



The Parker Ranch installation in Hawaii

Glenn Barnes, UNC Environmental Finance Center
Nate Geisler, City of Ann Arbor
Rich Deming, Calor Energy, Union County, NC

**Best Practices for
Establishing Municipal Funds
for Energy Efficiency Projects**
June 21, 2011

DOE's Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG) and the State Energy Program (SEP) by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs.



TAP offers:

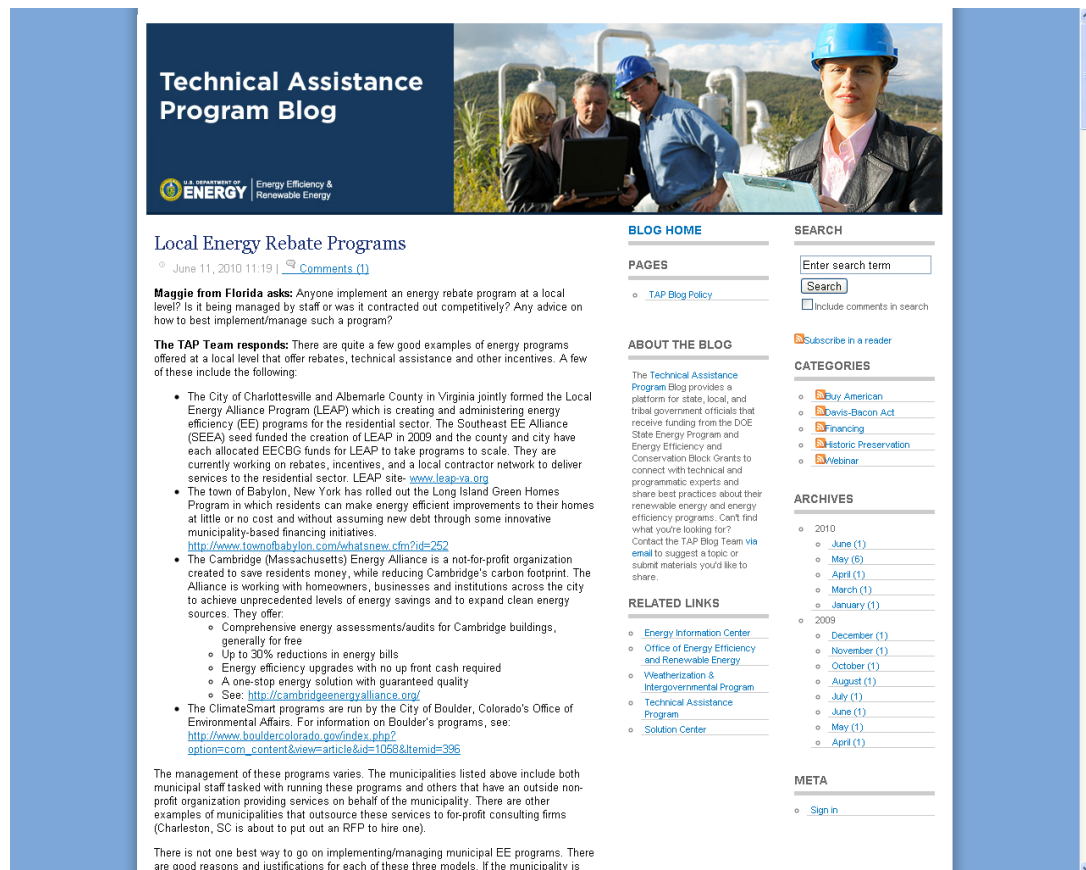
- One-on-one assistance
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 - Webinars
 - Events calendar
 - TAP Blog
 - Best practices and project resources
- Facilitation of peer exchange

On topics including:

- Energy efficiency and renewable energy technologies
- Program design and implementation
- Financing
- Performance contracting
- State and local capacity building

Access the TAP Blog!
<http://www.eereblogs.energy.gov/tap/>

Provides a platform for state, local, and tribal government officials and DOE's network of technical and programmatic experts to connect and share best practices on a variety of topics.



Technical Assistance Program Blog

U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

Local Energy Rebate Programs

June 11, 2010 11:19 | [Comments \(1\)](#)

Maggie from Florida asks: Anyone implement an energy rebate program at a local level? Is it being managed by staff or was it contracted out competitively? Any advice on how to best implement/manage such a program?

The TAP Team responds: There are quite a few good examples of energy programs offered at a local level that offer rebates, technical assistance and other incentives. A few of these include the following:

- The City of Charlottesville and Albemarle County in Virginia jointly formed the Local Energy Alliance Program (LEAP) which is creating and administering energy efficiency (EE) programs for the residential sector. The Southeast EE Alliance (SEEA) seed funded the creation of LEAP in 2009 and the county and city have each allocated EECBG funds for LEAP to take programs to scale. They are currently working on rebates, incentives, and a local contractor network to deliver services to the residential sector. LEAP site- www.leap-va.org
- The town of Babylon, New York has rolled out the Long Island Green Homes Program in which residents can make energy efficient improvements to their homes at little or no cost and without assuming new debt through some innovative municipality-based financing initiatives. <http://www.townofbabylon.com/whatsnew.cfm?id=252>
- The Cambridge (Massachusetts) Energy Alliance is a not-for-profit organization created to save residents money, while reducing Cambridge's carbon footprint. The Alliance is working with homeowners, businesses and institutions across the city to achieve unprecedented levels of energy savings and to expand clean energy sources. They offer:
 - Comprehensive energy assessments/audits for Cambridge buildings, generally for free
 - Up to 30% reductions in energy bills
 - Energy efficiency upgrades with no up front cash required
 - A one-stop energy solution with guaranteed quality
 - See: <http://cambridgeenergyalliance.org/>
- The ClimateSmart programs are run by the City of Boulder, Colorado's Office of Environmental Affairs. For information on Boulder's programs, see: http://www.bouldercolorado.gov/index.php?option=com_content&view=article&id=1058&Itemid=336

The management of these programs varies. The municipalities listed above include both municipal staff tasked with running these programs and others that have an outside non-profit organization providing services on behalf of the municipality. There are other examples of municipalities that outsource these services to for-profit consulting firms (Charleston, SC is about to put out an RFP to hire one).

There is not one best way to go on implementing/managing municipal EE programs. There are good reasons and justifications for each of these three models. If the municipality is

BLOG HOME

PAGES

- [TAP Blog Policy](#)

ABOUT THE BLOG

The Technical Assistance Program Blog provides a platform for state, local, and tribal government officials that receive funding from the DOE State Energy Program and Energy Efficiency and Conservation Block Grants to connect with technical and programmatic experts and share best practices about their renewable energy and energy efficiency programs. Can't find what you're looking for? Contact the TAP Blog Team via email to suggest a topic or submit materials you'd like to share.

RELATED LINKS

- [Energy Information Center](#)
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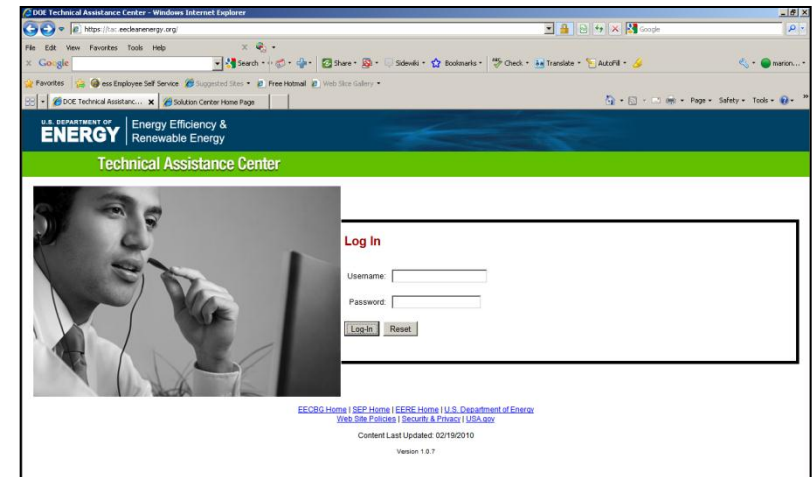
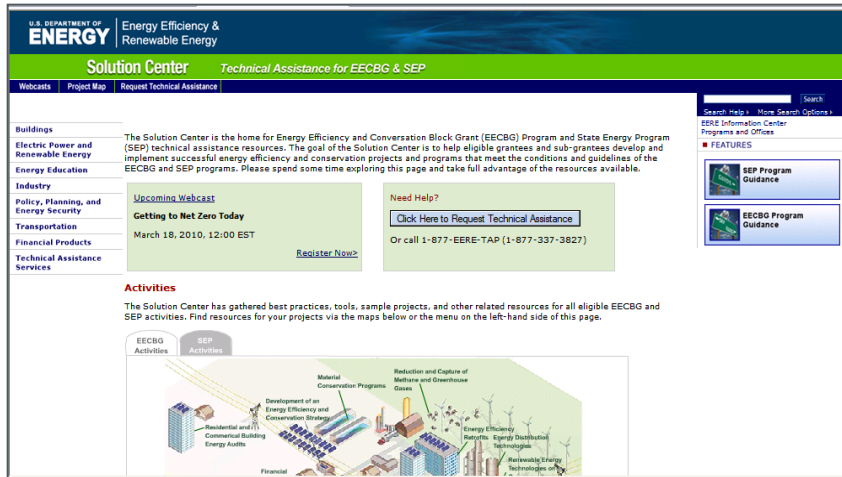
META

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2) Submit a request via the [Technical Assistance Center](#)



3) Ask questions via our call center at 1-877-337-3827 or email us at solutioncenter@ee.doe.gov

Webcast	Date	Time
Geothermal Heat Pumps: In Policy and Practice	June 23, 2011	3:00 - 4:15 EST
Partnering with Utilities 101: Introduction to Utility Energy Efficiency Programs and Developing New Partnerships	June 28, 2011	2:00 - 3:00 EST
Interior Lighting Efficiency for Municipalities	June 29, 2011	2:00 - 3:00 EST

For the most up-to-date information and registration links, please visit the Solution Center webcast page at www.wip.energy.gov/solutioncenter/webcasts



Glenn Barnes



Nate Geisler



Rich Deming

- **Overview:** Glenn Barnes, DOE TAP Technical Assistance Provider, UNC Environmental Finance Center
- **Case Study #1:** Nate Geisler, Energy Programs Associate, City of Ann Arbor, MI
- **Case Study #2:** Rich Deming, Principal, Calor Energy, Union County, NC
- **Other Case Studies, Funding Mechanisms and Challenges:** Glenn Barnes
- **Q & A**

- Some governments implemented sustainability programs and/or energy finance programs before ARRA
- Suddenly, a huge crop of governments received ARRA funds and were directed to spend them on sustainability and energy finance programs
- Many of those governments (and others who saw their success) want to continue with sustainability and energy finance programs post-ARRA

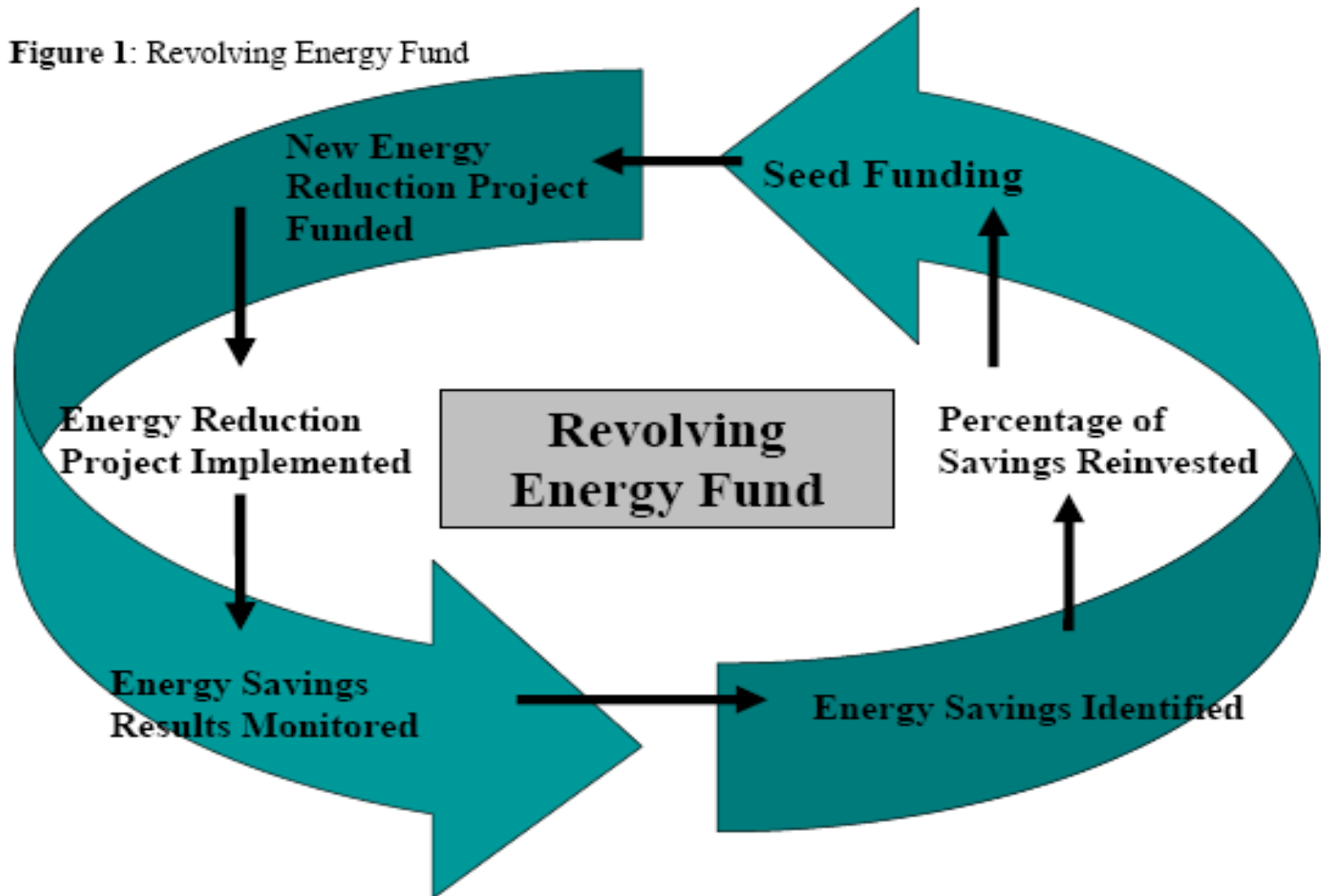


- Efficiency Upgrades on Public Buildings
 - Guaranteed Energy Savings Contracts
- Renewable Installations on Public Buildings
 - Examples: Knoxville Convention Center Solar (Third Party Equity), Moscone Convention Center, San Francisco Solar and Energy Efficiency (Public Funds), Farmington Hills, MI Solar (ARRA)
- Procurement Policies
 - Fuel Efficient Vehicle Policy in Arlington, MA
- Internal Revolving Loan Funds

- How a revolving energy fund works
- Choosing projects to fund
- How the money is handled
- Measurement and verification of projects

- Capitalized as a “bank” from which departments and divisions can borrow to fund energy efficiency, renewable energy or energy conservation projects.
- Allows municipalities to provide a continual stream of funds for energy efficiency improvements without tapping into existing capital cycles.

Figure 1: Revolving Energy Fund

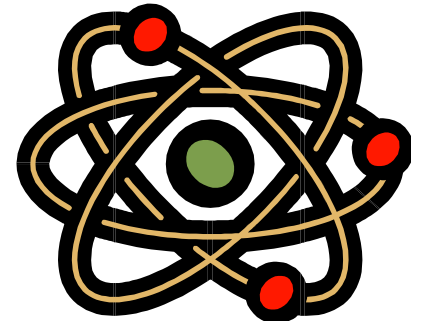
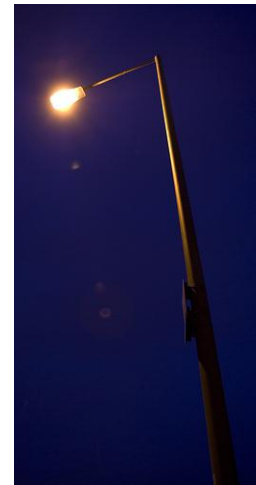


Source: Ann Arbor Energy Fund

- Based on audits of government facilities or other pre-determined criteria
- Energy efficiency tied to other capital improvements
- Applications from departments
- “Spreading the wealth”



Choosing Projects

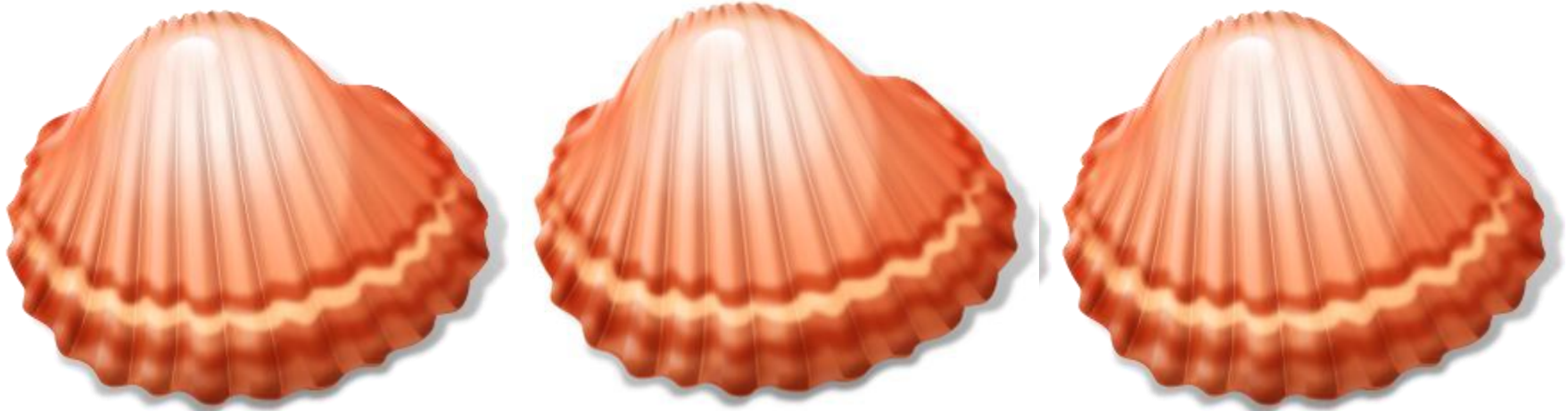


- Issues to consider
 - It may depend on your government's internal policies and/or how your energy bills are paid
 - A clear, consistent policy is key for the long-term success of the revolving fund
- Ways for the money to be handled
 - Within your finance office
 - Each department repays the fund
 - The budget includes a certain amount of money to be re-appropriated into the fund each year

- Actual Savings
- Estimated Savings (Defined repayment schedule)
- Upfront Agreements
- Determining Loan Terms

- From a finance and management perspective, the issue is how to determine repayments into the fund
 - Actual savings
 - Estimated savings
- If repayments are tied to actual savings (note: actual energy savings \neq actual dollar savings), you need a pre-determined M&V system
- If repayments are on a fixed schedule based on estimated savings, M&V is not relevant for repayments

Shell game?



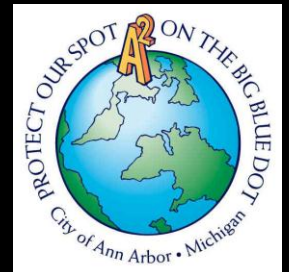
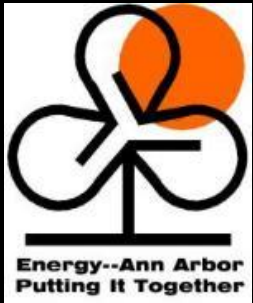
- Incentivizes
- Rewards leadership and innovation
- Creates a process for choosing projects

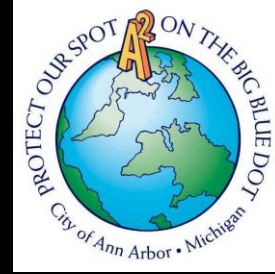


Energy Office

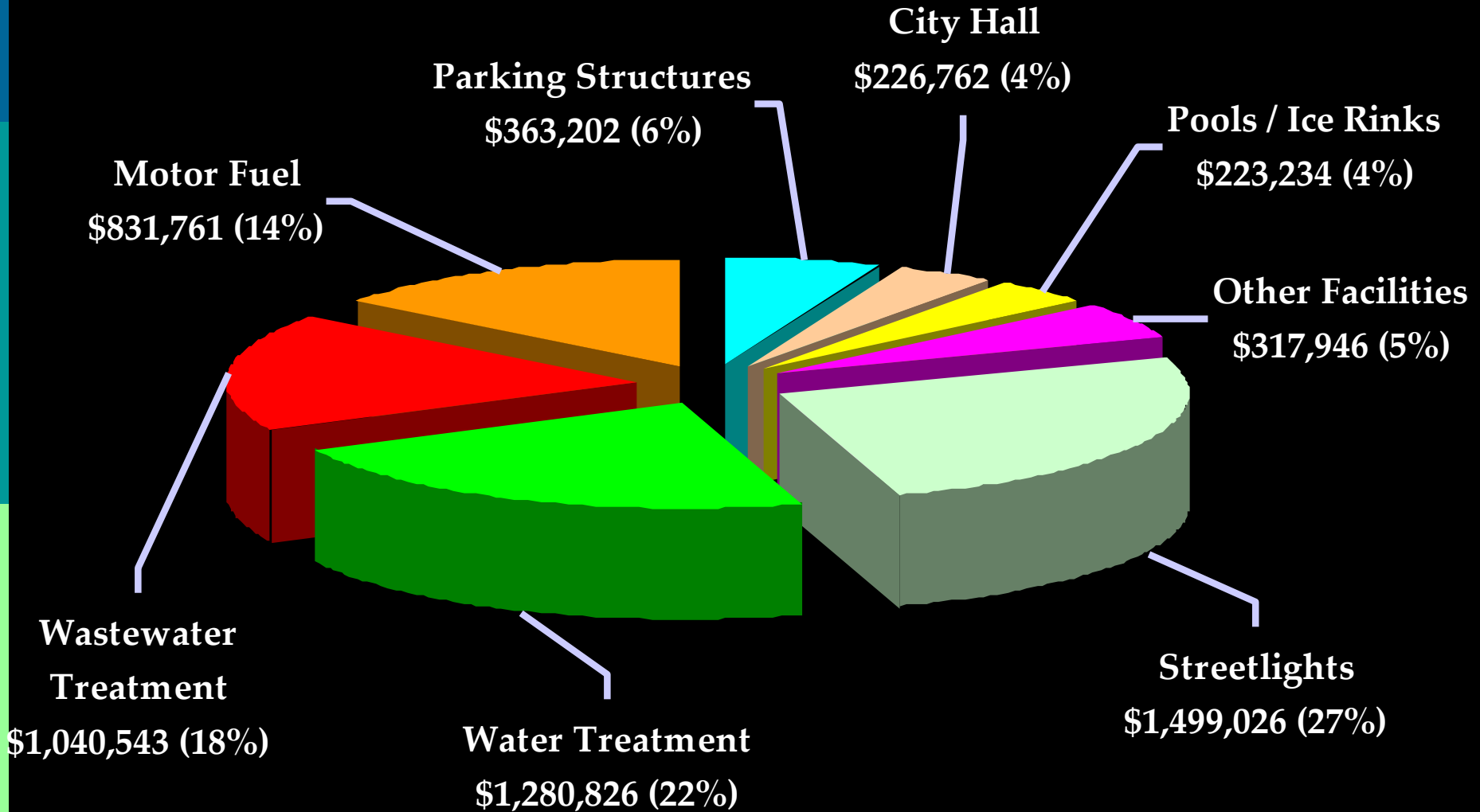
Ann Arbor, MI

City of Ann Arbor Municipal Energy Fund

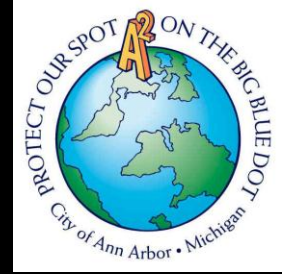




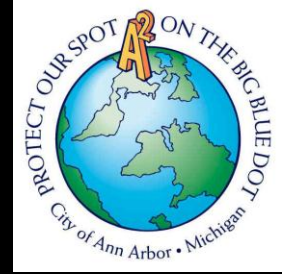
\$4.5-\$5M Annually on Energy



Energy Office



- In 1981 the City of Ann Arbor's Energy Plan called for energy conservation to be promoted in City buildings.
- This plan established goals and programs to reduce energy use and costs in Ann Arbor while moving the City towards more sustainable energy use. Consequently, the Ann Arbor Energy Office was created in 1985 to oversee improvements and projects.



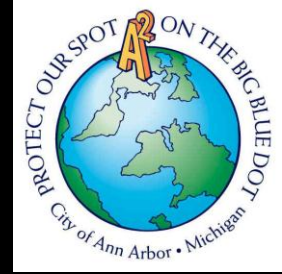
Energy Fund Nuts & Bolts

- ❑ The Energy Fund is used strictly for municipal programs aimed at improving energy efficiency at municipal facilities.
- ❑ The annual payments are made from a portion (80%) of the resultant energy savings, allowing facility budgets to be reduced or to apply the remaining savings (20%) to further improve the facility or services. Repayment starts the first year after the energy saving measures are installed.
- ❑ Repayments based on *estimated* energy savings.
- ❑ Fund projects with 3-5 year payback.



Nuts & Bolts cont.

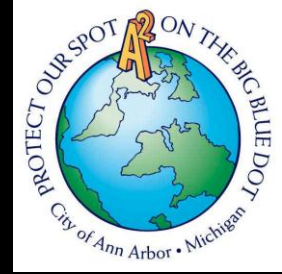
- ❑ The Fund is administered by the City's Energy Office under the supervision of a three-person board who approve funding, implement the projects, and often serve as project manager.
- ❑ The Office provides the board with information from energy audits along with applications from facility managers for projects requesting energy funds.
- ❑ The board reviews all applications and makes final decisions on what projects to fund each year.



Energy Fund Background

- The Energy Fund is financed by re-investing the funds saved through energy efficiency measures into new energy saving projects.
 - In 1988, the City utilized its municipal bonding authority to fund a \$1.4 million Energy Bond project. The Energy Bond enabled the City to implement energy efficiency measures in thirty City facilities. The payments for this ten-year bond were generated through energy cost savings.
 - With the bond paid off in 1998, the City chose not to eliminate the bond payment line item in the annual budget but rather to reduce it by 50% to \$100,000 for 5 subsequent years. This money was then used to establish the Municipal Energy Fund.

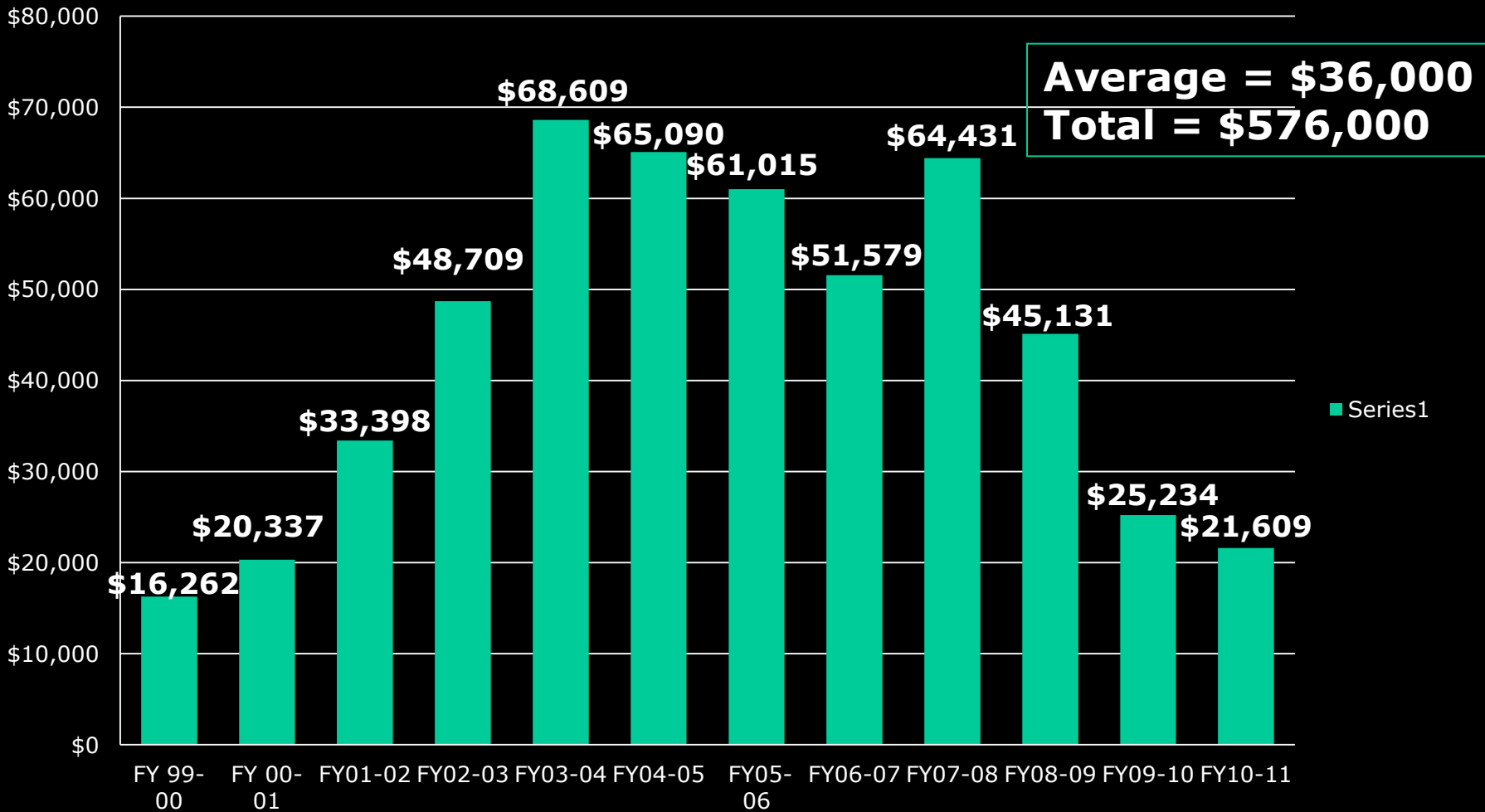
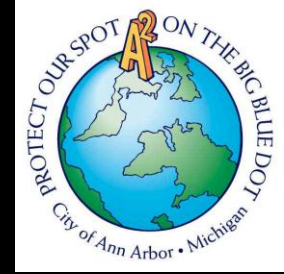
Energy Fund

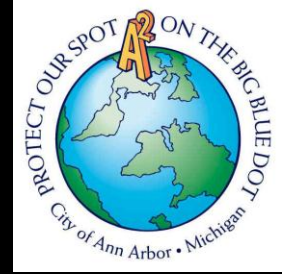


- City Council approved the first \$100,000 to be available in fiscal year 1998-99
 - \$87,000 was spent in the first year to update energy audits for 21 facilities and to implement lighting improvements at 14 of the facilities.
 - During fiscal year 1999-00 these improvements generated \$19,850 in energy savings of which \$15,880 was re-invested in the Municipal Energy Fund.
 - This money is transferred from the budgets of the facilities that receive the energy improvements to the Energy Fund at the end of fiscal year and be available to finance further energy improvements in future fiscal years.

- The \$100,000 budgeted annual contribution to the Fund was discontinued after the fiscal year 2003-04. From that point forward, the Fund has relied on payments from past projects to finance new projects.

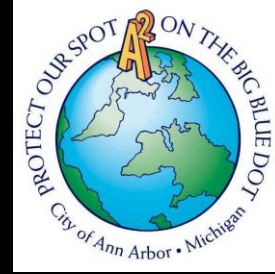
Energy Fund Annual Repayments 1999-2011





Example Energy Fund Projects

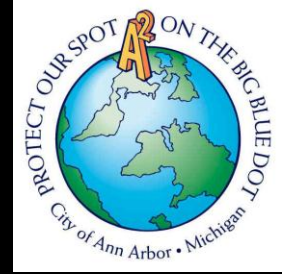
- ❑ Lighting Improvements, Airport HVAC, photovoltaics at Science Center (1999-00)
- ❑ LED traffic signals, Municipal garage lights (2000-02)
- ❑ City Hall cooling tower, solar pool heating, energy tracking software (ongoing-2010), vending misers (2002-03)
- ❑ Solar pool installs and repairs (2003-05)
- ❑ Airport taxiway LED pilot (2008-09)



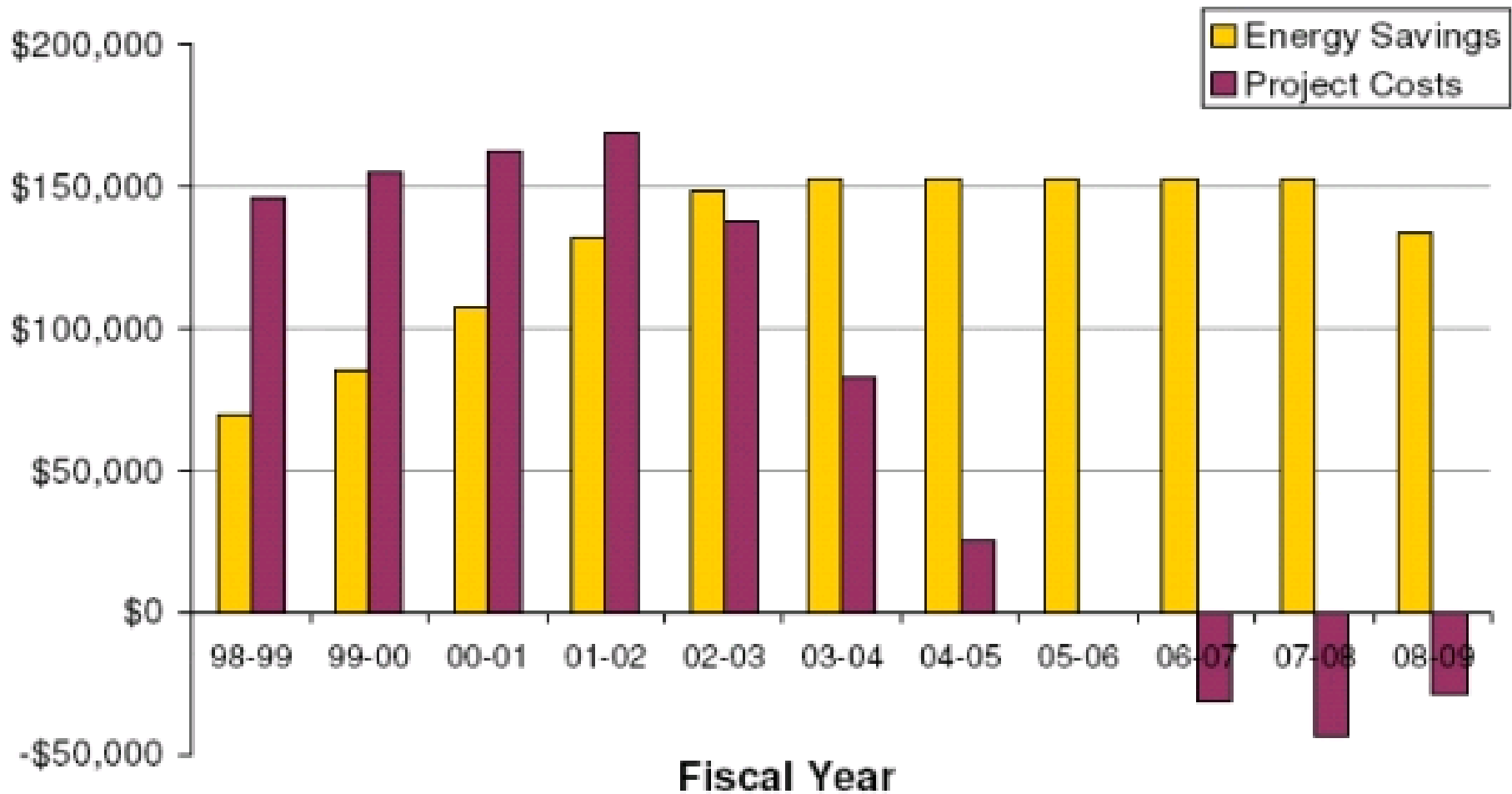
Allocated Retrofit Costs

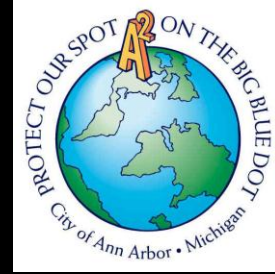
- ~\$330,000 for LEDs
- ~\$50,000 renewable energy projects
- ~\$237,000 miscellaneous efficiency projects

Energy Fund



Annual Energy Savings vs. Project Costs





Outcomes

- ❑ Over \$600K invested as loans
- ❑ Over \$146K annual energy savings, \$1.5M cumulative
- ❑ *Savings of over 1,000 MWh of electricity and 270 MCF of natural gas and reducing CO₂ emissions by over 980 tonnes annually*



Factors for Success

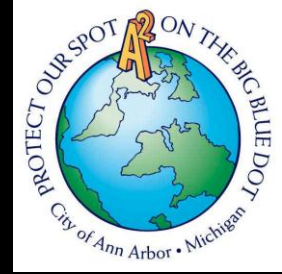
- ❑ Initial funding source (available for 3-5 years): The level of the initial funding will depend on funds available and the number and condition of municipal facilities.
- ❑ Manager assigned to support and coordinate the fund and its projects.
- ❑ The City of Ann Arbor has just over 60 facilities which pay \$4.5-5 million/year in energy costs. The \$100,000/year initial funding for the first 6 years has proven to be adequate, both for the energy saving opportunities available and for the fund management.
- ❑ Ann Arbor was fortunate to have an opportunity to establish the Municipal Energy Fund at a time when a ten-year bond was just being paid off.

Key Points

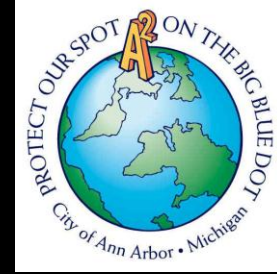


- ❑ **Project Paybacks:** Most projects financed by the Ann Arbor Municipal Energy Fund have payback periods of three to five years. For cities that have not been actively installing energy saving measures (“low hanging fruit”), there will be many opportunities available with payback periods of less than three years. This will contribute to a much quicker regeneration of an energy fund.
- ❑ **Leading by Example:** The Energy Fund is used strictly for municipal programs aimed at improving energy efficiency at municipal facilities. However, the Energy Plan calls for the City to lead by example, and this type of fund should be feasible for many local businesses that own and operate a large number of facilities.

Support Infrastructure



- The Energy Commission's charge includes the following duties:
 - Oversee City policies where energy efficiency and renewable energy should be addressed and advise City Council;
 - Create periodic public reports and recommendations on means of improving municipal and community energy efficiency and renewable energy;
 - Prepare, adopt, amend, and transmit to City Council plans identifying municipal and community-based energy efficiency, renewable energy and other production projects;
 - Research, formulate, and oversee community education programs; and
 - Identify and make recommendations regarding energy project financing options.



Resources & Contact Info

- Energy Office Website: www.a2gov.org/energy
- Energy Fund Website:
http://www.a2gov.org/government/publicservices/systems_planning/energy/Pages/EnergyFund.aspx
- Nathan Geisler - Energy Programs Associate
 - energy@a2gov.org
 - [734-794-6430 x43724](tel:734-794-6430)

Case Study: Union County Revolving Energy Fund

Planting a seed with EECBG stimulus funding

Department of Energy Webinar
June 21, 2011

Rich Deming, Principal
Calor Energy

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704-676-6300



Background

Union County is located south of Charlotte, North Carolina



- On the border with South Carolina
- Population: 201,1292
- Building portfolio: 16 buildings, 600,000 sq. ft.
- Commissioner/manager form of government
- Fastest growing county in NC, 6th fastest in the U.S.
- Received \$751,800 in EECBG Funding

Calor Energy is an Energy Consulting Firm in Charlotte

--*Energy Lead* for the Centralina Council of Governments

--Renewable Energy Strategy Practice

--Governments & Private Clients

--Technical, financial and process (RFPs, etc.) advice

--Experienced team of Engineers, CPAs and Technicians



Refresco Engineering did a complete assessment of the building portfolio -- High return Energy Efficiency projects, costs & ROI

Union County Energy Efficiency Initiative

Benchmarking and Opportunity Assessment Phase



Project Number 090601
June 17, 2009



Union County Energy Efficiency Initiative
Benchmarking and Opportunity Assessment Phase

PORTFOLIO OPPORTUNITY LIST (REVISED 09-01-2009)

Tag Descriptions:

AC = Agriculture Center	ML = Main Library
AS = Animal Shelter	PA = Patton Ave Sign Shop/Surplus
EL = Marshville (Edwards) Library	PE = Prospect Elementary School
FM = Farmer's Market	PS = Union County Public Schools
GC = Government Center	SO = Sheriff's Office/Jail
GH = Group Home	SV = Sun Valley Middle School
HC = Historic Courthouse	TO = Transportation Offices/Garage
HP = Historic Post Office	UV = Union Village
JC = Judicial Center	UW = Union West Regional Library
MH = Monroe High School	WL = Waxhaw Library

Strategy Tag	Strategy Description	Cost (\$)	Annual Savings (\$/Year)	Simple Payback (Years)
AS-1	Add programmable thermostats for all RTU's. Implement aggressive setback strategies to minimize excessive air conditioning during unoccupied hours.	\$1,000	\$2,800	0.4
TO-1	Add programmable T-stats to the garage and garage office air condition units. At the time of the survey, the garage unit t-stats were controlling the space temperature to 72 and 70 F, respectively. Implement an aggressive night and weekend schedule to match the occupancy of the garage. Consider raising the temperature setpoints to more typical garage temperatures (74-76 F).	\$750	\$1,580	0.5

SO-5	Install web-based control for existing Jail units to allow remote/easy modification of setpoints.	\$15,000	\$3,000	5.0
SO-4	Install a solar domestic hot water system. Cost assumes tax credit benefits passed back to owner through third-party leaseback financing. Actual monthly payment/benefit impacts will vary depending on contract terms.	\$20,000	\$4,000	5.0
HP-2	Provide occupancy sensors and/or timeclock control for lighting systems.	\$3,500	\$600	5.8
GC-4	Extend existing control system to VAV terminals in high rise floors to allow setpoint control from central web-based system.	\$36,000	\$6,000	6.0
JC-4	Convert hot water system to a primary secondary system with VFD control.	\$7,000	\$1,100	6.4
PS-4	Replace lavatory aerators with 0.5GPM aerators.	\$260	\$40	6.5
UW-3	Provide web-based remote access to control system to allow County staff to monitor settings and operation of facility from central location.	\$6,000	\$800	7.5
SV-1	Lighting Upgrades - Convert to High Efficiency T8 fixtures - Bulb & Ballast Replacement	\$82,386	\$10,280	8.0
PW-1	Lighting Upgrades - Convert to High Efficiency T8 fixtures - Bulb & Ballast Replacement	\$82,386	\$10,280	8.0
Totals =		\$654,664	\$249,085	2.6

The Calor team wrote the Energy Strategy Plan



UNION COUNTY ENERGY EFFICIENCY AND CONSERVATION STRATEGY PLAN

As required by the DOE Energy Efficiency and
Conservation Block Grant Program

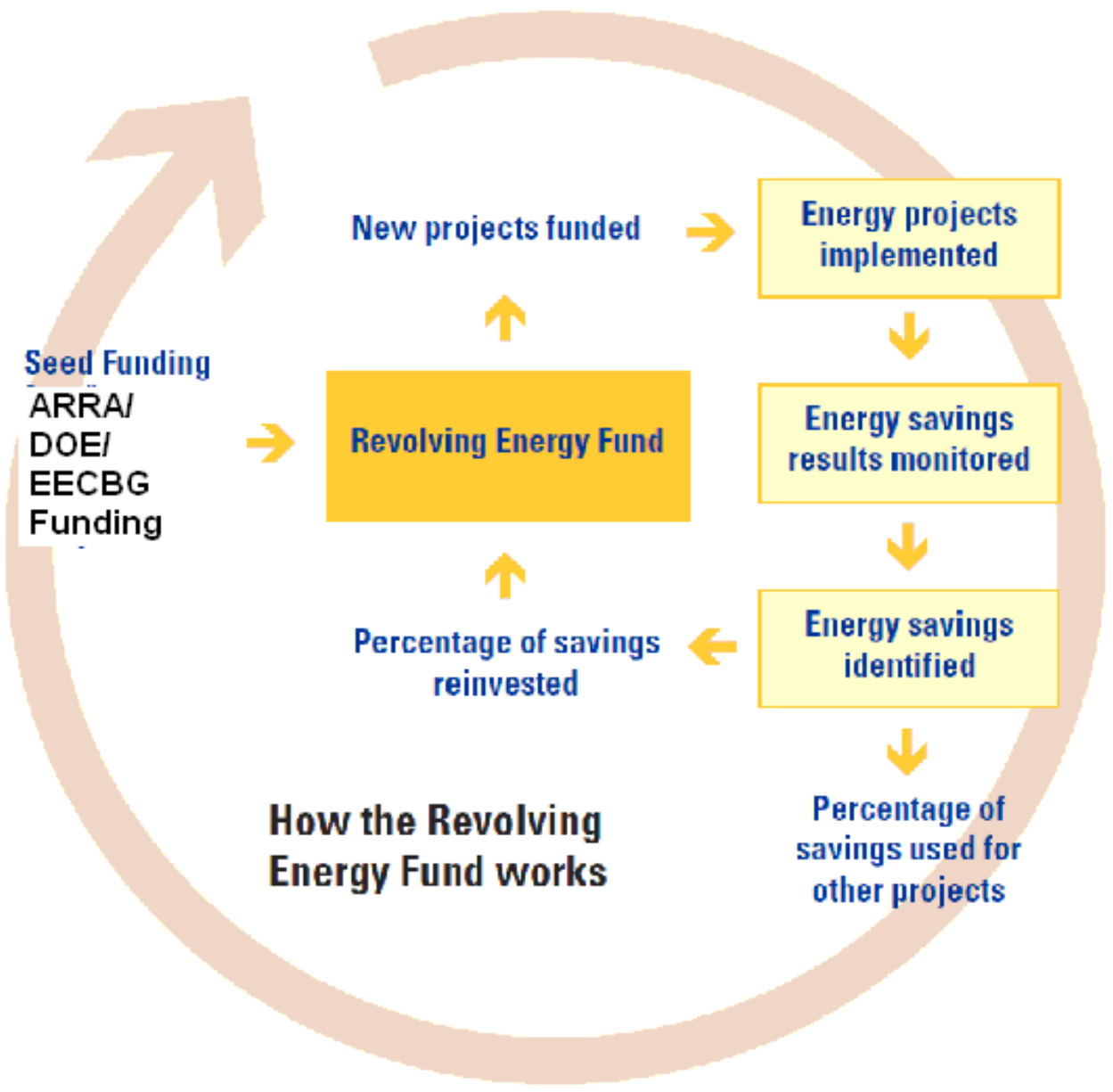
September 4, 2009



Prepared by:
Richard Deming, Energy Consultant
Centralina Council of Governments
1300 Baxter Street, Suite 450
Charlotte, NC 28204

- A. Set up an Energy Work Group
- B. Establish Timeline
- C. Establish “ground rules”
- D. Establish how fund is reapportioned
- E. Misc other sections
 - I. Answer specific DOE questions





How the Revolving Energy Fund works

Essential Issues:

1. Sign off by Legal Department
2. Sign off by Finance Department
3. Sign off by stakeholders in each relevant department
 - A. Building services
 - B. School System (for lighting projects)
 - C. Corrections (for solar thermal system)
4. Approval by the County Commission
 - A. Codify the re-apportioning requirement.

Projects:

1. Solar Thermal on the Jail
2. Lighting upgrades in two schools
3. All new outdoor lighting (induction)
4. HV/AC upgrades
5. Many low-cost, no-cost measures by maintenance department

Recommendations and Things To Keep In Mind

1. Development of Working Group gave project flexibility
2. Include stakeholders early and often
 - Working group included County Manager's representative, General Services, Finance Department and consultant.
3. County Commission Sign-off Is Essential

Next Steps – Moving Forward

- Engineer retained for two years to certify savings
 - A. Will create a report to present to the Commission
- Finance Department will re-opportune energy savings each year
 - A. Each project savings returned to 113% to help cover administration
- First energy savings will be documented and finance returned in FY 2012 Budget
- Working group will develop new project each year

Contact Info

Rich Deming, Principal
Calor Energy

www.calorenergy.com

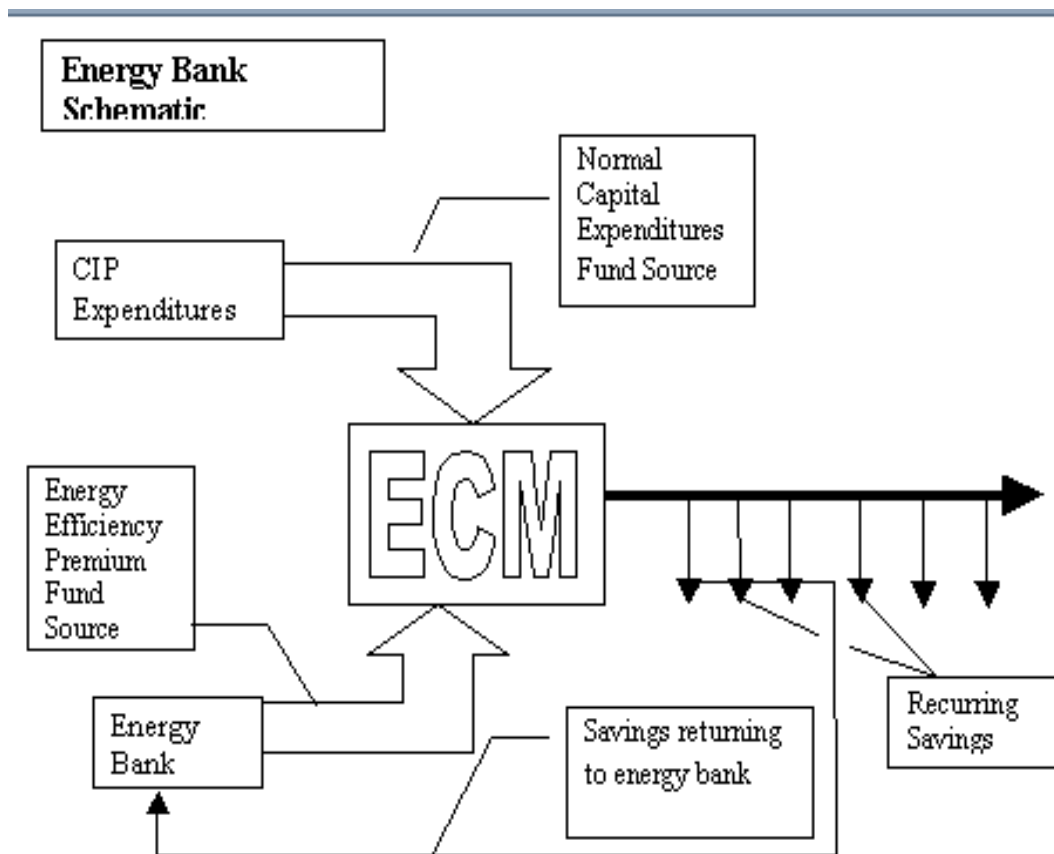
rich@calorenergy.com

704-676-6300



Additional Examples

- Established: 2006
- Seed money amount: \$500,000
- Seed money source: Bond
- Fund maintenance: 100% of energy savings



Established: 2010

Seed money amount: \$1,000,000

Seed money source: EECSBG

Fund maintenance:

- 100% of energy savings during payback period **plus one year**
- Assigning federal tax benefits to design companies
- Generate and sell RECs



So....

How do you
capitalize
the fund?



© 2004 Ted Goff



“This part of the plan will be funded with all the unused money we must have laying around someplace.”

Sources of Capital Funds

- Appropriated funds
- Unrestricted fund balance
- Capital reserve fund
- ESCO financing
- Grants
 - Public and Private
- Installment Purchase/Lease
- Fees
- Bond proceeds
 - G.O.
 - ARRA Bonds

Sources of Revenue

- Increased appropriated funds
- Savings linked to project
- Revenue linked to project
 - Energy sales
 - Green tags/Recs
- Assessments

- Appropriating funds
- Maintaining an expired budget line item
- Capitalizing on existing energy savings and other cost reductions
- Cost reductions from competitive bidding
- Private foundations and grants
- Bonds

- Avoided costs and
 - + Interest from borrowers
 - + Appropriated funds
 - + Renewable energy credits/Green tags
 - + Energy sales

- Inspiring participation
- Ensuring department budgets are not reduced
- Paying for fund administration
- Process for project selection
- Payback timeline
- Measurement and verification
 - Payback based on estimated or measured energy savings
 - Sub-metering

- Other grantee experiences
 - Do you have a fund for financing energy efficiency projects?
 - Have you faced any barriers setting up a municipal energy efficiency fund?
- Please participate in the Q&A session by:
 - Typing your question into the Q&A box –or –
 - Raising your virtual hand and we can unmute you to share your comment or question with the group

Thank You!

Glenn Barnes

UNC Environmental Finance Center

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glennbarnes@sog.unc.edu

Katy Newhouse

Northwest Regional Coordinator for DOE's TAP

503-525-6185

knewhouse@icfi.com