

**Best Practice:** Revolving Funds for City Energy Efficiency Projects

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**Description of Best Practice:**

The Office of Sustainability, at the City of San Antonio, has established a revolving Energy Efficiency Fund. The fund was established in 2011 using \$4.6 million of the City's American Recovery and Reinvestment Act (ARRA) funds. The fund was developed to help the City reduce its \$34 million per year utility budget through energy efficiency retrofits at its facilities. The City's building portfolio is comprised of over 15 million square feet encompassing fire stations, police stations, health clinics, recreation centers, service centers, warehouses, office buildings and parking garages.

With this fund, the City is working to do a comprehensive retrofit of all City facilities where it is economically feasible to do so. The energy efficiency fund allows the city to self-manage all of these retrofits from project design through close-out and measurement and verification of energy savings. Having this fund, and having developed much of the in-house capability, provides improved project economics due to lower management and installation costs, as well as no debt service costs. The average cost of the projects is \$20,000 and ranges from \$1,000 to \$250,000. Also, the City uses the fund to pay the marginal cost of efficiency improvements within larger capital projects. As savings are realized in each project, a portion of the savings is returned back to the fund to be used in future projects.

Savings in avoided cost is supplemented by utility rebates, and the reduced energy use contributes significantly to reduce local air emissions. Following is a discussion of how this fund came about and its implementation.

**Motivation for Revolving Fund:**

The revolving fund was established because the City needed a funding mechanism that would provide it the flexibility and opportunity to implement low cost, high impact projects like exterior and interior lighting retrofits, PC energy management, window film, HVAC control upgrades, pool pump control and retro-commissioning projects. Further, the City saw that there was an opportunity to significantly upgrade the efficiency of its high capital cost mechanical systems, i.e. chillers, air handling units, etc. by leveraging the fund to pay the marginal cost to improve the efficiency of equipment that was set to be replaced under the Capital Improvement Plan (CIP) and through emergency equipment replacement projects. Most recently the fund covered 20% of a \$1.3 million chiller replacement project. This 20% allowed the City to purchase high efficiency chillers and equipment controls that would not have been purchased if not for the fund.

The City had some challenges with performance contracting services, so the Office decided it was appropriate to develop expertise in house to conduct desk and site reviews of projects. As the Office developed this skill, it found it was able to develop and implement projects in house, without having to rely on an outside vendor for project management.



**Benefits of Revolving Fund:**

Because of this fund the City has been able to do a variety of things including:

- Decreased need to issue debt and remaining cash-flow positive for each energy efficiency project.
- Work through and reduce deferred maintenance projects and reduce overall operating costs for the City.



- Have flexibility to develop and implement projects quickly.
- Have the ability to leverage CIP project funds to significantly improve the efficiency of its equipment.
- Leveraging utility rebates to invest in future energy savings retrofits.
- Achieve significant reductions in local air emissions as a result of lower energy consumption.
- Improve the energy performance rating of many of its buildings, making some eligible for an Energy Star Certification.
- The City's energy use has decreased by 7% since 2008 while adding facilities providing increasing city services to a rapidly growing population.
- For a representative sample of projects across 103 facilities, the City has reduced energy efficiency project costs 54% by developing, funding, and implementing projects in-house vs. working with a turnkey energy service company for project development and implementation using 3<sup>rd</sup> party financing.

See Table 1 for additional details on the project.

**Table 1: Municipal Retrofits: Impact over 5 years\***

Total Projects	398	Simple Payback, years	7.3	
Total Facility Sites Improved	180	Electricity Savings, kWh/yr	58,227,372	
Capital Investment	\$36,127,097	Natural Gas Savings, CCF/yr	69,095	
Avoided Cost, \$/yr	\$4,219,509	Emissions Reductions	tons CO <sub>2</sub> e/yr	24,263
Rebates Received	\$5,427,701		lbs NO <sub>x</sub> /yr	26,731
			lbs VOCs/yr	596
*Includes projects that are underway and completed.				

### Challenges Faced and Addressed:

In an effort to track savings and capture this value, the Office of Sustainability worked with the Office of Management and Budget (OMB) to help them understand how savings could be tracked. As a result, the OMB developed a special revenue fund that captures the energy savings and any utility rebates.

Once the fund was established and a transfer process put in place, it was important to protect this fund, so that as the utility costs decreased, they could prevent OMB from reducing the utility budget and moving the savings to other funds to cover shortfalls or fund other budget lines. Significant effort was taken to educate financial administrators on how to recognize savings and understand the importance of protecting this revolving account for future economic savings.

Finally, to ensure future savings, the city is investing in a growing capacity to maintain the systems and see that they continue to operate efficiently. Measurement and verification programs and maintenance services offered by third parties is one solution to maintain efficient building operation. The City opted for an in-house approach with an expectation to reduce costs, increase jobs, and ensure that facility management staff has the resources to properly maintain facilities.

### Measuring Success:

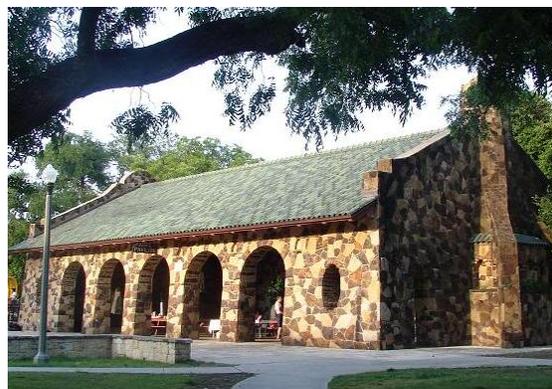
To measure success the City developed savings reports for completed projects in order to track avoided energy use and costs from each project. The savings reports were largely developed from EPA's Portfolio Manager, as well as in-house tracking spreadsheets.

### Description of process experience:



### *Establishing the Fund:*

To establish the fund the Office developed a business case and through a year-long process presented it to a variety of city departments, including the City Manager, the Chief Financial Officer, the Budget Director, the Finance Department and Building and Equipment Services Department. They demonstrate how other municipalities have been able to accomplish big energy projects using a revolving energy efficiency fund and how those efforts apply to the City. They also demonstrated the value of the program by quantifying potential energy savings plus all of the other benefits of the program, including relieving the general fund from personnel costs and helping to deal with deferred maintenance. Also, they put together a five year and 15 year project pro-forma. This pro-forma demonstrated what the fund would look like over time and the magnitude of savings and the affect on the general fund budget. The outcome was the development of a special revenue fund.



The fund was seeded with avoided costs and utility rebates resulting from ARRA funding of \$4.6 million in 2011. This seed funding was largely spent in the first year and a half. Each year, the Office attempts to either spend or encumber all funds. The fund receives revenue each year from the avoided energy costs of projects and rebate dollars from CPS Energy, the municipally owned utility. A portion of the avoided costs goes back to the City's General Fund each year with the remaining staying in the Energy Efficiency Fund.<sup>1</sup> Currently, the fund is revolving approximately \$1.8 million into projects each year. For each year, the funds are used to cover both energy efficiency projects and the personnel costs for staff professional development and to administer the energy efficiency program.

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### *Replenishing the Fund:*

The revenue for the fund is from two sources: rebates and energy savings. The revenue from rebates are projected for each fiscal year and then appropriated directly to the energy fund budget. As rebates arrive, these funds are placed directly into the fund. To capture avoided energy costs, the utility budgets for each department are set at the pre-energy retrofit level. Each month a one-twelfth transfer from the affected departments' utility fund to the energy efficiency fund is made<sup>2</sup>.

### **Project Development**

The Office takes a comprehensive approach in its project development process, beginning with developing building baselines to a comprehensive measurement and verification process. To establish baselines, identify and prioritize projects and to measure and track avoided costs, the Office used EPA's [Portfolio Manager](#). This is a free on-line tool offered by the EPA and used by many organizations. Most recently, governments and organizations participating in the Department of Energy's Better Building Challenge use Portfolio Manager to track all of the projects in the Challenge. The benefit of this system is that it not only allows the Office to track its buildings energy consumption, but also allows for a comparison of the City's buildings with similar building types across the climate zone and country.

Four key decision making factors are considered as the Office moves through the project development cycle. These key decision factors include:

- Building Energy Use Intensity - MMBtu per square foot to measure energy use.
- Profile of Building – Building function and the degree to which the public uses the building
- Life cycle stage of the equipment

<sup>1</sup> The fund was reduced by \$287,000 in 2014 when a portion of the funds was transferred over to the City's General Fund.

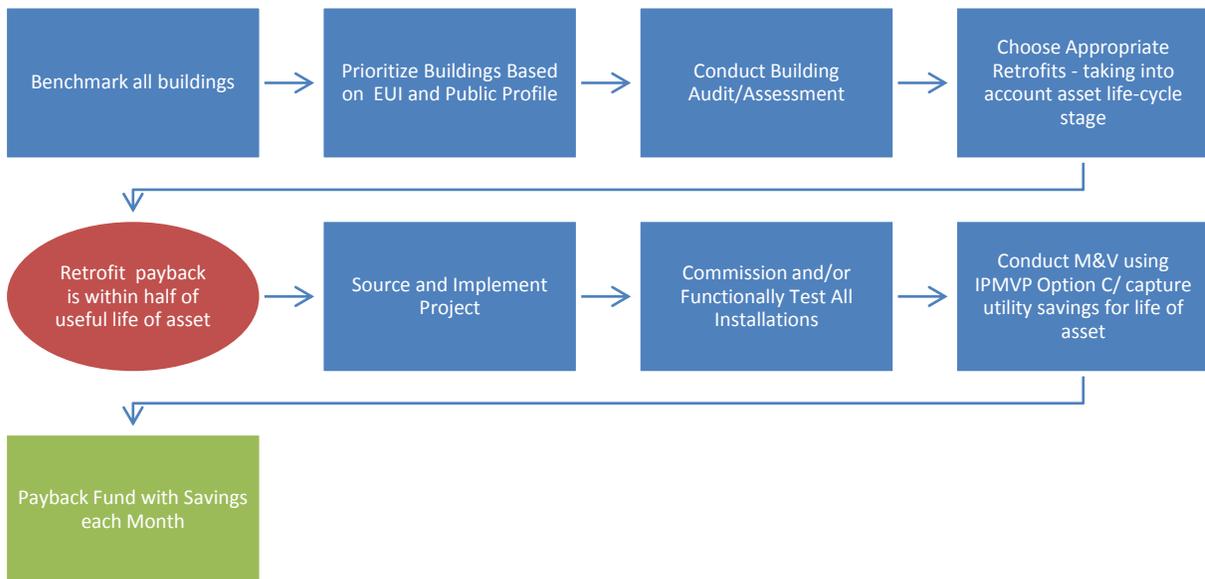
<sup>2</sup> Can recover 100% of energy savings from the enterprise departments; those departments that pay bills out of the general fund can only recover 50% back; the 50% was determined by the budget short fall;

- State of the equipment – Repair history
- Project Avoided Costs
  - Avoided costs returned the fund must exceed the project costs
  - Payback to the fund is within useful life of project<sup>3</sup>

For higher capital cost projects, such as chillers and other major mechanical equipment, the Office references the City’s Capital Improvement Plan and also works directly with the Building Equipment and Services (BES) Department to identify their priorities.

Following is the process flow the Office uses to develop, implement and monitor a project. As the Office develops projects it will bundle the services, based on the type of retrofit, across multiple facilities. They have chosen not to bundle different asset types within individual buildings. In other words, the Office does not bundle together lighting and mechanical retrofits to lower the payback on a project. It does, however, bundle multiple lighting projects across buildings to achieve economies of scale in bulk pricing and in project administration level of effort.

### Process Flow for Self-Performing Project



### Continuing Efforts

The Office intends on taking on additional efforts to build its program. To ensure optimal operation of its facilities, the Office plans to provide building operator training to augment its preventative maintenance program. This will be further supported by commissioning existing and new facilities in a continuous manner. The City is in the planning stage of developing high performance design standards for new construction of municipal facilities. The City also intends to develop remote access and control for all existing building automation systems within its buildings. Further, the City is working to implement standardized operational set-points and scheduling for mechanical equipment. With this ongoing effort the Office anticipates saving an additional \$65 million in energy costs over the next ten years.

<sup>3</sup> Use ASHRAE standard for useful life, as well as other standards for hot and humid climates.