



Smart Management for  
Small Water Systems

## How Do We Pay For It? Special Financing Mechanisms for Energy Management Projects



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# Four Special Financing Models for Energy Management

1. Internal Energy Revolving Funds (“virtuous cycle”)
2. Energy Savings Performance Contracting (ESPC)
3. Net Metering and Power Purchase Agreements (PPA)
4. QECB’s: Qualified Energy Conservation Bonds



# Internal Energy Revolving Funds



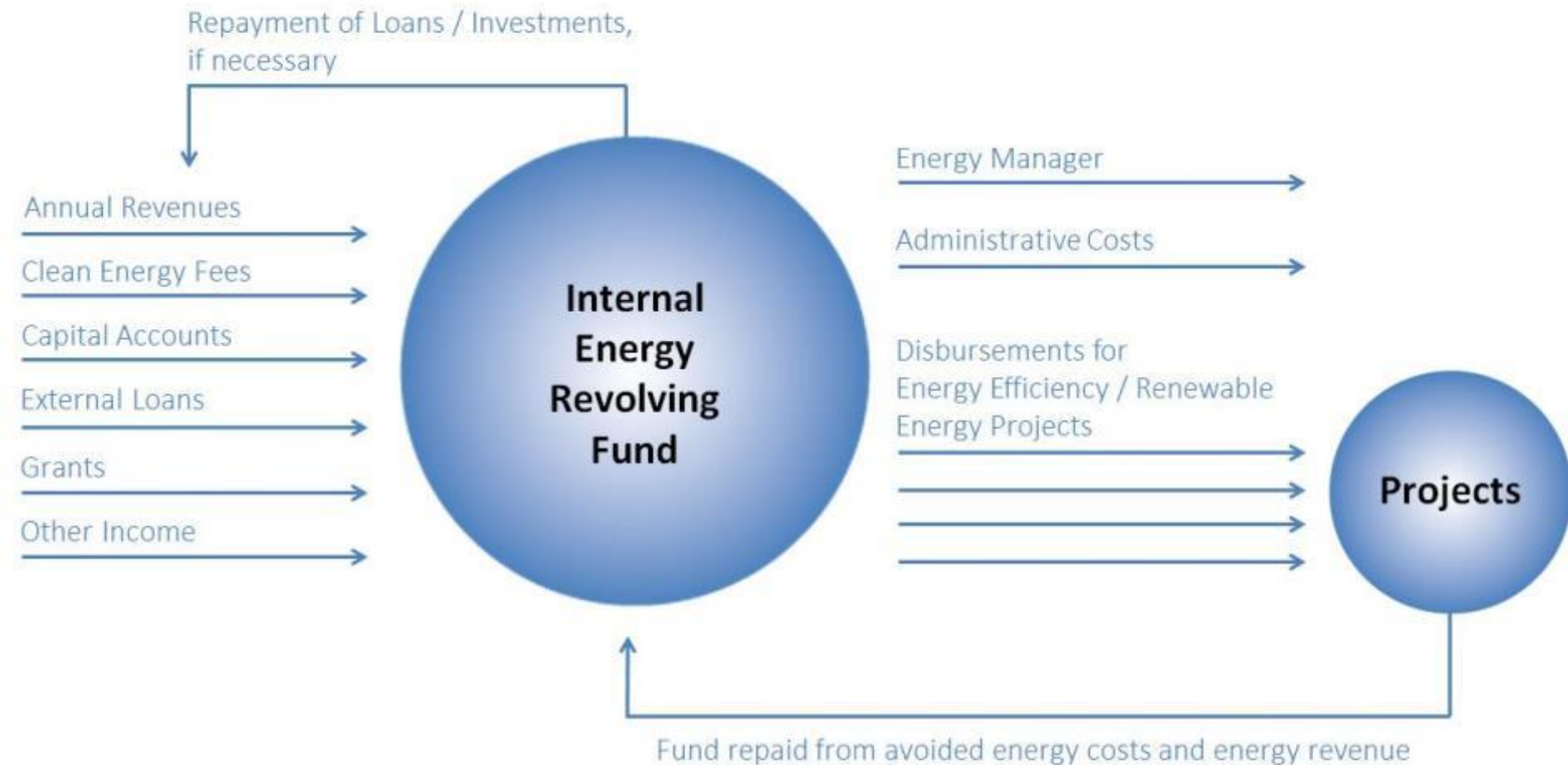


# How an energy revolving fund works

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



# Internal Energy Revolving Fund







# What Are “Avoided Costs”?

- And why do you think we use “avoided costs” and not “cost savings”?

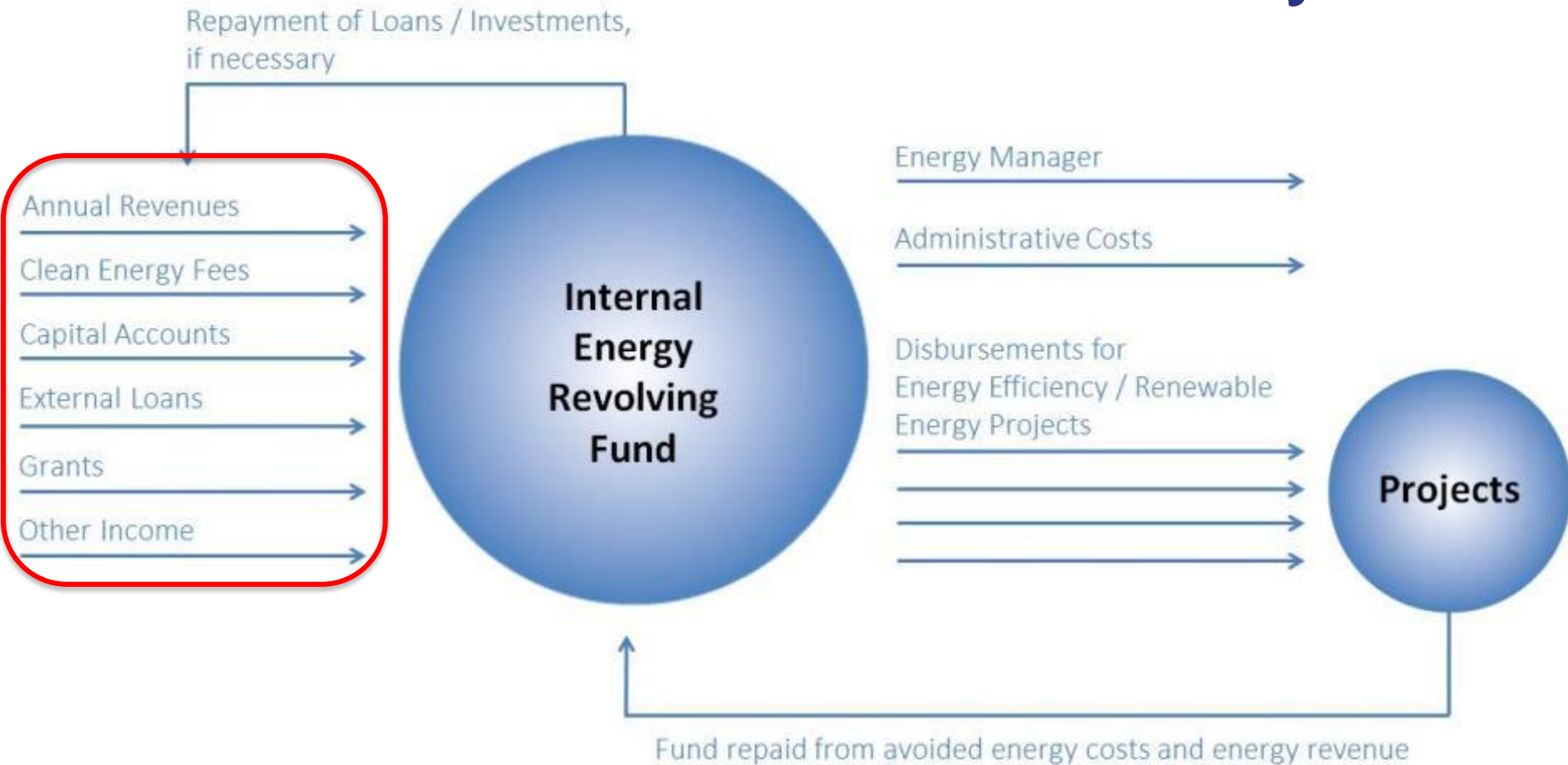


# What is an Energy Upgrade?

- An energy upgrade to water or wastewater system is really just a **capital improvement**
- You can treat energy upgrades just like any other capital improvement



# Establishment: Seed Money







# Establishment: Seed Money

- Revenue from rates & fees
- Unrestricted fund balance
- Capital reserve fund
- ESCO financing
- Grants
- Assessments
- Debt



# What is an Energy Upgrade?

- An energy upgrade to a water or wastewater system is also a **special capital improvement**
- As a result, there are special financing options available for energy upgrades



# Establishment: Seed Money

- Special loans for energy improvements (including SRF “green” projects)
- Rebates
- Tax Credits (for those eligible)
- Net Metering and Power Purchase Agreements (PPA)



# How the Money Is Handled

- Issues to consider:
  - It may depend on your water system'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



# How the Money Is Handled

- Ways for the money to be handled:
  - Within your finance office
  - Each project repays the fund
  - The budget includes a certain amount of money to be re-appropriated into the fund each year





# M&V of Projects

- From a finance and management perspective, the issue is how to determine repayments into the fund.
  - Actual savings
  - Estimated savings
  - Annual lump sum, regardless of savings

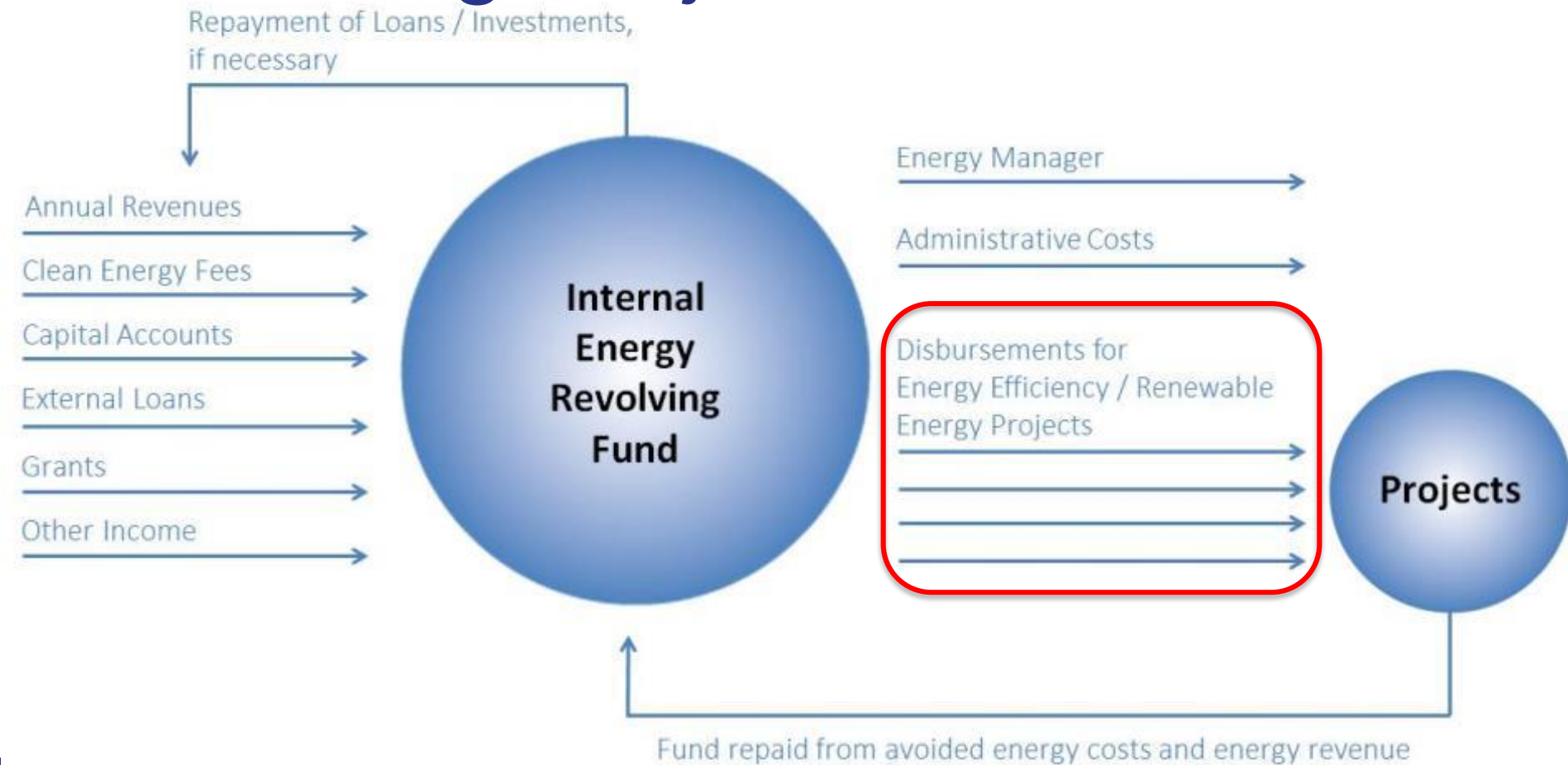


# M&V of Projects

- 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.



# Choosing Projects





# Choosing Projects

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







# Choosing Projects







# IERF Replenishment



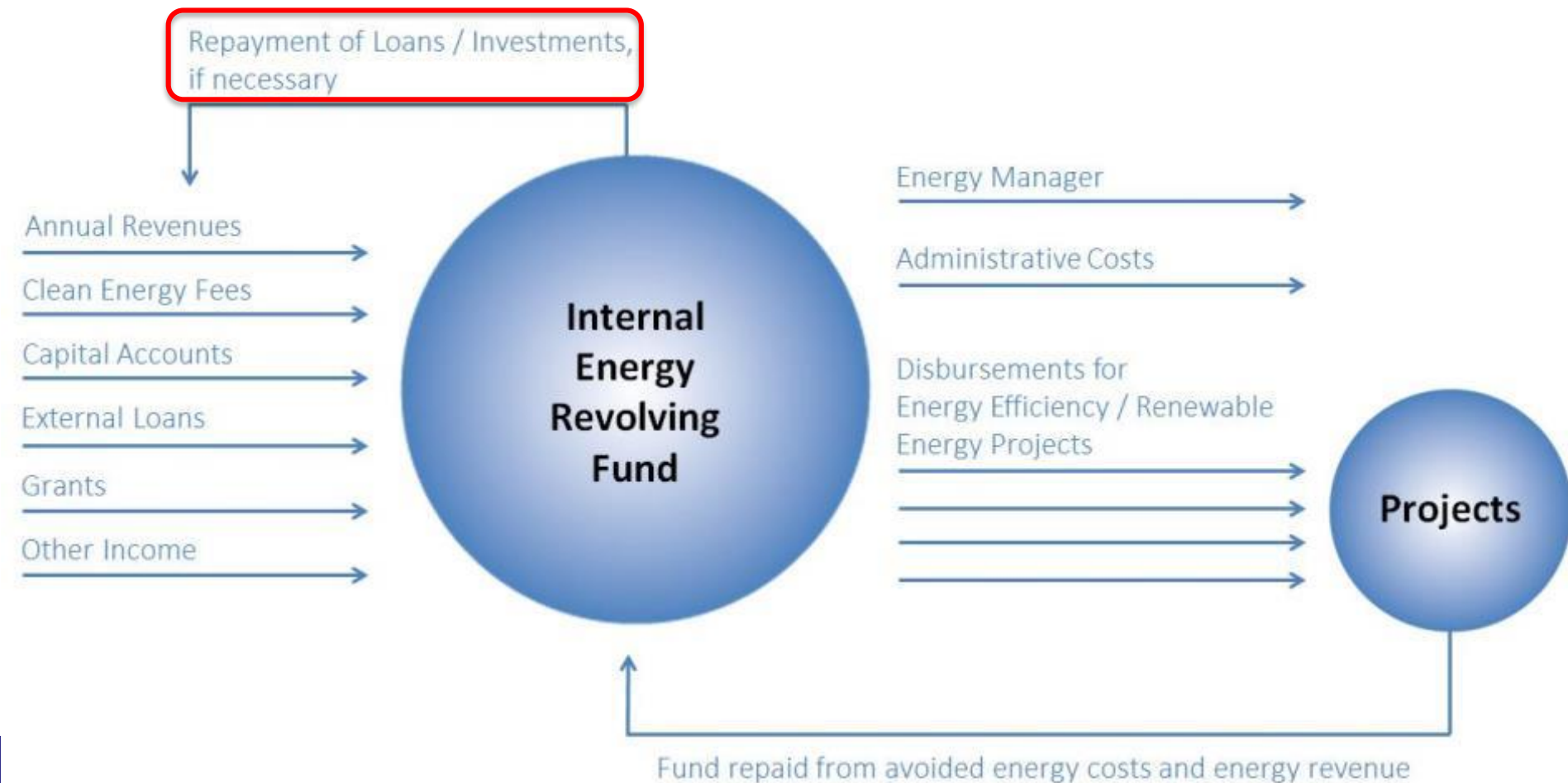


# IERF Replenishment

- Avoided energy costs
  - Repaid up to, or exceeding, 100% of project costs.
  - Note: You may wish to ask for more than 100% to cover administrative / overhead costs.
- Adding new money to the fund
- REC sales



# If You Borrow to Seed the Fund





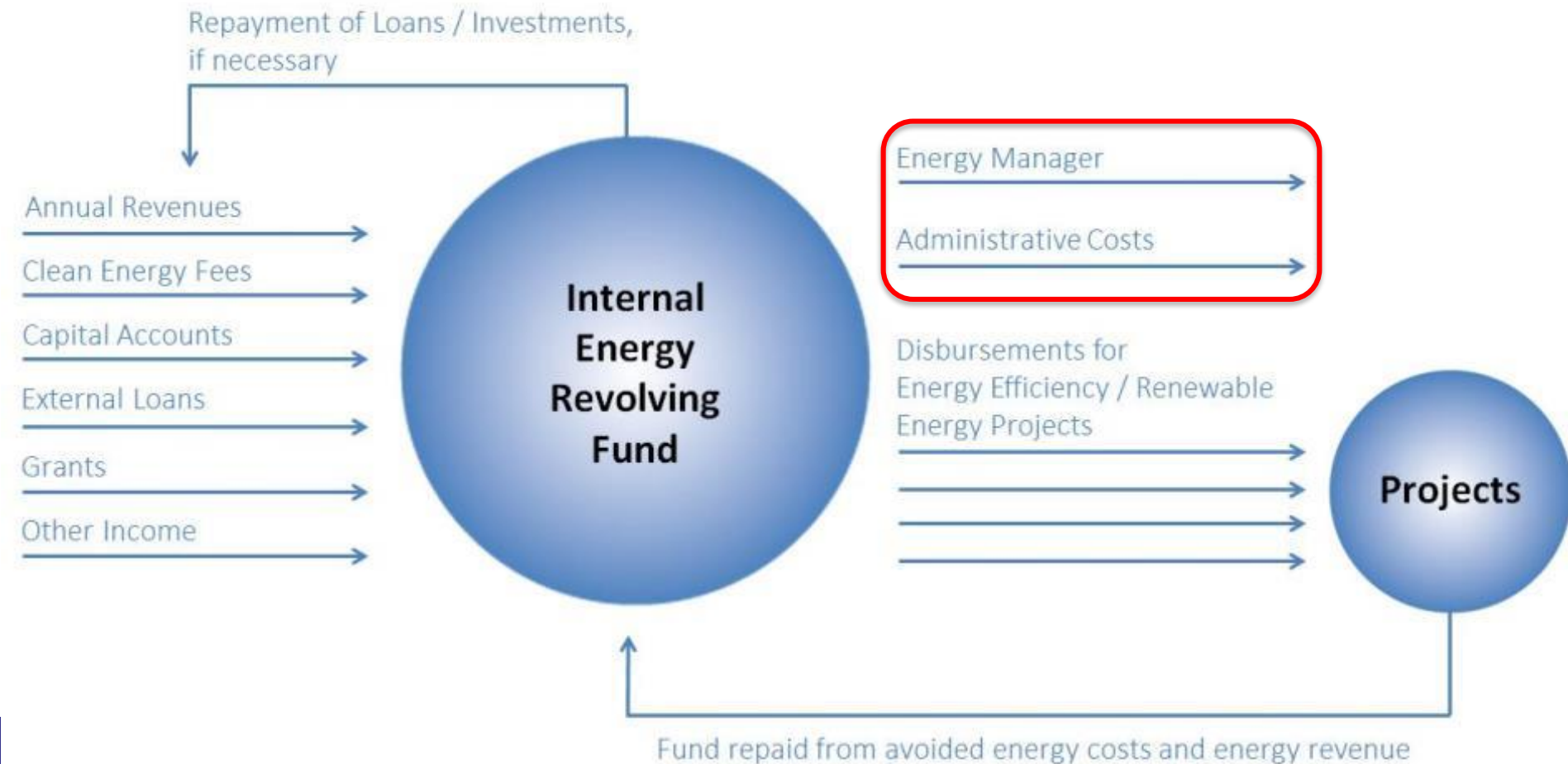
# If You Borrow to Seed the Fund

- Avoided energy costs can be used to repay your debt, and whatever is remaining replenishes the fund
- Have a Plan B





# IERF Administration







# IERF Administration

- This costs money!
- Can be paid out of the avoided energy costs



# Shell game?





# Management Benefits

- Structures incentives for energy improvements
- Rewards leadership and innovation
- Creates a process for choosing projects





<http://efc.web.unc.edu/2015/12/01/internal-energy-revolving-funds/>



Blog



Source: <http://pacinst.org/wp-content/uploads/sites/21/2012/10/water-energy-nexus-featured.jpg>

## The Virtuous Cycle: Internal Energy Revolving Funds for Small Water Systems

DECEMBER 1, 2015 / DAVID TUCKER / 0 COMMENTS

 Print  PDF

How can small (and large) water systems pay for energy efficiency and renewable energy, helping cut energy costs? As energy is often the largest variable expense in a water system's operating budget, this is a recurring

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# Webinar: Internal Energy Revolving Funds



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We work to enhance the ability of governments and other organizations to provide environmental programs and services in fair, effective and financially sustainable ways.

### Upcoming Events

- New Hampshire | Energy Management for Community Water Systems (Serving 10,000 people or less)  
Wednesday, June 1, 2016
- West Virginia | Rates and Finance Workshop for Small Water Systems  
Wednesday, June 1, 2016
- Webinar: Navigating Funding Options for Water Infrastructure  
Wednesday, June 1, 2016

1 of 3next >

View all events

### Latest News

- EPA to Provide EFC \$500K to Help 10 Communities with Water Infrastructure Development  
The U.S. Environmental Protection Agency (EPA) has provided \$500,000 in funding to The University of North Carolina at Chapel Hill's Environmental Finance Center (EFC) to assist communities addressing water infrastructure challenges.
- Z. Smith Reynolds Foundation awards \$90,000 to Environmental Finance Center  
Trustees of the Z. Smith Reynolds Foundation have awarded a grant to the Environmental Finance Center to work in partnership with the North Carolina On-Bill Working Group to provide education, support and other resources to rural

## EVENT

### WEBINAR: FIND MONEY IN THE WATER SYSTEM BUDGET: INTERNAL ENERGY REVOLVING FUNDS

Hosted by: Environmental Finance Center Network

#### Webinar

**Tuesday, April 12, 2016 2:00PM - 3:00PM EDT**

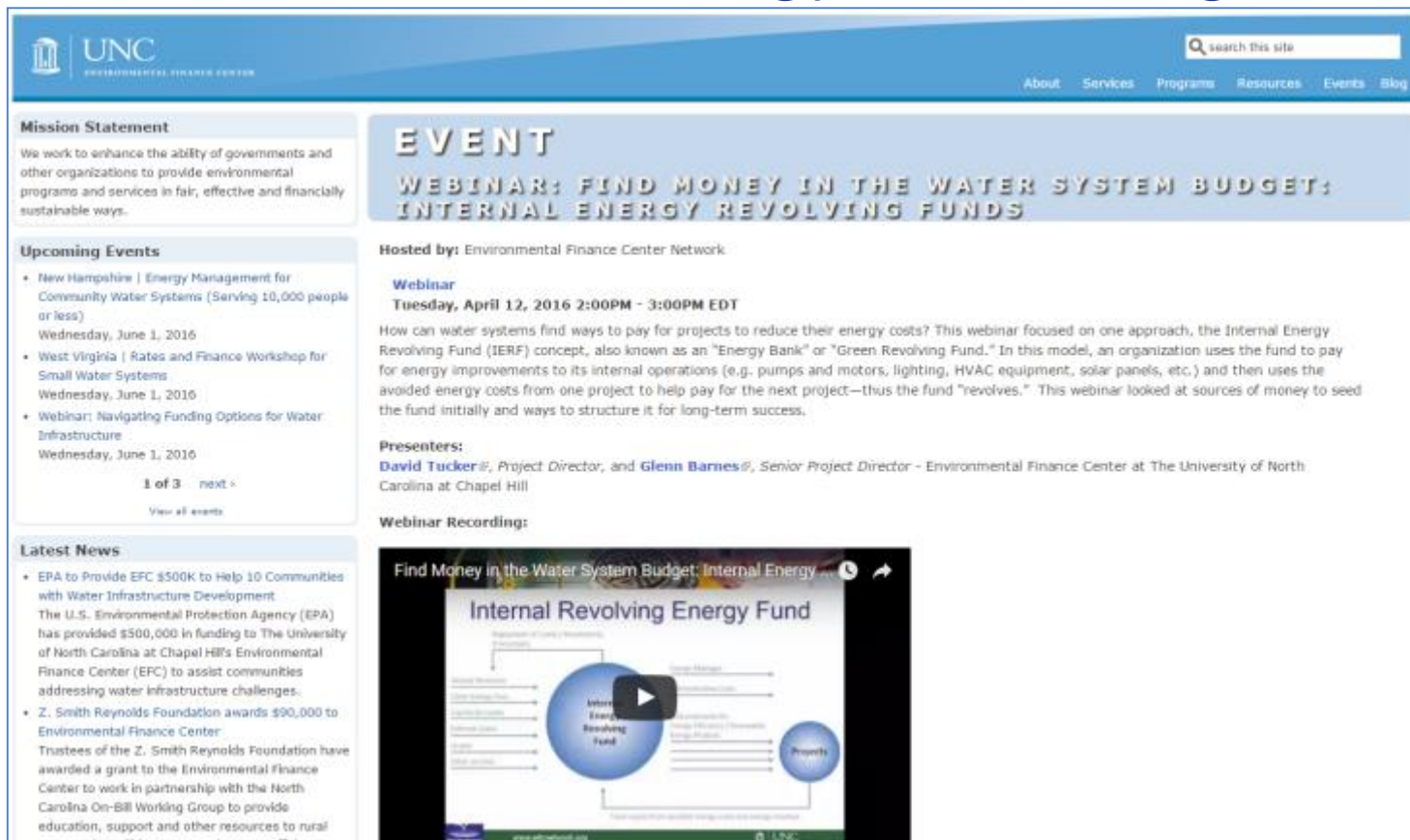
How can water systems find ways to pay for projects to reduce their energy costs? This webinar focused on one approach, the Internal Energy Revolving Fund (IERF) concept, also known as an "Energy Bank" or "Green Revolving Fund." In this model, an organization uses the fund to pay for energy improvements to its internal operations (e.g. pumps and motors, lighting, HVAC equipment, solar panels, etc.) and then uses the avoided energy costs from one project to help pay for the next project—thus the fund "revolves." This webinar looked at sources of money to seed the fund initially and ways to structure it for long-term success.

**Presenters:**  
**David Tucker**®, Project Director, and **Glenn Barnes**®, Senior Project Director - Environmental Finance Center at The University of North Carolina at Chapel Hill

**Webinar Recording:**

### Find Money in the Water System Budget: Internal Energy

#### Internal Revolving Energy Fund



<http://www.efc.sog.unc.edu/event/webinar-find-money-water-system-budget-internal-energy-revolving-funds>





# Discussion

- Have any of you already set up an internal revolving energy fund at your small system?
- If so, how is it working for you? Do you recapitalize the “bank” as planned? Have you expanded its capitalization across time?
- If not, is this something that sounds interesting to you to try?



# Three More Financing Models for Energy Management Projects

- Energy Savings Performance Contracting (ESPC)
  - An Energy Service Company (ESCO) is a synonym for an energy performance contractor
- Net Metering and Power Purchase Agreements (PPA's)
- Qualified Energy Conservation Bonds (QECCB's)



# Energy Savings Performance Contracting (ESPC)





# What is Performance Contracting?

- An ESCO proposes and designs a package of energy cost reduction measures, installs or implements those cost reduction measures, and guarantees the savings of the cost reductions.
- Typically, the ESCO puts up all of the capital for the energy projects; or has a financing firm do so.
- The ESCO pays itself back for the package over time using the stream of revenue provided by the energy reduction measures.
- Third party verifies ESCO reconciliation report.



# Benefits of Performance Contracting

- Solutions to Infrastructure & Operational Needs
- Guaranteed Results = Minimal Risk
- Reduced Operating & Utility Costs
- Best Life Cycle Cost, Not Just Lowest Price
- Turnkey Project Development & Implementation
- Saves Time & Provides Solutions





# Why not do it yourself?

- Often opportunities to reduce energy costs are well known but owners are unable to take advantage of them
  - Capital
  - Expertise
  - Manpower
- Can you guarantee the savings?



# Performance Contracting Advantages

- A process with a single point of responsibility (rather than multiple contractors for various projects).
- Provides you with the ESCO's capital.
- Provides you with the engineering and project management expertise of the ESCO.
- Guaranteed performance / savings.



# Performance Contracting Pitfalls

- Failure of owner to perform due diligence.
- Failure to understand contract.
- Overly optimistic expectations / promises.
- Poor project specifications:
  - IGA (Investment Grade Audit)
  - M&V (measurement and verification)
- Time must be allocated to see process through



# Steps to a Successful Project

- Assemble stakeholders
- Create data packet for project (application)
- Issue RFP
- Evaluate responses (select ESCO)
- Perform IGA
- Negotiate contracts
  - ESCO contract
  - Financial contract (in some cases)
- For govt. agencies: get approval from appropriate government agency





# Potential Performance Contracting Timeline

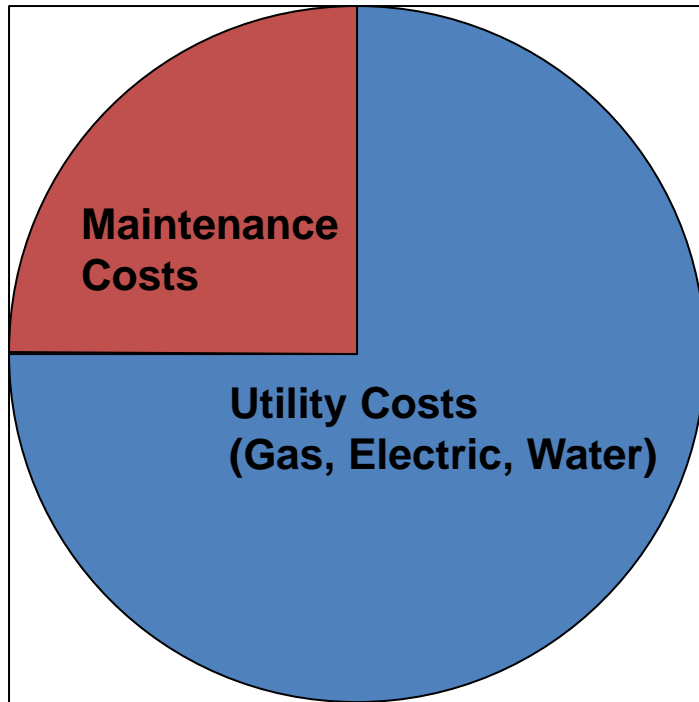




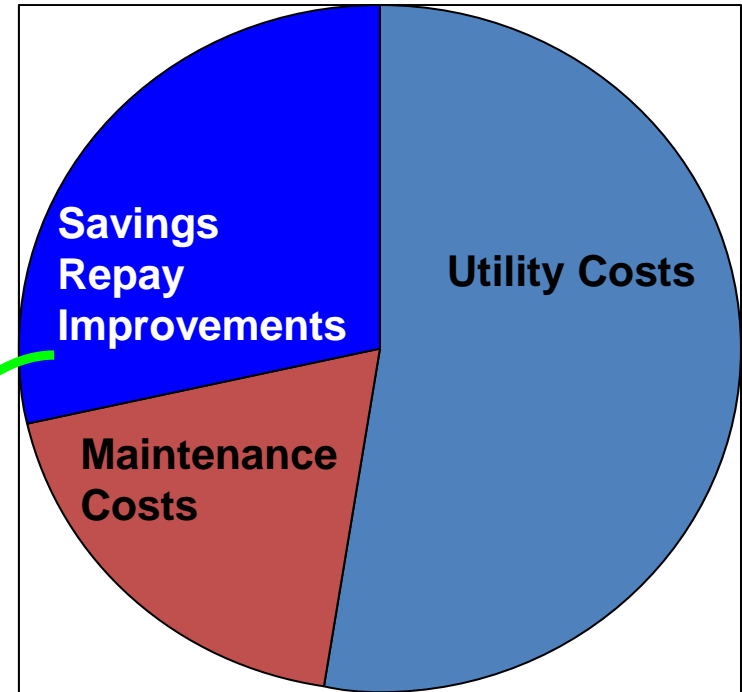
# Measurement & Verification

- Actual savings measured are compared to guaranteed savings by third party.
- If actual savings less than guaranteed savings, ESCO pays the difference to the governmental unit.
- The cost of the required third party M&V review is to be included in the contract.

# Funding: Annual Operating Budget



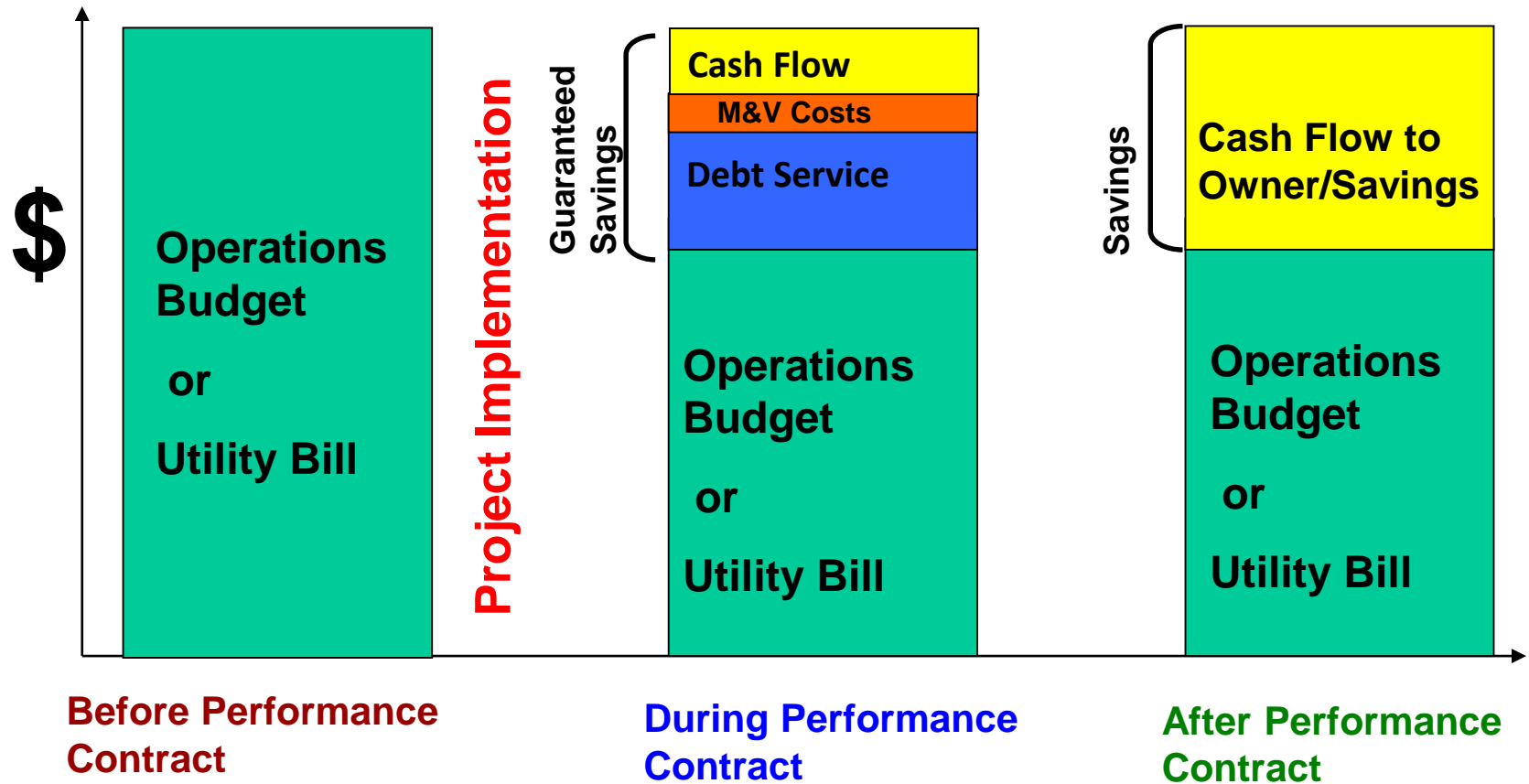
**Before Improvements**



**After Improvements**

**Savings generated fund the project!**

# PC Funding – Your Utility's Budget





# Performance Contracting – A Comparison

	<u>Plan/Bid/Spec</u>	<u>Performance Contracting</u>
<b>Financial</b>	Capital/Bond/Cash	<b>\$\$ You are already Spending – Operating Budget</b>
<b>Relationship</b>	Scope? Completion? Commissioned? Warranty...Gone	Continuous Partnership over life of contract
<b>Upfront Fees</b>	Yes	None
<b>Performance &amp; Financial Guarantee</b>	None	Operational & Financial
<b>Change Orders</b>	Yes – Almost Always	Not Typically



<http://efc.web.unc.edu/2015/08/13/energy-savings-performance-contracting/#more-4153>

Blog



Ten-horsepower variable speed motors, controlled by variable frequency drives (VFDs), Villa Magna condos, Florida

# Finding Money in the Water System Budget: Energy Savings Performance Contracting (ESPC)

AUGUST 13, 2015 / DAVID TUCKER / 0 COMMENTS

Print PDF

The way that drinking water and wastewater systems pay for energy improvements in the United States is changing – including for small drinking water systems (serving 10,000 or fewer people). As has often been mentioned on the EFC’s blog, the days of huge federal grants for construction of water and wastewater systems are [long past](#). Since an energy improvement is a kind of

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# Webinar: Energy Savings Performance Contracts



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### WEBINAR: Find Money in the Water System Budget: Paying for Energy Improvements

Event(s): WEBINAR: Find Money in the Water System Budget: Paying for Energy Improvements

Subject: **Management**  
Author(s): **David Tucker**  
Program: **Drinking Water and Wastewater**  
Presentation type: **Powerpoint**  
Date: **03/03/2015**  
Host Organization(s): **Environmental Finance Center at UNC**

File:  Find Money in the Water System Budget - Paying for Energy Improvements - Webinar - 2015-09-16 FINAL.pdf ( )

Project page: [Smart Management for Small Water Systems](#)

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T: 919.843.3528 | F: 919.843.2528

<http://www.efc.sog.unc.edu/event/webinar-find-money-water-system-budget-paying-energy-improvements>

# Some Useful Resources

- NAESCO
  - National Association of Energy Service Companies
  - Lists 32 ESCO's around the USA, and there are still more out there
  - <http://www.naesco.org/>
- DSIRE
  - Database of State Incentives for Renewables and Efficiency
  - Can search by zip code, state, or territory
  - <http://www.dsireusa.org/>





# Discussion

- Have any of you already done an Energy Savings Performance Contract?
- If so, what was your experience like? For how many years was the contract term?
- Would you use this process again?
- If you have not done so before, are you interested in trying a performance contract?



# Net Metering and Power Purchase Agreement (PPA)





# Net Metering

- If you generate electricity at your water / sewer system (e.g. from solar panels, wind turbines, biogas, etc.), and produce more electricity than you consume, under net metering, you sell the excess to the local electric utility.
- The utility must offer this service, and you must be properly interconnected to their system.
- Must be permitted under state law and regulation. Varies widely across the states and territories.



# Net Metering

- Rate per kWh of electricity net metered depends upon the agreement you sign with the electric utility (and thus on state law and regulation as well).
- Resources for New Hampshire Net Metering:
  - DSIRE
    - <http://programs.dsireusa.org/system/program?state=NH>
    - <http://programs.dsireusa.org/system/program/detail/283>
  - Talk with your water system's electrical utility.
  - NH Office of Energy and Planning (<https://www.nh.gov/oep/>)



# Power Purchase Agreement

- Like Net Metering, this may be an option for your water system if you generate renewable energy.
- Authority for PPA's varies greatly among different states and territories.
- Some states allow direct, third-party electrical sales via PPA's. Others do not.
- Second-party electrical sales PPA's are usually allowed – you sell what you generate to the local electrical utility at a contracted rate.





# Power Purchase Agreement

- Even in states where Net Metering is possible, a PPA may be required for large amounts of electrical sales, above a certain kWh or kW threshold.
- You must be properly interconnected to the electrical utility's system, of course.
- New Hampshire offers direct, third-party electrical sales / PPA's. See the following national map.
- For NH solar power PPA's (and other incentives), see this website for more info:
  - <https://www.nh.gov/oep/>

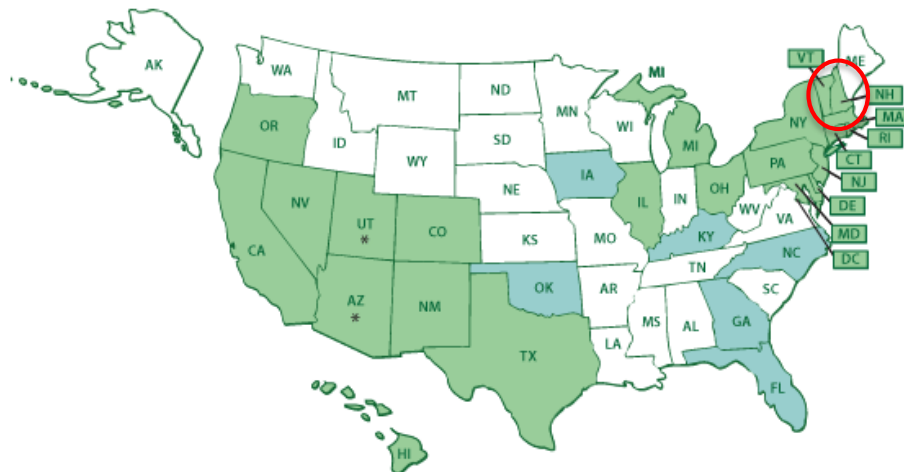


## Which states allow third-party ownership?

According to the [Database of State Incentives for Renewables and Efficiency](#) working in conjunction with IREC and Keyes and Fox, LLP, 22 states plus Washington D.C. and Puerto Rico have allowed third-party solar ownership in at least some jurisdictions. Typically, the determining factor to allowing third-party ownership is the state's definition of a "utility" in statute. Given the relatively new development of the ownership model, the matter has not been explicitly settled in many US states, as evidenced in the map below.

Click on your state below to find out which companies offer third-party financing in your state. The results will also include utility green pricing programs, retail green power products offered in competitive electricity markets, and renewable energy certificate (REC) products sold separate from electricity. For additional information about these distinct products, see our [Overview of Green Power Markets](#).

### 3rd-Party Solar PV Power Purchase Agreements (PPAs)



- Authorized by state or otherwise currently in use, at least in certain jurisdictions within the state
- Apparently disallowed by state or otherwise restricted by barriers
- Status unclear or unknown

\* Limited to certain sectors

Sources: Database of State Incentives for Renewable Energy & Efficiency and NREL (Feb. 2013)

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# Power Purchase Agreement: Example

- A company such as FLS Energy, Inc., finances some of, or all of, a renewable energy project. You may not have to put up any capital at all.
- For example, Hawaii PPA contract for large solar hot water project (1,400 homes). FLS has also done Camp Lejeune (N.C.) marine base.
- Sell electricity under long term sales contract – possibly lock in effectively much lower electric rates than today.



# Power Purchase Agreement: Example

- Going back to the case of Hawaii and FLS Energy, base electric price is about 28-29 cents per kWh.
- Selling BTU thermal equivalent of hot water in kWh terms may reduce this rate sharply (e.g. down to 20 cents per kWh), saving significant money across the long term (e.g. 10-15 years).



# PPA's and Tax Equity

- Local government water utilities do not pay income tax.
- But if a company like FLS Energy comes to contract a PPA with you, they can potentially still qualify for the 30% federal renewable energy investment tax credit.
- This may allow them to put up 100% of the necessary capital. You may get effectively much lower electric rates.
- Renewable Energy Credit (REC) sales may also help your utility and the company to finance the project.





# Qualified Energy Conservation Bonds





# Bonds

- Review: In general, a bond is a written promise to repay borrowed money
  - on a definite schedule and usually at a fixed rate of interest for the life of the bond
- Usually, government entities issue one of two kinds of bonds:
  - General Obligation (GO)
  - Revenue



# Qualified Energy Conservation Bonds

- Two main avenues for QECBs:
- Conduit bonding avenue territory must take action – but end recipient is “on the hook” in case of default on the bonds.
- Green community program – territory must take action – but TEO (or issuing govt. department) is on the hook in case of default on the bonds by end recipient.



# Qualified Energy Conservation Bonds

- Tax-credit bonds (issuer pays back principal and reduced interest because bondholder receives federal tax credit in lieu of interest).



# Qualified Energy Conservation Bonds

- 1%-5% effective interest rate for issuer
  - Issuer gets 3%-4% subsidy from Treasury
  - Typically a 15 to 20-year loan term
- Qualified projects are broadly defined, including 20 percent reduction of energy use in public facilities.





# Qualified Energy Conservation Bonds

- Essentially, it's an interest rate buy-down to create an effectively low-interest loan.
- May or may not be attractive to you during a time of low interest rates in general.
- DSIRE has details on QECB's in NH:
  - <http://programs.dsireusa.org/system/program/detail/3098>

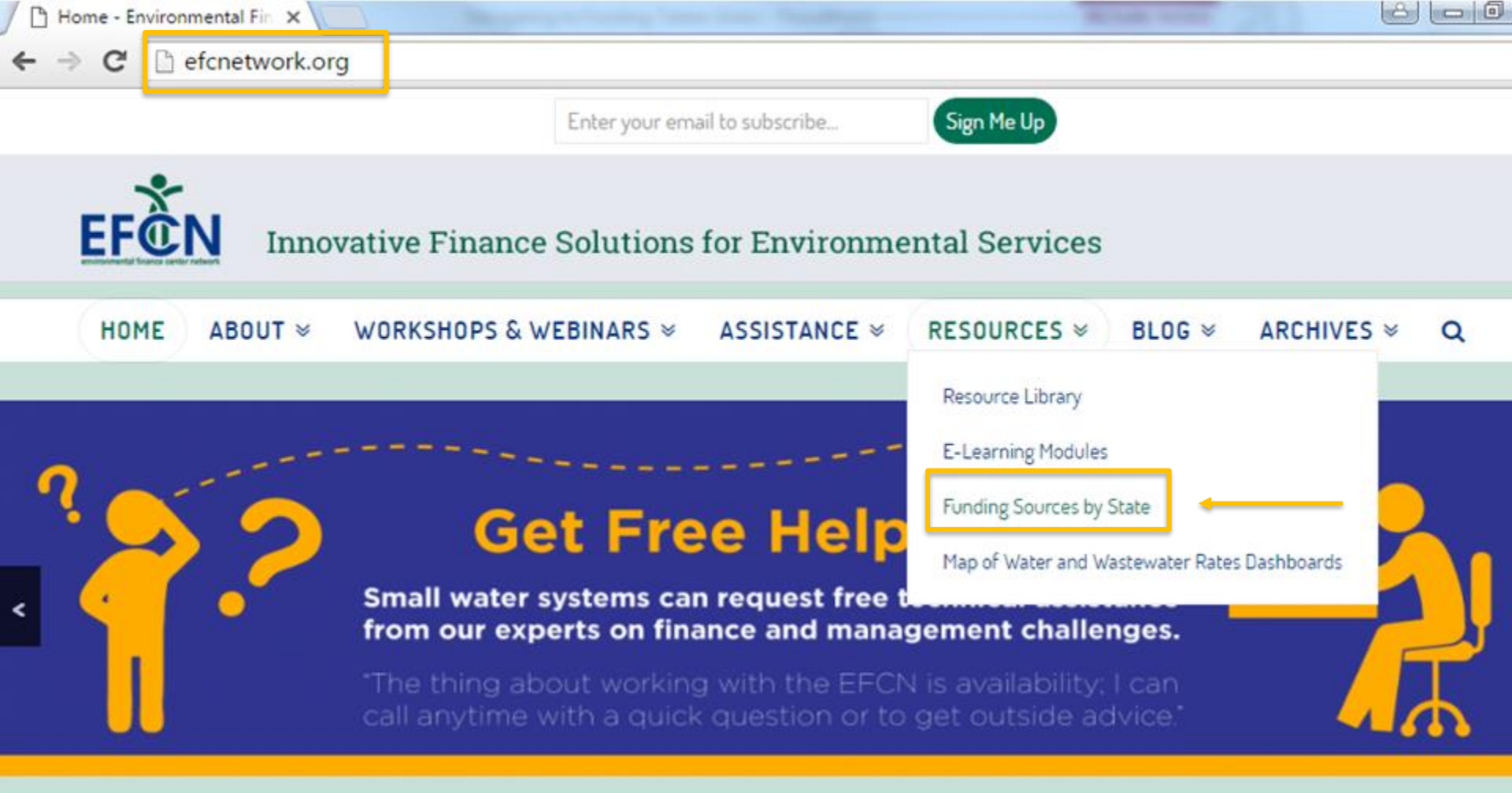


# Questions?



# Wrap Up Session

- Hand out NH funding matrices
- Complete evaluation forms
- Between Workshops 2 and 3:
  - Using your top several energy mgt. projects, (1) prioritize them all for implementation, and (2) determine a method of how to pay for each one.
- Workshop 3 will be in Plymouth, NH, on Wednesday, September 28, 2016



## Navigating to Funding Tables

Step 1: efcnetwork.org

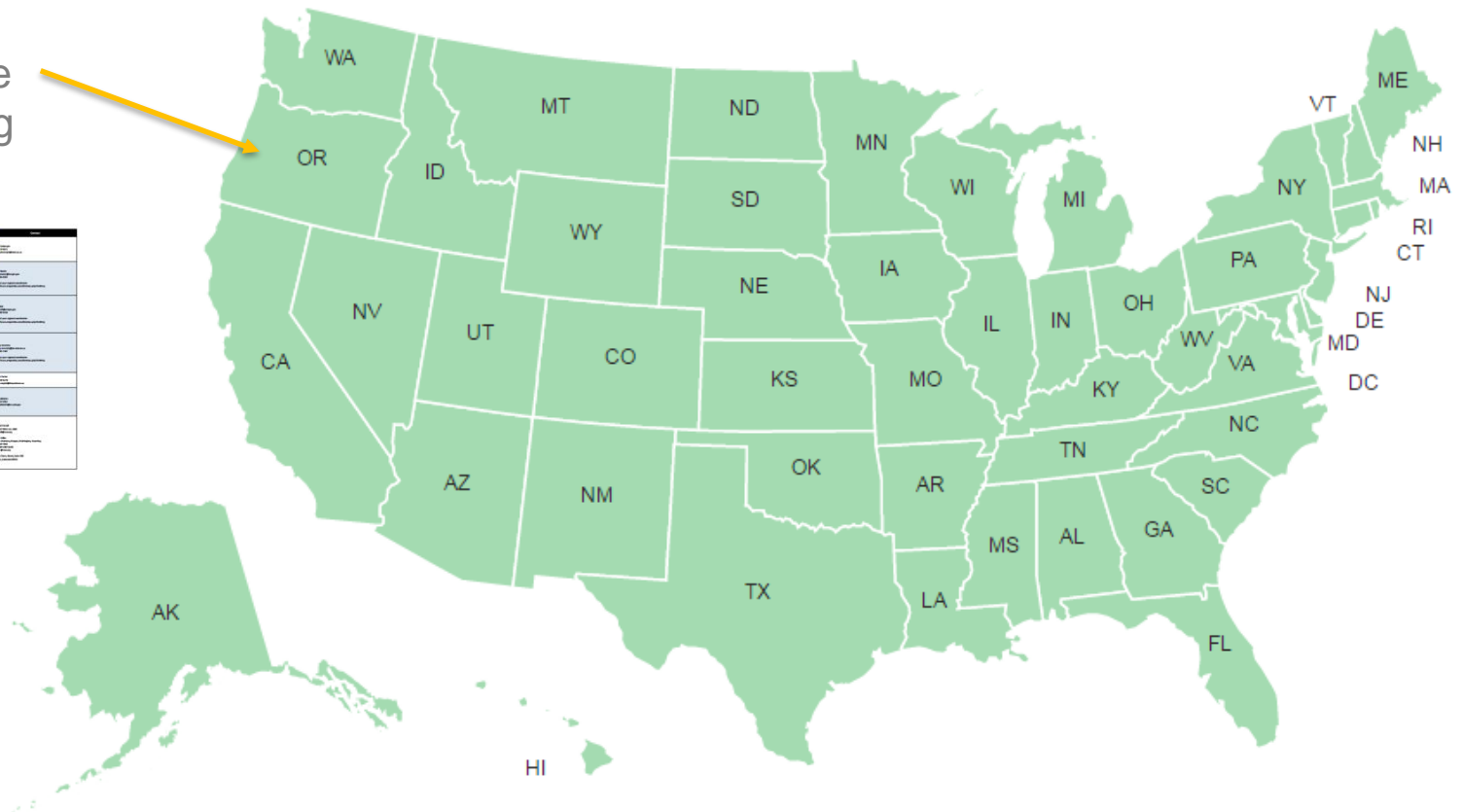
Step 2: Select "Funding Sources by State" under the Resources Tab

## Funding Sources by State

*Note: Some states may have additional resources listed below the map.*

Click on the map below to view funding sources for each state:

Click on an individual state to view funding table.

[illegible]





# Thank You!

And please let us know if you have any questions.

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