



Smart Management for
Small Water Systems

WEBINAR: Where Am I Starting From? Understanding Your Water System's Electric Bill + the New Electricity Baseline Builder for Water Utilities Tool

Wednesday, June 8, 2016
2:00 – 3:00 PM EST

This program is made possible under a cooperative agreement with EPA.



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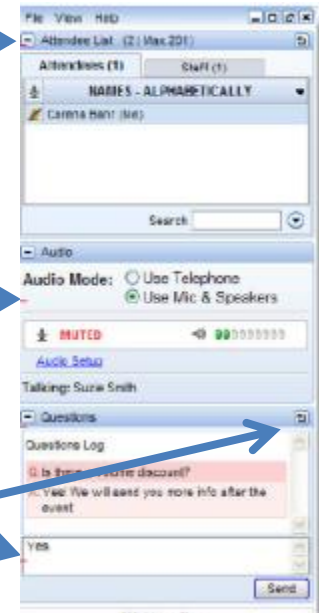


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Registrants of this webinar





About the Environmental Finance Center Network (EFCN)

The Environmental Finance Center Network (EFCN) is a university-based organization creating innovative solutions to the difficult how-to-pay issues of environmental protection and improvement. The EFCN works with the public and private sectors to promote sustainable environmental solutions while bolstering efforts to manage costs.

The Smart Management for Small Water Systems Program

This program is offered free of charge to all who are interested. The Project Team will conduct activities in every state, territory, and the Navajo Nation. All small drinking water systems are eligible to receive free training and technical assistance.

What We Offer

Individualized technical assistance, workshops, small group support, webinars, eLearning, online tools & resources



The EFCN Project Team

- Environmental Finance Center at The University of North Carolina at Chapel Hill
- EFC West
- Environmental Finance Center at Wichita State University
- New England Environmental Finance Center at University of Southern Maine
- Southwest Environmental Finance Center
- Syracuse University Environmental Finance Center





Areas of Expertise

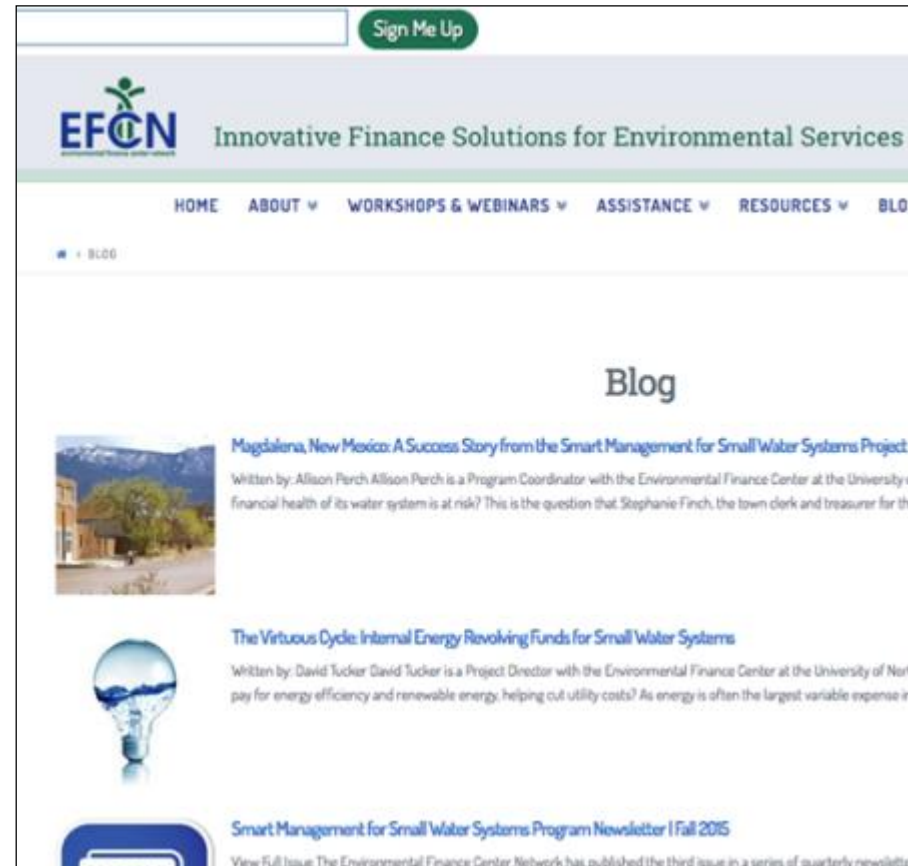
- Asset Management
- **Energy Management Planning**
- Financial Management
- Leadership Through Decision-making and Communication
- Managing Drought
- Water Loss Reduction
- Collaborating with Neighboring Communities
- Multi-funding
- Water Conservation
- Management and Finance 101
- Climate Resiliency
- Workforce Development

Small Systems Blog

Learn more about water finance and management through our Small Systems Blog! Blog posts feature lessons learned from our training and technical assistance, descriptions of available tools, and small systems “success stories.”

Common Blog Topic Areas

- Asset Management
- Energy Management
- Enhancing Regulatory Compliance
- Fiscal Planning & Rate Setting
- Funding Coordination
- Managerial & Financial Leadership
- Water Loss Reduction
- Water System Collaboration



efcnetwork.org/small_systems_blog/



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Dedicated to enhancing the ability of governments and other organizations to provide environmental programs and services in fair, effective, and financially sustainable ways through:

- Applied Research
- Teaching and Outreach
- Program Design and Evaluation



How you pay for it matters



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Find Money in the Water System Budget: Energy Management (E.M.) Webinar Series

#1: Paying for Energy Improvements: Internal Energy Revolving Funds (04/12/2016)

#2: Where Am I Starting From? Understanding Your Water System's Electric Bill + the New Electricity Baseline Builder for Water Utilities Tool (06/08/2016)

#3: Completing an Energy Audit: What You Need to Do Your Own (6/22/2016)



Speakers for Today's Webinar

- **David Tucker**, Project Director, UNC Environmental Finance Center
- **Laura Flagg**, Program Assistant, Syracuse University Environmental Finance Center



Agenda for Today's Webinar

Topic

Welcome and Logistics

David Tucker and Laura Flagg

Overview of how to understand your water system's electric bill and its components, and how this may help you to save money for your water system.

David Tucker

Brief demonstration of the Environmental Finance Center's new, Excel-based Electricity Baseline Builder for Water Utilities Tool.

David Tucker

Question & Answer Session and Wrap-Up

All



Polling Question 1

What kind of drinking water utility do you represent? (*choose one*)

- For-Profit Water Utility
- Local Government (Municipal or County)
- Not-for-Profit / Cooperative / Association
- Other H2O Util. (Authority, District, School, Hotel, etc.)
- Not a Drinking Water Utility



Polling Question 2

What size drinking water system does your utility operate (by number of people served)? *(choose one)*

- Very Small (500 or fewer people served)
- Small (501 to 3,300 people served)
- Medium (3,301 to 10,000 people served)
- Large or Very Large (10,001 or more people served)
- Not a Drinking Water Utility



Polling Question 3

For the electric bill(s) and electricity rate schedule(s) for your water system, do you feel that? (*choose one*)

- I understand my electric bill(s) and rate schedule(s) perfectly.
- I understand my electric bill(s) but not my rate schedule(s).
- I don't understand my electric bill(s) or rate schedule(s) that well.
- I have not looked at either my electric bill(s) or rate schedule(s).
- Not a Drinking Water Utility.



Energy Management for Small Water Systems

Where Am I Starting From? Understanding Your
Water System's Electric Bill + the New Electricity
Baseline Builder for Water Utilities Tool

David Tucker, Project Director at the Environmental Finance Center at
the University of North Carolina at Chapel Hill

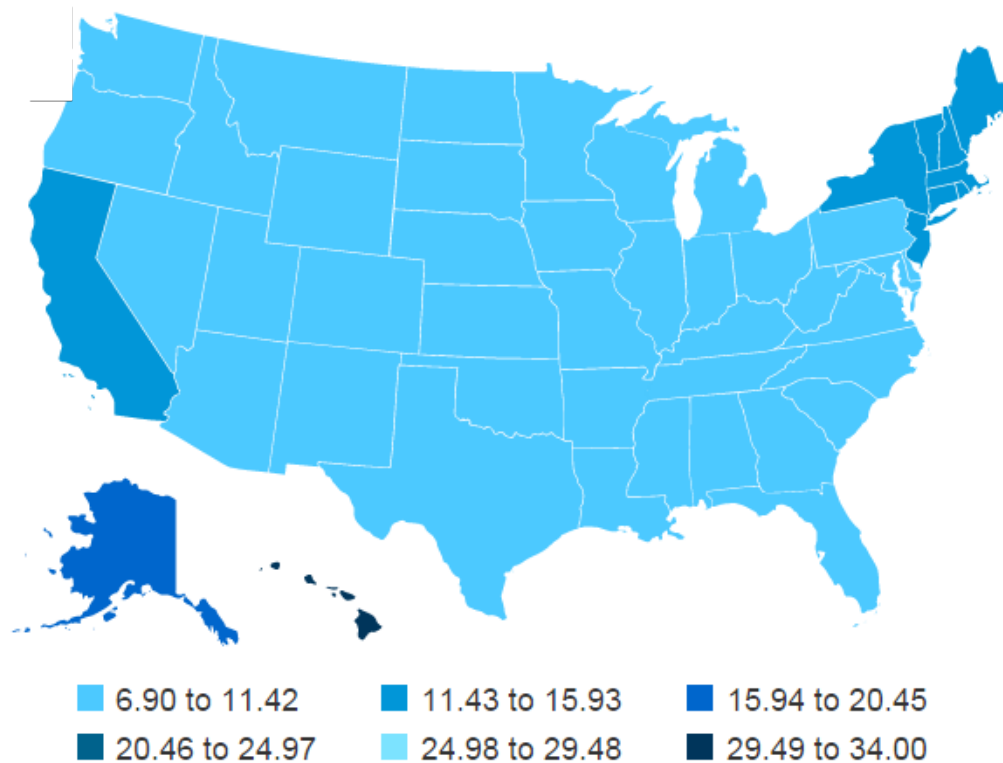


Understanding Your Electricity Bill





U.S. average retail price per kilowatthour is 10 cents



Source: U.S. Energy Information Administration as of Feb. 2016

Sample Electricity Bill for a Small Water System

Account No.	Service Location		Cycle	Service From	To	Days	Rate / Reference / Bill Type
92747600	WTPA OXBOW 460		2	11/01/2014	12/01/2014	30	45 / MUNICIPAL WAT / REGULAR
Meter Nbr	Pres Rdg	Prev Rdg	Mult	kWh Used			
50078	4867	4742	200.0000	25000			
				<p align="center">ACTIVITY PRIOR TO BILLING</p> <p>PREVIOUS BALANCE 4790.71</p> <p>PAYMENTS -4790.71</p> <p>BALANCE FORWARD 0.00</p> <p align="center">CURRENT BILL INFORMATION</p> <p>ENERGY 1997.75</p> <p>DEMAND CHARGE 260.00 KVA 871.00</p> <p>GRID ACCESS 58.95</p> <p>FRANCHISE FEE 87.83</p>			
<p>CONVENIENT WAYS TO PAY YOUR BILL</p> <ul style="list-style-type: none"> ■ SmartHub online Bill Pay - make a payment, access your account, or contact via online or mobile device. ■ Pay Now - quick online payment with real-time billing information. ■ Electronic Funds Transfer - Pre-Authorized transfer of payment from your bank to 				<p>Date: <u>12-17-14</u></p> <p>Acct: <u>500-462-413-00</u></p> <p>Authorized By: _____</p>			
				Current Charges Due By 12/29/2014		3015.53	
				Previous Balance Was Due 12/01/2014		0.00	
				Total Amount Due		3015.53	

Retain this copy for your records.



Typical Electric Bill Components

- Customer charge
- Consumption charge (by kWh)
- Demand charge (by kW)
 - May not apply in some rate structures, e.g. residential electric rate structures
- Other charges
- You may be able to switch rate structures



Base charges / Customer charges / Service availability charges

- Typically charged on a per meter basis regardless of consumption
- Typically covers administrative costs of providing service to the customer / access to the grid
- May have single phase vs. triple phase



Customer Charge Example

- Funds administrative costs of providing service to the customer – charged on a per meter basis

Commercial	Large Power	Curtailable Large Power
Single Phase: \$6.33 Triple Phase: \$12.65	\$48.67	\$131.70
*Per utility's website, effective 1/1/14		



Consumption Charges (by kWh)

- Charged on monthly, per kWh basis
- Typically covers the cost of fuel
- Can vary based on season
- Can vary based on time of day



Consumption Charge Example

- Energy charge— funds the cost for producing and delivering electricity plus investment in the power plants and facilities
 - Commercial: Uniform Rate at \$0.103832/kWh
 - Large Power: Decreasing Block Rate



Large Power Decreasing Block Rate

ENERGY CHARGE

The Virgin Islands Water and Power Authority uses a declining block pricing system for energy consumption. Blocks rates are determined based on progressive per kWh consumption.

	Block 1	Block 2	Block 3	Block 4
	kWh \leq 1,000	1,000 < kWh \leq 6,500	6,500 < kWh \leq 10,000	kWh > 10,000
\$/kWh	0.103722	0.090092	0.054644	0.049104

In addition to the per kWh rates, Large Power customers are assessed a flat rate customer charge.

Large Power Customer Charge
\$ 48.67



Electricity Rate Class Examples

Commercial

- Customer charge
- Surcharges
 - Line loss
 - Maintenance
 - OPEB
 - PILOT
 - Insurance
- Uniform rate energy charge
- Fuel charge

Large Power

- Customer charge
- Demand charge
- Surcharges
 - Line loss
 - Maintenance
 - OPEB
 - PILOT
 - Insurance
- Decreasing block rate energy charge
- Fuel charge



Types of Electric Rate Structures

- Your electric rate structure may go by any of many different names
- A small water system likely may have a Small General Service or Medium General Service electric rate structure
- Consumption charge (per kWh) portion:
 - Uniform rate
 - Increasing / inclining block rate
 - Decreasing / declining block rate



Demand Charges

- Charged on a per kW basis (or kVa)
 - Real power versus apparent power
- May be charged against the customer's peak demand or the utility's peak demand (coincident peak)
 - E.g. the top one hour per month, or top 15 min., etc.
- Typically covers capital costs, particularly for peaking capacity
- Does it carry over? (Ratchet Charge)



Demand Charge Example (per kW)

- Measured in kilowatts (kW), a measurement of power demanded at a given instant in time.
- There are no “demand ratchets” in this example rate structure, where you can get “stuck” with paying for a peak of demand for a long while, such as an entire year.

Commercial	Large Power	Curtable Large Power
NA	\$1.95/kW	-reduced rate (practically covers entire rate)

*Per utility's website, effective 1/1/14



kWh – like odometer

kW – like speedometer





Other Charges

- Fuel surcharges
- Line loss charges
- Maintenance charges
- Renewable energy and energy efficiency portfolio standard cost compliance charges
- Taxes



Surcharge Examples (per kWh)

- Line loss – funds projects geared towards reducing line loss in the electric system
 - \$0.002196/kWh (Commercial & Large Power)
- Maintenance - Funds earmarked for ongoing repairs, maintenance, and upgrades to the electric utility system
 - \$0.024863/kWh (Commercial & Large Power)



Surcharge Examples (per kWh)

- OPEB – Other Post-Employment Benefits
 - \$0.008668/kWh (Commercial & Large Power)
- PILOT – Payment in Lieu of Taxes to Territorial Government
 - \$0.000686/kWh (Commercial and Large Power)
- INS – Covers the cost for the electrical utility to self-insure
 - \$0.001925/kWh (Commercial and Large Power)



Surcharge Example: Fuel Charge

- Fuel charge – cost of fuel consumption collected from customers and paid directly to fuel supplier
 - \$0.279991/kWh (Commercial and Large Power)
 - Surcharge rates such as fuel charges may vary by month, by quarter, etc.



Rate options that can reduce your electricity bills

- Time-of-use rates
- Interruptible rates
- Net metering
- On-bill financing
- Switching your electric rate structure

Note: May require operational changes to take full advantage of rate.

Building a Basic Energy Usage Baseline

Better Baseline Exercise_Example - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Building a Simple Baseline													
2														
3	Facility:	Tutu Park Mall												
4	Meter #:	68980288												
5														
6	Bill Date (Month/Year)	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
7	Customer Charge	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67	\$48.67
8	Total Monthly Electrical Use (kWh)	21,600	19,680	25,440	15,600	18,960	26,640	19,680	22,800	19,440	26,160	22,560	19,440	26,880
9	Total Monthly Cost of Electric Use	\$11,757.83	\$10,711.02	\$14,759.89	\$9,435.27	\$10,115.05	\$14,235.93	\$10,496.80	\$12,120.80	\$10,343.68	\$13,897.93	\$11,478.42	\$9,899.52	\$13,587.63
10	Total Monthly Demand (kW)	2.6	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
11	Total Monthly Demand Costs	\$1,177.80	\$883.35	\$883.35	\$883.35	\$883.35	\$883.35	\$883.35	\$883.35	\$883.35	\$883.35	\$883.35	\$883.35	\$883.35
12	Number of Days in Billing Cycle	34	30	33	29	29	33	29	28	30	32	29	30	33
13	Average kWh Cost	\$0.54	\$0.54	\$0.58	\$0.60	\$0.53	\$0.53	\$0.53	\$0.53	\$0.53	\$0.53	\$0.51	\$0.51	\$0.51
14	Average Cost Per Day	\$381.89	\$388.10	\$475.51	\$357.49	\$380.93	\$459.63	\$394.10	\$466.17	\$375.86	\$463.44	\$427.95	\$361.05	\$439.99
15	Average Use Per Day (kWh)	635	656	771	538	654	807	679	814	648	818	778	648	815
16	Demand Charge as Percent of Total Bill	9.07%	7.59%	5.63%	8.52%	8.00%	5.82%	7.73%	6.77%	7.83%	5.96%	7.12%	8.16%	6.08%
17	Meter Usage Metric (Described)	Sales												
18	Meter Usage Metric (Measurement)	6,000,000	7,500,000	7,200,000	5,600,000	5,000,000	4,900,000	4,500,000	3,900,000	3,200,000	5,200,000	6,000,000	6,200,000	8,000,000
19	Energy Use Intensity	0.0036	0.002624	0.003533333	0.002785714	0.003792	0.0054367	0.0043733	0.0058462	0.006075	0.0050308	0.00376	0.0031355	0.00336
20														
21														
22	Dashboard													
23														
24		Monthly Electric Use							Electric Demand					



Why should we benchmark?

- To know where you're starting from with your water system's electricity usage.
- To be able to find usage variations across time and understand them.
- To track effectiveness of energy management projects implemented.
- To support stakeholder communication.

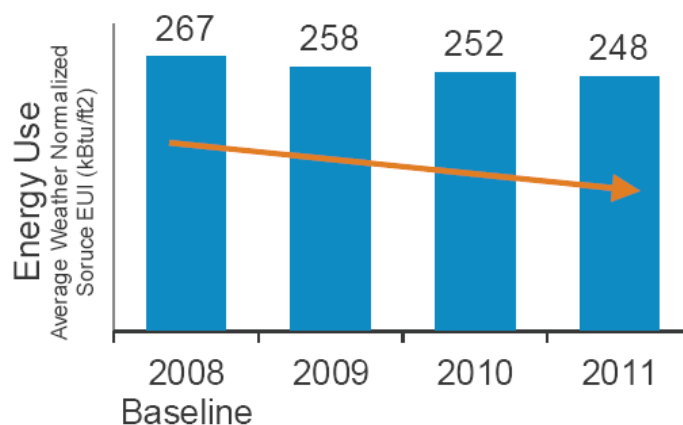
The Value of Benchmarking

Consistent benchmarking in buildings results in energy savings and improved performance.

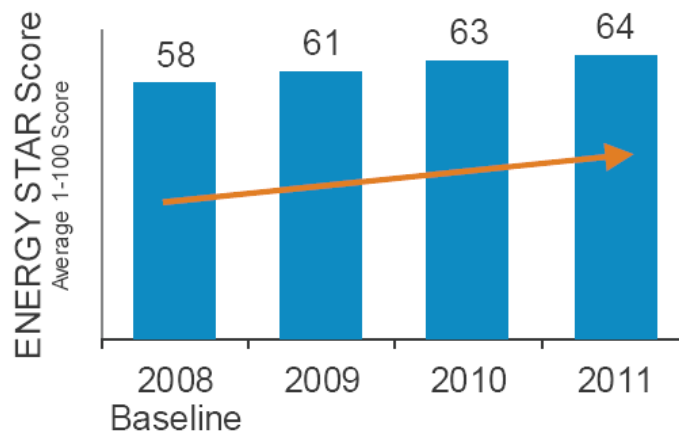
Source:

http://www.energystar.gov/ia/business/downloads/datatrends/DataTrends_Savings_20121002.pdf?8d81-8322

Energy Savings in Portfolio Manager



7%
Savings



6 point
increase



Data Needs

Inputs

- Bill Date
- Customer Charge
- Electric Use
- Electric Charge
- Demand
- Demand Charge
- Meter Usage Metric and Measurement

Calculations

- Average cost per kWh
- Average cost per day
- Average use per day
- Demand charges as a percent of total bill
- Energy use intensity



Portfolio Manager

- One example of benchmarking energy use
- Developed by ENERGY STAR program
- Maintained by US EPA and partners
- Not optimal for most small water systems
- More useful for larger water systems and/or wastewater systems



ENERGY STAR Commercial Buildings Program

- Offers a strategic approach to energy management
- Enables building owners, managers, and tenants to save money & protect the environment
- Provides organizations with measurable information on energy savings and greenhouse gas emissions reductions from commercial buildings
- Builds on strong ENERGY STAR brand recognition
- ENERGY STAR on a building = Superior Energy Performance
- Benchmarking is the first step



ENERGY STAR® PortfolioManager®

- ENERGY STAR Portfolio Manager is an effective **management tool** – it helps business and organizations by offering a platform to:
 - Assess whole property energy and water consumption
 - Track changes in energy, water, greenhouse gas emissions, and cost over time
 - Track green power purchase
 - Share/report data with others
 - Create custom reports

www.energystar.gov/benchmark



ENERGY STAR® PortfolioManager®

- Portfolio Manager is also a **metrics calculator** – it provides key performance metrics to integrate into a strategic management plan.
 - Energy consumption (source, site, weather normalized)
 - Water consumption (indoor, outdoor)
 - Greenhouse gas emissions (indirect, direct, total, avoided)
 - ENERGY STAR 1-to-100 score (available for many building types and wastewater treatment plants)
 - Compare to national median energy use intensity (site, source)
 - Compare baseline year vs. current year (energy, water, ghg)



EPA's State and Local Climate and Energy Newsletter

This message provides details about 15 upcoming webcasts offered by federal agencies and others. All webcasts are offered free of charge, but space may be limited.

EPA Webcasts

- June 15, 3:00-4:00 PM (EDT) – Air Quality Monitoring and Community Science
- June 21, 2:00-3:30 PM (EDT) – Learn What's New for the 2017 Climate Leadership Awards

ENERGY STAR Webcasts

- June 8, 15, 22, 29, times vary – Ask the Expert
- June 7, 2:00-3:00 PM (EDT) – What You Should Know About Financing Energy Efficiency Upgrades
- June 21, 1:00-2:00 PM (EDT) – ENERGY STAR and Green Building Rating Systems
- June 28, 1:00-2:00 PM (EDT) – Portfolio Manager 101
- June 29, 1:00-2:00 PM (EDT) – Portfolio Manager 201
- June 30, 1:00-2:00 PM (EDT) – Portfolio Manager 301



Energy Star / US EPA Webinars

 <https://esbuildings.webex.com/mw3100/mywebex/default.do?siteurl=esbuildings>

June 21, 1:00-2:00 PM (EDT) – ENERGY STAR and Green Building Rating Systems

During this session, attendees will learn how to use EPA tools and resources to help meet requirements for green building rating systems such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED), the Green Globes system, and others.

[Register](#)

June 28, 1:00-2:00 PM (EDT) – Portfolio Manager 101

Learn about the core functionality of EPA's ENERGY STAR Portfolio Manager tool. Attendees will learn how to: navigate Portfolio Manager; add a property and enter details about it; enter energy and water consumption data; and generate template performance reports to assess progress.

[Register](#)

June 29, 1:00-2:00 PM (EDT) – Portfolio Manager 201

Continue to learn about EPA's ENERGY STAR Portfolio Manager tool, with a deeper dive into more advanced functionalities such as: editing property data; correcting and updating property use details; using the data quality checker; and sharing property data.

[Register](#)

June 30, 1:00-2:00 PM (EDT) – Portfolio Manager 301

With a good background on the basic functionality of EPA's ENERGY STAR Portfolio Manager tool, learn about some advanced features including: using spreadsheet upload templates to update property data; setting goals and targets to plan energy improvements for properties; creating custom reports; and using the Sustainable Buildings Checklist.

[Register](#)



Benefits of Benchmarking: Examples

- After getting an energy assessment by a competent auditor, and using an electricity usage benchmarking tool, you may be able to identify and use your lowest cost water first.



Strategy: Use Lowest Cost Water First

- Determine the total unit cost of using each source.
- Know the limitations of each source (water rights, capacity, water quality).
- Understand the additional cost of using more than one source or pump station at once.
- Have prioritized source operation plans that maximize the use of lower cost water.

Source: Steve Jones/Hasen, Allen, and Luce



Strategy: Use Lowest Cost Water First

- Automate the prioritized operation plan as much as possible.
- Use proper PRV settings and controls settings that don't allow high cost water to be used over low cost water.
- Keep higher cost water where it is needed.
- Maximize the use of lower cost water in the areas of the system where it can be used.

Source: Steve Jones/Hasen, Allen, and Luce



Common Energy Use Intensity (EUI) Metrics

Metric	Application
Btu/ft ²	Any building
Btu/employee	Office building
Btu/unit of product	Assembly plant
Btu/lb of product	Manufacturer
Btu/number of beds occupied	Hotel or hospital
kWh/ft ²	Lighting
kWh/ton	Chilled water efficiency
W/ft ² airflow/min	HVAC systems

Tool Demo: The Electricity Usage Baseline Builder for Water Systems

4-Electricity Usage Baseline Builder.xlsx - Microsoft Excel

Electricity Baseline Building for Water Utilities

Water System Name
Town of Anywhere

Facility Name
Groundwater Well #1

Electric Meter Number
654321

Rate Structure
Increasing Block

Go to Dashboard **View an Example Bill**

Tips
Enter your data in the green cells.
Not sure what these columns mean? Click on the header to learn more!
Seeing red? Make sure you have entered in all the necessary information!

Meter Usage Metric
Have something else you want to compare to electricity usage? Use this column!
This could be gallons per month, residents, square feet, or any measure against which you want to measure energy efficiency.

Bill Date (Month/Year)	Fixed Costs			Variable Costs				Total Electricity Bill	Average kWh Cost (\$)	Average Cost Per Day (\$)	Average Electricity Use Per Day (kWh)	Demand Charge as Percent of Total Bill	Meter Usage Metric	Electricity Intensity
	Customer Charge (\$)	Other Fixed Costs (\$)	Days in the Billing Cycle	Total Electricity Use (kWh)	Total Cost of Electricity (\$)	Peak Monthly Demand (kW)	Peak Monthly Demand Charge (\$)						Units (gallons, residents, etc)	
Jan-14	\$28.00	\$0.00	34	1,250	\$73.13	59.45	\$406.00	\$507.13	\$0.0585	\$14.92	37	80.06%	23270	0.0537
Feb-14	\$28.00	\$0.00	30	950	\$58.40	55.58	\$398.87	\$485.27	\$0.0615	\$16.18	32	82.20%	28980	0.0328
Mar-14	\$28.00	\$0.00	28	800	\$56.95	46.8	\$388.97	\$473.92	\$0.0712	\$16.93	29	82.08%	26290	0.0304
Apr-14	\$28.00	\$0.00	30	750	\$43.88	58.8	\$401.60	\$473.48	\$0.0585	\$15.78	25	84.82%	285650	0.0026
May-14	\$28.00	\$0.00	32	1,250	\$73.13	59.2	\$404.34	\$505.47	\$0.0585	\$15.80	39	79.99%	1924000	0.0006
Jun-14	\$28.00	\$0.00	27	1,900	\$111.15	58.65	\$400.59	\$539.74	\$0.0585	\$19.99	70	74.22%	6406090	0.0003
Jul-14	\$28.00	\$0.00	32	10,950	\$640.58	58.9	\$402.29	\$1,070.87	\$0.0585	\$33.46	342	37.57%	5881590	0.0019

Instructions Electricity Use Graphs Sample blank worksheet

Tool Demo: Putting Your Electricity Bill into the Electricity Baseline Tool

Electricity Baseline Building for Water Utilities

Want to know where to find the information you need? Check out this sample electricity bill!

Days in Billing Cycle

Back to Your Electricity Bill Data

Total Electricity Use

Total Cost of Electricity Use

Peak Monthly Demand Charge

Peak Monthly Demand

Customer Charge(s)

Your bill may (will) look completely different! That's OK, this is here just to give you an idea of what you are looking for. You may not have demand charges, or customer charges, or may have something that is not shown here. Every utility has different ways of charging for electricity.

Cycle	Service From	To	Days	Rate / Reference / Bill Type
2	11/01/2014	12/01/2014	30	45 / MUNICIPAL WAT / REGULAR

Meter Nbr	Pres Rdg	Prev Rdg	Mult	kWh Used
50078	4867	4742	200.0000	25000

ACTIVITY PRIOR TO BILLING	
PREVIOUS BALANCE	4790.71
PAYMENTS	-4790.71
BALANCE FORWARD	0.00

CURRENT BILL INFORMATION	
ENERGY	1997.75
DEMAND CHARGE 260.00 KVA	871.00
GRID ACCESS	58.95
FRANCHISE FEE	87.83

Current Charges Due By 12/29/2014	3015.53
Previous Balance Was Due 12/01/2014	0.00
Total Amount Due	3015.53

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Other New Energy Management Resources for Water Systems



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

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



<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

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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: Find Money in the Water System Budget: Internal Energy Revolving Funds

Event(s): Webinar: Find Money in the Water System Budget: Internal Energy Revolving Funds

Subject:


Author(s): David Tucker, Glenn Barnes

Program: Drinking Water and Wastewater


Presentation type: Powerpoint

Date: 04/12/2016

Host Organization(s): Environmental Finance Center Network

File:  Find Money in the Water System Budget - Internal Energy Revolving Funds - Webinar - 2016-04-12 FINAL.pdf ()

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



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New IERF Tool in Excel!

Internal Energy Revolving Fund Wizard																
End of Year IERF Balance: Pink means the fund is out of money!			Project Label	Energy Source	Start Year of Project	Can you Afford to Start this Project in this Year?	Will the project save you money over its lifetime?	Current Annual Energy Consumption		Projected New Annual Energy Consumption		Estimated Annual Energy Costs Avoided	Estimated Current Cost of Energy	Annual Cost Inflation	Project Cost	Operating Costs
2016	\$	9,510.16	1 Pump Upgrade	Electricity	2016	YES	YES	25,000	kWh	20,000	kWh	20%	\$ 5,000	2%	\$ 10,000	\$
2017	✓ \$	8,725.50	2 Insulation	Electricity	2018	YES	YES	30,000	kWh	27,000	kWh	10%	\$ 6,000	2%	\$ 5,000	\$
2018	✓ \$	2,900.63														
2019	✓ \$	2,585.78														
2020	✓ \$	2,281.19														
2021	✓ \$	1,987.10														
2022	✓ \$	1,703.74														
2023	✓ \$	1,431.35														
2024	✓ \$	1,170.18														
2025	✓ \$	920.47														
2026	✓ \$	228.19														
2027	\$	667.05														
2028	\$	732.96														
2029	\$	804.07														
2030	\$	880.48														
2031	\$	962.27														
2032	\$	1,049.56														
2033	\$	1,142.45														
2034	\$	1,241.03														
2035	\$	1,345.40														

Go back to your initial IERF setup

Want to see the annual cash flow of the IERF?

Want to see some graphs showing how your IERF is working?

Want to see the cash flow for each project?

Only have this figure as a percentage of the previous energy use? Enter a formula here:
"=Current Energy Use * 1-% Reduction"

If the new device/r less (or more) to c this he

Will you be able to pay back your loans in this year?



Polling Question 4

Would you like to subscribe to the UNC Environmental Finance Center blog?
(choose one)

- Yes
- No



Polling Question 5 and Evaluation Survey Link

Are you interested in receiving in-depth technical assistance for your small water system? *(choose one)*

- Yes
- No
- Would Like More Information About This



Thank You!

And please let us know if you have any questions.

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