



Sustainable ESPC Projects M&V Begin with the End in Mind

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Begin with the End in Mind

- Energy savings to finance upgrades, improvements and revitalization of old or failing Government infrastructure.
- M&V to confirm proof of energy savings.



Begin with the End in Mind

- Realize Sustainable savings over project term.
 - Project size matters
 - People and their attitude are a key to success
 - Define what drives the “risk” to achieve energy savings in each ECM
 - Discipline to budget and do real maintenance



Sustainable Savings?

- Energy saving systems must maintain operational efficiency throughout project finance term
 - Holistic approach - Long-term perspective
- ESCO provides Engineering, Design, Construction, commissioning and O&M services
 - Spares, consumables, warranty, upgrades, training, shared risk, reserve account



Energy Project Economics

- \$1/yr energy savings → \$10 ECM
- \$1/yr energy savings → \$1 O&M

Project A \$1 million ES → \$10 million ECM

Project B \$1 million ES → \$8 million ECM
→ \$200 k O&M



Government O&M Record

- Budget cuts – COLS
- Downsizing – outsourcing - training
- Retirement, hiring away – loss of knowledge
- Software compatibility – upgrades
- Ageing Facilities – old equipment systems
- Poorly performing systems
- Poorly maintained facilities



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Identify Existing O&M \$\$\$\$

- Programmed preventative maintenance
- Trouble calls
- Emergency calls
- Special projects
- Outsourcing - Contracted costs
- Service agreements



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Who's Watching The Savings?

- Do they know what to look for?
 - Energy Managers
 - Resource Efficiency Managers
 - Facility Management Specialists
 - Energy Project Facilitators
 - Contracting Officers
 - Facility Directors
 - PWO's

- Collateral or primary duty?



Project Type & Size Matters

- Lighting & Water
 - Small or Large M&V usually prescribed
 - Reasonable life of ECM?
- HVAC, DDC – BAS – EMS, cogeneration
 - Large projects, complex, extensive training projects are better suited to ESCO O&M
 - Warranty, software upgrade, system support
 - Mix of existing and new equipment
 - Life of ECM?



Historic M&V

- Data is 15-18 months old before M&V report is received.
- Long lag between corrective action and when results show.
- Mistakes and errors in data collection produce fragmented M&V results.
- Expensive site M&V costs and limited linkage of problems identified to O&M issues or solutions



System Performance

- Data logging of normal O&M performance and energy consumption information.
- Whole system performance versus specific manufacturer's equipment "performance curves"
- Think of ESCO O&M services as a self-disciplined ECM performance insurance policy



Measurement & Verification

- Tie ESCO energy savings performance guarantees to ESCO O&M services for major Energy Conservation Measures (ECMs)
- Combine M&V data collection with daily O&M system performance operations
- Monthly O&M + real time performance reports



ESCO O&M - Reserve Account

- Reserve Account
 - Unplanned spare parts & consumables
 - Unplanned procurement
 - Software and equipment upgrades
- Mix of old and new equipment – share risk
- Warranty
- Training



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Conclusions

- Begin with End Objectives in Mind
- Look for Sustainable Long Term Solutions
- Create Synergies by finding Win-Win-Win Opportunities
- Link ESCO O&M Performance to ESPC Energy Savings guarantees



Conclusions

- Automate Performance Information Collection
- M&V tied to normal daily system performance collection along with normal monthly O&M status reports.
- Begin identifying historic costs associated with O&M that might be tied to possible ECMs to maximize future ESPC benefits.



Questions?

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For More Information

- Would you like to know more about this session?

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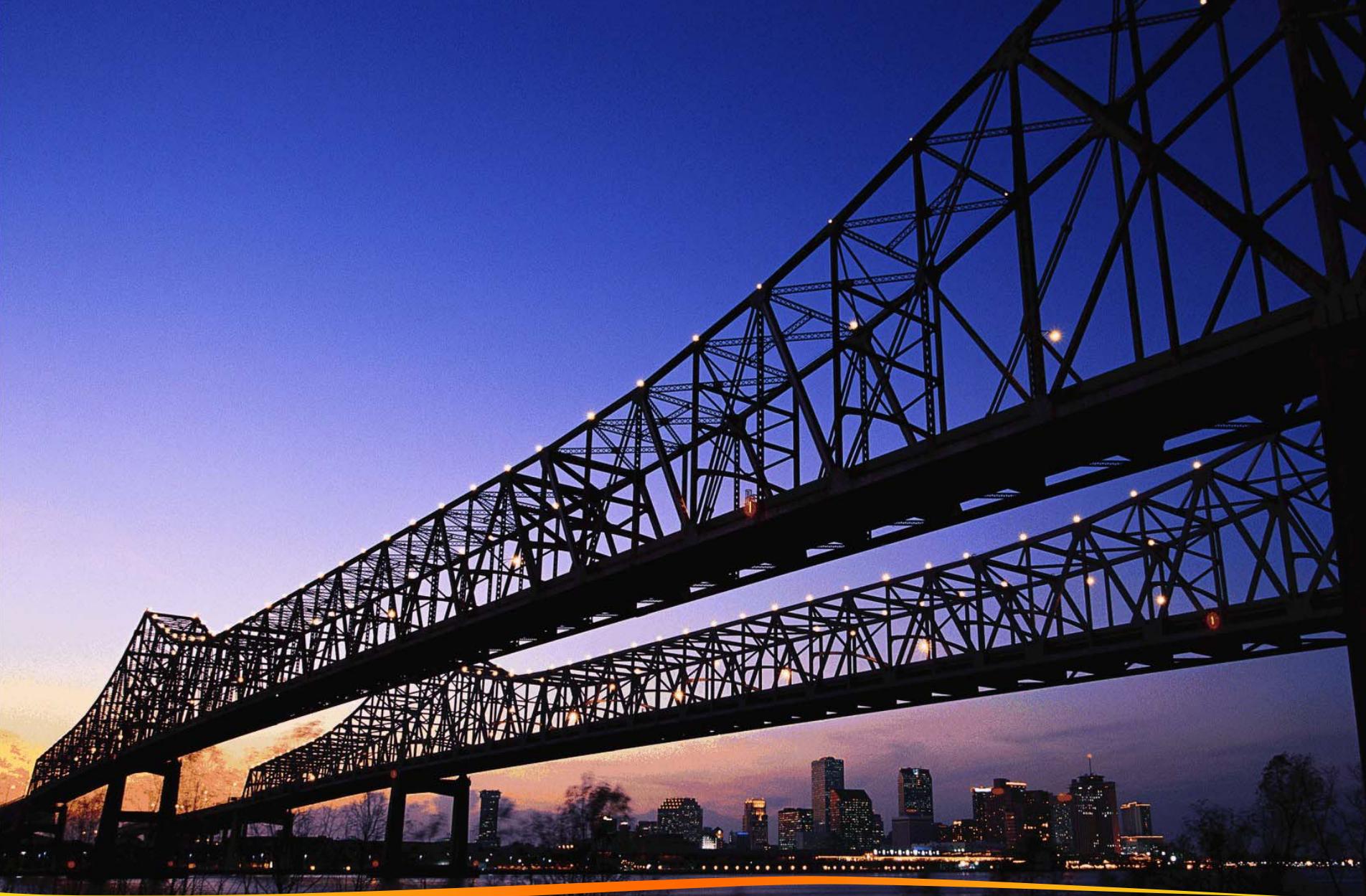
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Don't forget to fill out and drop off your session evaluations!



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