to Green Buildings in the City of Orlando.



EXECUTIVE SUMMARY

Purpose

During the creation of the city's first Community Sustainability Action Plan in 2013, the Green Works Task Force recommended that the City of Orlando pursue a comprehensive building policy that aligned with best practices from other forward-thinking cities like New York, Boston, and Seattle, in order to meet its city-wide goals of reducing electricity consumption by 20% and decreasing greenhouse gas (GHG) emissions by 90% by 2040.

Policy Elements

To effectively address the ongoing problem of building inefficiencies and ensure that these goals will be met, the Task Force specifically recommended building benchmarking and reporting using ENERGY STAR Portfolio Manager, public disclosure of building performance, as well as audits and retro-commissioning for lower-performing buildings.

Successes to Date

In addition to meeting the goals set forth in the Community Sustainability Action Plan, the city's development of the Building Energy and Water Efficiency Strategy (BEWES) policy was also driven by several core principles: leading by example, engaging stakeholders, developing key partnerships, and spurring market transformation. The city has demonstrated alignment with these - including adopting more stringent energy performance requirements for city-owned buildings, creating a diverse Clean Energy and Green Buildings Subcommittee, and developing educational and workforce development programs - throughout the process of policy development, policy passage, and into the first two years of policy implementation from 2017 - 2019.

Policy Trends

In order to accurately assess the community-wide involvement and impacts of the policy thus far, the BEWES Analytics Tool was created. By utilizing the recommended metrics for building performance, key policy indicators, and resulting effects, the Tool yielded the following key findings:

- The Help Desk experienced a nearly 150% increase in inquiries in 2019, providing support through 1,440 total calls and emails, as compared to 600 inquiries the year prior.
- The compliance rate increased from 39.8% to 46.2% between the first two years of the policy, despite a larger covered building stock.
- Benchmarking data indicated that building age was not correlated with building performance; the majority of buildings that reported perform better than their peers according to national energy use intensity averages and ENERGY STAR scores; and that building performance trends varied across building use type.
- Greenhouse gas emissions decreased between the first and second year of reporting, despite an increase in the number of buildings and gross floor area reported.
- There were substantial improvements to data quality between these years, with the vast majority of building submissions achieving the status of ‘fully complied’ in the second year of the policy.

Next Steps and Future Recommendations

Based on the analysis of the 2018 and 2019 benchmarked building set, the city offers the following recommendations for future applications and analyses of the benchmarking data:

1. Continue supporting and potentially expand a policy help desk that meets the evolving support needs demonstrated by the building owner community, as well as improving data quality, analyzing benchmarking data to understand trends in city-wide consumption over time, and tracking progress toward carbon reduction targets and other policy goals.
2. Continue providing free training and technical assistance to building owners and managers to learn about ways to enhance building performance and support them in achieving compliance for the BEWES policy.
3. Continue exploring strategies to improve building performance across the city. Use building benchmarking data to better understand the efficacy and impacts of codes and standards and evaluate new performance or outcome-based building codes.



POLICY BACKGROUND

POLICY PURPOSE

The Problem

In the City of Orlando, our largest buildings - those over 50,000 square feet - represent less than 5% of all commercial buildings but use more than half of our city-wide energy and water resources and are the single largest contributor to air pollution. As our community continues to grow - currently at a rate of 2% per year - the effects on public health, the local economy, and the environment, would also likely continue to increase if left unchecked.

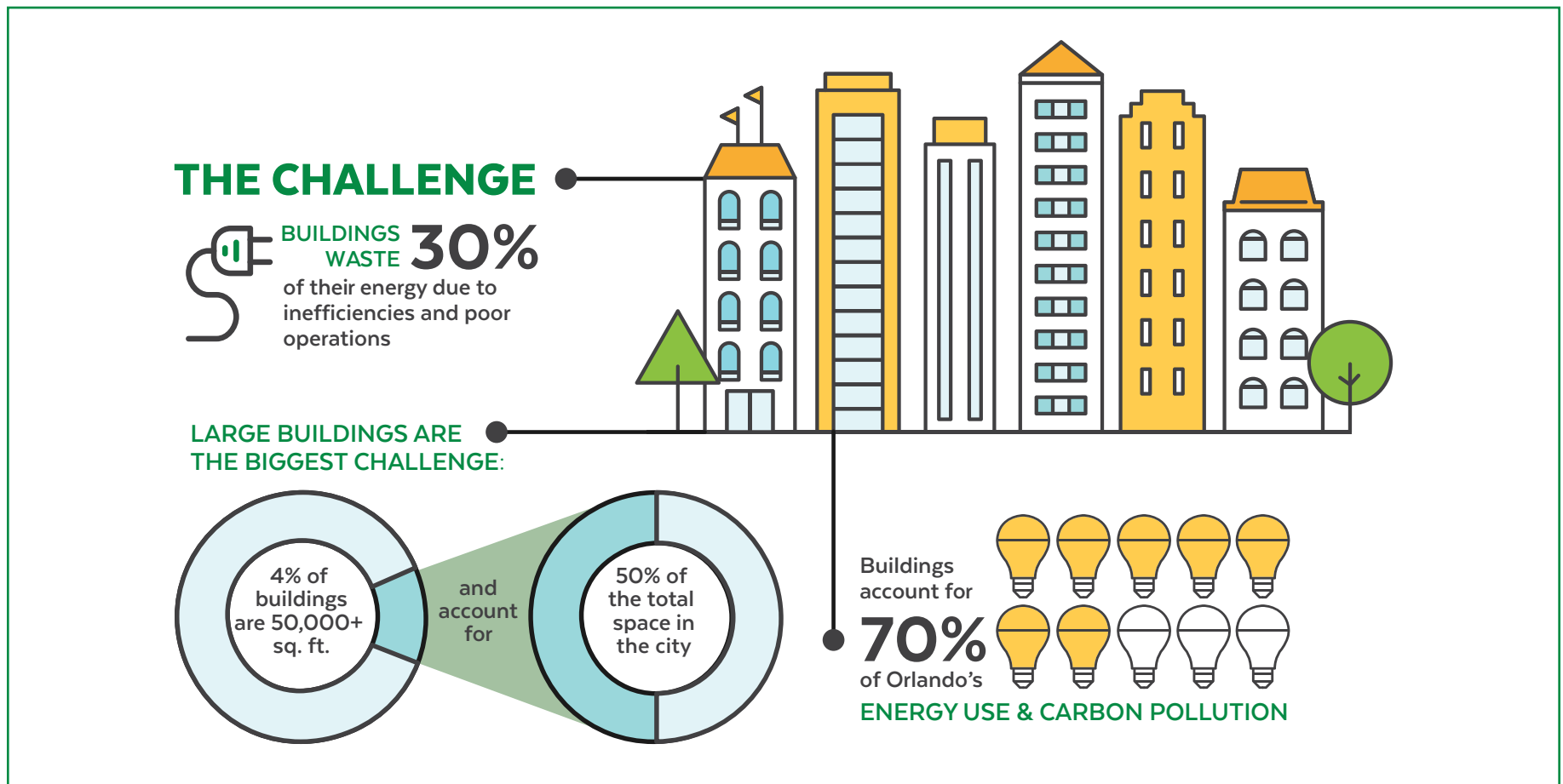


Figure 1. Energy use and resulting emissions from inefficiencies in large buildings in Orlando.

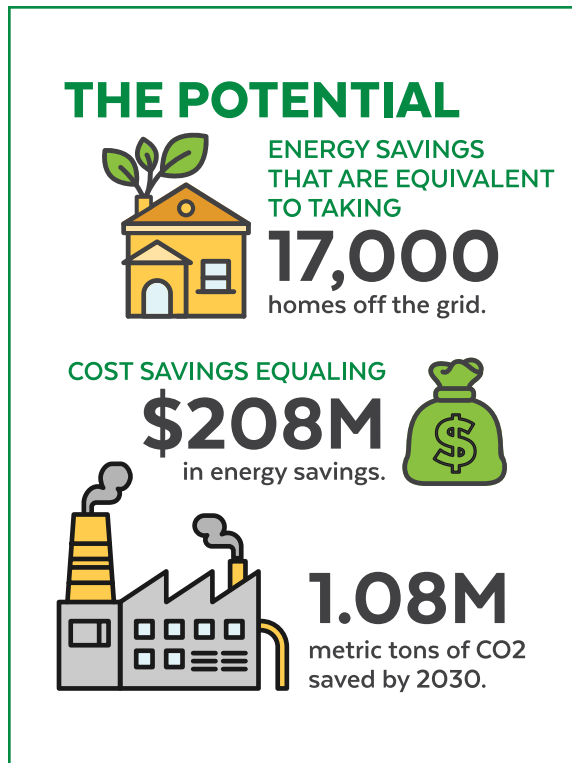


Figure 2. Potential energy savings resulting from benchmarking policy calculated in policy impact study for Orlando.

The Solution

With improved efficiency, these buildings can recover nearly 30% of energy that is often wasted through inefficiencies and outdated technologies. The first step toward identifying these opportunities is for building owners and operators to measure, ‘or benchmark,’ a given building’s current performance. By benchmarking current performance, it allows the building owner/operator to gain the knowledge they need to make decisions that can increase operational efficiencies, create cost savings, and invest in our city’s overall future.

The Pathway Forward in Orlando

During the creation of the city’s first [Community Sustainability Action Plan in 2013](#), the Green Works Orlando Task Force recommended that the City of Orlando pursue a city-wide goal to reduce greenhouse gas (GHG) emissions by 90% by 2040, as compared to 2007 levels. Key pathways to meet this goal include the targets to reduce electricity consumption by 20% through energy efficiency and meet 100% of the city’s required energy through renewable sources.

In order to effectively address the ongoing problem of building inefficiencies and meet these goals, the Task Force specifically recommended that the city adopt a comprehensive building policy that aligned with best practices from other forward-thinking cities like New York, Boston, and Seattle. The suggested policy would include building benchmarking and reporting, the public disclosure of building performance, as well as audits and retro-commissioning for lower-performing buildings. By making this information transparent, stakeholders, such as tenants and potential owners, could gain further insights into the investments they are making when deciding where to live and work. Additionally, the reports provided by auditing and retro-commissioning would provide an overview of further detailed and actionable information that can be used when considering and prioritizing potential improvements to a property’s base building systems.

THE SOLUTION



Enable information about building energy use through energy benchmarking and energy audits



Enable energy financing tools, such as Property Assessed Clean Energy (PACE)



Develop workforce training programs for building operators



Unlock new incentives and rebates

POLICY DEVELOPMENT

City Energy Project

In January 2014, the City of Orlando was selected as one of the first ten cities to take part in the [City Energy Project](#), a national initiative focused on developing policies and programs that drive energy efficiency, spur economic development and reduce pollution.

This partnership provided staff funding, technical expertise, and a peer-sharing network, which allowed the City of Orlando to pursue the recommendation outlined in the city's [Community Sustainability Action Plan \(2013\)](#) to adopt a building energy benchmarking policy.

As of November 2020, more than 30 municipalities and three states have adopted some form of [benchmarking and transparency policy](#), many of which include audits, retro-commissioning, or taking additional actions to improve building efficiency.

In addition to the City Energy Project funding, further staff assistance was provided by the [Environmental Defense Fund's Climate Corps Fellow program](#). This work included the creation of a data verification and compliance trends analysis tool that is used in reviewing data submitted in compliance with the policy and described in the compliance section of this report.

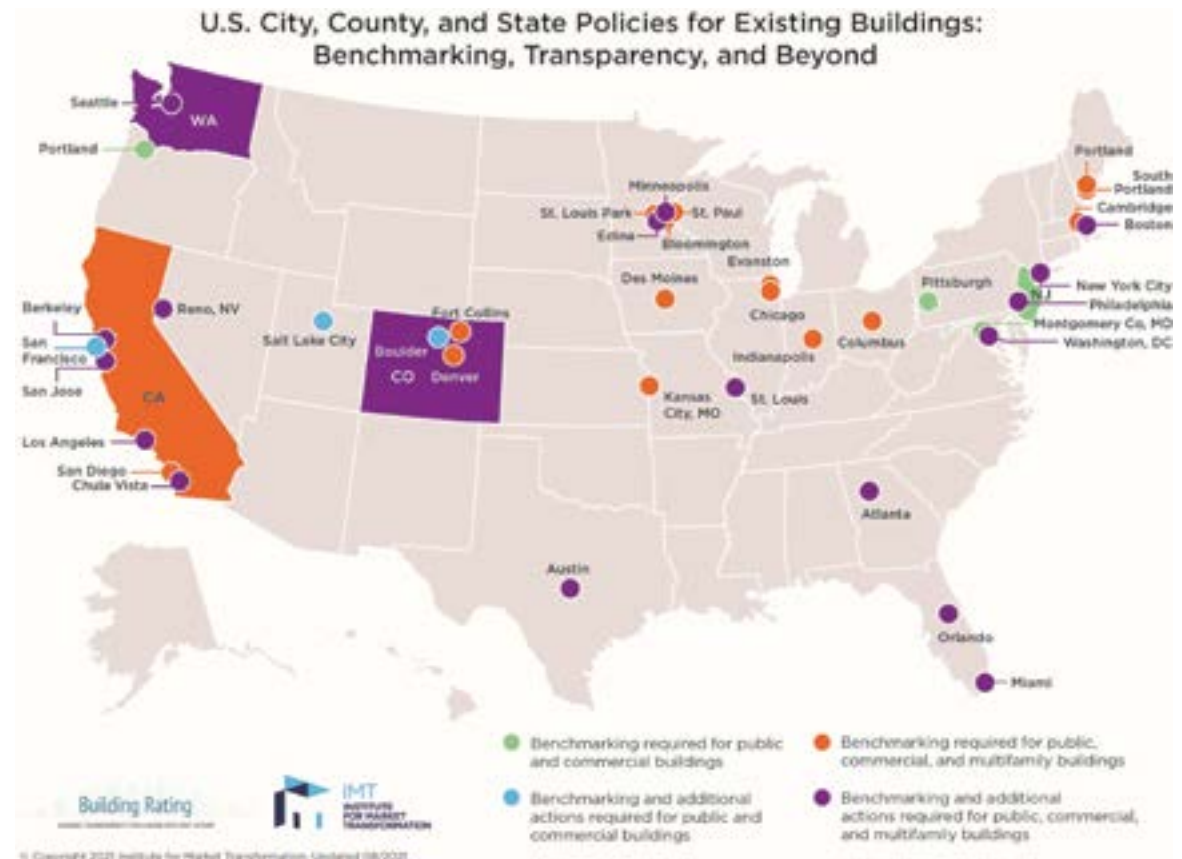


Figure 3. U.S. cities with existing benchmarking policies.
Source: Institute for Market Transformation.

Impact Study

In order to quantify the costs and benefits to implementing this specific type of benchmarking policy in the City of Orlando, the city contracted [GreenLink](#) to perform a third-party policy impact study. [The study](#) showed that this policy would result in significant reductions on utility expenditures and water use, as well positive effects on air quality, public health, and job creation.

IMPACT OF THE CITY ENERGY PROJECT BY 2030

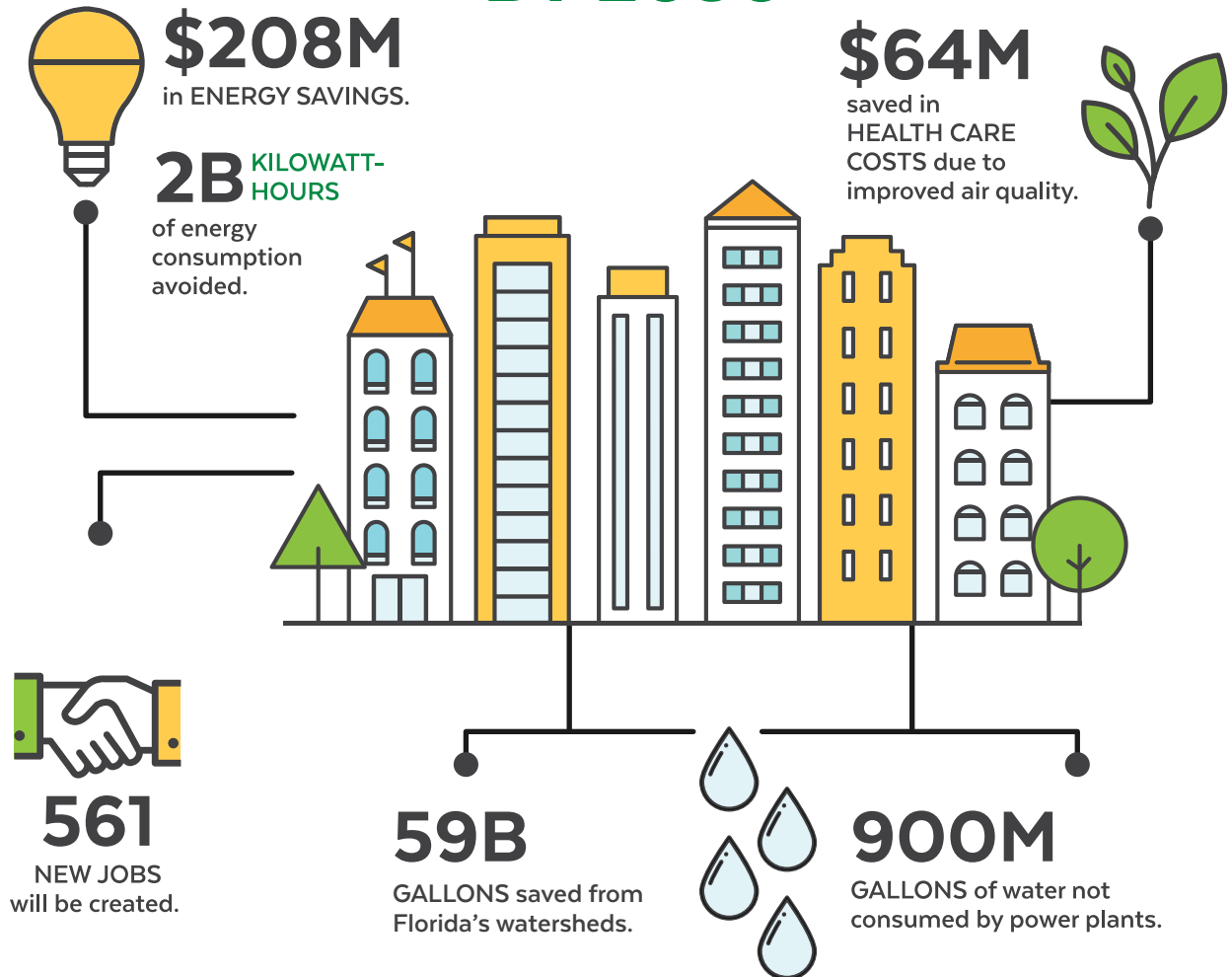


Figure 4. Orlando benchmarking policy benefits identified by 2030 in policy impact study.



BETWEEN 2015 AND 2030 THIS POLICY WILL:



SAVE MONEY AND IMPROVE COMFORT

This policy will save an estimated **\$208 million** in energy costs over the next 15 years. Enhancements to building energy efficiency will also result in improved comfort and productivity at home and in the workplace.



INCREASE JOB CREATION and ECONOMIC DEVELOPMENT

Improvements to energy efficiency spurs economic investment through reduced operating costs, increased asset values and improved worker productivity. In addition to benefitting existing positions, this policy will drive the creation of **more than 500 local high-wage jobs**.



IMPROVE AIR QUALITY AND PUBLIC HEALTH

When local buildings are more energy efficient, they consume less power, resulting in fewer emissions from power plants. With this improved air quality, we can expect **\$64 million** in reduced healthcare costs city-wide.



REDUCE WATER SUPPLY CONSTRAINTS

Electric power generation is the largest user of water, so reducing energy demand has a strong effect on preserving our limited water supply. As we face a significant impending water scarcity issue, building energy efficiency will conserve a critical **900 million gallons** of fresh water.

Stakeholder Engagement

From January 2014 through the time of policy passage in December 2016, the city held extensive engagement meetings to discuss this effort's purpose and inform the policy elements, timeline, and various stipulations. Meetings included participation across industry sectors with utility companies, trade associations, building owners, managers, operators, and labor interest groups.

350 In-Person Meetings and Presentations

10 Workshops

7 Stakeholder Roundtables

3 City Council Hearings

2 Community Summits

Throughout this process, the city held more than 350 meetings, 10 workshops, seven stakeholder roundtables, two community summits, and a three-part series of ENERGY STAR Training workshops, including data verification training to discuss the policy goals, purpose, and strategy, and develop the key elements of the ordinance.

Based on stakeholder feedback, changes were made to the size threshold of buildings covered by the policy, providing the option to select between an audit or retro-commissioning and adjusting the level of building performance that would trigger these actions, as well as modifying the form of penalty for non-compliance.



Figure 5. Mayor Dyer speaking at a stakeholder roundtable meeting regarding the benchmarking policy.



Figure 6. Stakeholders attend a policy overview meeting.

Policy Passage

In December 2016, Orlando City Council unanimously passed the Building Energy and Water Efficiency Strategy (BEWES), energy and water benchmarking, transparency, and audit/retro-commissioning policy.

GREEN WORKS ORLANDO GOALS:

- Save money for businesses and residents
- Create jobs and workforce development opportunities
- Reduce pollution and enhance public health
- Provide access to important energy information



Figure 7. City staff and stakeholders during the Orlando City Council meeting during which the policy was approved.



POLICY OVERVIEW

POLICY REQUIREMENTS

	PRIVATE BUILDINGS	MUNICIPAL BUILDINGS
Benchmarking deadline	August 1, 2018 (extended)	May 1, 2017
Building size threshold	50,000 square feet	10,000 square feet
Transparency deadline	September 1, 2019	September 1, 2018
Audit requirement	ASHRAE Level I (offered free of charge by utility)	ASHRAE Level II
Audit notification deadline	December 2020	December 2020

POLICY ELEMENTS

Starting on the extended first-year deadline of August 1, 2018 and now beginning on May 1, 2019 and every year after, buildings covered by the ordinance must comply with the policy. These properties include city-owned buildings above 10,000 gross square feet and any commercial and multifamily building above 50,000 gross square feet. The first step in this process is to perform annual energy and, optionally, water benchmarking using the free [ENERGY STAR Portfolio Manager tool](#) and then report the efficiency score to City of Orlando.

The BEWES policy has three components:

- Benchmarking
- Transparency
- Audit requirement



BENCHMARKING

Measuring building energy and water efficiency. Building owners track and report their energy and water usage annually in ENERGY STAR Portfolio Manager, a free online tool.

Benchmarking is the act of measuring and tracking performance metrics. In the building industry, benchmarking programs create standardized metrics to measure energy and water efficiency between similar buildings, just as miles-per-gallon (MPG) is used to compare a car's fuel efficiency. This helps building owners gauge performance relative to others in the marketplace, and is a proven, flexible and free first step for businesses that set them on an efficient path to save money, strengthen their brand, and stimulate the local economy.

WHAT ARE THE BENEFITS?

BUILDING OWNERS AND MANAGERS can lower their operational costs through ongoing benchmarking and are better able to compare performance between buildings to learn about cost-effective investments. Studies have found an annual savings of 2.4%, with a potential ENERGY STAR score increase of six points over a three year period.

BUYERS AND TENANTS are able to make better-informed decisions about buildings they live and work in based on energy use and estimated utility cost.

POLICYMAKERS can better identify financial incentives for segments of the market where money is most needed and track progress of achieving sustainability goals.

Benchmarking

The process of measuring and tracking energy and water use in buildings.



[ENERGY STAR Portfolio Manager](#) is a free, web-based calculator that helps organizations measure and track utilities in their buildings, providing a 1-100 score of how efficient a building operates compared to similar buildings across the nation of similar size, use type, and other characteristics. Portfolio Manager is the industry standard, and organizations have used it to measure and track the energy and water use of over 400,000 buildings across all 50 states, representing over 35 billion square feet (more than 40% of the commercial market).

Buildings that receive a 75 or above score are eligible to receive the [ENERGY STAR certification](#) and recognition from the U.S. EPA. To receive the certification, the *Statement of Energy Performance* must be verified by a registered architect or professional engineer and submitted to the U.S. EPA.



IT'S EASY TO BEGIN BENCHMARKING

- 1 Sign up online to the free ENERGY STAR Portfolio Manager (ESPM) benchmarking tool.
- 2 Add a property or building to your profile.
- 3 Collect information and data about your building's characteristics. The information collected can vary based on the various space types (i.e. Hotel, Retail, Office, etc.).
- 4 Collect at least 12 months of utility data (electric, gas, water, chilled water, etc.) for each meter associated with your building.
- 5 Enter the building characteristics and meter data into ESPM.
- 6 Verify the data you've entered into ESPM for quality assurance.
- 7 Generate and review your *Statement of Energy Performance*.
- 8 Continue benchmarking your building each month for ongoing monitoring of your performance.

Once the necessary building data has been entered into the system, the Portfolio Manager can calculate the property's energy metrics, including the [1-100 ENERGY STAR Score](#). For properties for which this information and a corresponding ENERGY STAR score is not available, its [EUI, or Energy Use Intensity](#) (kBtu/ft²), is provided.

The final step to benchmarking is submitting the property's Portfolio Manager report to the city via our unique reporting template which gives the city authorization to view the property's energy metrics. The submitted report has numerous building and energy metrics that provide more in-depth insight into the building's performance and energy efficiency.



TRANSPARENCY

Track use trends to drive improvements in building efficiency. Building owners share energy and water use data with the city utilizing the ENERGY STAR Portfolio Manager system.

Transparency

The reporting mechanism where buildings make benchmarking data available to the public.

Whereas benchmarking is an important best practice for internal building management, the accompanying public disclosure of the building’s energy performance promotes transparency and accountability. By enabling actionable information about energy and water use for tenants, businesses, investors, and lenders, the real estate marketplace can drive continuous improvement and high performance, resource-efficient buildings. Ultimately, sharing benchmarking data on a large scale opens up a conversation among all stakeholders and allows everyone to work toward common energy goals by recognizing and rewarding efficiency.



Figure 8. Mock-up example comparing the common ENERGY GUIDE label on appliances and the similar energy efficiency information that is made transparent for large buildings by the policy.

The city provided resources for building owners to improve their scores in alignment with the policy and designed a timeline that afforded one year to participate voluntarily and another year to comply without transparency before making the scores public. This time period was provided to allow building owners the opportunity to improve and address any concerns regarding their properties.

As of September 1, 2019, the city has reported the building efficiency scores in an annual report and an [online interactive visualization tool](#) displaying key building information.

Specifically, the report and transparency map include the following data:

- Descriptive information (property address, use type, and gross floor area)
- Energy output information (site and source energy use intensity, and total annual greenhouse gas emissions)
- The ENERGY STAR score, where available
- Ordinance compliance or non-compliance status (“participating,” “not participating,” “exempt,” or “voluntarily participating”)
- Optional notes regarding the property use, efficiency, occupancy or other details the building owner may wish to share

Energy and Water Audits

General assessments of the major energy- and water-consuming equipment and an inventory of systems in a building.



BUILDING AUDIT OR RETRO-COMMISSIONING

Identify and quantify opportunities to reduce energy and water use. Building owners in lower performing buildings submit a summary report that certifies an audit or retro-commissioning was completed.



Most buildings could function more effectively, as evidenced by ENERGY STAR benchmarking scores under 100. However, since buildings are as unique as people, they need to be independently analyzed to determine which improvements could most cost-effectively enhance their energy performance.

An energy audit is a detailed assessment of how a specific building can improve its performance through a review of base building systems and equipment that use energy. This includes lighting and hot water systems, HVAC units, devices that contribute to plug load and the building envelope.

Once this assessment has been conducted, building owners are provided with an audit report that captures areas where energy is being wasted, identifies capital improvements that will make the building more efficient and provides owners with actionable information on the financial impacts of the range of these improvements, including an estimate of project costs, calculated savings, and payback period.

As of December 2020, buildings that have an ENERGY STAR score below 50, the national average (or equivalent energy use intensity), will be required to perform an energy audit or choose to perform a retro-commissioning of their base building systems once every five years so that buildings can continually improve as technologies advance.

This audit requirement aims to better understand a building's performance, minimize energy waste, and maximize cost savings.



IS THERE A STANDARD AUDIT?

ASHRAE has created the industry standards for audits. ASHRAE defines three different levels of audits, ASHRAE Levels 1, 2 and 3, which increase in detail and accuracy. An ASHRAE Level 1 is a walk-through, while Level 2 is a “commercial grade” audit, and level 3 is an “investment grade” audit. Typically, the audits performed will be ASHRAE Level 2, the industry standard.

Free energy audits provided by both Duke and OUC will be eligible for compliance, meaning that there are no out-of-pocket expenses to comply with the BEWES policy.

The energy cost and greenhouse gas emissions savings identified by energy audits are typically in the range of 10 to 40 percent. However, the only way to unlock those savings is to have an expert perform the analysis and identify which measures to take. Something can be done to improve performance in almost all existing buildings.

WHAT ARE THE BENEFITS?

BUILDING OWNERS AND MANAGERS rarely conduct energy audits, which means they don’t know how much they could be saving through cost-effective upgrades. Audits show them, measure by measure, the business case for a set of optional upgrades that will bring better energy performance, increased equipment reliability, and net operating incomes. This means that building owners and managers are saving money not only through lower utility bills, but also by reducing maintenance and operating costs. These improvements can also lead to increased property value.

BUYERS AND TENANTS are able to live and work in a more comfortable environment. In energy-efficient buildings, thermostats turn off and on at the appropriate times, the lighting is more conducive to a productive work environment, and indoor air quality is better. All of these factors make energy-efficient buildings more appealing for prospective buyers and tenants.

THE ENTIRE CITY can experience increased economic development since widespread energy auditing directly creates jobs for credentialed energy auditors and indirectly creates engineering, contractor, and other skilled building professional jobs. Furthermore, the local community can benefit from reduced carbon pollution, improved outdoor air quality, and increased resilience to extreme weather effects.

Retro-Commissioning

A systematic process for optimizing the energy and water efficiency of existing base building systems through the identification and correction of deficiencies.

WHAT ARE THE BENEFITS?

BUILDING OWNERS AND MANAGERS gain improved system operation beyond preventive maintenance, extended life of equipment, increased operations and maintenance staff capabilities, and expertise on increased asset value, while experiencing fewer occupant complaints and reduced operational expenses. All of these outcomes increase the value of their asset(s).

BUYERS AND TENANTS are more comfortable, enjoy improved indoor environmental quality, and see declines in operating and pass-through costs as energy efficiency measures are implemented.

THE LOCAL COMMUNITY benefits from reductions in energy use across buildings that, as with auditing, lead to reduced carbon pollution, improved outdoor air quality, and increased resilience to extreme weather effects.

Commercial building systems frequently undergo operational adjustments and occupancy changes that hinder optimal performance over time. However, in many cases, these systems require fine-tuning rather than replacement. On average, half of the potential savings in a building come from better equipment (identified by an audit) and half result from better performance of existing systems (tuned up in retro-commissioning).

Retro-commissioning provides a study and re-tuning of mechanical, electrical, and controls systems that identify opportunities to reduce energy consumption by repairing existing equipment in a building. Depending on the age of the building, retro-commissioning can often resolve problems that occurred during design or construction, or address problems that have developed throughout the years of a building's life, ensure that systems are functioning as originally designed, and that performance is optimized.

Following this assessment, building owners are presented with the results, identifying any defects or original design variances, and an itemized list of fine-tuning options with estimates of the investment required and payback, as well as documentation and staff training.

As an alternative path to compliance, the owner of any building with performance below the national benchmark average (score of 50 or equivalent energy use intensity) may conduct a retro-commissioning exercise – rather than an audit – once every five years to help improve building performance and identify cost-effective upgrade opportunities to save money and natural resources.

OTHER POLICY DETAILS

Designated Benchmarker

One of the first steps in policy compliance is to identify who will serve as the benchmarking leader for a given property. This individual may be the building owner, a property manager, or a third-party energy consultant. This individual will need access to information on building characteristics and operations in order to obtain, enter, and verify utility use data.

The benchmarking leader should also demonstrate the ability to interpret the benchmarking results, audit summaries, and other building performance data. Qualified benchmarkers include Registered Architects (RAs), Professional Engineers licensed in the State of Florida, Certified Energy Managers (CEM), Certified Facilities Managers (CFMs), Building Energy Audits Professionals (BEAPs), Individuals with a Certificate of Proficiency of Benchmarking (CPB), Real Property Administrators (RPAs), Facilities Management Administrators (FMAs), System Maintenance Administrators (SMAs), System Maintenance Technicians (SMTs), High Performance Managers (HPMs), Certified Healthcare Facility Managers (CHFMs), Certified Plant Maintenance Managers (CPMMs), or designated staff with at least three years of professional experience performing benchmarking and energy audits on similar types of buildings, or additional credentials approved by the Director of Sustainability and Resilience.

Data Quality

Once the necessary data has been obtained and entered into ENERGY STAR Portfolio Manager, it is the responsibility of the benchmarker leader to ensure that the submission is accurate, complete, and free of errors in order to be in compliance with the policy.

Portfolio Manager provides a simple verification '[data quality checker](#)' tool that compares the building data entered, such as

energy values and property use details, with typical values for similar buildings. This verification allows the benchmarker to identify any possible typos, incorrect meter readings, missing information, faulty units of measure, and other common data entry problems or possible anomalies.

Penalty for Non-Compliance

Those who have not complied by the deadline will be notified by the city and identified as non-compliant in an annual report, as well as Orlando's [public benchmarking map](#) beginning in September 2019 and continuing every year after.

Exemptions

In certain, limited circumstances, a building that is 50,000 square feet and above may not be required to comply with the policy. Specifically, benchmarking is not required if any of the following criteria apply to a given building:

- It meets any of the exemptions defined for a covered city property
- The Director of Sustainability and Resilience determines that, due to special circumstances unique to the facility and not based on a condition caused by actions of the applicant, strict compliance with provisions of this ordinance would cause undue hardship
- The property qualifies as having a financial hardship
- The property is considered "industry," "manufacturing" or is part of a theme park attraction
- Substantially all of the non-city property is used for telecommunications infrastructure.
- More than three meters are associated with the property and:
 - » The electric utility does not provide whole-building data aggregation services
 - » The owner doesn't have access to master meters or any other means

SUCCESSSES TO DATE



Figure 9. LEED Certified Amway Center



Figure 10. OFD 1 Fire Station

In addition to meeting the goals set forth in the Community Sustainability Action Plan, the city's development of this policy was driven by several core principles: leading by example, engaging stakeholders, developing key partnerships, and spurring market transformation. Over the last several years, the city has demonstrated numerous successes in alignment with each area.

LEAD BY EXAMPLE

New Municipal Buildings Are LEED Silver or Above

Since 2012, the city has required that all [new municipal construction](#) projects meet the criteria and become certified as a [Leadership in Energy and Environmental Design \(LEED\)](#) 'Silver' property or higher. Buildings that meet these standards include the Amway Center (Gold), Geico Garage (Gold), Dr. Phillips Performing Arts Center (Silver), several fire stations, the permitting services building, and more.

Energy Efficiency in Municipal Operations

The City of Orlando is a participant in the [U.S. Department of Energy's Better Buildings Challenge](#), joining hundreds of organizations in committing to reduce energy use across its portfolio by at least 20% over 10 years. As a partner in this effort, the city verifies its annual progress with the Department of Energy and identifies replicable models and solutions for other organizations to follow.

To meet these energy reduction goals, the city utilized a municipal bond to make an \$18 million energy efficiency investment in public buildings. Through benchmarking, the City of Orlando identified buildings with a high energy use intensity (EUI), completed ASHRAE Level II Energy Audits and completed deep energy retrofits on more than 55 municipal buildings.

With savings tracking near \$2.5 million each year, this bond operates as a revolving energy fund that is utilized to pay down bond debt, fund future energy efficiency investments, and may be applied toward community programs and other projects, such as paying for half the cost of the new LEED certified police headquarters.

Advanced BEWES Policy Requirements for Municipal Buildings

To further demonstrate our leadership, the City of Orlando’s municipal building compliance requirements are more aggressive than those for private buildings. The city’s internal requirements include buildings of a much lower size threshold and took effect one year earlier than the private building requirement.



Figure 11. Lucid BuildingOS dashboard used for tracking energy performance across city buildings.

ENGAGE STAKEHOLDERS AND DEVELOP KEY PARTNERSHIPS

Central Florida Battle of the Buildings

The City of Orlando is a founding member of the Central Florida Energy-Efficiency Alliance, a committee of the U.S. Green Building Council of Florida and an alliance of local governments, academic institutions, utilities, professional organizations, and private entities committed to advancing sustainable business practices focused on energy and water efficiency throughout the Central Florida region. Over the last decade, CFEEA has led numerous outreach and engagement efforts with the building community including educational programming and launching the award-winning regional energy-saving competition, the Kilowatt Crackdown, originally held in 2011.

In May 2017, one year before the first BEWES compliance deadline, the City of Orlando partnered with the U.S. Environmental Protection Agency (EPA) ENERGY STAR Program and several other local organizations through CFEEA, to launch an updated version of the voluntary competition, called the Central Florida Battle of the Buildings.

This friendly, six-month, no-cost competition was designed to help commercial and multifamily building owners and managers become familiar with benchmarking in ENERGY STAR Portfolio Manager and explore pathways to potentially reduce energy, water, and even waste consumption at their facility. Participants were provided with helpful resources from the EPA, several in-person trainings, a series of webinars created specifically for the competition, and the opportunity to consult with a student energy specialist to assist with data entry, benchmarking, and competition logistics.

Over 250 buildings participated across Orange, Seminole, Volusia, Osceola, and Polk Counties and represented all major building sectors of various sizes. Winners were awarded at the USGBC Florida annual banquet, with distinctions for most efficient buildings across each sector and size, as well as most improved and most innovative. Additionally, all of those involved received recognition amongst peers and local governments and a certificate of participation directly from the U.S. EPA.



Figure 12. Mayor Dyer speaking at the launch event for the Central Florida Battle of the Buildings.



Figure 13. Central Florida Battle of the Building registration flyer.

Clean Energy and Green Buildings Sub-Committee

As discussed throughout policy development, the implementation of this policy was to be informed by a group of community stakeholders. These stakeholders would meet regularly to discuss and provide recommendations for current and upcoming policies and programs related to Clean Energy and Green Buildings (as one of seven focus areas specified within the Green Works Orlando Community Sustainability Action Plan).

The diverse group of stakeholders includes representation from the following sectors:

- Commercial Office: Building Owners and Managers Association (BOMA)
- Hospitality: Central Florida Hotel and Lodging Association (CFHLA)
- Multifamily: Apartment Association of Greater Orlando (AAGO)
- Industrial Warehouse: National Association of Industrial and Office Parks (NAIOP)
- Retail: International Council of Shopping Centers (ICSC)
- Healthcare/Hospitals: Florida Hospital
- Academia: UCF Florida Solar and Energy Center (FSEC)
- Developers: Urban Land Institute (ULI)
- Green Builders: U.S. Green Building Council (USGBC)
- Facilities Managers: International Facility Management Association (IFMA)
- Architects: American Institute of Architecture (AIA)
- Utility: Orlando Utilities Commission (OUC)
- Engineering: American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Energy Engineering: Association of Energy Engineers (AEE)

Sub-committee members committed to attend the meetings and provide input for policy and program development and implementation. With representation from a broad group of active local organizations, the sub-committee aids in identifying further resources and support in the community, and shares ideas and productive insight to make these initiatives a success. The valuable feedback received from these meetings assists the city in effective resource development, outreach and education plans, and compliance support.

The sub-committee kickoff meeting was held on April 12, 2018 and was followed by subsequent meetings in August 2018 and December 2019, during which time the sub-committee - led by the city staff - reviewed the first two years of the policy in terms of compliance, quality of submissions, outreach strategy, and training opportunities. During a meeting in August 2020, members also discussed the upcoming audit requirement and exemption qualifications.

REDUCE BARRIERS AND ENABLE INFORMATION



ENERGY STAR Training Workshops

To increase knowledge and awareness of building benchmarking, the City of Orlando, in partnership with the U.S. Green Building Council's Florida Chapter, has hosted a series of ENERGY STAR Portfolio Manager 101 training workshops over the last three years. By partnering with local organizations, such as Building Owners and Managers Association (BOMA), Apartment Association of Greater Orlando, International Facility Managers Association (IFMA), American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), and Central Florida Hotel and Lodging Association, these tri-annual workshops have provided training to more than 300 building operators in Central Florida.

These four-hour courses have covered a number of topics, including:

- Basics of energy benchmarking
- Obtaining the verification and statement of energy performance reports from Portfolio Manager
- ENERGY STAR certification process, including eligibility requirements and validation process
- Lighting, thermal comfort, and ventilation requirements associated with the verification reports.



Figure 14. Example building dashboard from ENERGY STAR Portfolio Manager.



Figure 15. Building owners and operators attend an ENERGY STAR training course hosted in conjunction with USGBC of Florida, OUC, and the City of Orlando in support of the policy.

Enabling PACE Financing

In March 2016, the City of Orlando's City Council unanimously approved a resolution to establish [Property Assessed Clean Energy \(PACE\)](#) financing to remove the barriers of high upfront costs and provide low-interest financing for home and business owners. This program was passed to expand the financing options available to building owners for improvements, including those identified through benchmarking or audits in accordance with the policy.

In the first three years of operation in the City of Orlando, PACE financing was utilized for nearly 200 projects, totaling more than \$4 million in improvements, including energy and water efficiency, climate resiliency, and solar panel installation for local buildings.

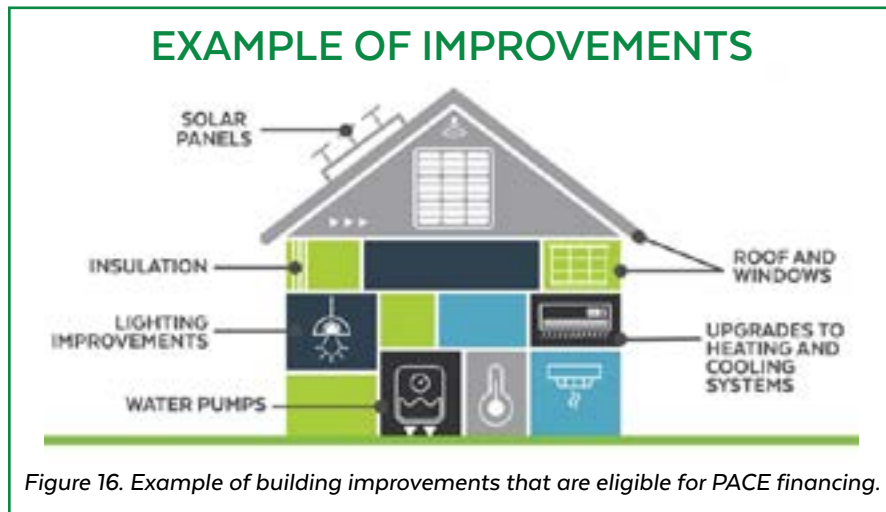


Figure 16. Example of building improvements that are eligible for PACE financing.

Utility Developing Whole Building Data Aggregation

Through ongoing collaboration, OUC, Duke Energy, and Tampa Electric Company (TECO), a local natural gas utility, each provide aggregated whole-building data upon request. This service, provided to building owners and property managers, allows for a streamlined benchmarking process, particularly for buildings with many separate meters and accounts.

OUC also provides the [OUConsumption Online tool](#) as an option for building owners to analyze metered interval load data for multiple locations, compare energy usage among similar facilities, and measure the effectiveness of various energy efficiency efforts. Other data tools currently in development from OUC include a data access platform to provide energy use data for community-planning, as well as piloting a Green Button data sharing program with Orlando's Lake Nona community.



Figure 17. Policy landing page on OUC's website.

Utility Program Outreach

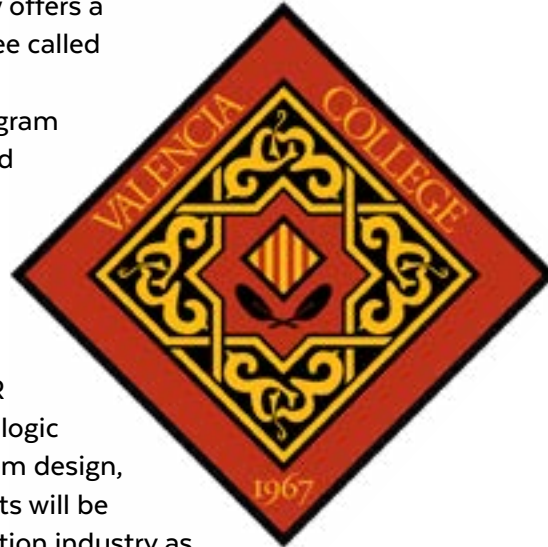
The City of Orlando has partnered with both Duke Energy and OUC throughout involvement in CFEEA and the Central Florida Battle of the Buildings, ENERGY STAR trainings, and other stakeholder engagement efforts. This ongoing collaboration has enabled extensive outreach to building owners and managers regarding existing local utility offerings for energy efficiency improvements, from free audits to commercial rebate and financing programs. Additionally, OUC has created a dedicated landing page for assisting with the [BEWES data collection and compliance process](#).

SPUR MARKET TRANSFORMATION

Workforce Development and Training Programs

The City of Orlando has collaborated with local organizations to develop several innovative programs that provide education and training to grow the local workforce of energy management professionals.

Orlando-based Valencia College now offers a two-year Associate of Sciences degree called [“Energy Management and Controls Technology”](#). This one-of-a-kind program teaches students how to manage and control a building’s electrical and mechanical systems efficiently using a broad range of current and emerging technologies. Through the program, students will develop a proficiency in HVAC/R commercial systems, control theory, logic and programming, installation, system design, and integration. Additionally, students will be trained to enter the building automation industry as skilled technicians capable of marketing, installing, designing, servicing, and troubleshooting complex commercial control systems.



The development of this program was funded by a \$900,000 grant from the National Science Foundation and upon its launch in fall 2018 was the first of its kind in Florida.

The curriculum was designed in consultation with the City of Orlando, engineering professors, and major regional employers, such as Siemens, Automated Logic, Trane, and Honeywell, each of whom are committed to hiring students enrolled in the program for internships, as well as the program’s graduates for post-degree careers.



Figure 18. Valencia College job training.

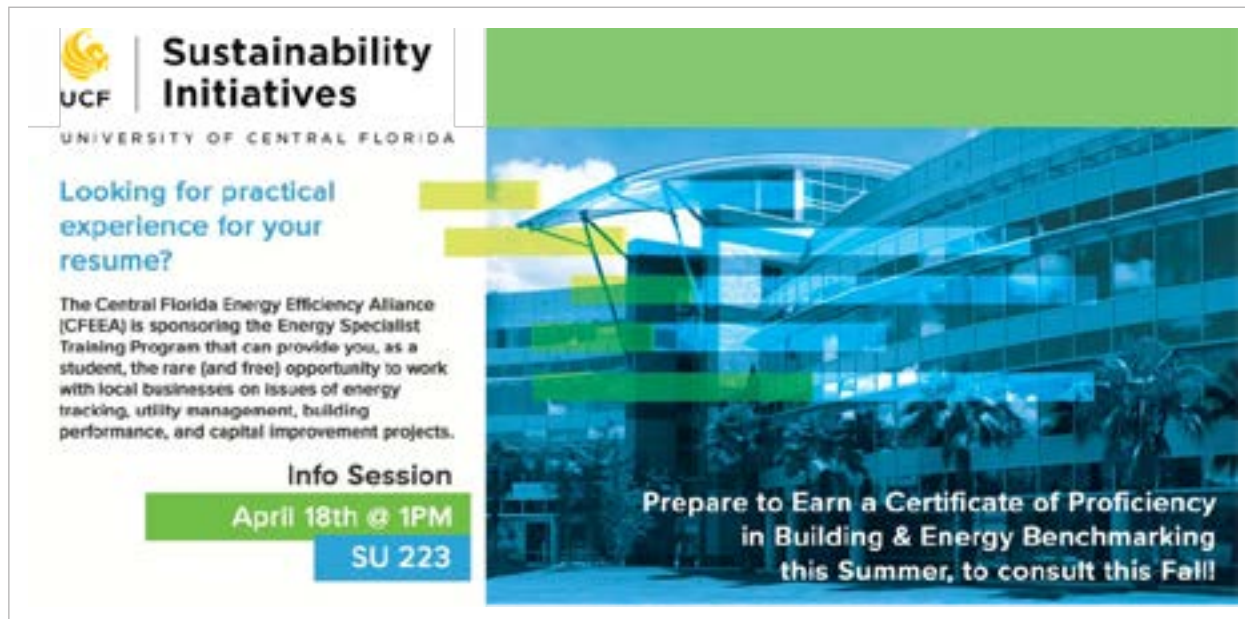


Figure 19. UCF Sustainability Initiatives posting for an Energy Specialist information session.



Figure 20. Mayor Dyer with the student Energy Specialists at the Central Florida Battle of the Buildings launch event.

In conjunction with the Central Florida Battle of the Buildings, the City of Orlando partnered with the University of Central Florida to create an Energy-Specialists-in-Training program. These twenty-five students completed a month-long curriculum in which they received full training on ENERGY STAR Portfolio Manager and a high-level overview of energy management basics.

These students were available to provide data entry, building benchmarking, site visits, and provide basic feedback and suggestions for building owners and operators who participated in the competition. In return, these students obtained valuable skills and experience, gained exposure to various organizations and sectors, and received recognition from both the University of Central Florida, CFEEA, and the City of Orlando.

Policy Support Resources Development


The City of Orlando has developed numerous resources to provide information regarding energy efficiency, the role and process of benchmarking, audits, retro-commissioning, and the purpose, goals, and estimated impacts of the policy. The [policy webpage](#) has extensive policy compliance support resources and tools available including:

- The list of buildings covered by the policy
- Building contact form
- Compliance checklist
- Numerous EPA guides and resources for using ENERGY STAR Portfolio Manager
- Policy background, elements, and frequently asked questions
- Information about free upcoming training sessions
- Benchmarking reporting link directly to ENERGY STAR Portfolio Manager

Policy Help Desk

The City of Orlando also established a dedicated BEWES Help Desk to assist building operators with their policy-related questions. Trained staff provide direct phone and email assistance to building owners and operators regarding the use of ENERGY STAR Portfolio Manager, policy compliance, exemption requests, benchmarking submission verification, and other energy efficiency inquiries.

The Help Desk staff also manages policy implementation, including building database management and updates, as well as conducting benchmarking data verification and compliance analysis. Regular policy outreach includes notification, compliance, and reminder letters, which are sent to taxpayers for the building according to the Orange County Property Appraiser and Orange County Tax Collector websites until building contact forms for the policy are submitted. The Help Desk staff also participates in a number of national working groups and peer networks to stay informed and engaged regarding benchmarking policy implementation best practices.



Benchmarking Compliance Checklist

Buildings are required to complete these steps no later than July 1st, 2020

Please visit the City of Orlando Building Efficiency Policy Website (orlando.gov/buildingefficiency) for further guidance, training sign-up, and other available resources.

1 Get Started		
<input type="checkbox"/>	Determine whether your building(s) must comply in 2020	<ul style="list-style-type: none"> Review the building list and details about which buildings are covered by the policy at orlando.gov/buildingefficiency to determine benchmarking compliance obligations. Generally, buildings 50,000 square feet and greater must benchmark (Step #2) and report (Step #3).
<input type="checkbox"/>	Identify a benchmarking leader	<ul style="list-style-type: none"> Designate a building staff member or third-party partner to be your benchmarking leader. Guidance regarding how to select the most qualified and appropriate individual for this role can be found in the FAQ section at orlando.gov/buildingefficiency
<input type="checkbox"/>	Share your contact information with us	<ul style="list-style-type: none"> Share the benchmarking leader's contact information with us by completing the online contact form at orlando.gov/buildingefficiency
2 Benchmark Your Building(s)		
<input type="checkbox"/>	Create a Portfolio Manager account and property profile(s)	<ul style="list-style-type: none"> Visit www.energystar.gov/porfoliomanager and refer to the benchmarking guides at orlando.gov/buildingefficiency You may use existing Portfolio Manager accounts and profiles.
<input type="checkbox"/>	Gather basic information required by Portfolio Manager	<ul style="list-style-type: none"> Guidance for various property types is available at: www.energystar.gov/buildings/tools-and-resources/fast-portfolio-manager-property-type-definitions-and-use-details
<input type="checkbox"/>	Obtain monthly whole-building energy and water data for January-December 2019 (all fuel types)	<ul style="list-style-type: none"> Electricity and Water*: Access 2019 electricity and water use data by contacting your utility service provider: <ul style="list-style-type: none"> Orlando Utility Commission: commercial@ouc.com or 407.423.9018. Duke Energy: billhistory@duke-energy.com or 800.700.8744. Natural gas: Access 2019 natural gas use data by viewing your Tampa Electric Company account or creating an online account at tecoaccount.com. If you need assistance, email mybusinessaccount@tecoenergy.com or call 866.832.6248.
Buildings with multiple tenants and those who are employing a third-party partner to complete benchmarking may need to complete and submit the tenant authorization forms available at orlando.gov/buildingefficiency . Your utility company will confirm whether or not this step is necessary for your specific building.		
*Note: It is strongly recommended that building water use is benchmarked, in addition to electricity and natural gas use; however, water benchmarking is not required for compliance.		
<input type="checkbox"/>	Enter property uses and details into profile(s)	<ul style="list-style-type: none"> On the DETAILS tab, use the ADD ANOTHER TYPE OF USE menu to select a property use. Click ADD and enter requested info, and repeat for additional property uses.
<input type="checkbox"/>	Enter energy use data for all fuel types	<ul style="list-style-type: none"> On the METERS tab, click ADD ANOTHER METER. Enter requested info and repeat for additional meters or fuel types.

City of Orlando • Mayor's Office of Sustainability and Resilience • 400 South Orange Avenue • Orlando, FL 32801

407.246.2534 • orlando.gov/buildingefficiency • buildingefficiency@cityoforlando.net



POLICY COMPLIANCE REVIEW



ORLANDO BUILDING ID

Like other cities with building benchmarking policies, the City of Orlando developed a unique six-digit identification number that was assigned to each building covered by the policy. This number served to differentiate each structure covered by the policy, including those that shared a parcel with other structures, structures that spanned more than one parcel, or a combination of both scenarios. The BEWES Help Desk uses this number to identify all records, correspondence, and compliance data for a given building.

BEWES ANALYTICS TOOL

The policy compliance data included in the subsequent sections of this report reflect the metrics commonly reported by cities in advanced stages of energy benchmarking ordinance implementation, such as Philadelphia, Seattle, Chicago, Denver, and others.

The following compliance results were generated using the BEWES Analytics Tool, a dashboard that was developed to provide real-time metrics for energy benchmarking compliance, data quality, and building performance for the City of Orlando. This tool provides the functionality to track, assess, and inform annual processes critical

for BEWES program operations. Compatible with the ENERGY STAR Portfolio Manager, the platform's summary reports are seamlessly integrated with the tool's dashboard.

The BEWES Analytics Tool also generates graphics that reflect up-to-date results comparing ENERGY STAR benchmarking summary outputs with the BEWES building database. These have also been included to illustrate the compliance results as well as comparative annual trends.

COMPLIANCE TRENDS

Compliance rates may be considered in terms of either total building count or gross floor area represented. The distinction between these metrics is important for considering the distribution of buildings in compliance. For example, a compliance rate that is somewhat low according to total building count, but quite high in terms of gross floor area indicates that a relatively small total number of buildings complied, but that those represented some of the largest buildings covered by the policy (e.g., those over 200,00 square feet). Conversely, a high compliance rate by total building count paired with a much-lower gross floor area covered would suggest that a high number of individual buildings complied, but that the average size of those who reported was skewed toward relatively smaller buildings included in the policy (e.g., those closer to the 50,000 square feet threshold).

KEY TERMS FOR ENERGY METRICS

ENERGY STAR Score: The ENERGY STAR score is a measure of how well your property is performing relative to similar properties, when normalized for climate and operational characteristics.

EUI: EUI stands for Energy Use Intensity. It is the energy use per square foot at a property (energy divided by square foot). EUI enables you to compare different sized buildings.

Source EUI: Source Energy Use is the total amount of raw fuel that is required to operate your property. Source EUI is divided by the property's square footage.

Site EUI: The annual amount of all the energy your property consumes on-site, regardless of the source. Site EUI is divided by the property's square footage.

Greenhouse Gas Emissions: Greenhouse Gas (GHG) Emissions are the carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) gases released into the atmosphere as a result of energy consumption at the property. GHG emissions are expressed in carbon dioxide equivalent (CO₂e), a universal unit of measure that combines the quantity and global warming potential of each greenhouse gas.

Source: U.S. Environmental Protection Agency (EPA) ENERGY STAR Portfolio Manager
(<https://portfoliomanager.energystar.gov/pm/glossary>)

2017: PUBLIC BUILDING COMPLIANCE AND PREPARATION FOR PRIVATE BUILDING COMPLIANCE

2017 Policy Compliance Timeline

In 2017, the city conducted benchmarking for its 51 municipal properties 10,000 square feet and larger, marking the first season of required compliance and reporting for the policy. The city led by example by benchmarking buildings of a significantly-lower size threshold one year prior to mandatory compliance for privately-owned buildings. This effort aligned with the city's larger initiatives for energy efficiency across public buildings, including participation in the [Better Buildings Challenge](#).



In July, the city partnered with USGBC to launch the Central Florida Battle of the Buildings voluntary competition, introducing benchmarking to the community at large and providing extensive support and educational programming, including in-person ENERGY STAR Portfolio Manager training classes, in preparation for the first year of private building compliance for the BEWES policy.

As the Battle of the Buildings competition was coming to a close in December, building owners and operators could access the list of privately-owned properties that were covered by the policy on the city's dedicated [BEWES webpage](#). This webpage also included extensive policy support resources and how-to guides, as well as policy background information, and a 'frequently asked questions' section to guide building owners throughout the entire process of compliance.



May 2017

Benchmarking scores are reported for city-owned properties in accordance with the first compliance season for public buildings.

December 2017

The privately-owned covered buildings required to comply is posted online in preparation for the 2018 compliance season.

2019

July 2017

The Central Florida Battle of the Buildings voluntary competition launches and runs through December 2017.

2018

2018: PRIVATE BUILDING COMPLIANCE AND PUBLIC BUILDING TRANSPARENCY

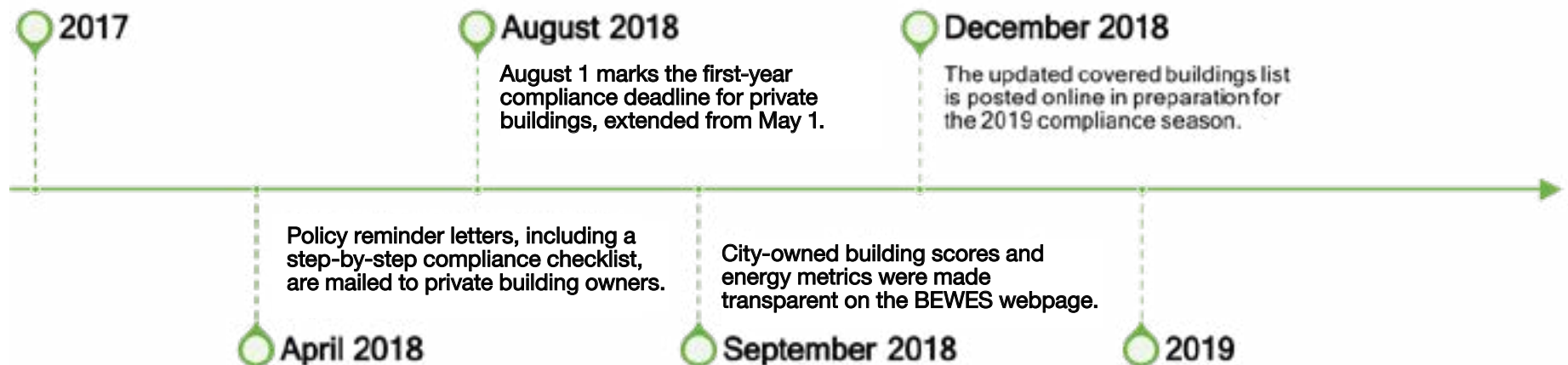
2018 Policy Compliance Timeline

In preparation for the first year of required compliance for private buildings 50,000 square feet and above, the city launched the BEWES Help Desk. Through the Help Desk, dedicated staff members provided policy support via phone and email, in addition to the policy resources available on the BEWES webpage.

Following the covered building list posting on the BEWES webpage the previous December, reminder letters were sent in April, followed by final reminder postcards mailed in July. Additionally, as a first-year courtesy, the benchmarking deadline was extended from May 1 to August 1.

Throughout this time period, the city continued to host several ENERGY STAR Portfolio Manager training workshops in partnership with USGBC. These in-person classes provided an opportunity for building owners to practice benchmarking and often even fulfill their compliance in real-time with the assistance of a building efficiency expert. The dates, location, and RSVP details for these events were included in the compliance letters, posted on the BEWES webpage, and promoted through various partner organizations.

In September 2018, a transparency report detailing the energy efficiency and performance of the 51 city-owned properties covered by the policy was posted on the BEWES webpage, one year before this requirement went into effect for privately-owned buildings.



2018 Policy Correspondence and Support

Policy Reminder Letters

After posting the policy requirements and building list on the BEWES webpage in December 2017, the Office of Sustainability and Resilience later sent out policy reminder letters in April 2018. More than 2,800 letters were sent to potential property owners across the initial list of 731 privately-owned buildings. These individuals included those who had paid property taxes on these specific properties during the prior year, as identified through the Orange County Property Appraiser and Orange County Tax Collector records.

Help Desk Support

The newly-launched BEWES Help Desk was immediately utilized by both property owners and operators seeking to identify the appropriate point of contact for the policy, understand the policy elements, use ENERGY STAR Portfolio Manager, and complete benchmarking. By the extended compliance deadline of August 1, 2018, the Help Desk had received nearly 600 individual email and phone call requests for assistance.

ENERGY STAR Training Workshops

In continued partnership with USGBC, as well as OUC, BOMA, and other community partners, the city hosted three ENERGY STAR Portfolio Manager training sessions throughout the compliance season to assist individuals with the benchmarking process. These workshops were well-attended, averaging close to thirty participants per session.



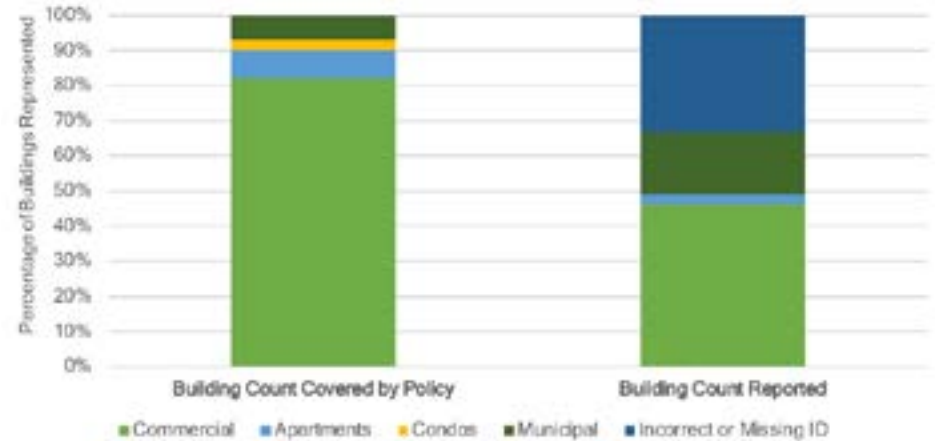
Figure 21. Postcard sent to building owners and operators as a reminder about the upcoming policy compliance deadline.

2018 Compliance Rates

Number of Buildings in Compliance

In the first year of mandatory community-wide policy compliance, 291 of the 731 total buildings covered by the policy submitted energy benchmarking reports through ENERGY STAR Portfolio Manager. The resulting compliance rate was 39.8% by building count for properties above 50,000 square feet.

2018 Comparison of Total Building Count Covered by Policy vs Building Count Reported

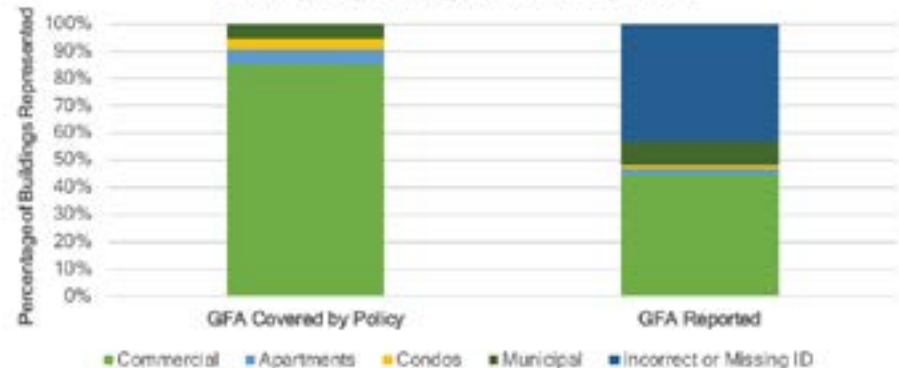


Compliance by Reported

Gross Floor Area (GFA)

When considering the compliance total according to the total gross floor area (GFA) covered by the policy's 731 buildings, the 291 buildings that were reported accounted for 57,572,161 square feet, or 51.7% of the overall GFA.

2018 Comparison of Total Gross Floor Area (GFA) Covered by Policy vs GFA Reported

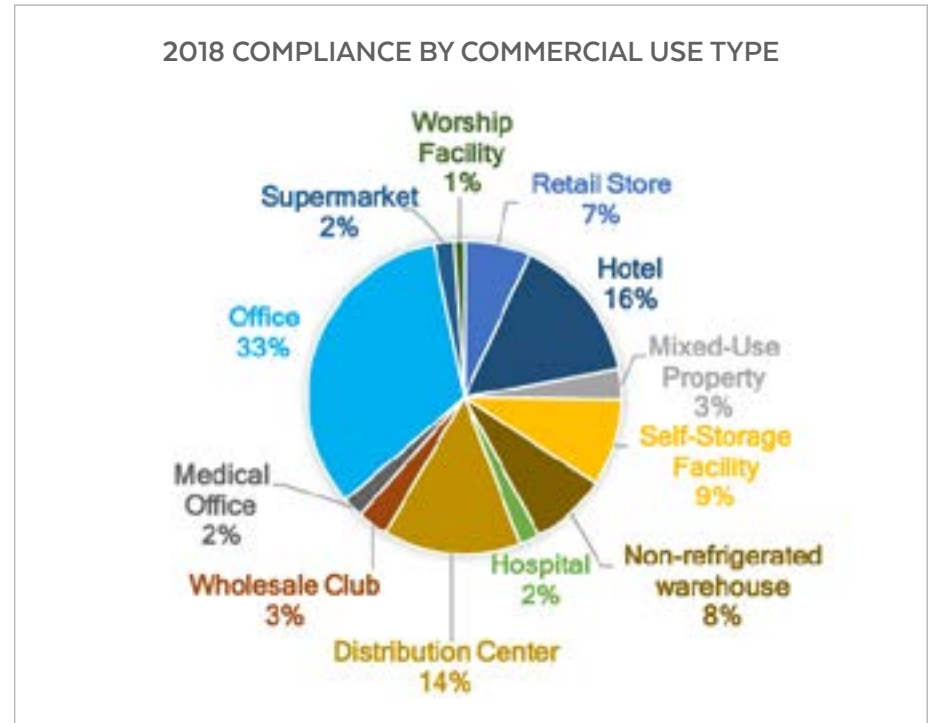


Compliance by Property Use Type

In terms of the general types of buildings required to comply with BEWES, 82% of the GFA was comprised of various types of commercial spaces. Of these, 25.8% of commercial building achieved first-year compliance. The full distribution of commercial property use types that were reported in the first year are included in the '2018 Compliance by Commercial Property Use Type' graph.

The remaining 18% of the total GFA covered by the policy included apartments and condominiums, as well as municipal buildings. Within this classification, 21.4% of all apartments and 5.8% of all condominiums reported during the first year of required compliance. The municipal buildings achieved 100% compliance.

Of the number of buildings that complied, 47% were commercial submissions, 1% were apartments, 1% were condominiums, 17% were municipal buildings, and 34% of the submissions had incorrect or missing Orlando Building ID information so their property type could not be calculated by the BEWES Analysis Tool.



2018 Performance Indicators

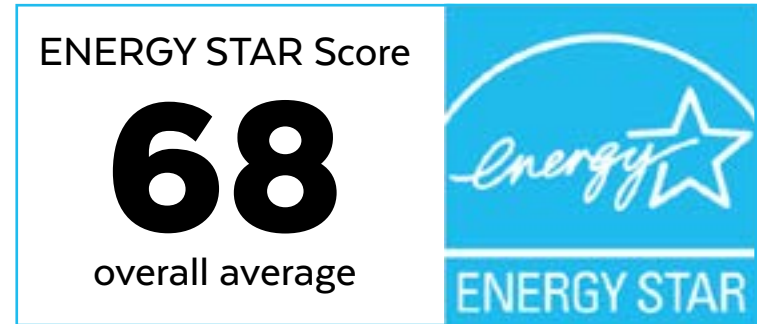
Average Energy Star Score

One-hundred and fifty-one buildings, or just over half (52%) of properties, reporting in the first year of compliance received an ENERGY STAR score. The mean score was 67.9 and the median score was 80.

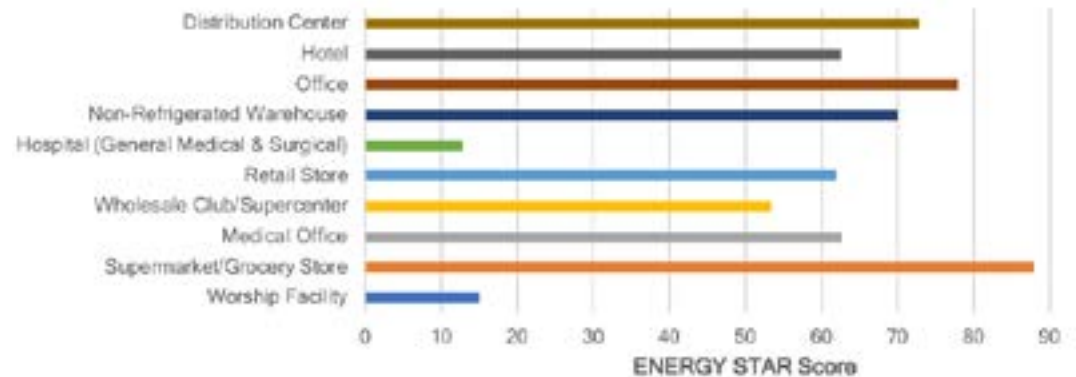
Commercial buildings (66.6) outperformed apartments (34.7) on average and the one condo that reported received an ENERGY STAR score of 80. The 61 scorable buildings that had incorrect or missing Orlando Building ID numbers demonstrated an average score of 43.9. A total of 35 properties received ENERGY STAR scores below the national average of 50.

Building Performance by Property Use Type

First-year ENERGY STAR scores varied widely based on property use type (right), with the highest performing building types including three supermarkets (88), 51 offices (77.9), and 24 distribution centers (72.8).



2018 ENERGY STAR Score by Commercial Use Type



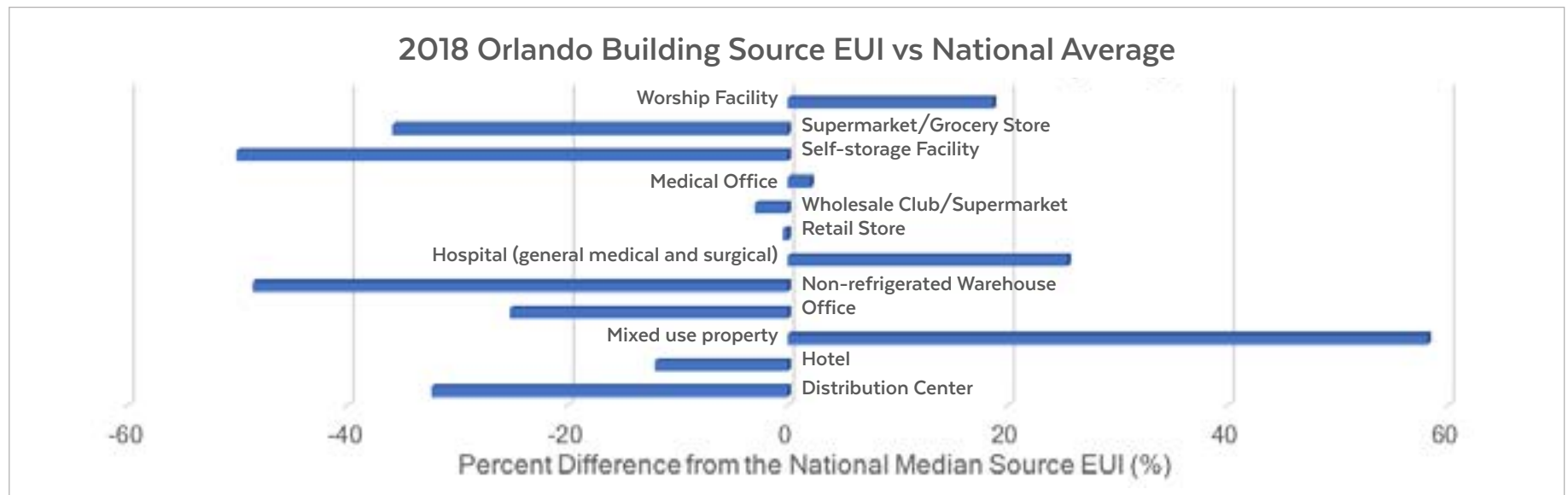
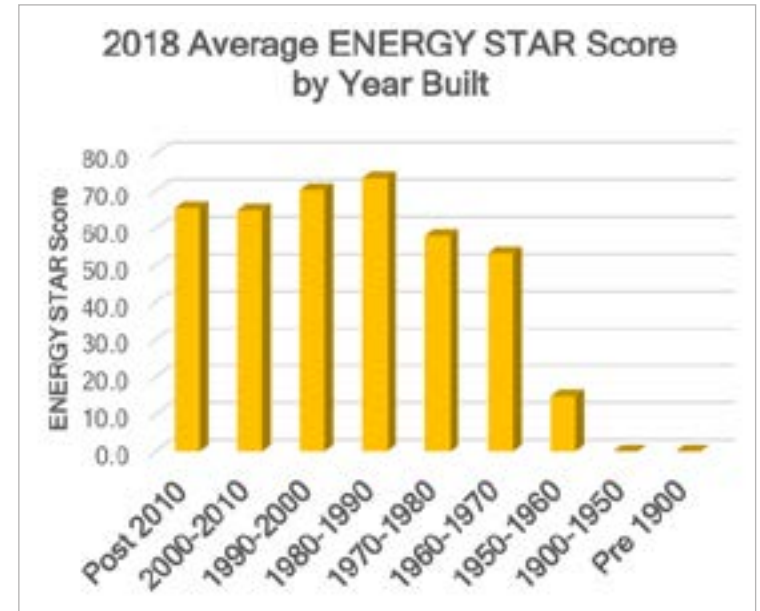
Building Performance by Year Built

As observed in other cities, ENERGY STAR scores were not strongly correlated with age; the 98 buildings built between 1980 and 2000 received the highest scores (72), compared to the 102 buildings constructed after 2000 (65). The 40 buildings built from 1960 to 1970 had an average score of 55 and those predating 1960 demonstrated an average score of 15.

Energy Use Intensity

When compared to the national average, the Source Energy Use Intensity (EUI) varied across Orlando property use types. Most Orlando property EUI values were negative in relation to the national average, indicating that they outperformed similar buildings by consuming less energy per square foot in the year reported. Property use types that demonstrated this pattern included self-storage facilities (-50.1%) and non-refrigerated warehouses (-48.6%).

Conversely, four hospitals received source EUI values that exceeded the national average by 25.5% and two mixed-use properties by 58.2%, suggesting potential opportunities for energy savings in these space types. However, specific property characteristics and reporting details that could influence these results must first be investigated before making this determination.

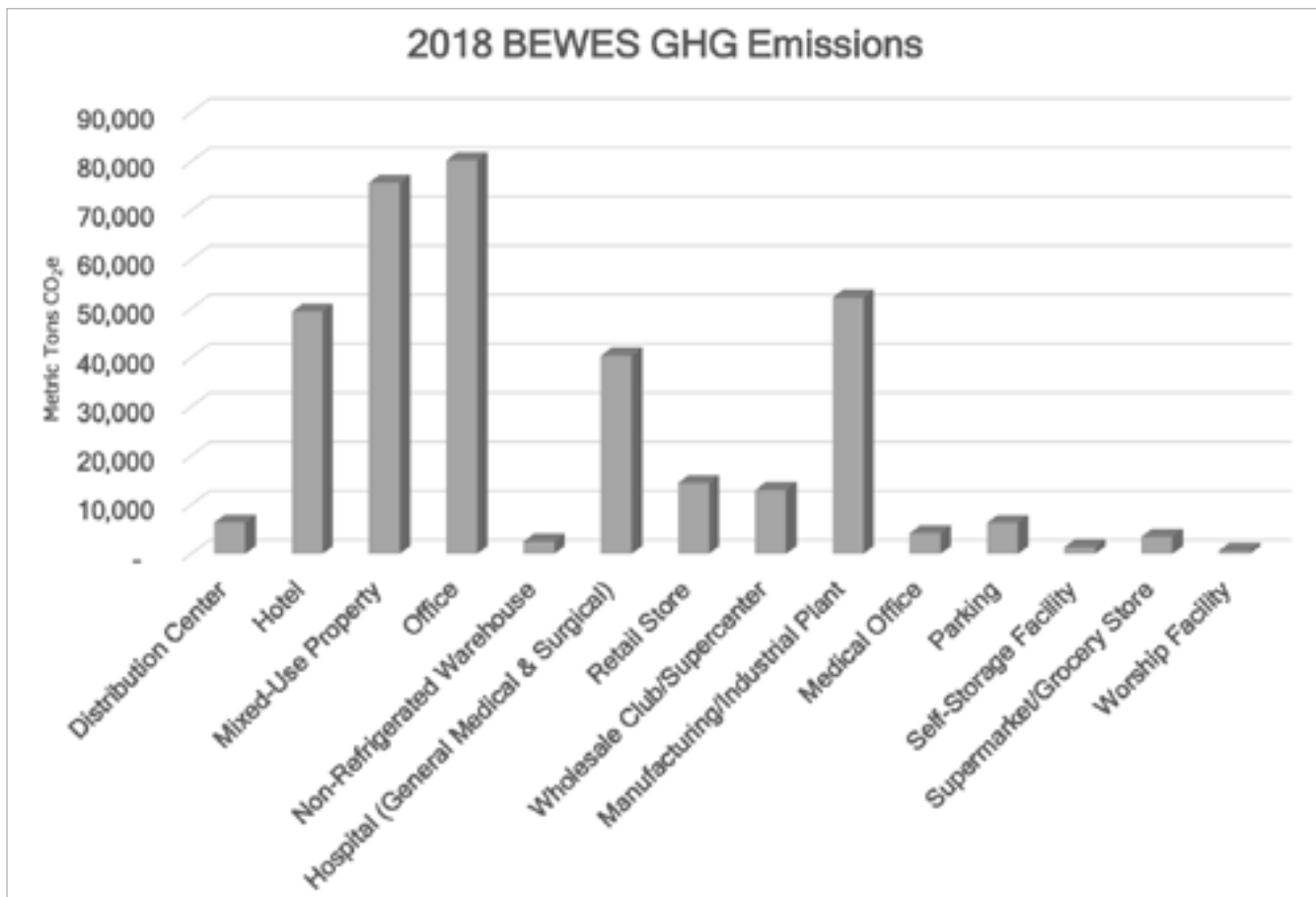


2018 Greenhouse Gas (GHG) Emissions from Reported Buildings

As expected, the greenhouse gas (GHG) emissions resulting from the reported buildings were primarily attributed to grid-supplied electricity with a fuel mix of primarily coal and natural gas, and direct combustion of fuels on-site (natural gas). The resulting emissions totaled 334,361 metric tons of CO₂ equivalent (CO₂e).

The property use type that resulted in the highest GHG emissions were offices (24% of the overall total), which aligns with their representation as the single-largest portion of commercial property types.

However, the next largest contributor to the total GHG emissions were mixed-use properties (22.6%), which made up a much smaller portion of the overall building list. Further review is needed to determine the nature of this difference between representation and resulting emissions.



2018 Data Quality Overview

The data obtained from the ENERGY STAR reports that accompany each building benchmarking submission are screened for data quality issues. The criteria used in this data quality screening have been provided by EPA ENERGY STAR Portfolio Manager, as well as identified in resources developed from best practices across cities with building benchmarking policies, such as [IMT's "Managing Benchmarking Data Quality" guide](#).

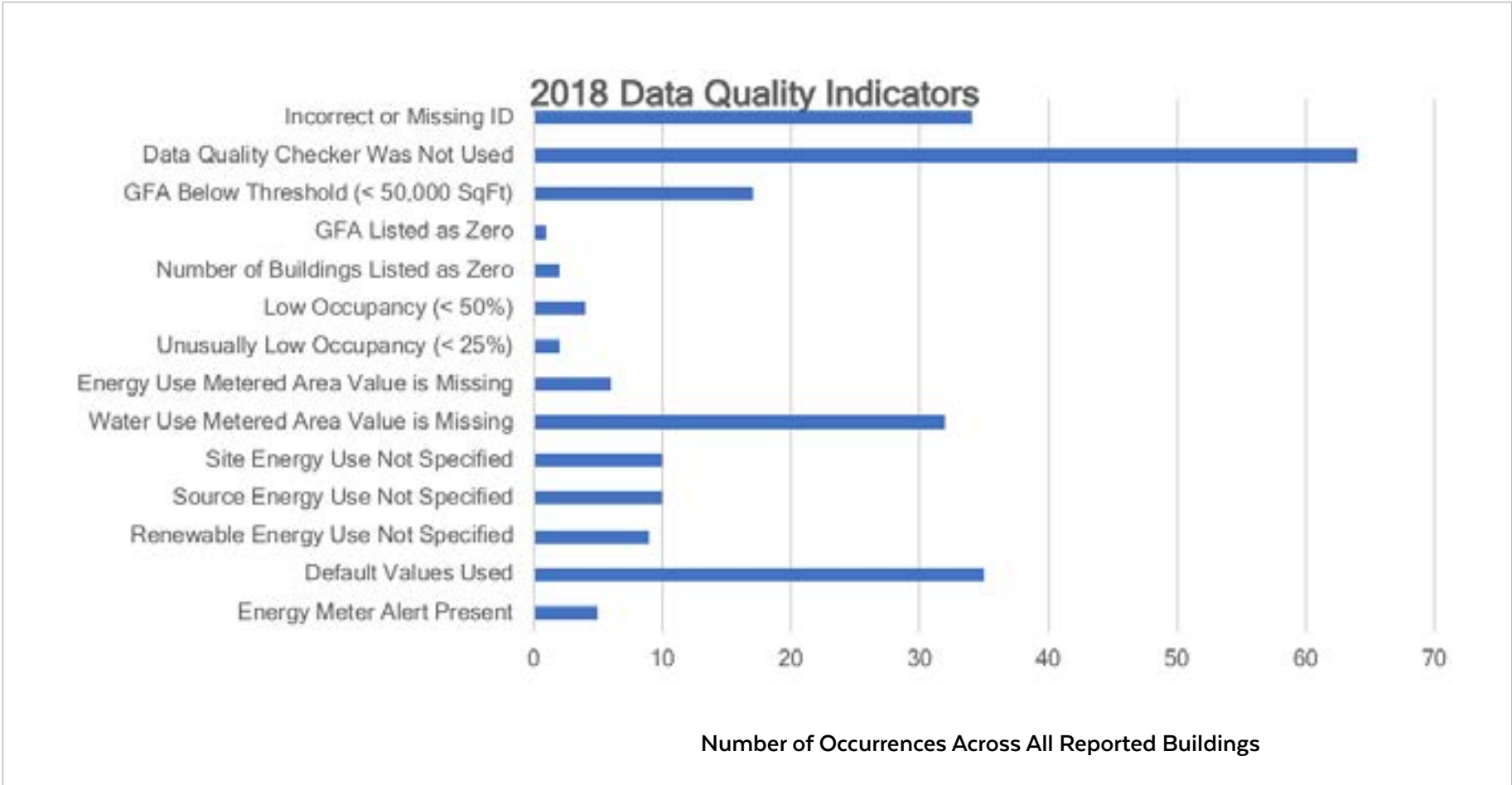
By identifying and resolving these data quality issues, the BEWES Help Desk is able to provide improved and targeted assistance to building operators, increase the accuracy of building performance information, and explore additional opportunities for energy savings. Like other cities, such as Chicago and Seattle, the City of Orlando requires a satisfactory level of data quality for each submission prior to granting "compliance" status.

Following the compliance deadline, the city mails compliance status letters to building owners and if applicable, the city informs them of their data quality issues and how to resolve them. There have also been instances in which buildings that do not meet the 50,000 ft² size threshold still choose to report their data to us. In these cases, these submissions are listed as 'Voluntarily Compliant.'

In the first year of policy compliance, the most common data quality issue (present in 64% of submissions) was that the individual submitting the benchmarking report did not utilize ENERGY STAR Portfolio Manager's Data Quality Checker. This tool analyzes the benchmarked data in a building profile and provides detailed explanations and solutions for any alerts that arise. By running this checker, the benchmarker is able to resolve any errors, omissions, or unusual results before submitting their report to the city, ensuring that they have the most accurate submission possible. The city also uses this data to tailor our correspondence to building owners and emphasize ways to minimize the most common errors.

The next most common data quality issue found in the first year of compliance was that 35% of building submissions included the use of default values. These default values are derived from the sample population that was used to create each building type's score and are designed to be a placeholder when the exact values for certain property use details are unknown. Although these values can be utilized in a submission when the access to this information is unavailable or undocumented, the actual values should be entered in most cases.

Finally, as discussed previously, a large portion (34%) of buildings did not include an Orlando Building ID number. This figure represents only blank details for this response, whereas other related figures may include incorrect ID numbers as well.



2019: PRIVATE BUILDING TRANSPARENCY AND SECOND YEAR OF COMMUNITY-WIDE REPORTING

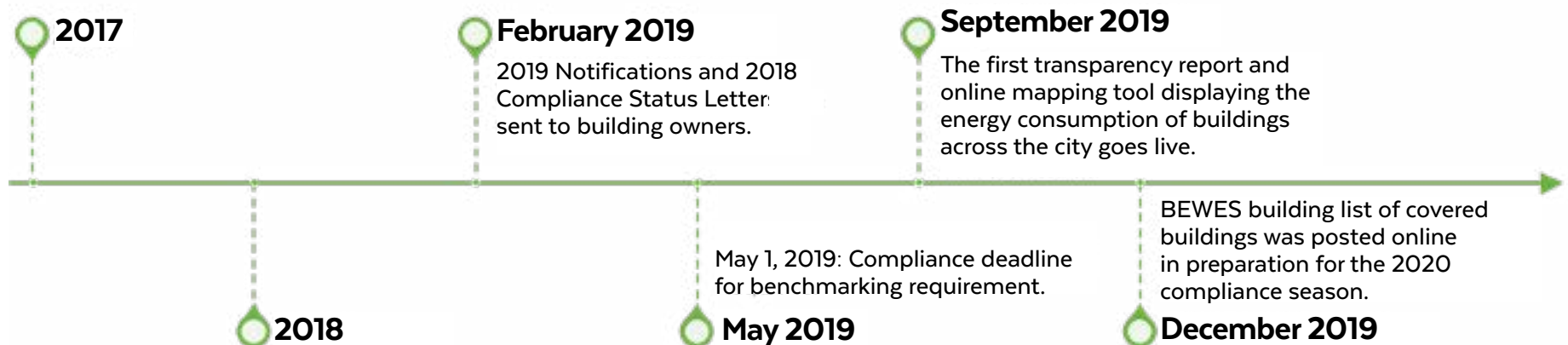
2019 Policy Compliance Timeline

In the second year of the BEWES ordinance, the Help Desk established a standard policy cycle which began with mailing out notification letters. In February 2019, the city mailed the notification letters, which also included the 2018 Compliance Status letter, to building owners. Beginning in January 2019, the city also brought on an energy policy coordinator to assist in the implementation of the policy and manage the Help Desk.

The compliance deadline was May 1st and several in-person benchmarking training sessions were held prior to the deadline. 2019 Compliance Status Letters were then mailed out in July. These addressed certain data quality issues if they were present, and allowed building owners to re-submit their properties if needed.

In August 2018, the EPA updated performance metrics for U.S. buildings in ENERGY STAR Portfolio Manager based on the most recent market data available. The 1-100 ENERGY STAR scores and other source energy metrics for previously benchmarked properties in Portfolio Manager were updated across all time periods to reflect the latest performance metrics. This update was part of EPA's standard process to keep ENERGY STAR metrics as current as possible, and reflective of current market performance.

In September 2019, the first annual transparency report and online visual mapping tool became live which included the energy consumption data for privately-owned commercial and multifamily properties. The building and energy metrics listed in the report included descriptive information; energy output information; the ENERGY STAR score, where available; and ordinance compliance or noncompliance status.



The visualization mapping tool allowed this information to be displayed to the public and encouraged residential or commercial tenants to take building efficiency into account when deciding where to live, work, or invest.

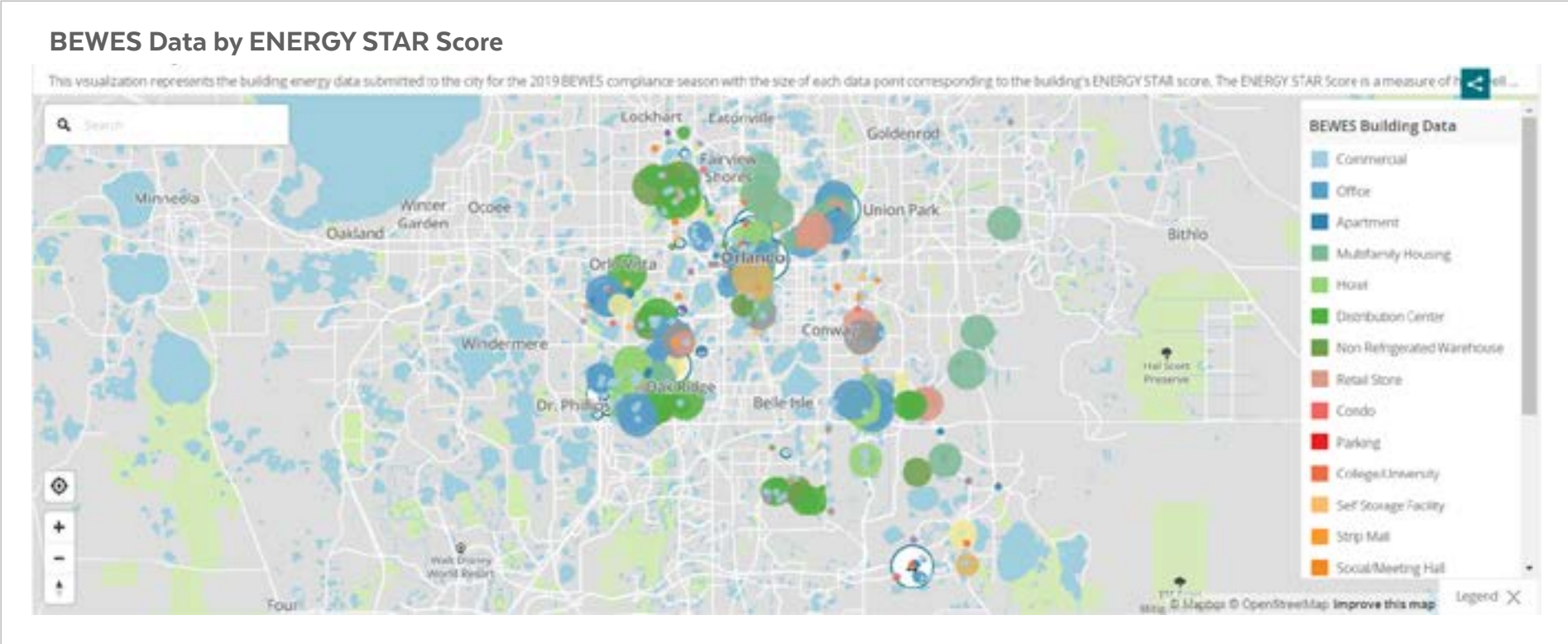


Figure 22. Transparency map displaying buildings, represented as circles, covered by the policy. The color of each circle depicts the building type, as listed on the sidebar to the far right, and the size of each circle shows its ENERGY STAR score.

2019 Compliance and Performance Indicators

2019 Policy Correspondence and Support

Compliance and Policy Reminder Letters

The updated building list was posted to the BEWES webpage on December 1, 2018. In addition, to prepare for the May 1, 2019 compliance deadline, reminder letters were sent out in February 2019 to approximately 2,300 potential property contacts to reach the revised building database of 924 buildings.

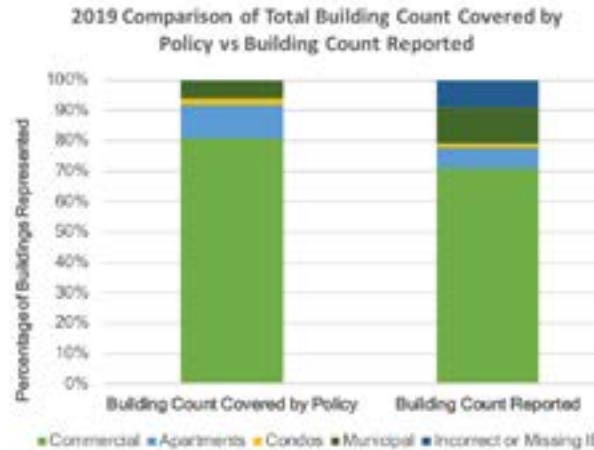
Help Desk Support

The BEWES Help Desk saw a nearly 150% increase in inquiries, providing support for more than 890 requests for assistance by May 1 and more than 1,440 total calls and emails throughout the entire year.

ENERGY STAR Training Workshops

In response to the increased volume of total inquiries from building operators, the city offered an additional ENERGY STAR Portfolio Manager training workshop, increasing the total number from three to four sessions in 2019. In doing so, the city was able to reach more than 70 building operators and assist them in learning how to benchmark their properties.

2019 COMPLIANCE RATES

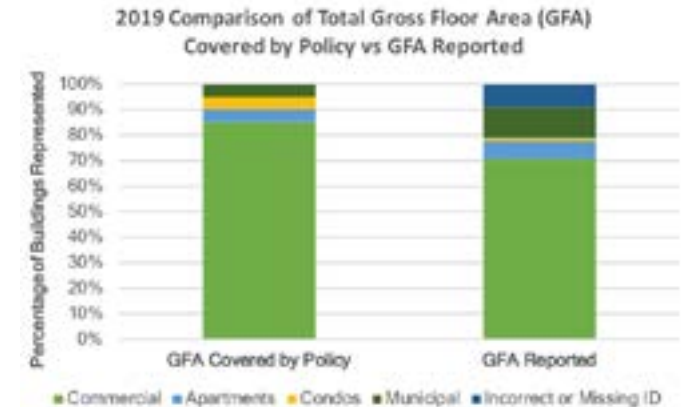


Number of Buildings in Compliance

In the policy's second compliance season, 427 out of the total of 924 properties submitted their benchmarking portfolios to the city in compliance with the BEWES ordinance. The city achieved an increased 46.2% compliance rate for buildings at or above 50,000 square feet.

Compliance by Reported Gross Floor Area

The 46.2% compliance rate by building count corresponded to 65.2% of the policy's covered gross floor area and a compliance rate for properties that meet the minimum size threshold of 50,000 square feet. This increase in the amount of GFA reported indicates that several buildings of larger-than-average size were in compliance in comparison to the first year.

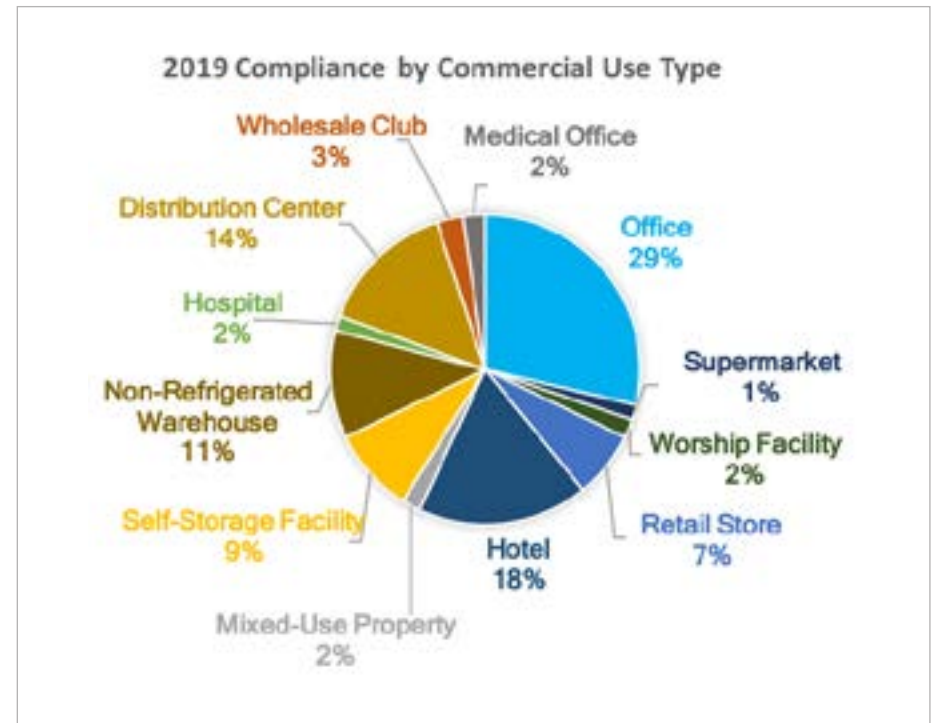


Compliance by Property Use Type

Commercial buildings still comprised the 82% majority of the total space covered by the policy. Of these, 55.8% of commercial buildings achieved compliance. The most common commercial property spaces to report were offices, hotels, and distribution centers. The full distribution of commercial property use types that were reported in the second year are included in the '2019 Compliance by Commercial Property Use Type' graph.

Of the remaining 18% of total GFA covered by the policy, apartments accounted for an increased 5% of total buildings, representing a 54.7% compliance rate. Condominiums still represented 4% of the total GFA and achieved a 32.6% compliance rate. Municipal buildings were 5% of the total covered building space and achieved 100% compliance.

From the total number of buildings that complied, an increased 71% were commercial submissions, 7% were apartments, 1% were condominiums, and 12% were municipal spaces. Buildings with incorrect or missing Orlando Building ID numbers decreased to 9% of total submissions.



2019 Performance Indicators

Average Energy Star Score

In 2019, 235 buildings (55%) that were reported in the second compliance season received an ENERGY STAR score. The mean score was a 59.7, with a median score of 63.

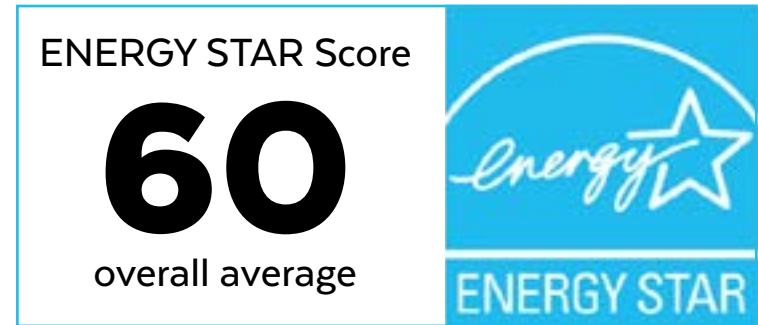
This year, apartment buildings (84.7) performed better than commercial buildings (56.4) on average, and the three condominiums that reported received an average ENERGY STAR score of 88.7.

Also, 23 of the scoreable buildings had incorrect or missing Orlando Building ID numbers which demonstrated a reduced average score of 33.4.

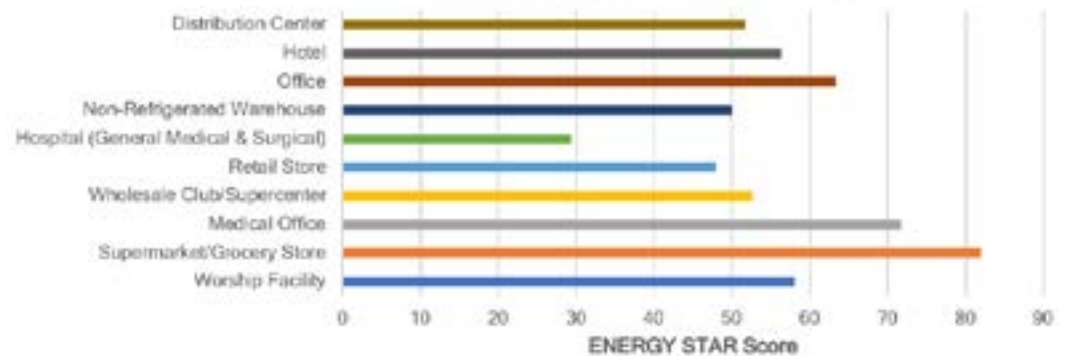
An increase of 77 properties received ENERGY STAR scores below the national average of 50.

Building Performance by Property Use Type

Second-year ENERGY STAR scores continued to demonstrate a diverse range of building performance based on property use type. The most efficient building types again included three supermarkets (82), as well as five medical offices with the second-highest performance (71.6), followed by 66 office buildings (63.4).



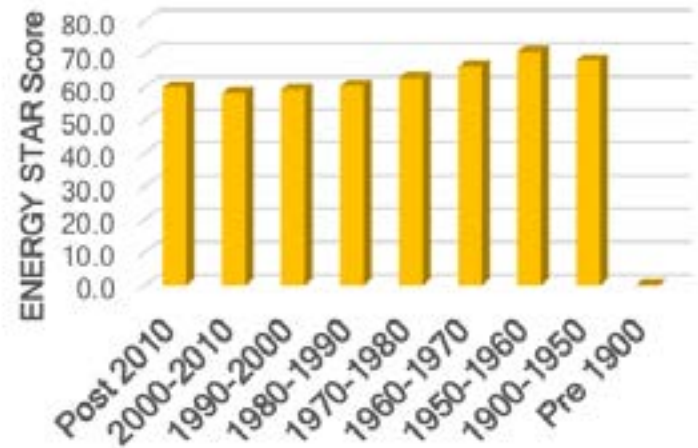
2019 ENERGY STAR Score by Commercial Use Type



Building Performance by Year Built

As with the results from the prior year, building age was not strongly correlated with performance. The seven properties built between the years 1950 and 1960 received the highest average ENERGY STAR scores (with a mean of 71) compared to the properties built from 1960 through 1990, which received an average score of 63. The 106 buildings that were built between 2000 - 2010 demonstrated a lower average score of 58.

2019 Average ENERGY STAR Score by Year Built

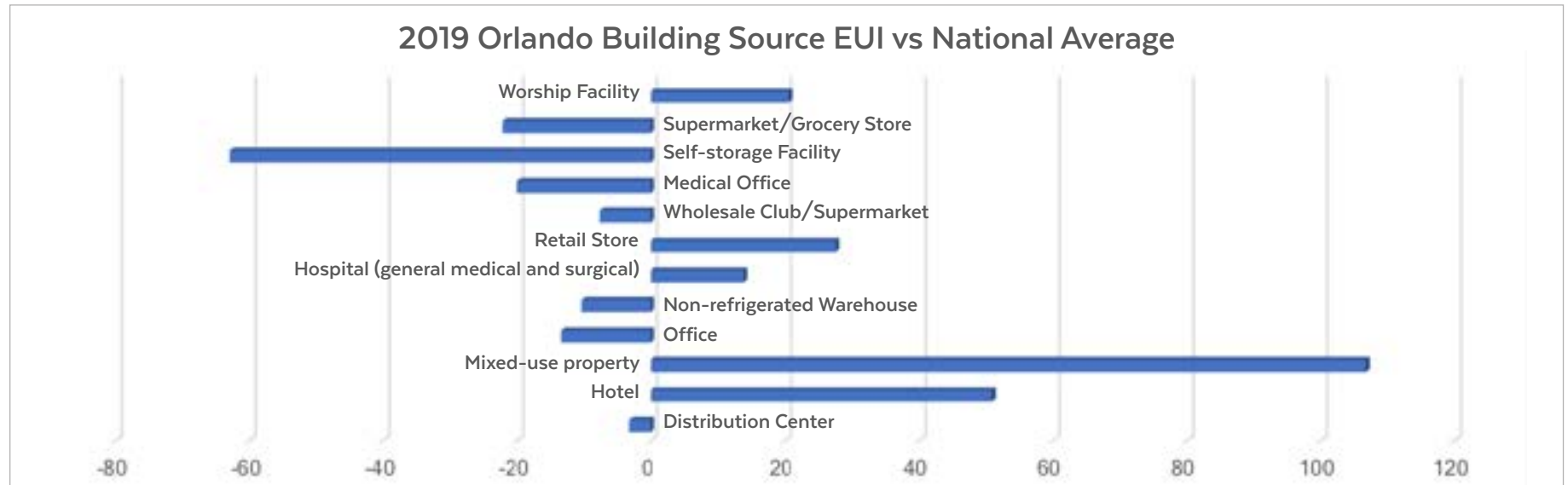


Energy Use Intensity

In the policy’s second compliance season, the majority of property use types continued to reflect a lower source EUI as compared to the national average, indicating that these buildings in Orlando outperformed peers outside this policy and/or the city. The most efficient property types again included self-storage facilities (-62.9%), as well as supermarkets (-22.2%).

Meanwhile, the property use types that received positive percent differences – and were considered less efficient than the national averages – included mixed-use properties (106.8%) and hotels (51%). It is possible that these outlying values can be attributed to inaccurate benchmarking from using default or incorrect values. Additional exploration is needed before concluding that these are inefficient buildings that have the most potential to benefit from energy upgrades.

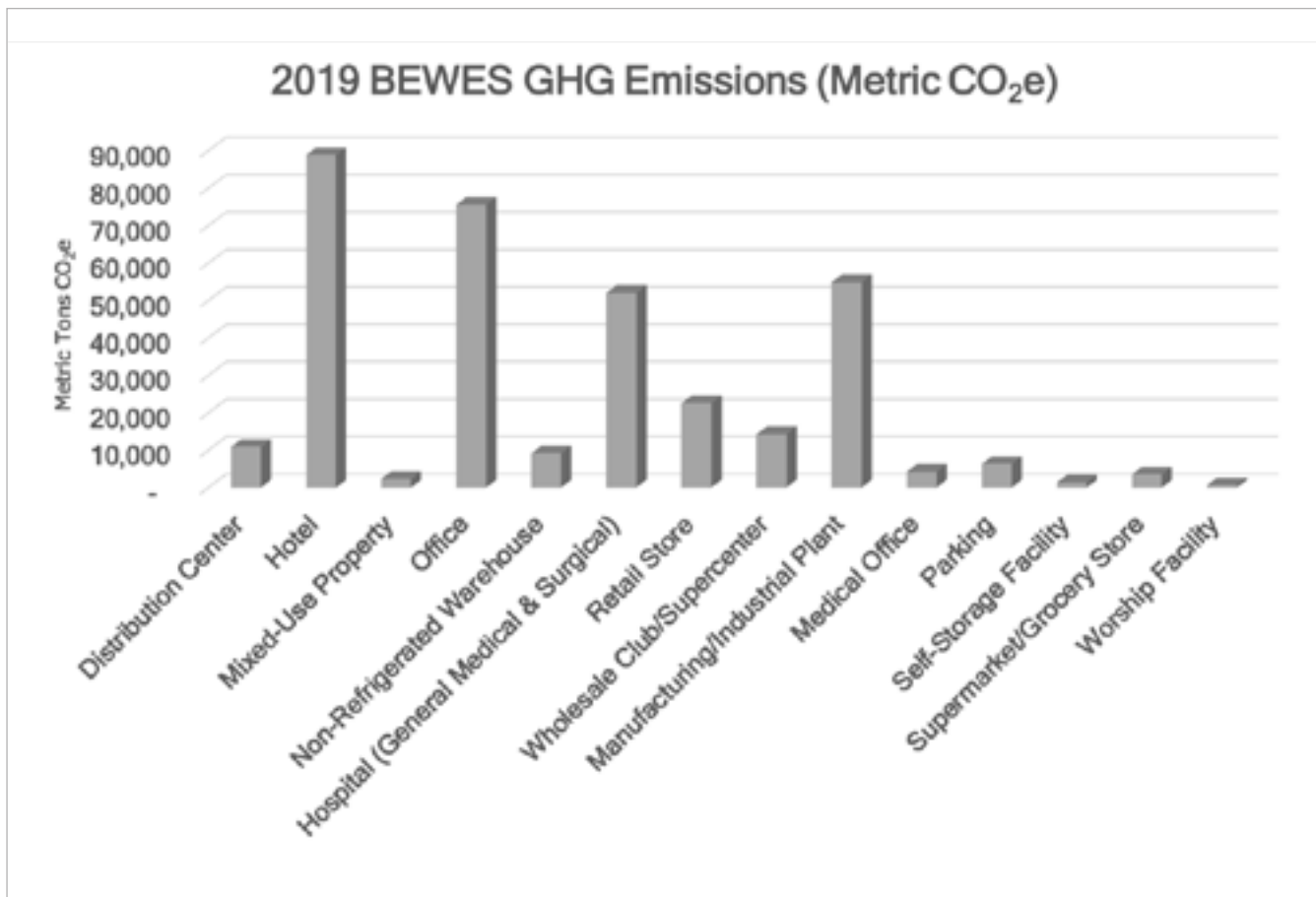
2019 Orlando Building Source EUI vs National Average



2019 Greenhouse Gas (GHG) Emissions from Reported Buildings

In 2019, the total greenhouse gas emissions produced by reporting buildings totaled 330,379 metric tons of CO₂e. The property use types that contributed most to this value were hotels (26.9%) and office spaces (22.9%), the two most common space types.

The dramatic reduction in emissions resulting from spaces labeled as ‘mixed-use’ likely reflects a shift in categorizing these more specifically according to their primary use type.



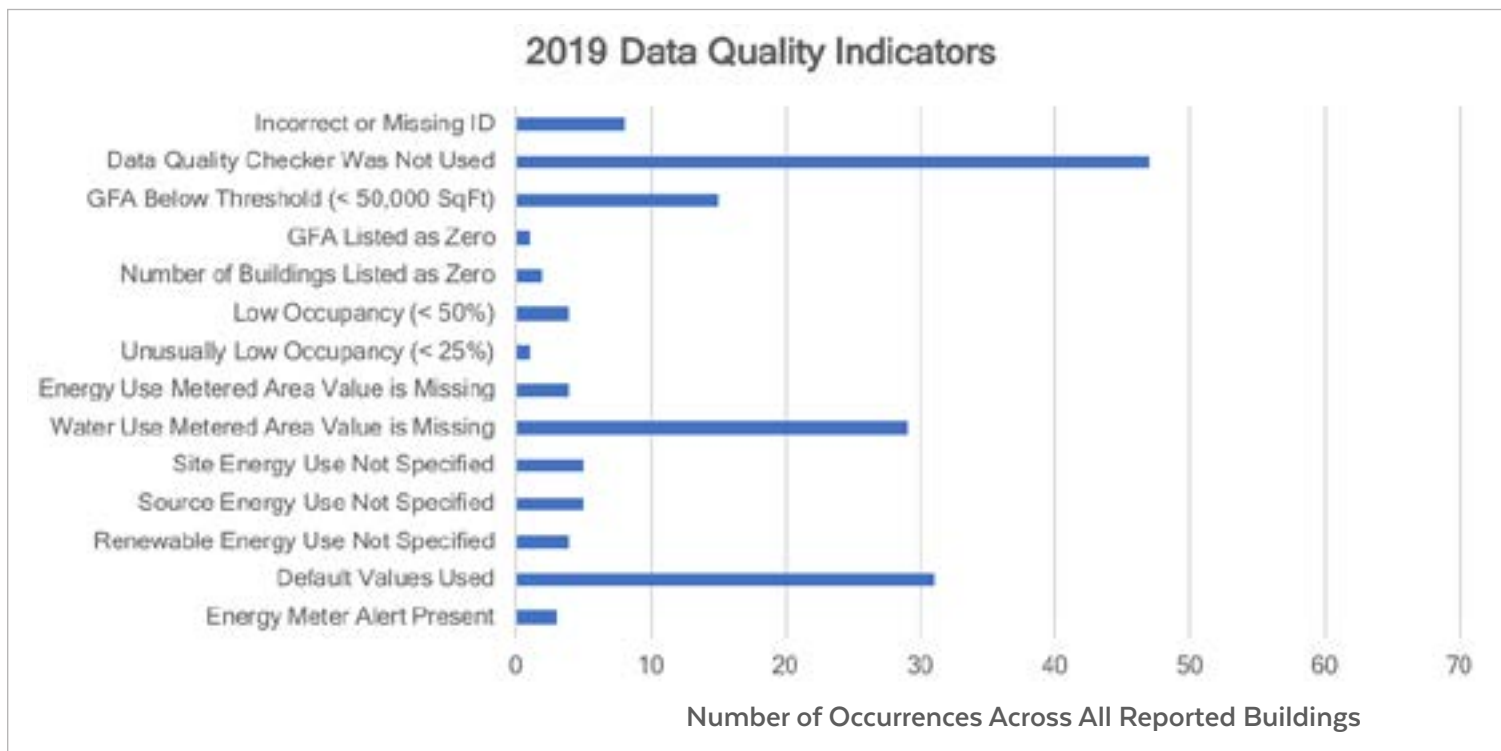
2019 Data Quality Overview

In the second year of compliance, the most common data quality issue continued to be the prevalence of benchmarking reports that were submitted without running the Data Quality Checker, albeit with decreased frequency (47%) in comparison to the year before.

Default values were found in 31% of all submissions, a figure similar to the prior year. Given this trend, it may be possible that certain values are somewhat difficult to obtain or properly enter during benchmarking. Further review should determine whether the default values found across submissions are utilized in the same fields – and thus present a recurring theme.

The third most-common error received was that the water use for metered areas was not provided in 29% of cases. Since the policy only requires energy use to be benchmarked and maintains that water reporting is optional, this is a finding that may be anticipated, but one that also suggests that the majority of reported buildings include the optional data.

Finally, 15% of all buildings that submitted were below the policy threshold of 50,000 square feet. Although this entry may have been made in error in some cases, there are several buildings that have chosen to voluntarily comply with the policy despite their size.



POLICY IMPACT TO DATE

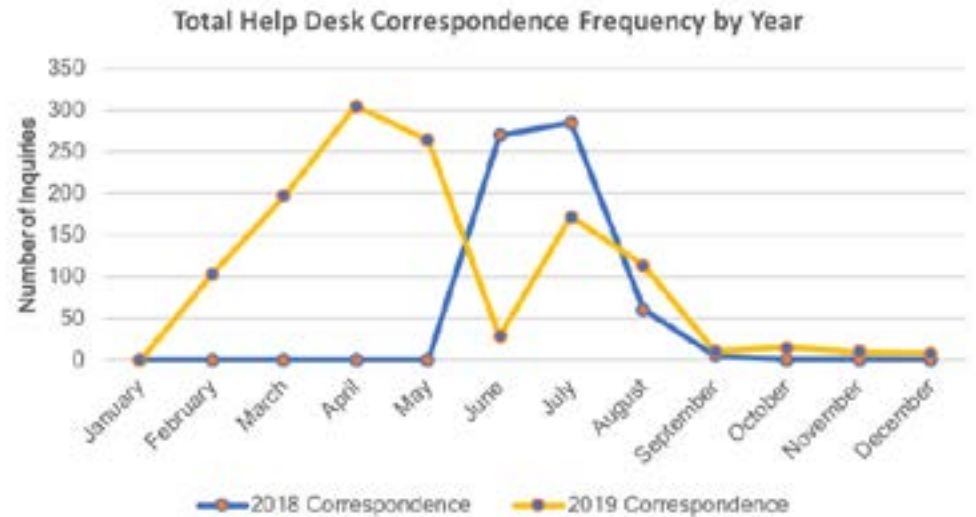
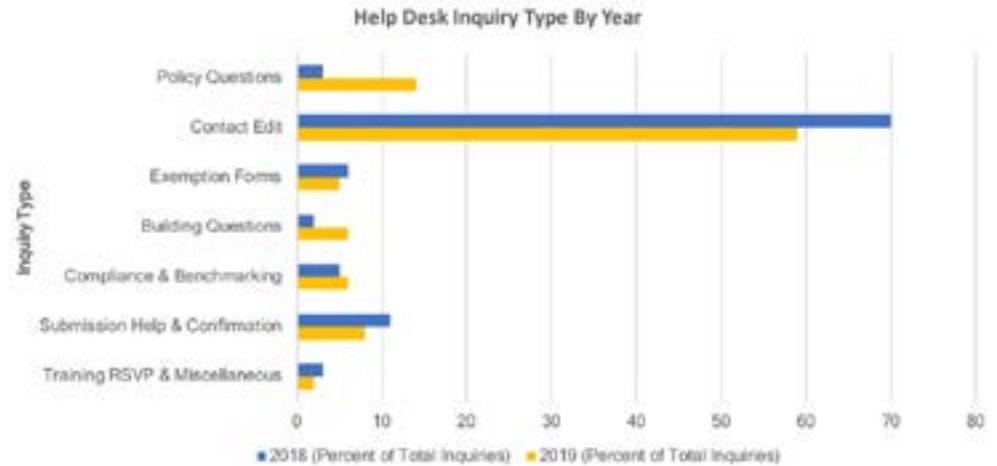
Increased Policy Correspondence and Targeted Support

In 2018, the Help Desk received more than 600 inquiries, of which 66% were emails and 34% were phone calls. The number of inquiries increased by nearly 150% in 2019 with more than 1,440 inquiries, consisting of 60% emails and 40% phone calls. This welcome increase in correspondence reflected a higher number of building operators who were engaged during the policy’s second year, as well as an increased compliance rate. It is likely that continued outreach efforts on behalf of the city and its partners resulted in expanded awareness regarding the policy and that the compliance status letters sent out after the first year had a stronger effect on contacting the city than the reminder letters alone.

The peak time periods of correspondence volume varied from 2018 to 2019, as illustrated in the ‘Total Help Desk Correspondence Frequency by Year’ graph, with a higher volume of correspondence later in the compliance season in 2018 since the compliance deadline was extended in the policy’s first year from the standard May 1 to a courtesy date of August 1.

The initial spike in correspondence seen in 2019 was likely the result of the upcoming compliance deadline approaching, and the second spike later in the summer a result from building owners receiving compliance status letters that included the instructions to contact us to resolve any benchmarking issues present.

The nature of the inquiries sent to the Help Desk also evolved from the first to the second year of compliance. In 2018, the majority of inquiries were focused on submitting contact information, confirming submissions, and requesting exemptions. However, in the second year of compliance, owners were submitting fewer contact forms, likely because the correct point of contact was already on file for buildings that had reported the year prior. Building operators were also asking more questions that were focused on the policy in general, as well as building and compliance information. It can be anticipated that building owners will continue to ask questions that are more relevant to contact information, exemptions, and the policy at large until the majority understand the benchmarking process, whereas inquiries asking for compliance confirmation will continue to become more frequent over time.



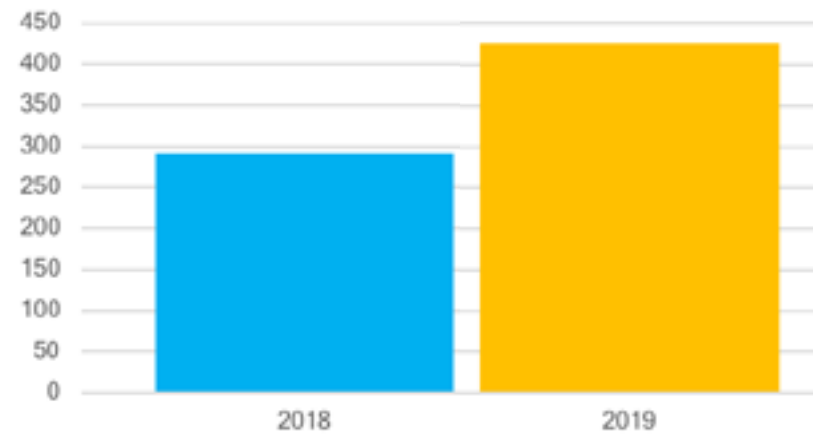
Increased Compliance

The first-year compliance rate of 39.8% was similar to first year compliance rates experienced in other cities, particularly where there is no financial penalty for non-compliance.

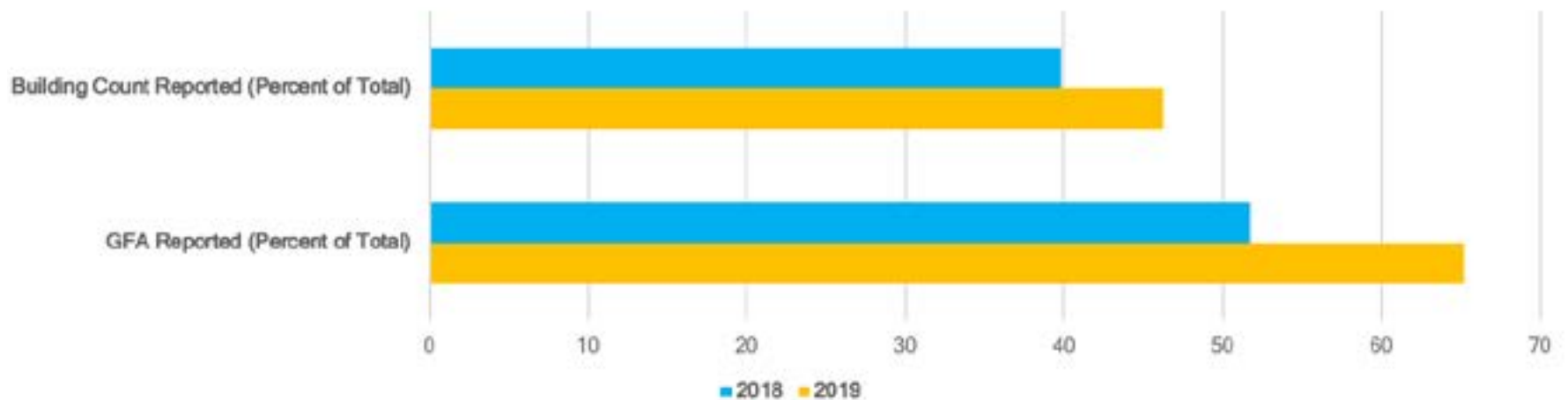
The number of covered buildings in the updated building list increased from 2018 to 2019, yet there were still steady increases in compliance rates. The increase of 136 additional buildings reporting led to a compliance rate of 46.2% in the second year of the policy. This increase reflects both increased policy awareness and improved data quality in submissions, with more submissions receiving a 'full-compliance' status.

The total reported GFA rose from 51.7% to 65.2%, tipping the scale at achieving more than half the designated building square footage covered by the policy in compliance in between the first and second year of the ordinance.

Number of Buildings Achieving Compliance by Year



Compliance Rates by Year



Concurrent Trends Across Performance Indicators

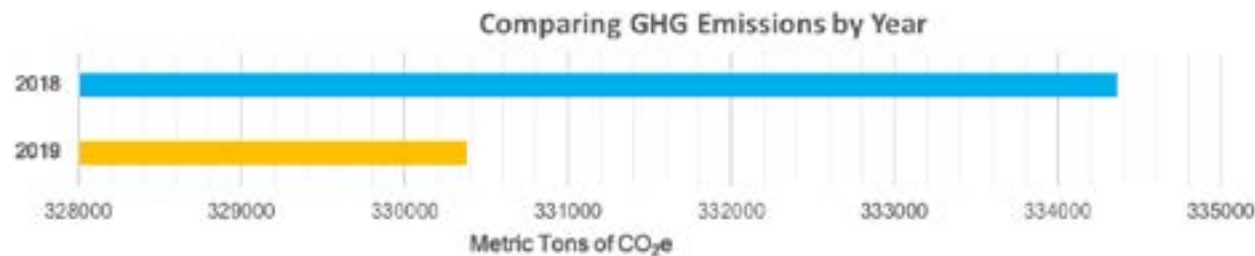
When comparing the ENERGY STAR scores of all buildings that reported during the 2018 and 2019 compliance seasons, the average score decreased from a 68 to a 60, and more buildings scored below the national average of 50 in 2019. However, this change likely resulted, in part, due to the revised algorithm that ENERGY STAR employed to calculate building performance based on updated information and an expanded building set.

Furthermore, the percentage of buildings that received scores increased from one year to the next, rising from 52% to 55%. These values should be considered in context of the corresponding rise in overall reported buildings from 151 receiving scores (of the 291 total) in 2018 to 235 (of the 427) in 2019. With the increased number of buildings receiving scores comes a broader distribution of building performance.



Reduced Greenhouse Gas Emissions

During the first and second year of the BEWES ordinance, compliant buildings were responsible for emission of 334,361 and 330,379 metric tons of CO₂e, respectively. This decrease of emissions is quite surprising considering that the GFA reported increased from 57,572,161 ft² in 2018 to 89,660,835 ft² in 2019. This change could have resulted from the improved benchmarking quality demonstrated in the second year or more accurate data. However, it is also possible that this difference is the result of decreased energy use due to improved energy monitoring, enhanced energy conservation behaviors, and/or the pursuit of energy efficiency improvements or retuning. Additional investigation into the cause(s) of this decrease will provide beneficial context for further policy support and reporting.



Improved Data Quality

In 2018 and 2019, the top two most prevalent data quality indicators present demonstrated that benchmarkers were not running Portfolio Manager's Data Quality Checker and that many were leaving default values in their submission. However, after sending targeted correspondence following the first-year submissions, as well as emphasizing the use of the tool as a major step in the benchmarking process, more individuals ran Data Quality Checker in 2019.

Due to the frequency and variety of errors present in the first year of reporting, as to be expected, there was a balanced distribution between nearly-perfect satisfactory submissions, those with minor data quality issues present (such as a missing Orlando Building ID number or not running the Data Quality Checker tool), and those that had major data quality issues (such as missing utility data or occupancy values).

In 2019, with the increased use of the Data Quality Checker tool, targeted correspondence, additions in inquiries, and familiarity with the policy, the percentage of satisfactory submissions increased substantially from 35% to 74% and submissions containing either minor or major data quality concerns comprised only 18% of total submissions.

2018 Data Quality Indicators by Type



2019 Data Quality Indicators by Type





FUTURE RECOMMENDATIONS AND NEXT STEPS

LOOKING AHEAD

2020: The Third Year of Community-Wide Compliance

In the third year of the policy, the audit and/or retro-commissioning component of BEWES took effect. All building owners of properties covered by the policy will still be required to benchmark and this information will continue to be made transparent each year. However, those who receive ENERGY STAR scores below the national average (those below a score of 50) will also be notified that they are required to conduct a free energy audit (or complete retro-commissioning as an alternative path for compliance) once over the next five years. This audit requirement focuses on lower-performing buildings since they have the most potential for energy savings and increasing their scores. The goal of this audit requirement is for owners to better understand their building performance and identify potential cost-saving opportunities, and as a result, minimize energy waste.

Expanding Educational Opportunities and Outreach

As the city continues its commitment to providing high-quality educational and training opportunities in partnership with USGBC, the programming will continue to evolve as determined by the policy needs, compliance rates, nature of building owner inquiries, and increasing baseline knowledge regarding building energy efficiency. In order to engage building operators that have not yet fully complied, the city and USGBC will host a diverse building owner panel to provide a platform for discussion of individual experiences with the policy process and results to date. Furthermore, in addition to the ENERGY STAR Portfolio Manager 101 courses provided each year, new 201-level workshops will be added to target the increasingly-advanced building performance, portfolio management, and project prioritization questions stemming from the policy. Finally, virtual or hybrid in-person programming will be provided in consideration of the COVID-19 crisis, as well as tailored benchmarking and audit support that reflect the changes in occupancy throughout due to the pandemic.

CONSIDERING BEST PRACTICES FROM LEADING CITIES

Outsourcing Help Desk Assistance

Denver

In order to manage peaks in inquiries and requests spanning the policy's 3,000 buildings, the City of Denver outsourced their Benchmarking Help Center. This support included assisting the city with communicating with building owners; setting up and using Salesforce to import and update covered building lists; automatically importing ENERGY STAR Portfolio Manager submissions; checking data quality with automatically-generated flags; sending compliance status letters and email reminders; processing exemption requests; and setting up a dashboard to monitor compliance.

Chicago

The City of Chicago's Benchmarking Help Center provides assistance to building operators who need to comply in partnership with Elevate Energy, an affiliate of the Center for Neighborhood Technology, a 35-year-old non-profit organization whose mission is to promote the development and perpetuation of vibrant urban communities that are both environmentally and economically sustainable. Each year, Elevate responds to more than 800 annual inquiries across the 348 buildings, encompassing 260 million square feet, that are covered by the policy. Elevate's system leverages a Salesforce program, which enables communication between the building database, Help Center, and reporting progress. With Elevate's help, the policy has reached an impressive 90% compliance and improved data quality since 2014. By securing the necessary funding to outsource the majority of their inquiries, the City of Chicago's full-time employee who focuses on the policy can dedicate his or her time toward analyzing response trends, providing tailored support based on these patterns, and exploring strategic policy development opportunities based on the ongoing implementation results.



Figure 23. Denver skyline.



Figure 24. Chicago Skyline.

Expanded Policy Requirements

During policy passage, it was agreed upon that compliance rates would be monitored annually and that these results would be utilized to determine whether the current form of the policy has reached its intended goals. Specifically, if benchmarking compliance has not reached 80% by the third year, the city will consider revisiting the policy and determining specific strategies to increase participation.

Size Threshold

In many other cities, such as New York and Austin, the size threshold for a building benchmarking policy is lowered over time as building owners and operators become aware of the policy and compliance rates are stable. By expanding the policy in this way, more buildings are provided with the actionable information that benchmarking enables, and in turn, the energy use across these spaces – and the resulting greenhouse gas emissions – tends to decrease.

Audits and Retro-Commissioning

Another approach toward enhancing the impacts of a building benchmarking policy is to either require both audits and retro-commissioning for lower-performing buildings; to conduct one or both of these assessments for all commercial buildings; and/or to require that all energy conservation measures (ECMs) with a certain payback period (e.g., five years) are performed. One example of this more advanced, action-oriented approach includes Philadelphia’s policy requirement that building owners perform regular building tune-ups to improve their energy efficiency performance.



Figure 25. Austin skyline.



Figure 26. Philadelphia skyline.

Building Performance Standard

As the City of Orlando looks to expand the impact of building energy efficiency opportunities to complement the practice of energy benchmarking, a new type of policy, a [building performance standard \(or BPS\)](#), has been identified as one of the most powerful tools to date.

A BPS is a forward-thinking policy commitment in which a city establishes a long-term definition for high-performance buildings and drives all buildings to achieve interim targets that increase over time. The combination of short- and long-term goals assures that building performance improves consistently over time and also sends appropriate market signals to discourage investments in inefficient and environmentally-damaging technology. From a building owner perspective, a BPS provides flexibility: owners can use whatever technologies and operational strategies they decide are most effective and economical to meet the target. Additionally, throughout these performance improvement cycles, cities are collecting data and working with the private sector, utilities, and others to create incentives and programs and offer technical assistance.

Cities such as New York; St. Louis; Washington, DC; Reno; and Boulder, as well as the entire state of Washington, have all adopted some form of whole-building performance standards.



Figure 27. St. Louis skyline.



Figure 28. Reno skyline.



CONCLUDING REMARKS

The practice of benchmarking the performance of the built environment throughout Orlando is critical to understanding opportunities for improvement and achieving our sustainability goals. Based on the analysis of the 2018 and 2019 benchmarked building set, the city offers the following recommendations for future applications and analyses of the benchmarking data:

1. Continue supporting and potentially expand a policy help desk that meets the evolving support needs demonstrated by the building owner community, as well as improving data quality, analyzing benchmarking data to understand trends in city-wide consumption over time, and tracking progress toward carbon reduction targets and other policy goals.
2. Continue providing free training and technical assistance to building owners and managers to learn about ways to enhance building performance and support them in achieving compliance for the BEWES policy.
3. Continue exploring strategies to improve building performance across the city. Use building benchmarking data to better understand the efficacy and impacts of codes and standards and evaluate new performance or outcome-based building codes.

By pursuing thoughtful, well-designed programs and policies that address the largest buildings, such as BEWES, cities may be able to reduce their building-based energy consumption and the resulting air quality impacts, resulting in hundreds of millions of dollars saved by residents and businesses alike. Together, we can continue to further our goals to conserve our resources and minimize our impact on our environment, ultimately benefiting everyone who lives, works, learns, and plays in the City of Orlando.

PARTNERS AND SUPPORTING ORGANIZATIONS





**GREEN WORKS
ORLANDO**