Agenda

▪ Introductions
▪ Project Background & Goals
▪ Core Topics
  ◦ Benchmarking & Discussion
  ◦ Auditing & Local Case Study
▪ Table Activity
▪ Next Steps
Goals and Outcomes

▪ Understanding of the Brisbane Building Efficiency Program
▪ Discussion on core topics, including
  ◦ Benchmarking
  ◦ Energy auditing
  ◦ Retrocommissioning
▪ Obtaining input from YOU, the key stakeholders
▪ Wrapping up with clear next steps
Who’s in the room?

- **Introductions & Stakeholder Roles**
  - What is your interest in the Brisbane Building Efficiency Program?
  - What is your experience with benchmarking or auditing?

- **Stakeholder Types**
  - City staff & Council members
  - Environmental organizations
  - Local building/business owners
  - Industry professionals
  - Regulatory agency & utility reps
Connecting Brisbane’s 5 Values with the Ordinance

- **Safe Community**: Safe Buildings + Energy + H20
- **Community Building**: Meeting Shared Goals
- **Ecological Sustainability**: Built Environment Impact
- **Financially Prudent**: Shared Economic Benefits
- **Economic Development**: Job Creation + Productivity
What type of buildings are in Brisbane?
Building Owners & Average Building Size
What size of buildings should we look at?

We see that we can reach 69% of building area (residential, commercial and industrial) in Brisbane if we chose a 10,000 sf cutoff for the benchmarking ordinance.
Recap of Workshop 1 (April 9)

Topics covered

- Benchmarking concepts
- Benefits of efficiency
- Feedback

Feedback Overview

- Values
  - Decarbonization
- Challenges
  - Low Return on Investment
- Best Practices
  - Free energy assessments
Let’s Talk About Benchmarking
Benchmarking is the first step in understanding your building; it’s setting a baseline.
How to Think About Benchmarking

It’s all about *Comparisons*

- **Self**
- **Peers**

**Scenarios**

*These identify opportunities to save and help document those savings*
How is Benchmarking Used?

- Building owners benchmark energy use to make more informed decisions.
- 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.
Who else is doing this?
Proposed Benchmarking in Brisbane

- 10,000 sqft cutoff
- Multifamily, Commercial and Industrial
- Use Portfolio Manager
- Annual Reporting
- Start May 1, 2021
- Enhanced Rigor to support quality reporting and workforce
Audits & Retrocommissioning (RCx) Intro
Audits & RCx Intro

An energy audit is an assessment of a building’s energy systems to identify opportunities to save energy and money.

Think of energy audits as physical for your building.

- Benchmarking: Stepping on scale
- Audit: Physical
- RCx = Exercise
- Retrofits = Diet
- Saving Energy: Losing Weight
Audits & RCx Intro

Energy audits produce a list of energy conservation measures (ECMs) with associated costs and savings.

ECMs can be implemented by contractors.
Audits & RCx Intro

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
Audits & Retrocommissioning help provide insights and answers for building owners and for the City.
2016 - Energy Efficiency Audit
DoubleTree by Hilton
San Francisco Airport North
Executive summary

Verdafero carried out a comprehensive energy audit to identify Energy Conservation Measures (ECMs) at DoubleTree by Hilton San Francisco Airport North.

The EnergyStar rating of the property at the time was 71. This means that it is better than 71% of comparable hotels across the nation.

We identified several opportunities within the facility that could achieve estimated annual savings of $60,780 adding approximately $810,399 of value to the asset with a 7.5% capitalization rate.

If these savings are realized they would increase the EnergyStar rating or efficiency of the property to 87.
<table>
<thead>
<tr>
<th>ECM</th>
<th>Annual Savings ($)</th>
<th>Annual Utility Savings (kWh)</th>
<th>Annual Carbon Savings (lbsCO₂e)</th>
<th>Est. Measure Costs ($)</th>
<th>SPP (months)</th>
<th>ROI (%)</th>
<th>NPV ($)</th>
<th>Asset Value Increase (7.5% cap rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECM 1 – Install Window Film</td>
<td>$9,582</td>
<td>62,220</td>
<td>42,471</td>
<td>$26,500</td>
<td>33</td>
<td>36%</td>
<td>$47,835</td>
<td>$127,760</td>
</tr>
<tr>
<td>ECM 2 – Fluorescent bulbs</td>
<td>$5,609</td>
<td>36,347</td>
<td>24,810</td>
<td>$832</td>
<td>2</td>
<td>674%</td>
<td>$27,264</td>
<td>$74,787</td>
</tr>
<tr>
<td>ECM 3 – Incandescent bulbs</td>
<td>$320</td>
<td>2,075</td>
<td>1,416</td>
<td>$3</td>
<td>0</td>
<td>10667%</td>
<td>$1,601</td>
<td>$4,267</td>
</tr>
<tr>
<td>ECM 4 – CFL bulbs</td>
<td>$4,968</td>
<td>32,194</td>
<td>21,975</td>
<td>$1,598</td>
<td>4</td>
<td>311%</td>
<td>$23,288</td>
<td>$66,240</td>
</tr>
<tr>
<td>ECM 5 – Candelabra bulbs</td>
<td>$1,098</td>
<td>7,113</td>
<td>4,855</td>
<td>$32</td>
<td>0</td>
<td>3431%</td>
<td>$5,467</td>
<td>$14,640</td>
</tr>
<tr>
<td>ECM 6 – Staircase Lights</td>
<td>$552</td>
<td>3,574</td>
<td>2,440</td>
<td>$102</td>
<td>2</td>
<td>541%</td>
<td>$2,661</td>
<td>$7,360</td>
</tr>
<tr>
<td>ECM 7 – Bollards</td>
<td>$1,372</td>
<td>8,894</td>
<td>6,071</td>
<td>$741</td>
<td>6</td>
<td>185%</td>
<td>$6,134</td>
<td>$18,293</td>
</tr>
<tr>
<td>ECM 8 – Outdoor Spotlights</td>
<td>$2,643</td>
<td>17,127</td>
<td>11,691</td>
<td>$985</td>
<td>4</td>
<td>268%</td>
<td>$12,255</td>
<td>$35,240</td>
</tr>
<tr>
<td>ECM 9 – Parking</td>
<td>$5,580</td>
<td>36,157</td>
<td>24,681</td>
<td>$2,079</td>
<td>4</td>
<td>268%</td>
<td>$25,871</td>
<td>$74,400</td>
</tr>
<tr>
<td>ECM 10 – Occupancy Sensors</td>
<td>$1,509</td>
<td>9,777</td>
<td>6,674</td>
<td>$360</td>
<td>3</td>
<td>419%</td>
<td>$11,344</td>
<td>$20,120</td>
</tr>
<tr>
<td>ECM 11 – Economizers</td>
<td>$7,087</td>
<td>46,021</td>
<td>31,414</td>
<td>$13,500</td>
<td>23</td>
<td>52%</td>
<td>$23,154</td>
<td>$94,493</td>
</tr>
<tr>
<td>ECM 12 – PTAC</td>
<td>$12,721</td>
<td>82,603</td>
<td>56,384</td>
<td>$32,550</td>
<td>31</td>
<td>39%</td>
<td>$42,267</td>
<td>$169,613</td>
</tr>
<tr>
<td>ECM 13 – Kitchen Exhaust Hoods</td>
<td>$139</td>
<td>1,737</td>
<td>1,186</td>
<td>$332</td>
<td>29</td>
<td>42%</td>
<td>$781</td>
<td>$1,853</td>
</tr>
<tr>
<td>ECM 14 – Laundry Equipment</td>
<td>$7,600</td>
<td>0</td>
<td>0</td>
<td>$0</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>$101,333</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$60,780</strong></td>
<td><strong>345,839</strong></td>
<td><strong>21,975</strong></td>
<td><strong>$79,614</strong></td>
<td><strong>16</strong></td>
<td><strong>76%</strong></td>
<td><strong>$229,922</strong></td>
<td><strong>$810,399</strong></td>
</tr>
</tbody>
</table>
Thermal heat map of typical guest room window
Typical Audit Finding

Lobby Bathroom Occupancy

- Occupancy vs Lights On
- Data range from 3/19/2016 to 3/21/2016
Interesting ECM Examples

Exhaust Hoods Runtime over 1 Week

Figure 31 – Example of a mechanically fixed outside air damper

Figure 37 – Kitchen exhaust hoods

<table>
<thead>
<tr>
<th>Savings:</th>
<th>30,681 kWh per year</th>
<th>($4,725)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity savings:</td>
<td></td>
<td>($4,725)</td>
</tr>
<tr>
<td>Annual Electricity charges:</td>
<td></td>
<td>($4,725)</td>
</tr>
<tr>
<td>Total Energy Savings:</td>
<td></td>
<td>($4,725)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Economizer costs:</td>
<td>9 @ $1,000 per unit $9,000</td>
</tr>
<tr>
<td>Estimated Installation costs:</td>
<td>9 @ $500 per unit $4,500</td>
</tr>
<tr>
<td>Total Additional Costs:</td>
<td>$13,500</td>
</tr>
<tr>
<td>Total Costs:</td>
<td>$13,500</td>
</tr>
</tbody>
</table>

Simple payback period: 34 Months
ROI (Return On Investment): 35.00%
NPV (Net Present Value): 10 yrs. $23,154

Table 15 – Economizer retrofit analysis table
Table Activity
Auditing Feedback Areas

- Frequency & timing
- Type of support needed (i.e. case studies, call line)
- Connection to financial incentives
- Information to implementation
- Which buildings report (same as benchmarking requirement?)
- Disclosing information
- Recognition opportunities
Next Steps

✓ Workshop 1: Goals and Outcomes
✓ Survey 1 - Benchmarking
✓ Workshop 2: Strategy and Options
■ Survey 2 - Audits
■ Study Session
■ Planning Commission Feedback
■ Open Space and Ecology Committee Feedback
■ Council Presentation
Thank you!

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brisbaneca.org/building-efficiency-program