Municipal Energy Management in KCMO and The Energy Solutions Hub

Dialogs on Sustainability, K-State
July 21, 2018

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Municipal Energy Management in KCMO

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Over a Decade of Progress
Triple Bottom Line Approach
Embraced by Mayor, City Council & City Manager
Action in KCMO

Extensive energy efficiency to City buildings

(e.g., 78-year old, 30-story City Hall received ENERGY STAR® 92 in 2012)
Annual Results In 6 Municipal Buildings, 2010 - 2015

Electricity ↓ 29%
Steam ↓ 36%
Chilled water ↑ 0%

Annual total energy ↓ 25%

Avoided cost over the 5-year period $2 million

(actual energy cost only decreased 3.8% due to rate increases for electricity, steam, and chilled water)
Achievements

Between 2000 and 2013, electricity usage was reduced by 21% in municipal operations, while electricity use increased by 14% across the community.
Collaboration on Energy Use Across the Metro

- Mid-America Regional Council (MARC)
- Johnson County, KS & Jackson County, MO
- Utilities – KCP&L, Spire & Veolia
- Greater KC Chamber of Commerce
- US Green Building Council (USGBC)
- Metropolitan Energy Center & Clean Cities Coalition
- Bridging The Gap (BTG)
- KC Industrial Council
Basic steps to turn Benchmarking into action

1. Behavior change by building occupants can be a low-cost measure to achieve energy savings
2. Perform baseline energy assessments of several larger buildings and those known to have large energy use
3. Identify & secure financial resources needed to implement investments most likely to reduce energy use
4. Implement measures in one or more strategic buildings
5. Monitor performance over time to determine effectiveness & results
Fire station energy challenge

Five fire stations
September 2015 – November 2016

Goal
Incentives
Assistance
Participation
Results
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**Total**

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performance contracting

Decreases utility cost
Upgrades aging equipment
Reduces deferred maintenance
Promotes financial and environmental stability
Reduces energy and operating costs
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STAIRWELL LIGHTING

ELEVATOR LOBBY LIGHTING

OCCUPANCY SENSORS
VARIABLE FREQUENCY DRIVES
Monitor Achievements

- Track & report cost savings and “avoided costs”
- Share the results with key internal stakeholders
- Use initial successes as a foundation for further action
- Identify most successful measures & assess potential to apply those measures to additional buildings
- Repeat the steps & continue to monitor trends over time on all actions
Lessons Learned

- Leadership from the top is essential
  - Elected officials’ understanding of the value proposition is important
- Benchmarking provides a baseline for analyzing trends over time
- Look for strategic opportunities to create early success in cost savings
- Data is needed to make informed decisions re investments & to measure progress
- Partnerships/collaborations are vital to long-term success
- It’s essential to be creative, flexible, and persistent
Financing is a significant challenge

- performance contracting,
- federal grants,
- utility rebates,
- capital projects in City budget

In KC we have been “strategically opportunistic” by taking advantage of various opportunities that present themselves & others that we seek out
Implementation in municipal operations vs. community-wide is different

- City intends to own & operate buildings for 50+ years, so life-cycle benefits are particularly relevant
- Opportunities for energy savings also exist in other areas: traffic signals, streetlights, water & wastewater operations
Energy Solutions Hub
The Need

- Larger buildings already addressed
- No specialist position in smaller companies
  - Less sophisticated consumer
  - Limited use of energy efficiency programs
  - Difficulty marketing to these consumers
- Limited accuracy of available metrics
How big is the smaller business market?

138,000 small biz\(^{\dagger}\) \times 81.7 MWh/y\(^*\) \times 4\% = 440k MWh/y

\(^{\dagger}\) OpenDataKC
\(^*\) 2015 EIA
Impact of Program Initiative

138,000 small biz

81.7 MWh/y*

4%

= 440k MWh/y
Implementing Our Program

- Outreach
- Resource Matchmaking
- Education & Technical Assistance
- Project Performance Assessment
MEC Advantage: Mobilizing our Outreach Network

- Energy Providers
- Vendors & Service Providers
- Stakeholders
- Building Owners & Managers
- Advisory Council
Resource Matchmaking

- Regional Energy Efficiency Coordination
- Energy Vendor Database
- Peer Group Meetings

Referrals
Education & Technical Assistance
... focused cost benefit analysis

Concierge Service
Educational Workshops
Trainings & Certifications
Resource Library
Codes and Policies
Program Performance Assessment
... evaluate outcomes

Use of EE Programs  
LEED Buildings  
Metrics  
Accuracy  
Integrated Resource Planning

4% Annual Energy Use
Need for Power Plant Upgrades
Opportunities to Participate

- BOC Certification
- Peer Groups
- Low-cost Audits
- Newsletter Signup
- Host a Hub Presentation
- Energy Vendor Database
- Launch Event Sponsor
- Membership

metroenergy.org
Join us for an *Speed Greening* Networking Event

**Lifted Spirits Distillery, August 31**

Go to metroenergy.org and click on **Get Involved**
1982 – 1983 energy action plan

Better lighting control
Lighting levels
Energy consumption monitoring
Public building weatherization
Electric cars and fleet right-size policy
Solar utilization/economic development and employment (SUEDE)
Metropolitan Energy Center
● transforming energy use in America's Heartland since 1983

Mc i terminal A

main and lower lever lighting upgrade
CONVENTIONS AND ENTERTAINMENT

12 Air Handling Units in Conventions Center (includes Bartle Hall)
1 Air Handling Unit on the West side of Municipal Auditorium
Replaced metal halide lights in Level III Exhibition Halls with LED
Reduced lighting, heating, and cooling output during set up and tear down of exhibits
Systematic replacement of light fixtures
Parks and recreation
Headquarters office renovation
Public works street lights and traffic signal improvements

Streetcar route – 170 LED street lights with smart controls
Missouri Route 210 – 70 LED street lights
South Marion Park Drive – 70 LED street lights
Freighthouse District – 70 LED street lights
5,491 LED lights in traffic signals at 316 intersections – American Recovery and Reinvestment Act
Central fleet

Replaced Solid Waste large 13 liter engine with smaller, more energy efficient 10 liter engine trucks

Heavy duty trucks featuring heavier dual tire type pusher axles were replaced with trucks featuring light weight single tire steerable type axles

Implemented an automated fuel management system that helps to identify vehicles that are being underutilized

MSC and Brooklyn repair facilities have quick doors installed at the main entrances and exits. Quick doors are large overhead doors that quickly move up and down faster than conventional overhead doors to save energy

Solid Waste Division trucks will have air-disc brakes that not only improve braking performance but also are lighter than the older technology drum brakes, improving energy efficiency
RENEWABLE ENERGY

Solar Lease and Access Agreement
Solar Services and Access Agreement
Energy Conservation Measures – American Recovery and Reinvestment Act
Electric Vehicle Charging Stations
Metropolitan Energy Center

transforming energy use in America's Heartland since 1983