Programmatic Risk

By: James Filanc, LEED AP
Director, Business Development
Southern Contracting
760-744-0760

CLTC CAMPUS LIGHTING RETROFIT FORUM
Reduce energy use and maintenance costs
with demonstrated lighting technologies

UCDAVIS
JULY 1, 2009

UCIrvine
JULY 13, 2009
Things to consider

- Scope / complexity of retrofit program
- Age, number and type of buildings
- ECM calculations and assumptions
- Measurement and verification
- Financial constraints
- Contracting Strategy
- On-going maintenance plan (MBCx)
- Commissioning
Scope / Complexity of Retrofit Program

Or ???

Is it just a lighting retrofit or a whole building ECM retrofit?

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Scope / Complexity of Retrofit Program

✓ Different architectural standards requiring different ECM approaches = $$$
✓ Title 24 vs. ASHRAE – what is your goal to exceed??? = $$$
✓ LEED Certification = $$$

Tool – Develop Owner’s Performance Requirements (OPR) from outset
Age, Number and Purpose of Buildings

Or ???

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Age, Number and Purpose of Buildings

✓ Impact on technology selection = $$ $
✓ Impact on contract T&Cs = $$ $
✓ Impact on schedule = $$ $

Tool – Develop Strategic Energy Plan to guide EE investment
ECM calculations and assumptions

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ECM calculations and assumptions

✓ Hours of operation = $$$
✓ HVAC Set Points = $$$
✓ Air Exchange Rates = $$$
✓ Controls strategies = $$$
✓ Daylighting saves $$$

Tool – Have a third-party verify all assumptions and calculations.

The performance of your investment depends on it!
Measurement and Verification

1. List ECM and project objectives and constraints
2. Evaluate Project and ECM level objectives and constraints to identify candidate M&V options.
   A B C D
3. Evaluate savings risk for the M&V option.
   Risk acceptable
4. Estimate cost for the M&V option. Is M&V cost acceptable?
   Cost acceptable
5. Write M&V Plan.

M&V approach too risky
M&V cost not acceptable

What is your data source?
Is it part of your MBCx plan?

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Measurement and Verification

✓ **Develop M&V approach for each ECM.**
✓ **M&V Plan should be built into overall program.**
✓ **IPMPV** – International Performance Measurement and Verification Protocol will play a greater role in receiving third party financing.
✓ **IEEFP** -- International Energy Efficiency Financing Protocol

**Tool – Utilize a third-party M&V Agent**

“Trust but verify”
Financial constraints

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Financial Engineering

- Utility programs – incentives and rebates
- CEC loans
- Third-party banks / ESCOs
- Leasing
- Your energy bill
- Maintenance and operations budgets
- CCC/UC/CSU/IOU programs
- Investment Tax Credits / Accelerated Depreciation
- IT’S DIZZYING!


Blend your ECM paybacks --
Finance long term-ROI ECMs with short term ECMs

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Contracting Strategy

Risk vs. Reward

"Just sign here, sir - it clears me of any responsibility."

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Contracting Strategy

✓ Performance guarantees = $$$
✓ Align energy team goals with Owner
✓ Reduced Cost = Shorter Payback = More Books
✓ What is your risk appetite?

Tool – Consider Design-Build-Finance contract vs. Performance contracting
Performance risks may now be assumed because of work by CLTC, WCEC and others.

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## Design-Build-Finance Vs. Performance Contracting

<table>
<thead>
<tr>
<th></th>
<th>D-B-F</th>
<th>Performance Contracting</th>
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<tbody>
<tr>
<td>Total Cost</td>
<td>No Risk Premium</td>
<td>Owner Pays Risk Premium</td>
</tr>
<tr>
<td>Performance Risk</td>
<td>Owner assumes</td>
<td>PC assumes</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Maintain Control</td>
<td>PC provides</td>
</tr>
<tr>
<td>Financing</td>
<td>By Owner</td>
<td>By PC</td>
</tr>
<tr>
<td>Control / Design ECMs</td>
<td>By Owner</td>
<td>By PC</td>
</tr>
<tr>
<td>Energy Audit</td>
<td>By Owner</td>
<td>By PC</td>
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*Considering Design-Build-Finance extends competitive choices*

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"We need to reach an agreement on the thermostat settings. The cold people have declared war on the hot people!"
On-going Maintenance

✓ How you track system performance = $$$
✓ Preventative maintenance is cheaper than repairs!!! = $$$
✓ MBCx and maintenance should be joined at the hip
✓ M&V-based financing will soon require proof

Tool – Consider procurement / installation of an ECM system
Link existing maintenance programs with ECM FD&D, sub-metering and systems monitoring

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Commissioning

✓ Retro-commissioning vs. ????
✓ Commission a building once
✓ Save $$$
✓ New Performance Baseline for M&V

Tool – Identify Commissioning Agent as member of Team

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**Programmatic Risk**

- Energy Audit
  - ECMs
  - Energy Calcs.
  - ROI Model

- Sub-metering
  - Support M&V
  - Identify ECMs opportunities
  - Foundation for MBCx

- Owner’s Performance Requirements
  - Building Use
  - DSM Goals
  - GHG Goals

- Finance Plan
  - Financial Constraints
  - M&V Requirements
  - Payback model

- D-B ECMs
  - Existing Systems
  - New ECMs
  - Commission once!!!
Summary

Risk vs. Reward

What are your trade-offs?

Risk Management is part of your plan!