



# Building Efficiency Program

## Economic Development Subcommittee Meeting

August 29, 2019

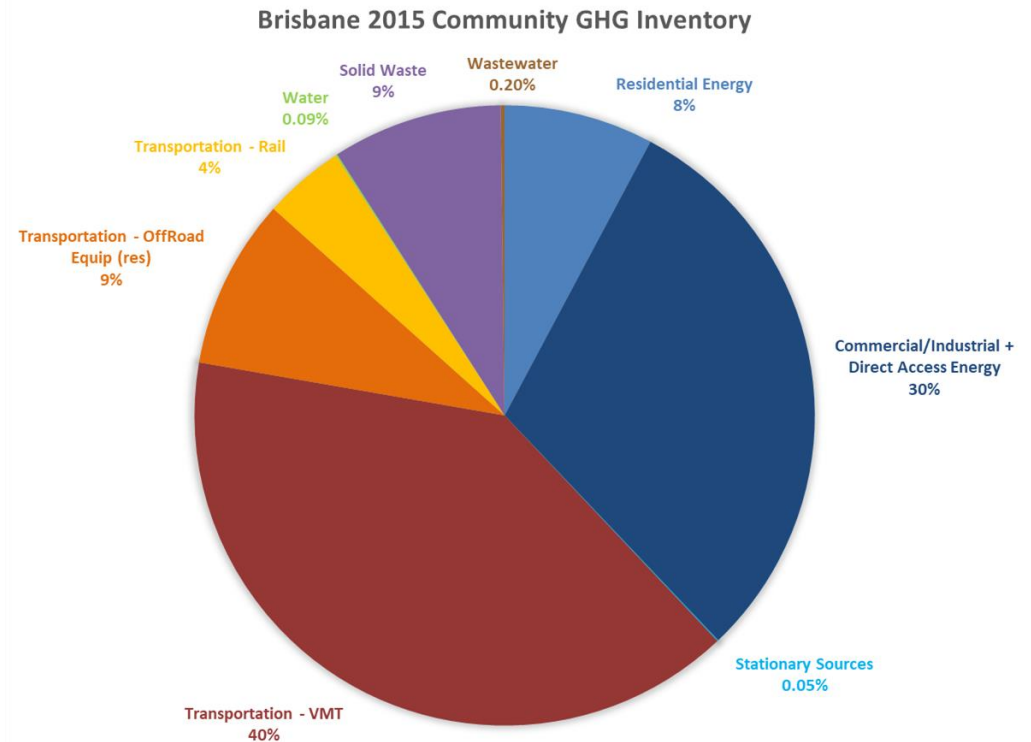
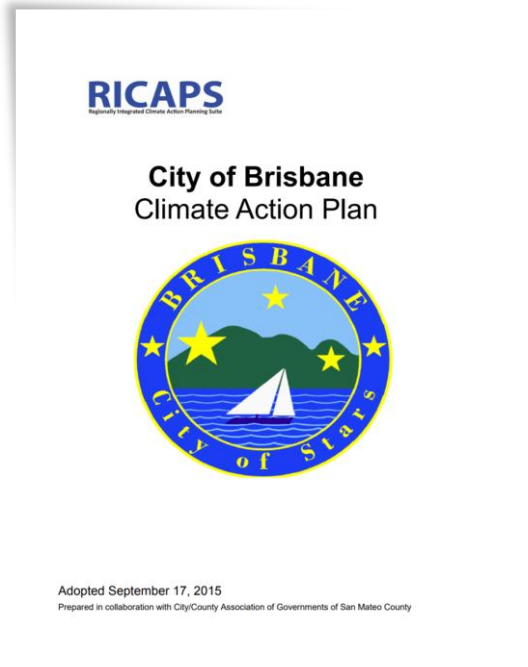
# Agenda

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1. Welcome & Introductions
2. Project Background
3. Technical Concepts Review
4. Stakeholder Engagement
5. Ordinance Draft Review
6. Expected Impact
7. Questions/Discussion
8. Next Steps
9. Public Comment



# Project Background



# Connecting Brisbane's 5 Values with the Ordinance



## Safe Community

Safe Buildings + Energy + H2O



## Community Building

Meeting Shared Goals



## Ecological Sustainability

Built Environment Impact



## Fiscally Prudent

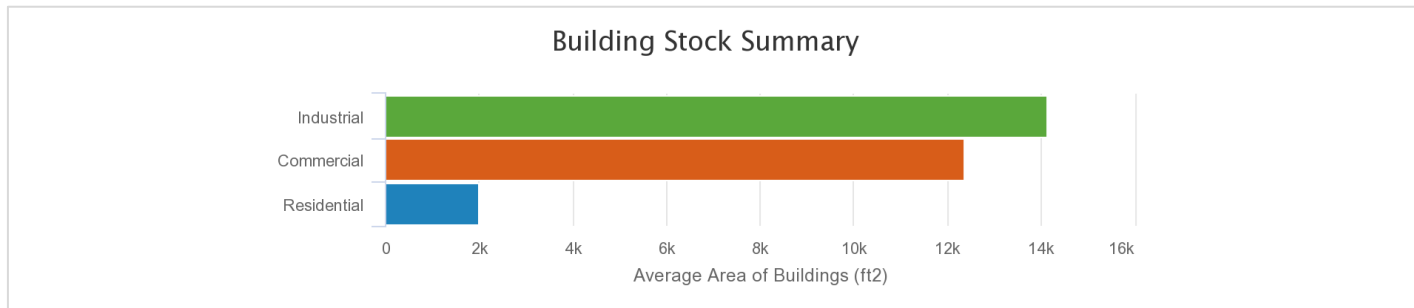
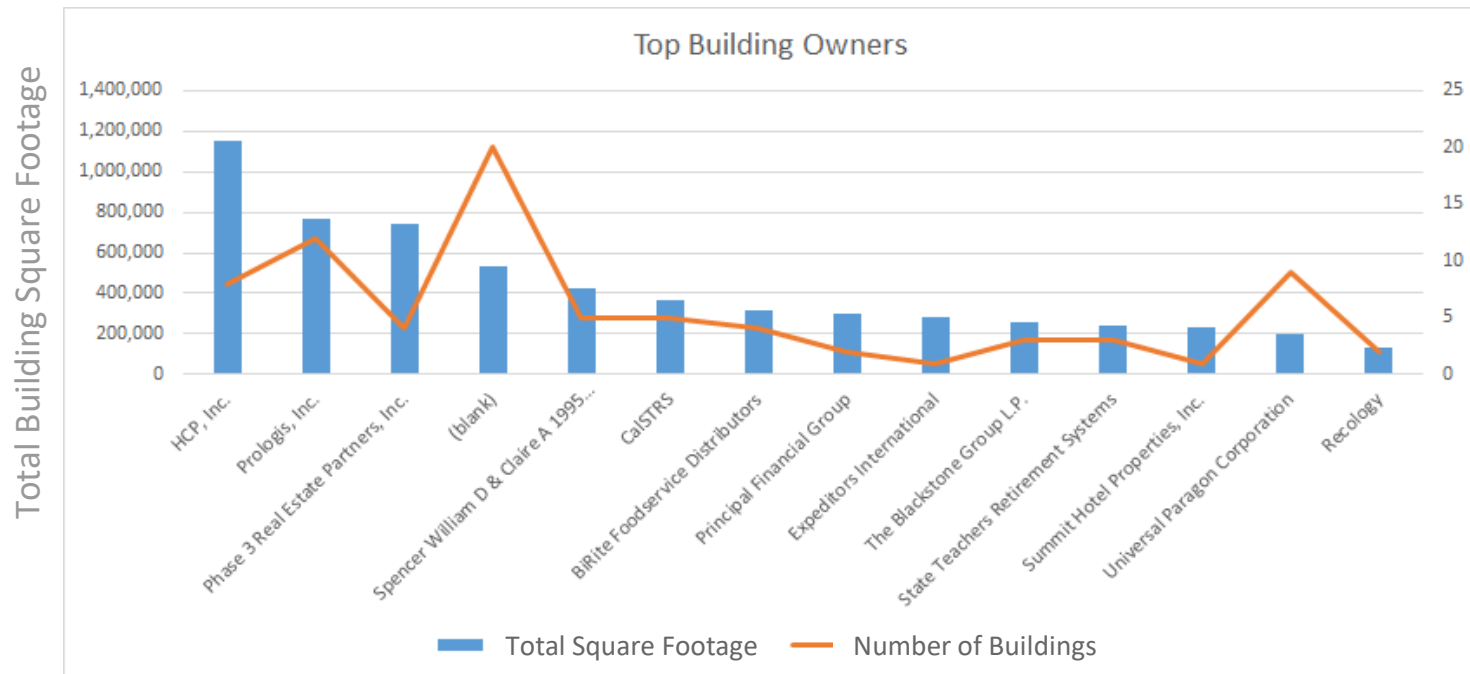
Shared Economic Benefits



## Economic Development

Job Creation + Productivity



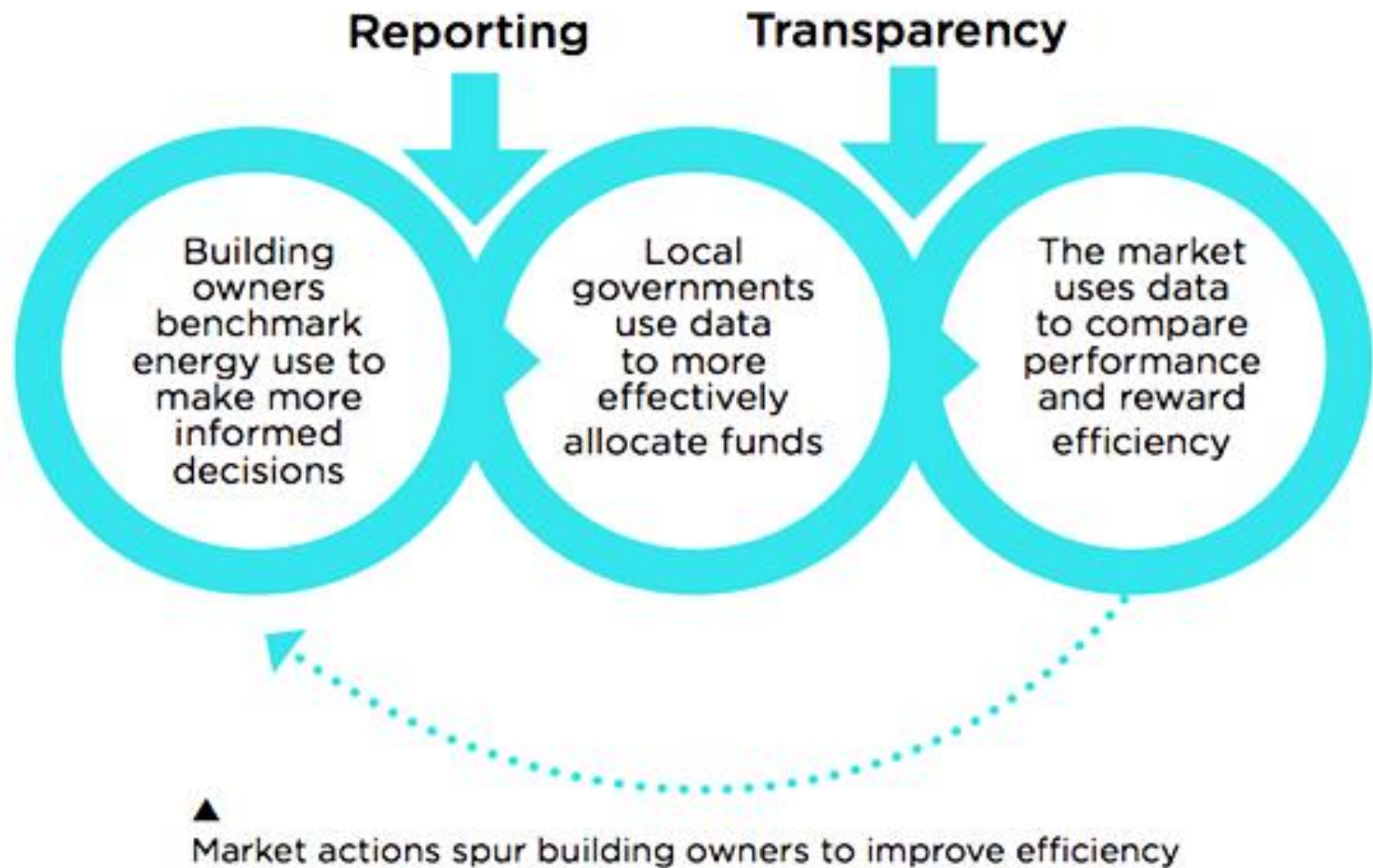


# Brisbane Building Owners & Average Building Size



# Technical Concepts Review





# How is Benchmarking Used?



# ENERGY STAR Portfolio Manager

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- No cost, interactive energy management tool
- US Department of Energy + Environmental Protection Agency
- **Benchmarked in Portfolio Manager**
  - 21+ billion sf
  - 185,000 buildings
  - 25% of total building market





# Audits Refresher

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- Energy audits produce a list of energy conservation measures (ECMs) with associated costs and savings
- Different levels of audits give varying levels of detail

Asset Score (10-39k)	<ul style="list-style-type: none"><li>○ Brief on-site survey of the building</li><li>○ Standardized and quick audit for small to medium buildings</li><li>○ Savings and cost analysis of low-cost/no-cost Energy Conservation Measures (ECMs)</li><li>○ Identification of potential capital improvements meriting further consideration</li></ul>
ASHRAE Level 2 (40k +)	<ul style="list-style-type: none"><li>○ More detailed building survey</li><li>○ Breakdown of energy use</li><li>○ Savings and cost analysis of all ECMs</li><li>○ Identification of ECMs requiring more thorough data collection and analysis (Level 3)</li></ul>



# RCx Refresher

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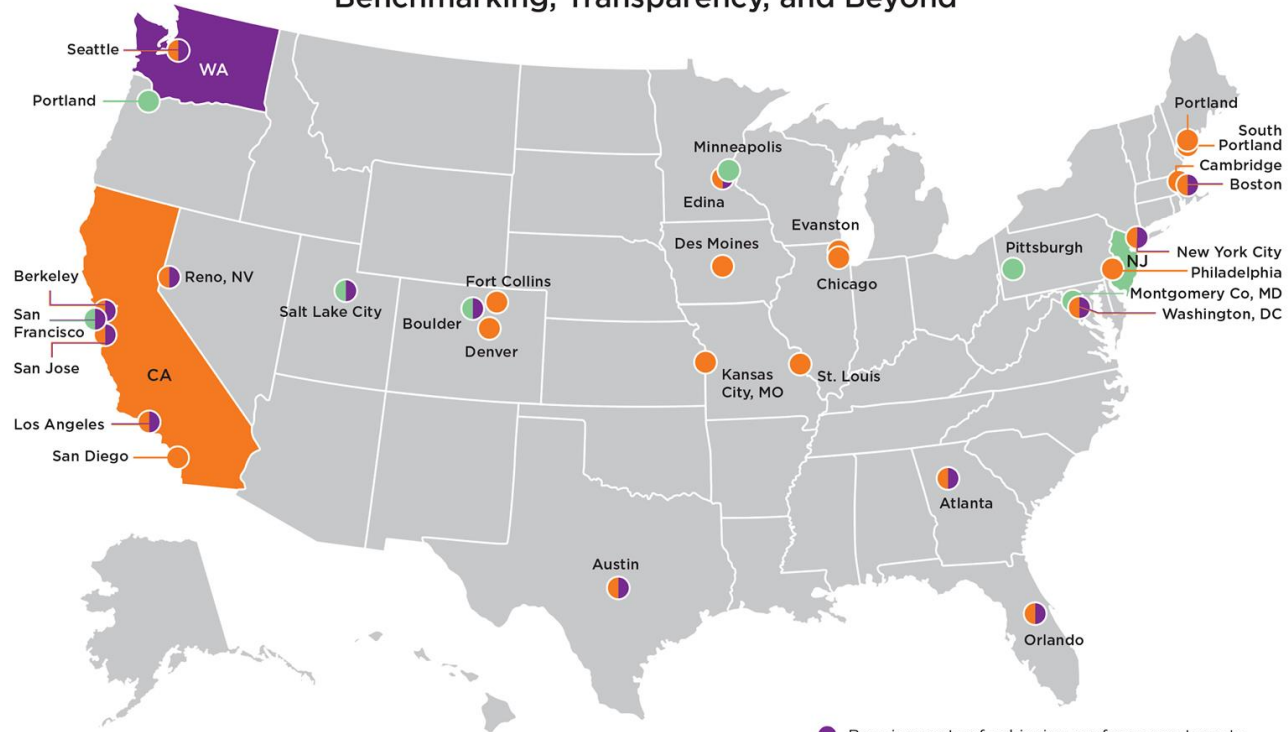
***Retrocommissioning (RCx)*** typically refers to simple fixes to ensure a building's systems are operating the way they were designed to

Examples:

- checking your thermostat is programmed appropriately for temperature, timing
- making sure your AC isn't running all night
- making sure lights are on during the day

# Who else has similar programs?

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



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# Stakeholder Engagement Efforts

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- 2 Workshops
- 2 Webinars
- Online: website, email, surveys
- Staff 1-on-1 meetings with:
  - Prologis
  - UPC
  - Bi-Rite
  - FW Spencer
  - Phase 3





# Draft Ordinance Review



# Ordinance Sections

- Authority
- Purpose
- Applicability
- Definitions
- **Benchmarking & Self-Reporting**
- **Beyond Benchmarking**
- **Performance Path**
- **Prescriptive Path**
- Required Submittal
- Record Maintenance
- **Schedule for Compliance**
- **Penalties for Violation**
- Declaration of Public Nuisance
- **Fees**
- **Appeals**

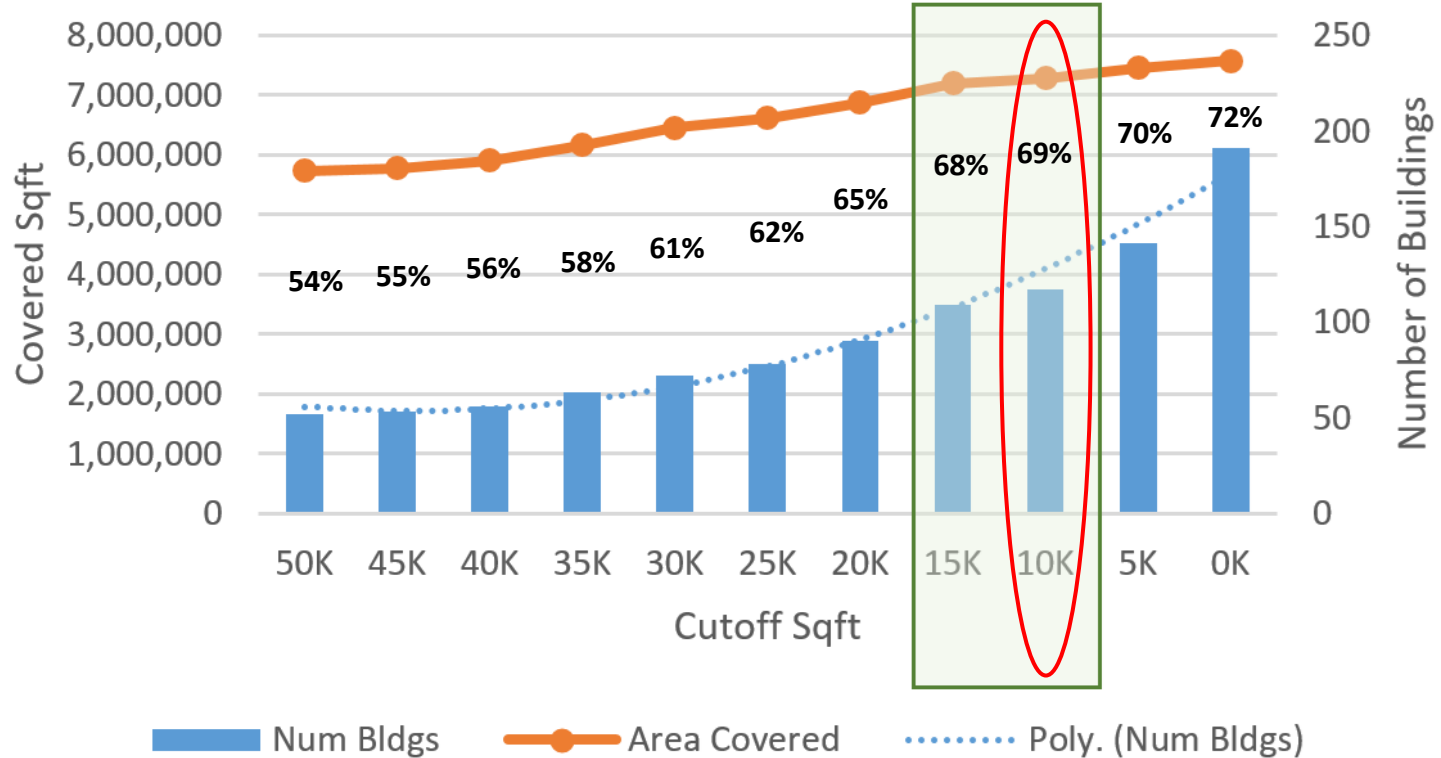


# Key Questions

- What buildings are covered?
- Who is exempt?
- What is the Performance Path?
- What is the Prescriptive Path?
- What is the schedule?
- Are there penalties or fees?



## Number of Buildings vs Covered Sqft

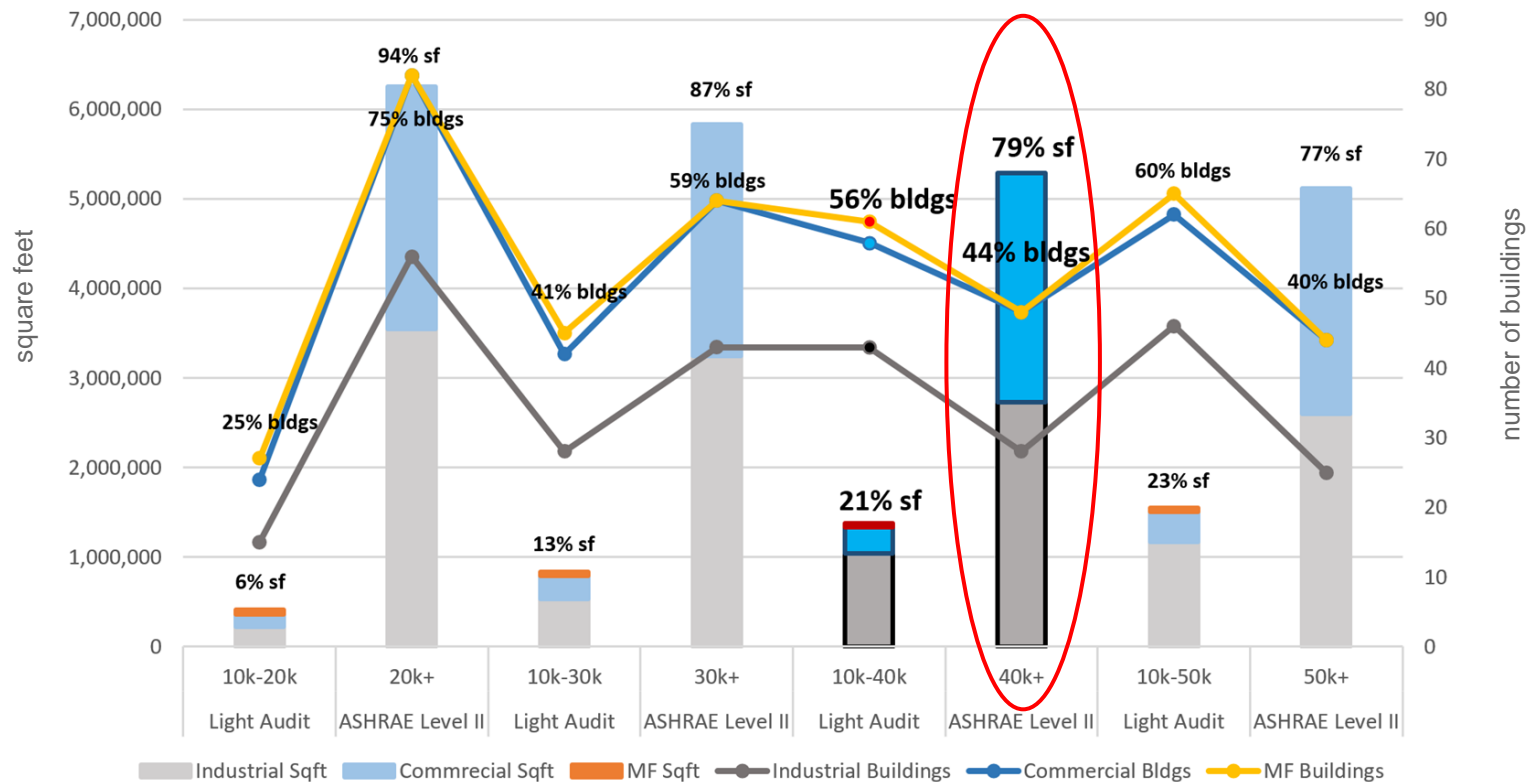


# What size of buildings should we look at?

69% of building area (multi-family residential, commercial and industrial) in Brisbane is covered under a 10,000 sf cutoff for benchmarking



# Beyond Benchmarking Cutoff Scenarios



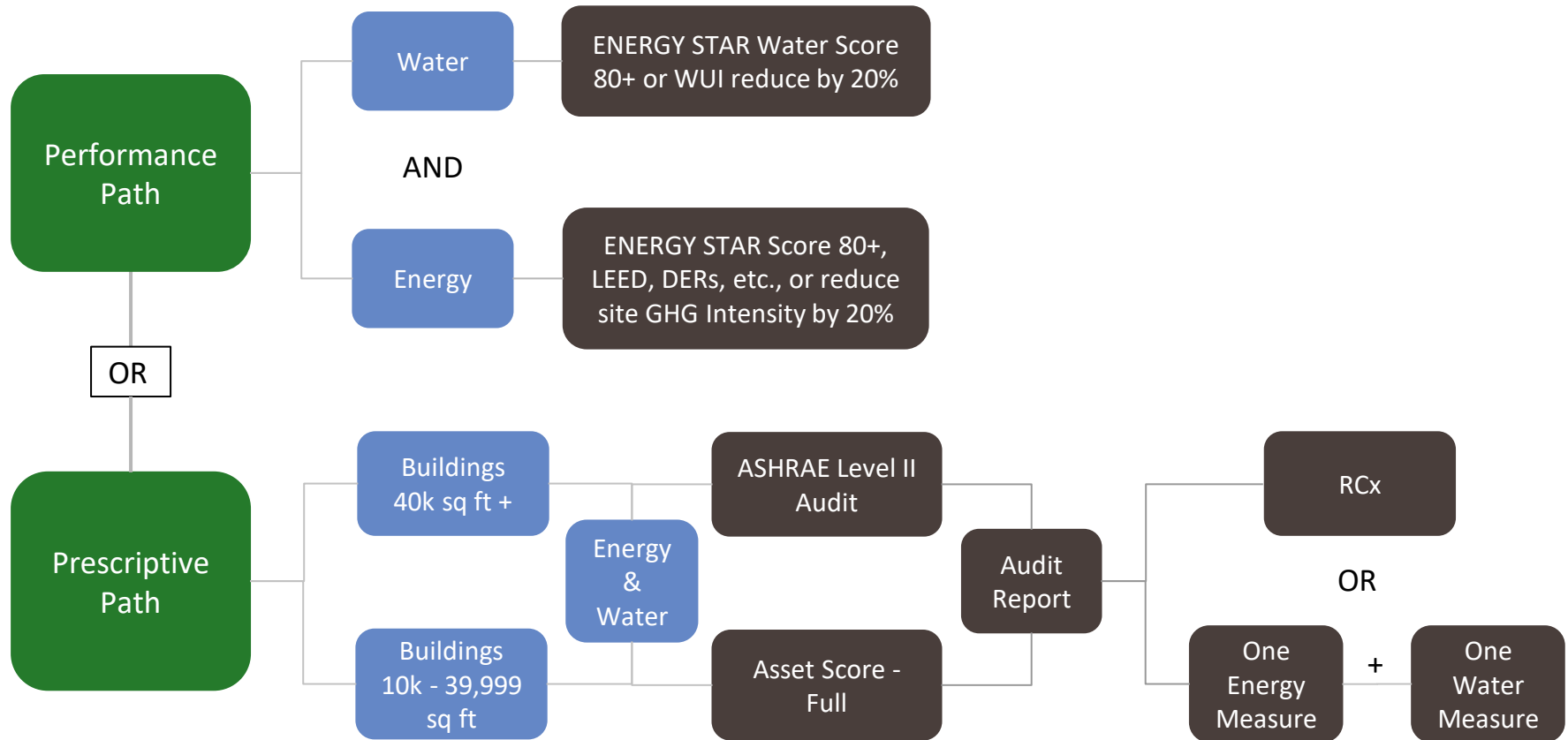
## Why 40,000 square feet?

Minimize number of buildings affected, maximize square footage captured.

# Compliance Pathways

Annual Benchmarking beginning 2021 - 10,000 sq ft or more

Beyond Benchmarking: every 5 years beginning: 2023 for commercial + residential, 2024 industrial



# Exemptions

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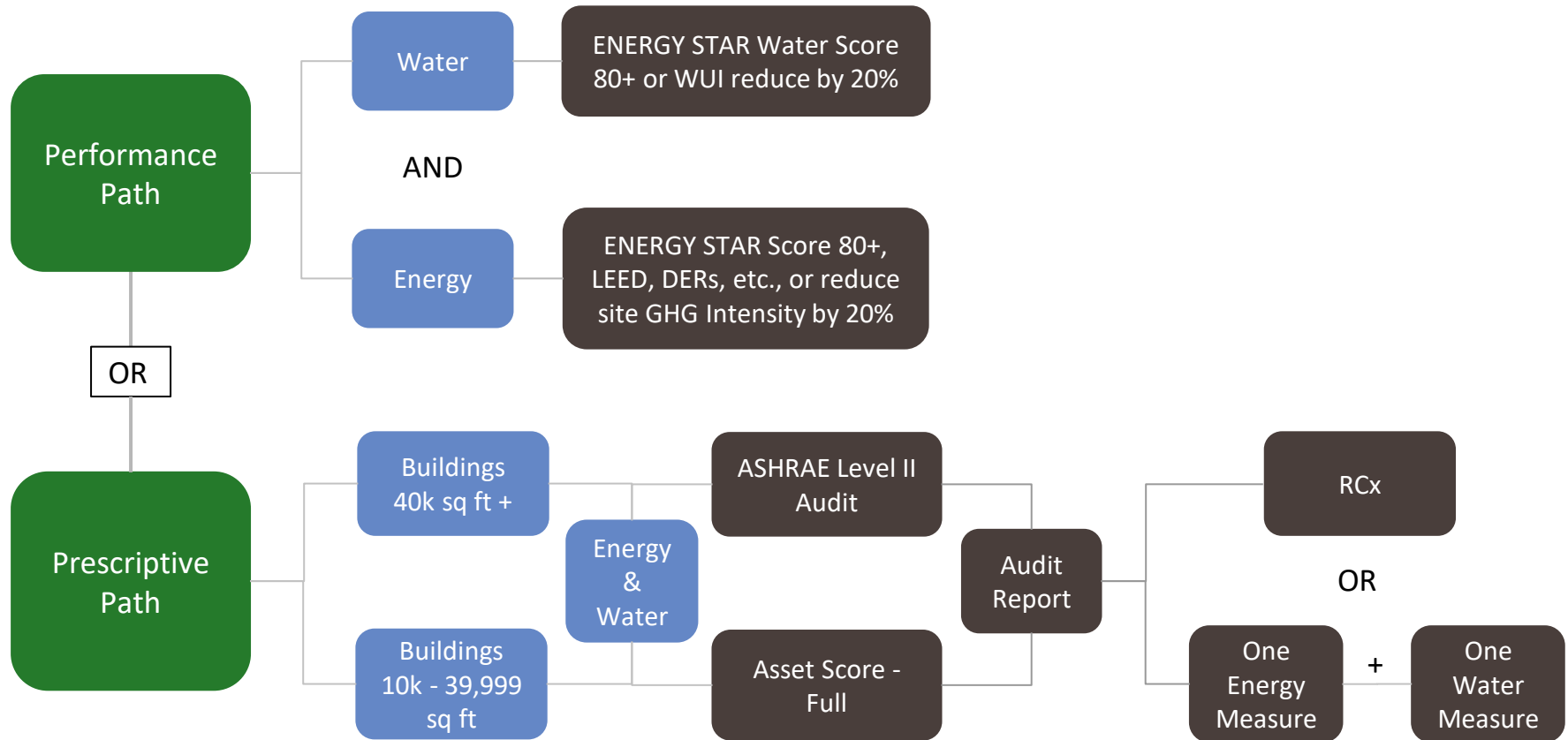
- No Certificate of Occupancy for the entire year
- The entire building was not occupied due to renovation (50% for Beyond Benchmarking)
- The building did not receive energy or water services for the entire year
- A demolition permit for the entire building has been issued, or a schedule for demolition can be reasonably documented
- Beyond Benchmarking adds:
  - Intended for sale with real estate appraisal within 1 year of reporting deadline
  - Recently constructed and received Certificate of Occupancy within last 5 years; report next cycle



# Compliance Pathways

Annual Benchmarking beginning 2021 - 10,000 sq ft or more

Beyond Benchmarking: every 5 years beginning: 2023 for commercial + residential, 2024 industrial



# Performance Path Options

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- Energy Star Score 80+
- Improved Energy Star Score by 20+ points relative to baseline year
- Weather-normalized site GHG Intensity 25+% below property type average
- Weather-normalized site GHG Intensity reduced by 20+% relative to baseline year
- Installed Distributed Energy Resources (DERs): solar PV, battery electric storage, grid-interactive efficient building, decarbonized building



# Prescriptive Path Options

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- Conduct an audit:

- Buildings 10,000-39,999 square feet: Asset Score Full
- Buildings 40,000+ square feet: ASHRAE Level II Audit

- And perform either:

- Retro-commissioning
- Retrofits - energy and water efficiency or Distributed Energy Resources measures



# Schedule

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- By May 1, 2020 (& annually thereafter)
  - Benchmarking of all city-owned buildings over 2000 sqft
- *City option for voluntary early compliance pilot*
- May 1, 2021 (& annually thereafter)
  - Benchmarking of all private buildings over 10,000 sqft
- May 1, 2023 (& every 5 years thereafter)
  - Beyond Benchmarking report for Commercial & Residential buildings over 10,000 sqft
- May 1, 2024 (& every 5 years thereafter)
  - Beyond Benchmarking report for Industrial buildings over 10,000 sqft



# Penalties, Fees, and Appeals

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## ■ Penalties:

- The violation of any provisions of this Chapter shall constitute an infraction punishable by the fines, penalties and enforcement provisions set forth in Chapters 1.14, 1.16 and 1.18 of this Code

## ■ Fees:

- None currently set
- May be imposed by Council Resolution

## ■ Appeals:

- To the City Manager within 15 days





# Expected Impacts

## ■ How many buildings are affected?

- Benchmarking: 109 / 6.6M sqft
- ASHRAE Level 2 Audits: 61 / 1.3M sqft
- Asset Score - Full: 48 / 5.3M sqft

## ■ What are the expected GHG Impacts?

- ~2700 MTCO<sub>2</sub>e reduction within 5 years of ordinance effective date



# Questions / Discussion



# Energy Efficiency Improvement Options

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- Lighting meeting current CA Building Code
- Replace all gas water heaters with electric heat pump or tankless water heaters
- Replace all refrigerators with Energy Star models
- Replace all gas stoves with electric induction
- Install smart thermostats
- Install solar thermal heating/cooling
- Install a cool roof
- Participate in approved utility retrofit program



# DER Improvement Options

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- Solar Photovoltaic
- Stationary Electric Storage
- Grid-interactive Efficient Building
- Electric Vehicle (EV) Charging Infrastructure
- Decarbonized Building (produces onsite or procures carbon-free renewable energy in an amount sufficient to offset the annual carbon emissions associate with operations)



# Water Efficiency Improvement Options

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- All plumbing systems meeting current CA Building Code
- Outdoor landscaping and irrigation in compliance with current Brisbane Water Conservation in Landscaping code
- Install greywater system following CA code
- Insulate all hot water pipes in accessible locations
- Participate in approved water utility retrofit program



# Average Audit Savings and Costs

- **Asset Score**
  - PNNL [technical report](#) states data collection takes 6 - 20 hours
  - ~ \$600 - \$2,000 at \$100/hr
  - Asset Score [reference](#) report
  
- **Savings**
  - Utility costs in U.S. office buildings average \$2.20/sq. ft.
  - 20% reduction in energy use = savings of \$0.44/sq. ft. (DOE EERE 2011c)

Building Size	ASHRAE Level 2 Audit Cost Estimate	RCx Report Cost Estimate*
40,000 sq. ft.	\$6,000	\$12,000
100,000 sq. ft.	\$15,000	\$30,000

\*RCx typically has low cost measures

	\$ / Sq. Ft.
Audit Cost	\$0.10 - 0.15
RCx Cost	\$0.20 - 0.30
Total Cost	\$0.30 - 0.45
Estimated Utility Savings	\$0.44

Costs recouped in ~1 year; savings continue



# Questions / Discussion



# Next Steps

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- ✓ Workshop 1: Goals and Outcomes
- ✓ Webinar 1 - Benchmarking
- ✓ Workshop 2: Strategy and Options
- ✓ Webinar 2 - Audits
- ✓ Study Session
- Planning Commission - Sept 12\*
- Open Space & Ecology Committee - Sept 18\*
- Council Presentation - Nov 7\*

\*tentative dates





# Thank you!

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