New Strategies for Old Buildings: Working in Existing Buildings

How to Sell Your Project Using Financial Matrices

Presenter: Charles D. Herbertson
City of Culver City
Culver City At a Glance

Location – Westside of Los Angeles County, 6 miles Northeast of LAX

Population – 40,000

Size- 5+ Sq. Miles
Step #1: Benchmarking

Determine where the best opportunities for savings may be.
Benchmarking cont.

Metrics Included:

- Total Annual Electrical Costs & Use per Facility
- Total Annual Use & Cost Intensity (Per Square Foot) per Facility
Step #2: Comprehensive Audits

Quantify Possible Savings

Financial Measures demonstrate project value

- Net Present Value
- Internal Rate of Return
- Return on Investment
- Simple Payback
Develop List of Proposed Energy Saving Measures

• Utilizing the comparison metrics and expected available budget – select the most cost effective and desirable energy savings measures to pursue.

1.1 Recommended Measures
The following mechanical energy efficiency measures (EEMs) are recommended for the city to pursue based on an analysis of the energy savings, costs, available rebates, and additional O&M improvements that these measures provide.

- EEM-1: Install or Repair Supply Fan VFD (retrocommissioning)
  This measure proposes to replace the existing variable frequency drives (VFDs) that are intended to control the supply fan motor speeds on the building’s rooftop air conditioning units. The existing VFDs have malfunctioned and the fans now operate in ‘bypass mode,’ meaning that the fans are operating at full speed whenever they’re active. Installing new drives will re-establish variable speed control of the supply fan motors and allow for reduced fan energy consumption any time the full airflow is not required.

- EEM-2: Install, Repair, or Optimize Return Fan VFD (retrocommissioning)
  This measure proposes to replace the existing VFDs that are intended to control the return fan motor speeds on the building’s rooftop air conditioning units. The existing VFDs have malfunctioned and the fans now operate in ‘bypass mode,’ meaning that the fans are operating at full speed whenever they’re active. Installing new drives will re-establish variable speed control of the supply fan motors and allow for reduced fan energy consumption any time the full airflow is not required.

- EEM-3: HVAC Energy Management System (EMS)
  This measure proposes to replace the existing HVAC energy management system (EMS) with a new, upgraded EMS. The new EMS will allow for better control of equipment operating hours, improved air-side economizer operation, and finer control of temperature set points throughout the building.
## Project Financial Plan

<table>
<thead>
<tr>
<th>Energy Efficiency Measure (EEM) Description</th>
<th>Electric Savings (kWh)</th>
<th>Peak Savings (kW)</th>
<th>Gas Savings (therms/yr)</th>
<th>TOTAL Annual Cost Savings</th>
<th>Gross Project Costs ($)</th>
<th>Rebates Incentives ($)</th>
<th>Net Project Costs ($)</th>
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<tbody>
<tr>
<td>Exterior LED wall wash luminaries</td>
<td>$934</td>
<td>-</td>
<td>-</td>
<td>$159</td>
<td>$8,216</td>
<td>$108</td>
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<td>Exterior LED outdoor pole/aim</td>
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<td>-</td>
<td>$914</td>
<td>$75,020</td>
<td>$8,142</td>
<td>$66,878</td>
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<td>Exterior Screw-in PAR/Reflector</td>
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<td>$914</td>
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<td>Interior LED fixture replacement</td>
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<td>-</td>
<td>$15,369</td>
<td>$75,020</td>
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<td>Exterior LED fixture replacements</td>
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<td>Lighting controls - occupancy</td>
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<td>$455</td>
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<td>(24)</td>
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<td>&gt;500 watts Wall or Ceiling</td>
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<td><strong>Total Financials if you bundle all</strong></td>
<td><strong>438,429</strong></td>
<td><strong>60</strong></td>
<td><strong>(581)</strong></td>
<td><strong>$55,321</strong></td>
<td><strong>$416,647</strong></td>
<td><strong>$40,246</strong></td>
<td><strong>$376,401</strong></td>
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</table>

**Install or repair supply fan VFD**
- $60,350

**Install, repair or optimize return fan**
- $32,272

**HVAC - energy management**
- $111,989

**HVAC Energy Management**
- $101,671

**Tie Into Central Plant**
- $33,242

**Optimize sizing of cooling equipment - retrocommissioning**
- $7,688

**HVAC - energy management system (EMS)**
- $15,330

**HVAC - energy management system (EMS)**
- $19,194

**Total Financials if you bundle all Lighting &**
- $398,985

- $17,104

- $57,996

- $700,613

- $80,902

- $389,711
Investigate Funding Options

• Utility On-Bill Financing Programs
• Low Interest Loans Available from CEC
• Grants
• City Budget Requests
• Don’t forget to take into account utility rebates and incentives
RECOMMENDATIONS

- **KEEP THE AGENCY BOARD INFORMED**
  - Utilize Sub-Committees or Progress Reports.
  - Develop champions on the elected board if possible
  - Let them take credit

- **FOLLOW UP WITH DOCUMENTATION OF ENERGY SAVINGS**
  - Celebrate your success
  - Lay the groundwork for future projects.

- **CONSIDER ALTERNATIVE APPROACHES TO PROJECT DELIVERY**
  - National Joint Powers Authority – one option
April 2015

-10%
Lower consumption than last month.

131,041 kWh
Your facility's total consumption over the past month.

-11%
Lower consumption than last April.