



BENCHMARKING ADVISORY COMMITTEE Meeting-2

December 17, 2019

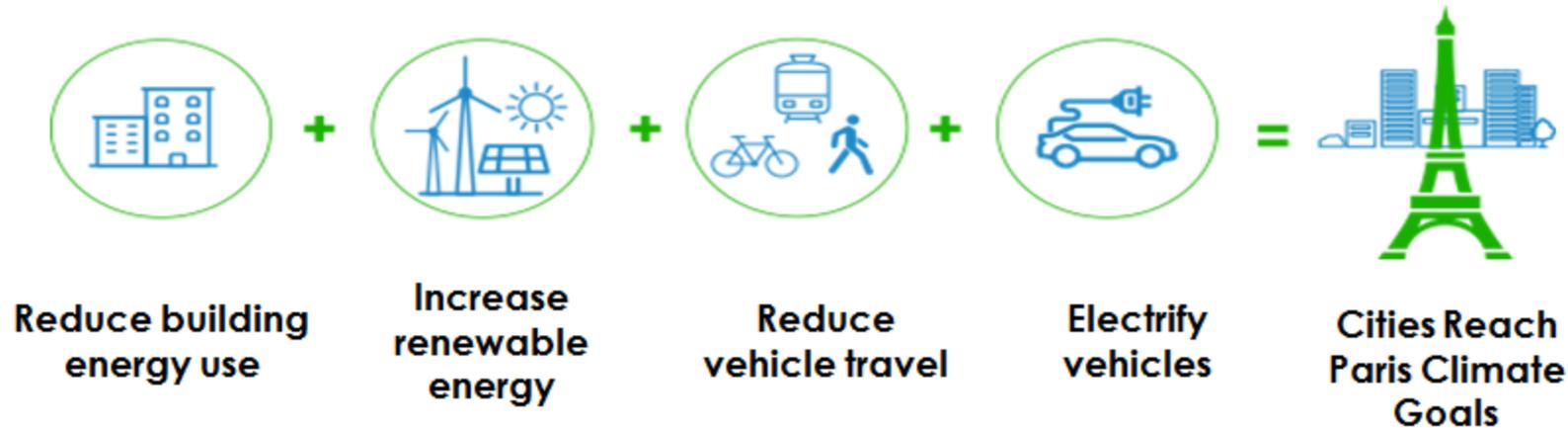
OUR GOALS FOR TODAY

- Review Meeting-1 highlights; brief overview of benchmarking
- Understand the significance of ENERGY STAR Portfolio Manager
- Assess energy data flow for a citywide benchmarking program

Background

- SA Tomorrow Sustainability Plan adopted August 11, 2016
 - Vision: “*San Antonio is a leader in high performance and resilient buildings and infrastructure.*”
- On September 24, 2018, the EPA announced that Bexar County was in marginal nonattainment of federal ozone standards.
- On June 22, 2017, City Council passes Resolution # 17-3844 in support of the Paris Climate Agreement.
- San Antonio’s population projected to increase by one million people by 2040.
- San Antonio’s Climate Action and Adaptation Plan, adopted on October 17, 2019, identifies benchmarking of large buildings as a strategy to reduce energy consumption

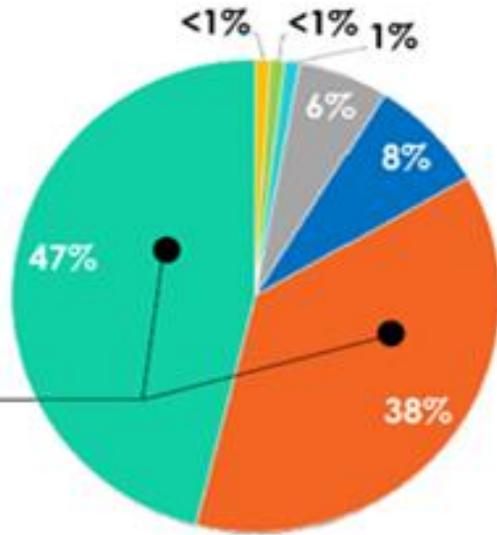
The **American Cities Climate Challenge** is a Bloomberg Philanthropies initiative that aims to accelerate and deepen U.S. cities’ efforts to create the greatest climate impact through 2020 and showcase the benefits – **good jobs, cleaner air, and cost savings** – that climate solutions brings.



San Antonio's 2016 Greenhouse Gas Emissions

85%

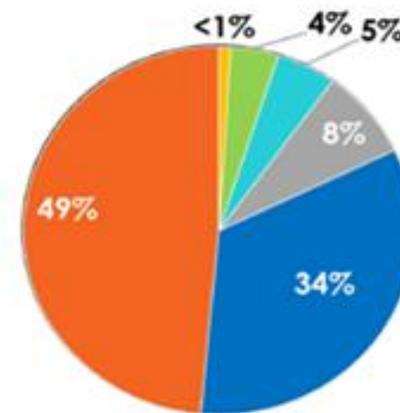
of the opportunity to reduce GHG emissions lies within Transportation & Buildings



San Antonio's Total Emissions by Sector



Building Sector Energy Use



FUEL



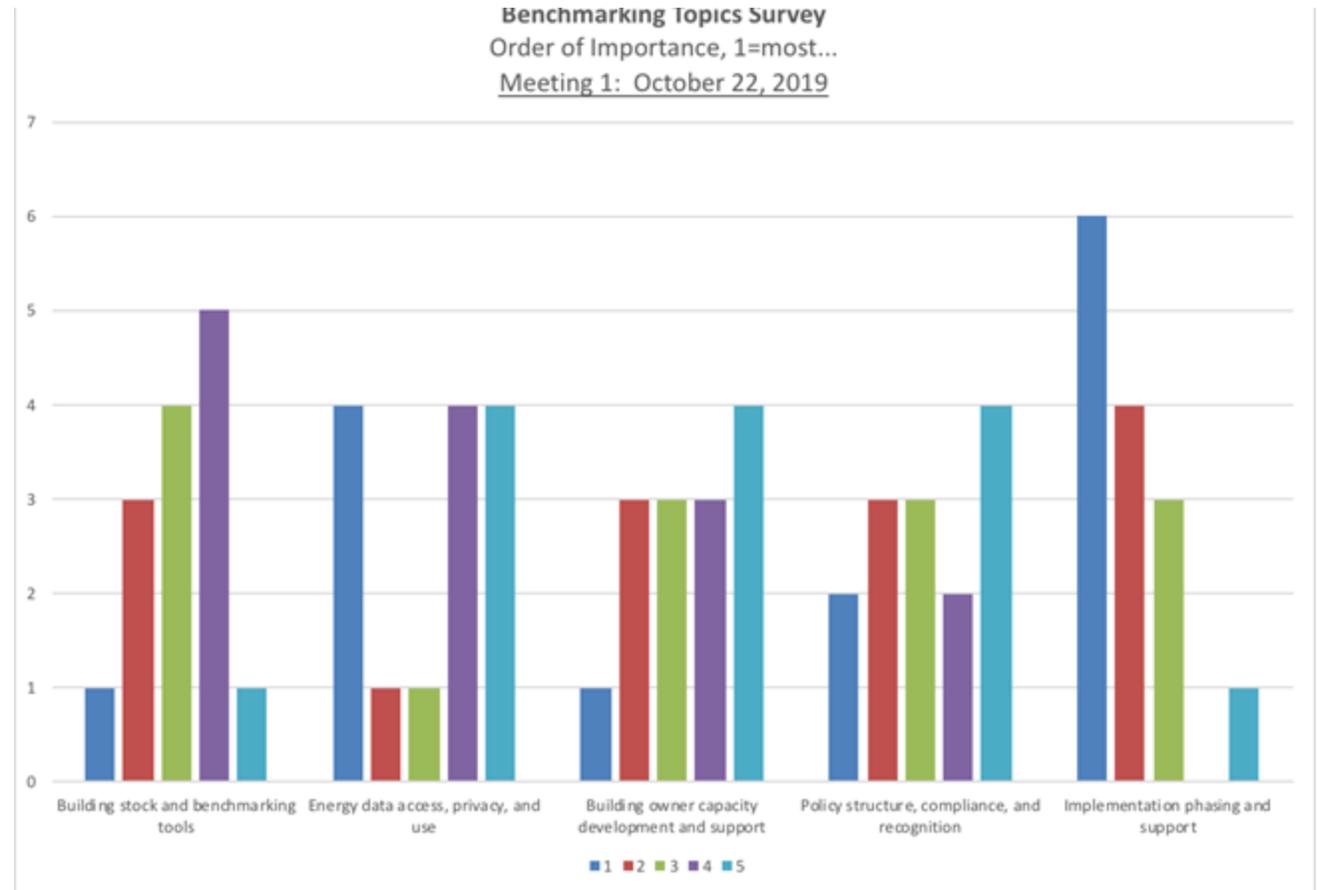
ELECTRICITY



Meeting 1 Recap

Meeting 1 - Recap

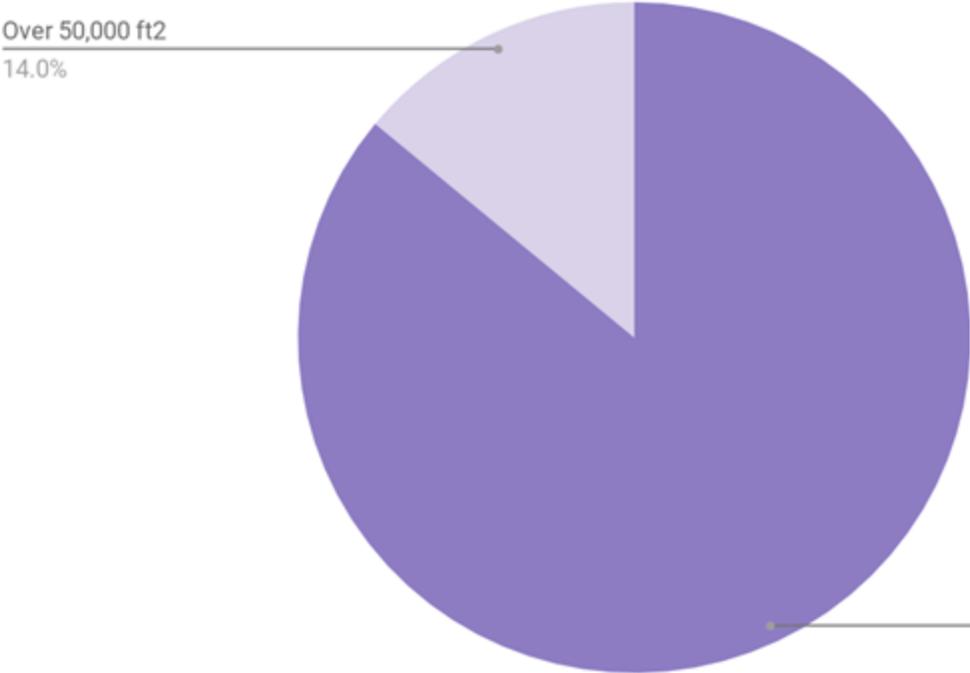
- Review SWOT Analysis from July '19 Roundtable
- Set the stage to deep dive on benchmarking topics
 - Building stock and benchmarking tools
 - **Energy data management, privacy, and use - Dec 17, 2019**
 - Building owner capacity development & support
 - Policy structure, compliance, and recognition
 - Implementation phasing and support



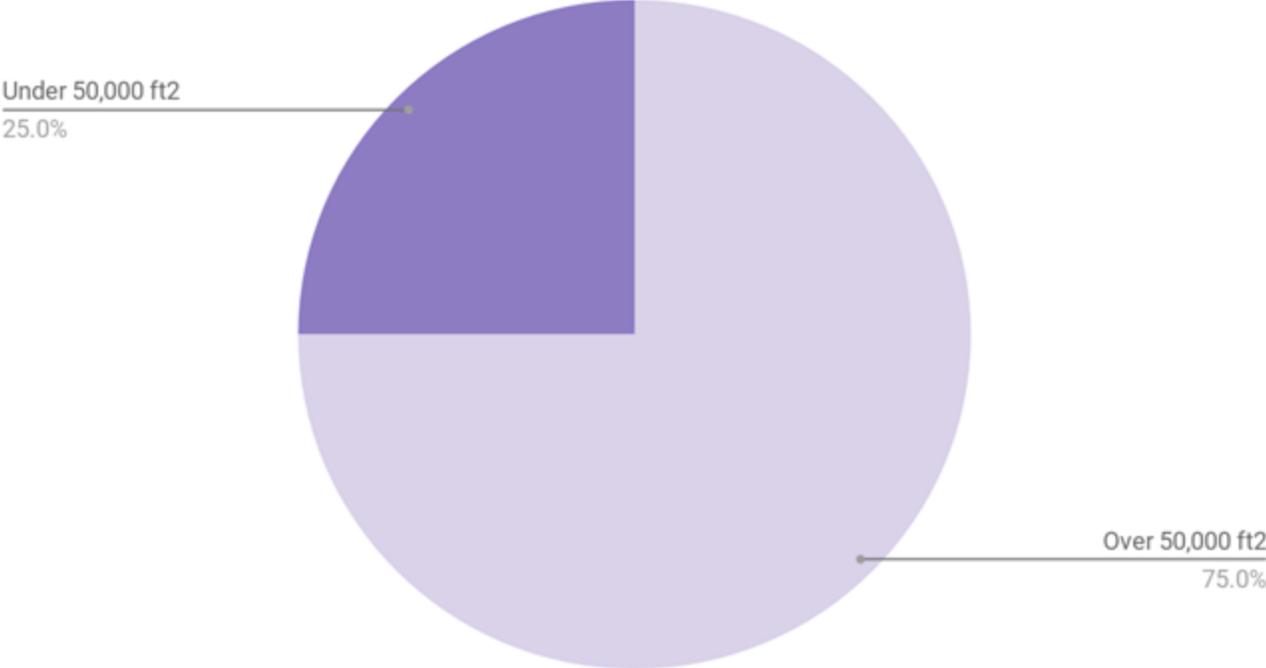
Introduction to Benchmarking

San Antonio - Commercial Buildings Breakdown

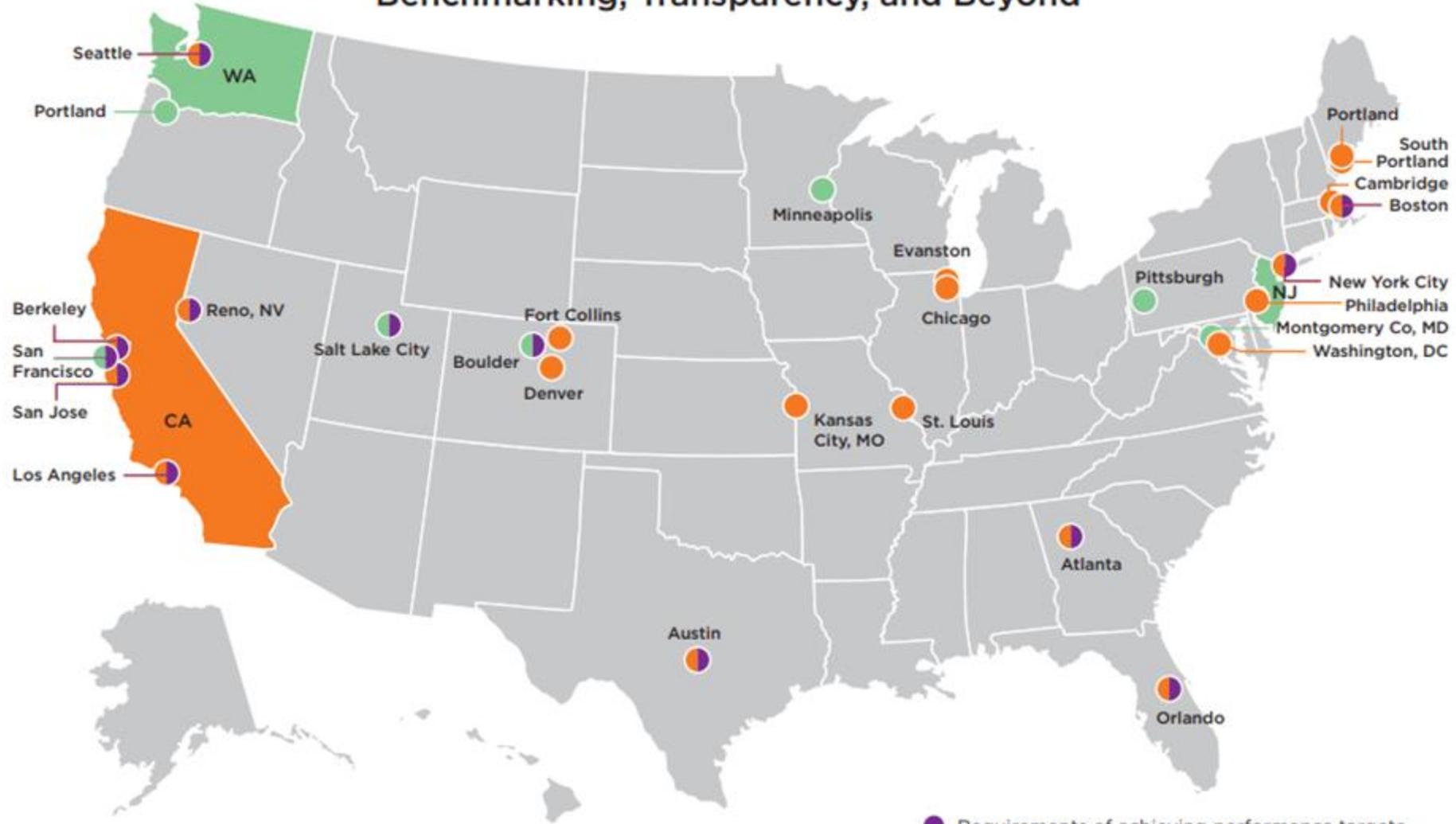
Number of buildings



Covered floor area



U.S. City, County, and State Policies for Existing Buildings: Benchmarking, Transparency, and Beyond



- Requirements of achieving performance targets or completing additional actions
- Benchmarking policy for public, commercial, and multifamily buildings adopted
- Benchmarking policy for public and commercial buildings adopted



Building Energy Scorecards

City of Minneapolis




**City of Minneapolis
Health Department
Environmental Health Division**
50 South Fourth Street Room 400
Minneapolis, Minnesota 55415
www.minneapolismn.gov

April 13, 2017

To: Nick Jette, SOL VISTA
Subject: 2016 EPA ENERGY STAR Benchmarking Report

2016 Report Compliance
Hotel Minneapolis

Reference Property (City Record): **Building Count** **Building Area, ft²**

Owner: OHP Minneapolis LLC 1 201,739

Property Address: 401 2nd Ave S, Minneapolis, MN 55401

Minneapolis Building ID(s): 104799

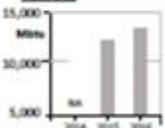
Minneapolis Property ID(s): 2302924330775

Thank you for submitting the ENERGY STAR Benchmarking Report for the above property. The report is compliant with City requirements and is accepted. Following is summary of building performance.

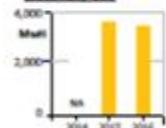
| Year | ENERGY STAR Score* | Energy Use Intensity EUI kWh/sq ft | CO2 Emissions Metric Tons |
|------|--------------------|---------------------------------------|------------------------------|
| 2016 | 16 | 147 | 3,166 |
| 2015 | 16 | 143 | 3,181 |
| 2014 | NA | NA | NA |

* An ENERGY STAR Score of 50 corresponds to the national median, 75 is a Star Performer.

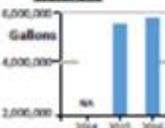
Fuel Use



Electricity Use



Water Use



See Page 2 for comparison of your building performance to Minneapolis peers.
Report data will be posted on the City website and be available to the public.

If you have any questions, please contact us at nplsenergystar@minneapolis.gov or 612-673-3091.
Thank you,

Energy Benchmarking Team
City of Minneapolis

If you need this material translated or in an alternative format, please call 311 or 612-673-3000. TTY users may call 612-673-1157. Spanish, American Sign Language, and other language services are available. For more information, please call 612-673-3000. Service: Open, Health and Environment. In large hall meeting. Subject: Building Energy Benchmarking. For more information, please call 612-673-3000. Hearing: Open. For more information, please call 612-673-3000.

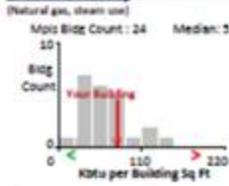
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Hotel Minneapolis

Peer Comparison: Fuel, Electricity and Water Use Intensity
Minneapolis Hotel Buildings

Fuel Use Intensity
(Natural gas, steam use)

Mois Bldg Count: 24 Median: 52



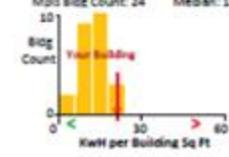
Your building Fuel Use Intensity of 78 kBtu/sq ft exceeds the Minneapolis Hotel Buildings median.

Fuel use can be reduced by: 1.) tightening your building (doors, windows, wall and ceiling insulation), 2.) improving HVAC efficiency (tune-up, upgrades, recommissioning, managing ventilation), 3.) reducing indoor temperatures (Operating hours temperature reductions, unoccupied space setbacks). For example, a one degree reduction in average winter indoor temperature could save \$7,000 annually.

A 5% reduction in your total fuel use could save *\$19,200 annually.

Electricity Use Intensity

Mois Bldg Count: 24 Median: 12



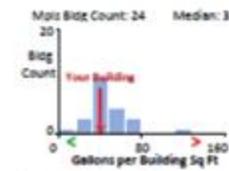
Your building Electricity Use Intensity of 20 kWh/sq ft exceeds the Minneapolis Hotel Buildings median.

Electricity use can be reduced by managing air conditioning, ventilation, refrigeration, computer systems and lighting power use. For example, each 1,000 watts of lighting on during 60 weekly operating hours but now turned off manually or via motion detectors or timers, would save *\$300 annually. Each 1,000 watts of T-8 fluorescent lighting converted to LED's could save *\$150 annually. Controlling Power Factor can also save costs.

A 5% reduction in your total electricity use could save *\$17,000 annually.

Water Use Intensity

Mois Bldg Count: 24 Median: 37



Your building Water Use Intensity of 33 gallons/sq ft is below the Minneapolis Hotel Buildings median.

Water use can be further reduced. Minneapolis water costs .92 cents/gallon including sewer charges, plus fees in 2016. Heating water for lav use can cost more than .5 cents/gallon. And Minneapolis water rates are increasing over 3% per year. Increasing efficiency of fixtures, dish washers, shower heads, and irrigation can save. And storm water charges can be significantly reduced via landscaping changes. See the City Water Department website.

* Savings are order of magnitude estimates.

Your 2016 water use was 5,830,000 gallons. Each 10,000 gallon reduction in domestic water use saves \$92.

Pathways for Improvement

1. Building Energy Challenge

Join buildings across the city to reduce greenhouse gas emissions 15% by 2020.

www.minneapolisenergybenchmarking.org/challenge/

2. City Funding for Energy Efficiency

Apply for a Green Business Cost Share for your next energy efficiency project.

www.minneapolismn.us/environ/ment/green/index.htm

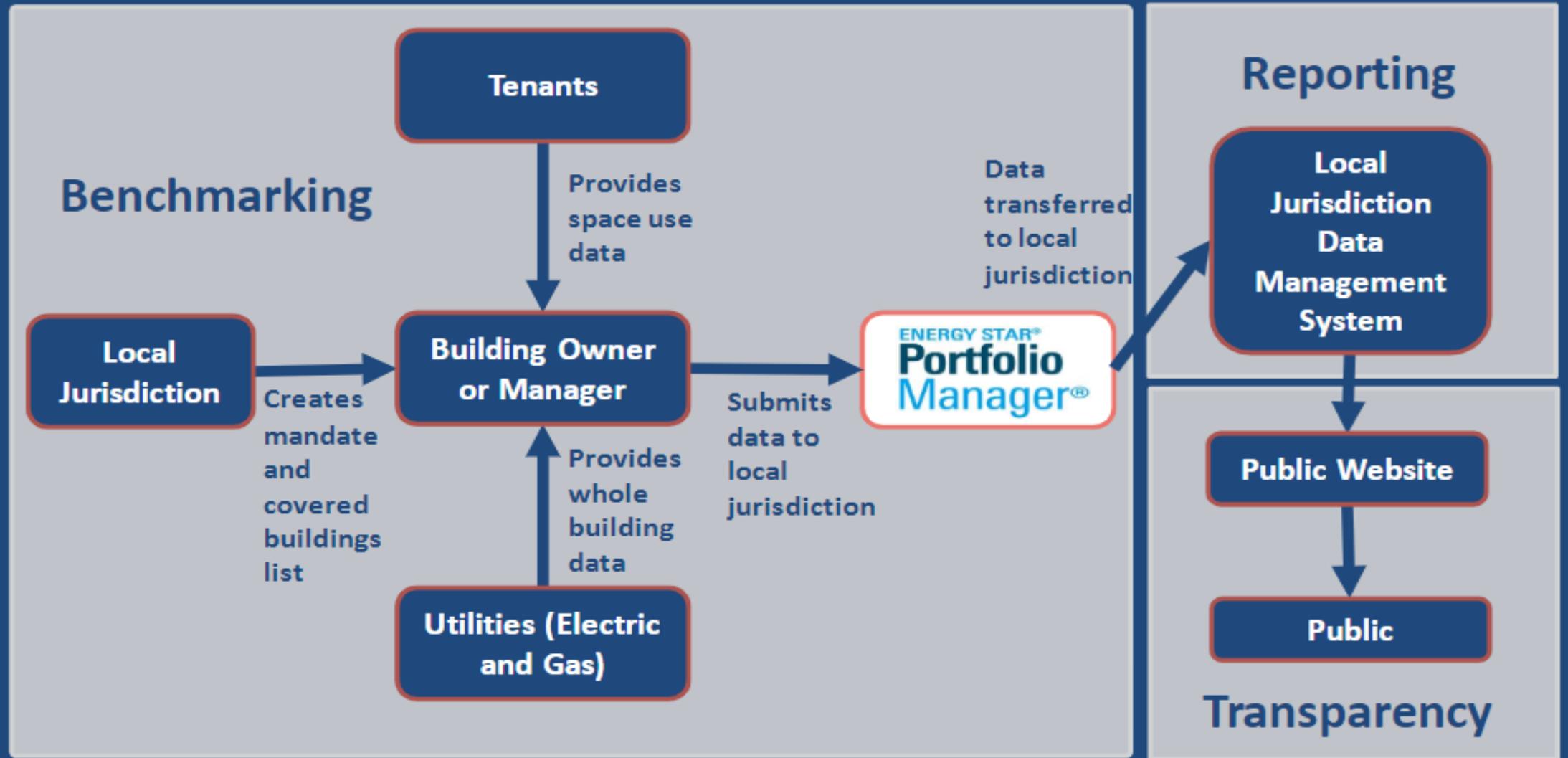
3. ENERGY STAR Certification Grants

Certify your high-performing building with a City grant covering 60% of review costs!

www.minneapolisenergybenchmarking.org/funding/grants/

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Benchmarking Process – Data Flow



Energy Data Management

ENERGY STAR Portfolio Manager

Data Flow > Portfolio Manager



Anna Morton, P.E.
Morton Gestalt
mortongestalt.info

What is Portfolio Manager?

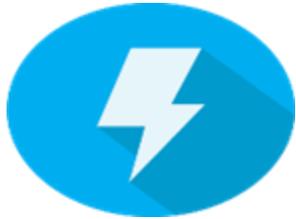
- Free, Online Building Management tool
- Run by the EPA
- Launched in 1999
- Use in 2018
 - 270k properties
 - 26 billion square feet





ENERGY STAR® PortfolioManager®

Hundreds of metrics, including:



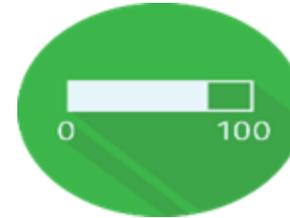
Energy use Source, site,
weather normalized,
demand



Water use
Water use intensity,
Water Score
(for Multifamily)



Waste & Materials
Waste intensity, diversion
rate



**1-100
ENERGY STAR
score**



GHG emissions
Indirect, direct,
total, avoided

Use Portfolio Manager to understand comparative performance

- ANY building can be benchmarked
- Benchmarking through Portfolio Manager enables you to:



Compare your building to a **national sample** of similar buildings



Compare your buildings of a similar type to **each other**

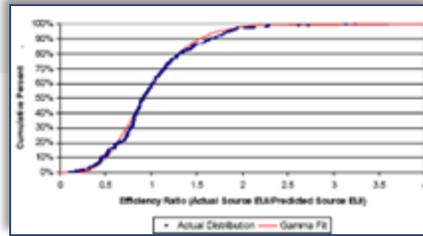


Identify underperformers in your portfolio and set priorities

Developing a 1 – 100 ENERGY STAR Score



Nationally representative survey



Data analysis



| Descriptive Statistics for Variables in Final Regression Model | | | | |
|--|---|--------|---------|---------|
| Variable | Full Name | Mean | Minimum | Maximum |
| SrcEUI | Source Energy per Square Foot | 198.4 | 19.62 | 1133 |
| LNsqFt | Natural Log of Square foot | 9.535 | 8.517 | 13.82 |
| PCDen | Number of Computers per 1000 ft ² | 2.231 | 0.0273 | 11.11 |
| LNWkHrs | Natural Log of Weekly Operating Hours | 3.972 | 3.611 | 5.124 |
| LNWkrDen | Natural Log of Number of Workers per 1000 ft ² | 0.5616 | -3.882 | 2.651 |
| HDDxPH | Heating Degree Days x Percent Heated | 4411 | 0.0000 | 9277 |
| CDDxPC | Cooling Degree Days x Percent Cooled | 1157 | 0.0000 | 5204 |

Note:
- Statistics are computed over the filtered data set (n=498 observations).
- Values are weighted by the CBECs variable ADJWTS.
- The mean values are used to center variables for the regression.

Statistical modeling



Comparison between actual energy data and the modeled estimate



sears



USAA Real Estate Company



Hines



Who Is Using Portfolio Manager?

- Building owners, managers, tenants, service providers
- Local, county, and state governments, some with benchmarking and public disclosure policies
- Federal agencies under executive orders & statutes
- Green building certification programs
 - LEED, Green Globes
- Consumer information sites
 - TripAdvisor, CoStar, Apartments.com
- Investors, via sustainability reporting and ranking
 - GRESB, Greenprint, CDP
- Multifamily financing industry
 - Fannie Mae, Freddie Mac, HUD
- **Your Local 2030 District**



How to use Portfolio Manager?

1. Create Account
2. Create Property
3. Upload Meter Data



Information Needed to benchmark

Property information

- Building type
- Name, street address, ZIP/postal code

Property type data

- Gross floor area
- Use details (e.g., workers, operating hours)

Utility bills

- All purchased and on-site generated energy and water

Four Ways to Get Data in to Portfolio Manager

Manual Data Entry

- Type in each number for each monthly entry

Single Meter Spreadsheet

- Use a spreadsheet to update one meter a time

Multi-meter Spreadsheets

- Use a spreadsheet to update multiple meters from multiple properties

Web Services

- Companies electronically enter utility data into Portfolio Manager through a process of data exchange called “web services”

Upload meter data

Manual entry



Spreadsheet upload



Web services



(you can also hire a 3rd party to enter your data)

How is Portfolio Manager used in the Benchmarking Process?



upload utility data to property

share property with the city

Energy Data Privacy & Use

What do other Cities publish?

| Building Identification |
|--|
| Local Building ID/Portfolio Manager ID |
| Parcel Number/Tax Parcel/Tax ID/BBL ID |
| Property or Building Name |
| Parent Property Name |
| Owner |
| Address |
| Postal Code |
| Community/Neighborhood/Ward/Borough |
| Location (Latitude, Longitude) |
| Compliance Status |
| Property Characteristics |
| Property Floor Area (buildings) (ft ²) |
| Property Floor Area (buildings and parking) (ft ²) |
| Number of Buildings |
| Primary Property Type |
| Property Uses |
| Year Built |

| Energy Metrics |
|---|
| Energy Star Score |
| Energy Star Certified |
| Source EUI (kBtu/ft ²) |
| Weather Normalized Source EUI (kBtu/ft ²) |
| Site EUI (kBtu/ft ²) |
| Weather Normalized Site EUI (kBtu/ft ²) |
| Electricity Use - Grid Purchase and Generated Onsite (kWh) |
| Electricity Use - Grid Purchase and Generated Onsite (kBtu) |
| Natural Gas Use (therms) |
| Natural Gas Use (kBtu) |
| District Steam Use (kBtu) |
| Fuel Oil #2 Use (kBtu) |
| Other Fuel Use |
| Onsite Solar (kWh) |
| Total Site Energy (kBtu) |
| Total Site Energy - % Electricity |
| Total Site Energy - % Gas |
| Total Site Energy - % Steam |
| Percent Better than National Median Site EUI |
| Percent Better than National Median Source EUI |

| GHG Metrics |
|---|
| Total GHG Emissions (Metric Tons CO ₂) |
| Total GHG Emissions Intensity (kgCO ₂ e/ft ²) |
| Direct GHG Emissions (MtCO ₂ e) |
| Indirect GHG Emissions (MtCO ₂ e) |
| Water Metrics |
| Water Use (kgal) |
| Municipally Supplied Potable Water, Indoor Intensity (gal/ft ²) |
| Water Intensity (gal/ft ²) |
| District Chilled Water Use (kBtu) |

Transparency Matters

| City | Program Components | Energy Savings Benchmarked Buildings |
|--|---|--|
| Chicago ¹ 2013-2016 | Benchmarking & Transparency | 4.0% (over 3 years) \$17.6 million per year in energy savings |
| San Francisco ¹ 2010-2014 | Benchmarking & Transparency Audits (2013) | 7.9% (over 4 years) 16.9% carbon savings |
| New York City ² 2010 - 2013 | Benchmarking & Transparency Audits (2013) Lighting Upgrades (2025) | 5.7% (over 3 years) 9.9% carbon savings |
| Washington, D.C. ³ 2012 - 2013 | Benchmarking & Transparency | 3% (over 1 year) |
| Seattle ⁴ 2011 - 2013 | Benchmarking; No Transparency | 0.6% (over 2 years) |

ENERGY STAR Certified Buildings



2018 TOP CITIES



Discussion

- What should be collected by building owner vs. reported to the City vs. disclosed to the public?
- What methods of displaying energy and water use are most helpful or effective?
- How can the City support the reporting process?
- Do any working groups need to be designated for implementation?

Proposed Meeting Schedule

- ~~• Meeting 1 – Oct 22, 2019, Tue~~
- ~~• Meeting 2 – Dec 17, 2019, Tue~~
- Meeting 3 – Jan 21, 2019, Tue
- Meeting 4 – Feb 20, 2019, Thr
- Meeting 5 – Mar 24, 2019, Tue
- Meeting 6 – Apr 23, 2019, Thr

Topics of Discussion

- Building stock and benchmarking tools
- ~~Energy data management, privacy, and use~~
- Building owner capacity development and support
- Policy structure, compliance, and recognition
- Implementation phasing and support; financing tools

Contacts

- Doug Melnick, Chief Sustainability Officer, City of San Antonio, Douglas.Melnick@sanantonio.gov
- T. Adil Chowdhury, Climate Advisor, Natural Resources Defense Council, achowdhury@nrdc.org