Strategic Energy Efficiency & Financing

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AASB – Fall Boardsmanship
Sept. 18, 2016
Energy efficiency is a smart investment
Multiple benefits of energy efficiency
Background

American Recovery & Reinvestment Act funds
  Benchmarking
  Energy Audits
  White Paper

Alaska Energy Efficiency Revolving Loan Fund
  Outreach
  Technical Assistance

Department of Energy funds
  Strategic Energy Management Practices Guide
Energy Efficiency Potential

• Public buildings - 5,000 in AK
• Average age - 33 yrs.
• Annual energy expenditure - $640 million
• AK has some of the highest energy costs in the US
Energy Efficiency Works

The take away:

- Assuming average savings of 20%, potential **annual savings of $125 million** in our public facilities
- EE can help reduce costs and focus limited public dollars on core activities
Average EUI by region
Average School EUI by region
Fruit on the ground

• Turn it off:
  – School Refrigerators in summer
  – Vending machines when building not occupied – cheap timers work well
  – Boilers, HVAC, lights, fans, pumps when building is unoccupied
  – Computers and office equipment when not occupied
Low Hanging Fruit

• Track energy use
• Re-program controls to actual operations
• Occupancy sensors
• Tune up existing equipment – boilers, HVAC, controls, etc.
Overhead Fruit

• Build efficiency into planned maintenance
  – Pump, motor or ballast replacement
• Consolidate modular design to reduce energy load to underutilized areas
• Retro-commissioning
• Educate operators on specific systems – snowmelt, DDC, Lighting controllers, etc.
• Demand controlled ventilation
• Lighting retrofits
Recommendations: Policy

1. Develop an energy policy
   • Set goals
Recommendations: Policy

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2. Establish an Energy Conservation Coordinator/Manager
Recommendations: Policy

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3. Develop an energy management plan
   • Establish a level of accountability
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4. Provide Operator Training
Recommendations: Policy

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3. Develop an energy management plan
   • Establish a level of accountability

4. Provide Operator Training

5. Prioritize efficiency retrofits
Impact of Energy Policy

- Energy efficiency goals & design standards signal owner intent
- 70% annual savings - Machetanz School

Photo credit McCool Carlson Green mcgalaska.com
Impact of Energy Management

The Bottom Line:
It pays to know how much energy you use, and where and when you use it.
Energy Management, cont.

Avoid this...

- As designed by engineering
- As manufactured
- As installed
Energy Management, cont.

- Goals, Communication & Accountability

WHAT I REALLY WANTED !!
Impact of Operator Training
# Impact of Priorities – Cost of Delay

Cash Flow Calculator

<table>
<thead>
<tr>
<th>INPUTS &amp; OUTPUTS</th>
<th>Pre-Retrofit Annual Energy Expenditure</th>
<th>Cost for Improvements</th>
<th>Post-Retrofit Annual Energy Expenditure</th>
<th>Design/Engineering</th>
<th>Cost for Improvements</th>
<th>Post Retrofit Annual Energy Cost Savings</th>
<th>Project Management</th>
<th>Number of Payments per year</th>
<th>Post Retrofit Annual Energy Savings %</th>
<th>Contingency</th>
<th>Project Costs - Down Payment</th>
<th>Loan Term (yrs.)</th>
<th>Interest Rate</th>
<th>Discount Rate</th>
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<tbody>
<tr>
<td>$460,000</td>
<td>$563,000</td>
<td>$317,000</td>
<td>$84,450</td>
<td>$16,890</td>
<td>$56,300</td>
<td>$720,640</td>
<td></td>
<td></td>
<td>31%</td>
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<td>6</td>
<td>2.500%</td>
<td>8.0%</td>
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<td>$143,000</td>
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<td>2.0%</td>
<td></td>
<td></td>
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<tr>
<td>Assumed Project Life</td>
<td>15</td>
<td></td>
<td></td>
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<td></td>
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</table>
# Impact of Priorities – Cost of Delay

<table>
<thead>
<tr>
<th>INVESTMENT ANALYSIS</th>
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<tbody>
<tr>
<td>Project Cost</td>
<td>$ 720,640</td>
<td>Includes applicable incentives or down payment of $0</td>
</tr>
<tr>
<td>Internal Rate of Return (IRR)</td>
<td>21%</td>
<td>Assumes 2.0% annual utility cost increase</td>
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<tr>
<td>Simple Payback</td>
<td>5.04</td>
<td>Only applicable if using internal funds</td>
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<tr>
<td>Cost of Delay (6 Months)</td>
<td>$ 84,081</td>
<td>Lost incremental cash flow from waiting to implement project</td>
</tr>
<tr>
<td>Life Cycle Savings</td>
<td>$ 1,739,051</td>
<td>Assumes loan and immediate action, with 15 year equipment life</td>
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<tr>
<td>Annual Savings</td>
<td></td>
<td></td>
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<tr>
<td>With loan payment</td>
<td>$ 22,789</td>
<td>Represents average energy cost savings - loan payments</td>
</tr>
<tr>
<td>No loan payment</td>
<td>$ 168,161</td>
<td>Represents increased cash flow from energy cost savings, in scenarios where no loan is taken, or where loan is paid off</td>
</tr>
</tbody>
</table>
Energy efficiency is a wise investment
But if it makes so much sense...?
But if it makes so much sense...?
Mechanisms for investing in EE:

- Grant
- Cash
- Loan
Financing, can I afford it?
Before Improvements

- Maintenance Costs
- Energy Costs

After Improvements

- Maintenance Costs
- Savings
- Repay Improvements
- Energy Costs

Savings

Improvements
Capital Solutions

- Alaska Housing Finance Corporation
  - Alaska Energy Efficiency Revolving Loan Program (AEERLP)

  State, Municipal, Schools and the University of Alaska

  No minimum /maximum

  Development costs reimbursable
AHFC’s AEERLP Rates

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<th>Year</th>
<th>Rate</th>
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<tr>
<td>15</td>
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</table>
Capital Solutions

- United States Dept. of Agriculture
  - Rural Development - Community Facilities

- Loans and grants
- Construct or improve facilities
- Rural requirement
Capital Solutions

- Rural Community Assistance Program (RCAC)

- Non & for-profits, public and tribal governments
- Housing, community facilities, small business
- Short-term loans for project development available
Capital Solutions

Commercial Lenders

- Lender originated to lender standards
- Lease purchase available
- May be more restrictive than state programs
If it makes so much sense...?
Barriers beyond money

Knowledge and motivation to pursue energy project financing
Before you can finance:

- You need energy use information
- A solid scope of work
- And something to back up the loan
- Sometimes it’s worth it to ask for help from a project developer
Project Developers
Project Development

Preliminary development phase:

- Benchmark
- Portfolio analysis
- Work with stakeholders
- Walk through energy audits
- Evaluate technical feasibility
- Evaluate funding alternatives
Project Development

Development phase:

- Level 2 energy audits
- Develop scope of work
- Final package for financing
- Contracts awarded
- Construction commences
- Commissioning
- Measurement & Verification
Facilitating Energy Efficiency Projects

1. DOE Remote Alaska Communities Energy Efficiency (RACEE) Competition

2. DOT prequalified Energy Efficiency Project Developers

3. AHFC’s Technical Assistance Center & Kickstarter grants
Thank You

Alaska Housing Finance Corporation
https://www.ahfc.us/efficiency/

Energy Efficiency Technical Assistance Center

eetac@ahfc.us
1-877-257-3228

or

Tim Leach
tleach@ahfc.us
907-330-8198