A case study of the City of Orlando Revolving Energy Fund, Energy Manager position, and lessons learned from the implementation of the ARRA Energy Efficiency Conservation Block Grant.

- ARRA EECBG Project Details
- Reasoning behind the Revolving Energy Fund
- Importance of long-term sustainability funds
- Decision maker buy-in
- Funding challenges
- Keys to Success

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Fleet & Facilities Management Division, Office of Business and Financial Services
Energy Manager – seeded from ARRA EECBG

Scope of work – Controls (most important), HVAC, lighting

Results: $70k after 6 months, tracking right with the EOR’s estimate of $140k annually
Reducing emergency funds & strategizing deferred maintenance

Turning seed money into a long-term sustainability budget
  - Post-ARRA plan

Sources for Revolving Loan Funds if there’s no seed money to kick it off:
  - Utility incentives/rebates
  - Sustainable construction projects
  - Routine replacement of capital assets w/ higher efficiency
Savings that makes sense – long term sustainability planning: A city-wide initiative

Funding challenges
- Access to capital
- Lowest hanging fruit for fastest payback: proof of concept projects
- How to avoid having the savings skimmed off for “budget reductions”

How our Revolving Energy Fund works
- Payback mechanics: Estimated savings vs reality
- REF fund recycling: how to make it grow

ESCO’s
Keys to Success: On-staff Energy Manager

- The Energy Manager position should be self sustaining
  - Mechanical Engineering background
  - Construction and Controls experience
  - Professional Certifications

- Latitude to operate as an outside consultant from within your organization

- Sustainability Champion: Source for current energy efficiency and renewable energy technologies and rebate opportunities

- Bridging the gap between design, operation, and maintenance professionals
Controls – the infrastructure to bring it all together

- The heart of our energy efficiency project was the installation of a Web-based native BACnet Energy Management System (EMS) infrastructure.
- This tool allows us to fine tune the programmed operations of our equipment located at the 26 project sites addressed with this grant, perform real time energy and efficiency calculations, remote troubleshoot equipment failures, trend and report any pertinent building metric we can develop from control input/output points, and graphically display the real-time indoor climate, environmental quality, and power consumption of these facilities.
Lighting – the lowest hanging fruit (usually)

Before even considering replacing lights with higher efficiencies, focus on shutting off the lights that don’t need to be on. We’ve installed occupancy sensors in spaces where 24/7 lighting is unnecessary, and have modified our site lighting circuits to operate off either a photocell, programmable timer, or integrated the contactors into our EMS.

Photometrics: a MUST for lighting retrofits. Before you buy into the dog and pony show of LED vendors, have them provide you with an .ies photometric file of your existing lighting levels vs their proposed.
**HVAC – the lion’s share of your power consumption**

- Factor in your rebate structure when replacing your HVAC systems
- Target equipment that is near the end of its useful life.

- We’ve enacted a policy with our maintenance department and mechanical contractors that they are to perform a cost analysis of the minimum code equipment vs. the highest efficiency equipment that is appropriate for the application that will pay for itself within 5 years, factoring in rebates.

- With a BAS now in place, this calculator can be refined to a more exact number of runtime hours for each specific piece of equipment, whereas before ASHRAE Std. 90.1 design data for our climate zone was used.

### 5 Ton Direct Expansion Split System (example from Beardsley)

<table>
<thead>
<tr>
<th>SEER Rating</th>
<th>OUC Rebate</th>
<th>Installed Cost (less rebate)</th>
<th>ΔOp front cost</th>
<th>kW draw</th>
<th>$/kW/hr</th>
<th>$/kW/yr</th>
<th>ΔAnnual oper. cost</th>
<th>ΔOperating $</th>
<th>ΔPayback vs baseline</th>
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</table>

**Constants:**
- Cooling hours: 2803
- kWh charge: $0.075
- kW demand charge: $8
- Note: 13 SEER is minimum energy efficiency per FL code

\[ \text{kW} = \frac{\text{BTU/hr}}{\text{SEER}} \]
You can find our official Municipal Sustainability Plan at

If you have any questions, please feel free to contact me at
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Thank you!