Building Efficiency Program
Economic Development Subcommittee Meeting
August 29, 2019
Agenda

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 + H20

- **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?

Reporting:
- Building owners benchmark energy use to make more informed decisions

Transparency:
- Local governments use data to more effectively allocate funds
- The market uses data to compare performance and reward efficiency

Market actions spur building owners to improve efficiency
ENERGY STAR Portfolio Manager

- 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

- 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) | ○ Brief on-site survey of the building  
| | ○ Standardized and quick audit for small to medium buildings  
| | ○ Savings and cost analysis of low-cost/no-cost Energy Conservation Measures (ECMs)  
| | ○ Identification of potential capital improvements meriting further consideration  
| ASHRAE Level 2 (40k +) | ○ More detailed building survey  
| | ○ Breakdown of energy use  
| | ○ Savings and cost analysis of all ECMs  
| | ○ Identification of ECMs requiring more thorough data collection and analysis (Level 3)  

RCx Refresher

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?
Stakeholder Engagement Efforts

- 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?
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.
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

Performance Path

- Water
  - ENERGY STAR Water Score 80+ or WUI reduce by 20%

- Energy
  - ENERGY STAR Score 80+, LEED, DERs, etc., or reduce site GHG Intensity by 20%

OR

Prescriptive Path

- Buildings 40k sq ft +
  - Energy & Water
  - ASHRAE Level II Audit
  - Audit Report
  - Asset Score - Full

- Buildings 10k - 39,999 sq ft

- RCx
  - One Energy Measure
  - One Water Measure
Exemptions

- 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

Prescriptive Path

Water

And

Energy

Buildings 40k sq ft +

Buildings 10k - 39,999 sq ft

Energy & Water

ASHRAE Level II Audit

Energy Measure

Audit Report

One Energy Measure

RCx

OR

One Water Measure

ENERGY STAR Water Score 80+ or WUI reduce by 20%

ENERGY STAR Score 80+, LEED, DERs, etc., or reduce site GHG Intensity by 20%

E80+ or WUI reduce by 20%

80+, LEED, DERs, etc., or reduce site GHG Intensity by 20%
Performance Path Options

- 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

- 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

- 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

- **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 MTCO2e reduction within 5 years of ordinance effective date
Questions / Discussion
Energy Efficiency Improvement Options

- 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

- 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

- 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)

<table>
<thead>
<tr>
<th>Building Size</th>
<th>ASHRAE Level 2 Audit Cost Estimate</th>
<th>RCx Report Cost Estimate*</th>
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</thead>
<tbody>
<tr>
<td>40,000 sq. ft.</td>
<td>$6,000</td>
<td>$12,000</td>
</tr>
<tr>
<td>100,000 sq. ft.</td>
<td>$15,000</td>
<td>$30,000</td>
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*RCx typically has low cost measures

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<tr>
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<th>$ / Sq. Ft.</th>
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<tbody>
<tr>
<td>Audit Cost</td>
<td>$0.10 - 0.15</td>
</tr>
<tr>
<td>RCx Cost</td>
<td>$0.20 - 0.30</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$0.30 - 0.45</td>
</tr>
<tr>
<td>Estimated Utility Savings</td>
<td>$0.44</td>
</tr>
</tbody>
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Costs recouped in ~1 year; savings continue
Questions / Discussion
Next Steps

✓ 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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