WATER FOR ENERGY AND ENERGY FOR WATER: CHALLENGES AND OPPORTUNITIES FOR UTILITIES

Webinar #2

Partnerships between water and energy utilities to address water/energy challenges

June 19, 2014

Welcome from the Organizers

CENTER FOR CLIMATE AND ENERGY SOLUTIONS

Joe Casola,
C2ES Staff Scientist, Director for Science and Impacts

ASSOCIATION OF METROPOLITAN WATER AGENCIES

WaterISAC

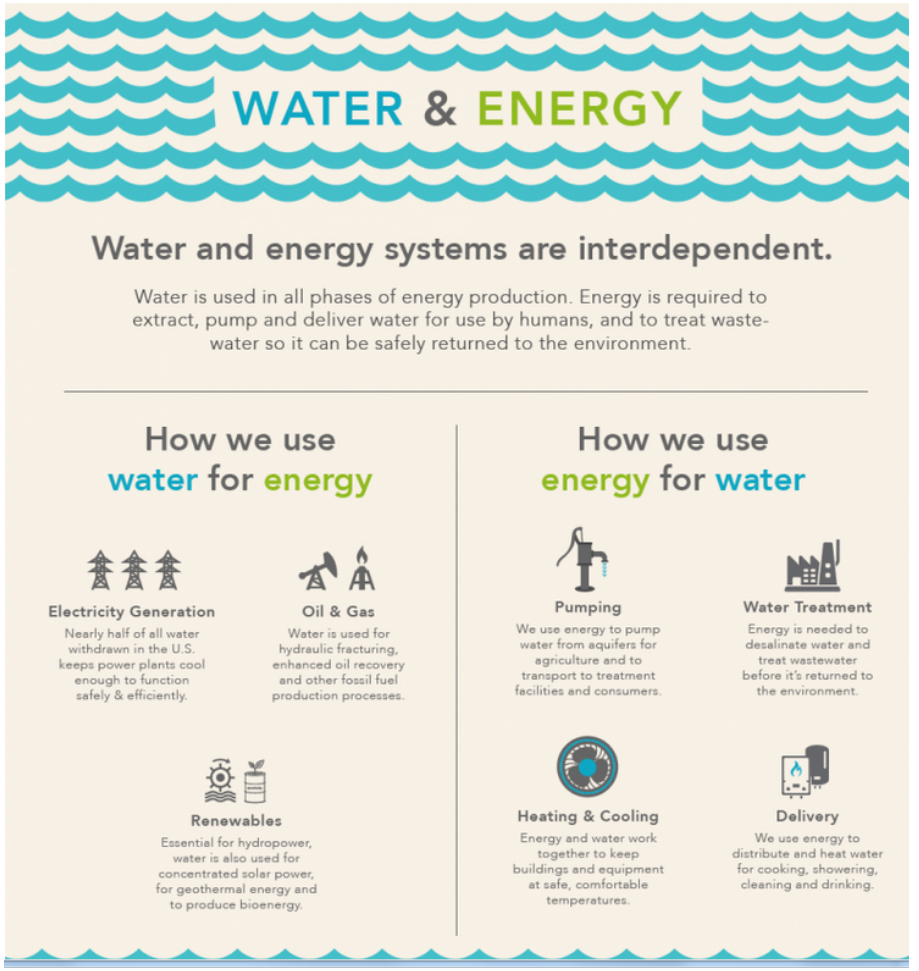
Erica Brown,
AMWA, Director of Sustainability and Climate Programs

Three-Part Webinar Series

- **Part 2 (today): Partnerships between water and energy utilities to address water/energy challenges**

- **Part 1 (May 8): Water/energy issues from national and federal perspectives**
  Slides and video available
  http://www.c2es.org/science-impacts/adaptation/water-energy-webinar-series

- **Part 3 (July 24): Effective stakeholder engagement on water and energy issues**



DOE – The Water-Energy Nexus: Challenges and Opportunities
http://www.energy.gov/articles/ensuring-resiliency-our-future-water-and-energy-systems
http://www.energy.gov/downloads/water-energy-nexus-challenges-and-opportunities

Webinar Logistics

- Two 15-minute presentations followed by facilitated Q&A
- Questions to be submitted by typing them into the Dialog Box
- Moderators will announce questions for speakers – we'll try to get to as many as possible!
- Three polling questions…

Audience Polling Question #1

Which phrase best represents the organization you represent?

A. Water/wastewater utility

B. Energy utility

C. Local/state/federal government

D. Consultancy

E. Other (e.g., NGO, academia)

OWASA's Partnership With Duke Energy

AMWA – C2ES Water-Energy Webinar
June 19, 2014

Orange Water and Sewer Authority

A public, non-profit agency providing water, sewer and reclaimed water services to the Carrboro-Chapel Hill community.

Outline

- OWASA “101”
- Progress in Partnership with Duke Energy
  - Annual Review
  - Energy Rates Workshop
  - Power Feed Arrangements
  - Standby Power
  - Energy Efficiency
- Additional Opportunities

Our Customer Base

~82,000 residents
~21,000 accounts
UNC Chapel Hill largest customer
No industry

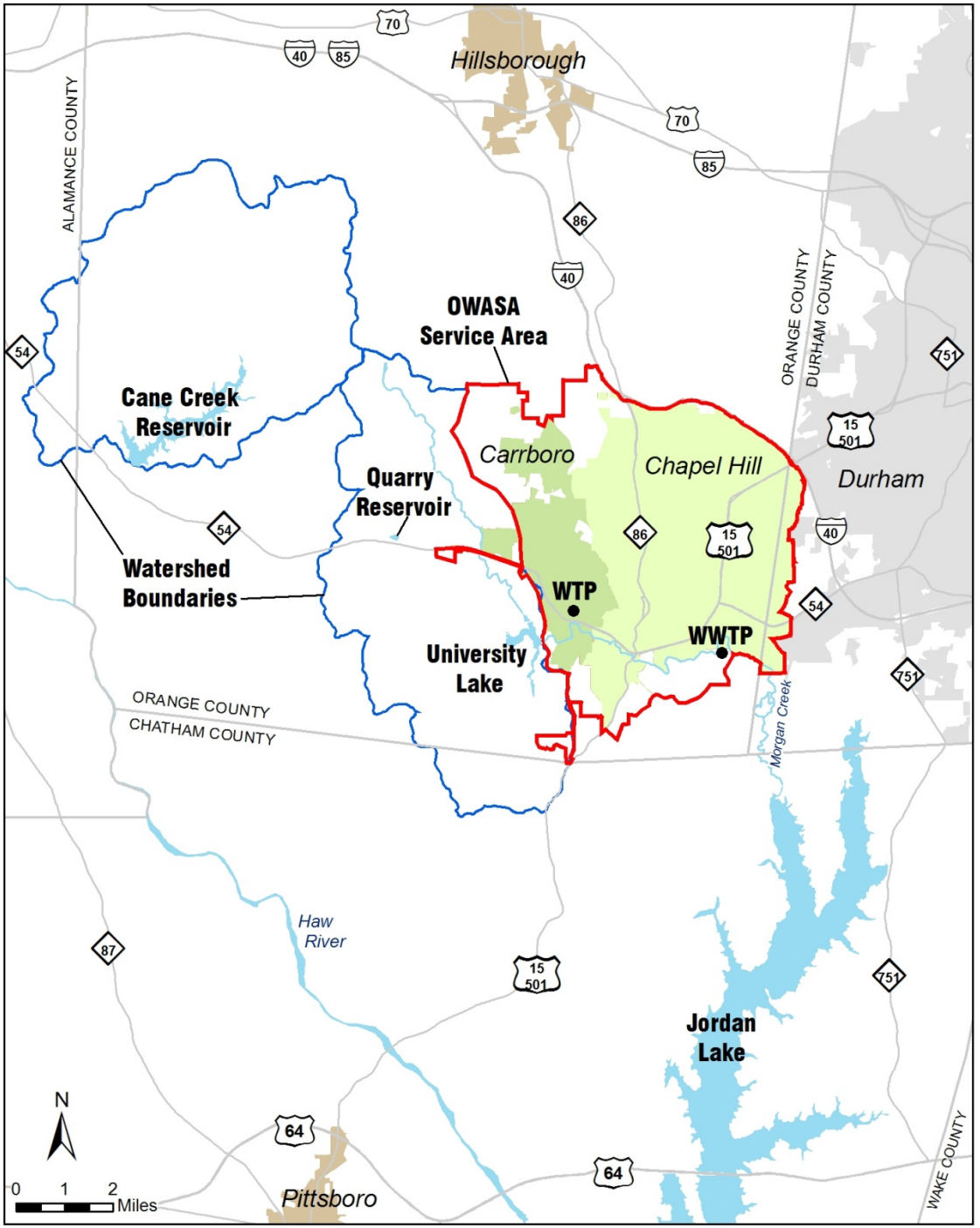
Water Supply

3 Surface Water Sources
20 MGD WTP
3 System Interconnections
2 pressure zones

Wastewater Management

14.5 MGD WWTP
21 Pumping Stations
Reclaimed Water System

OWASA



OWASA "101"

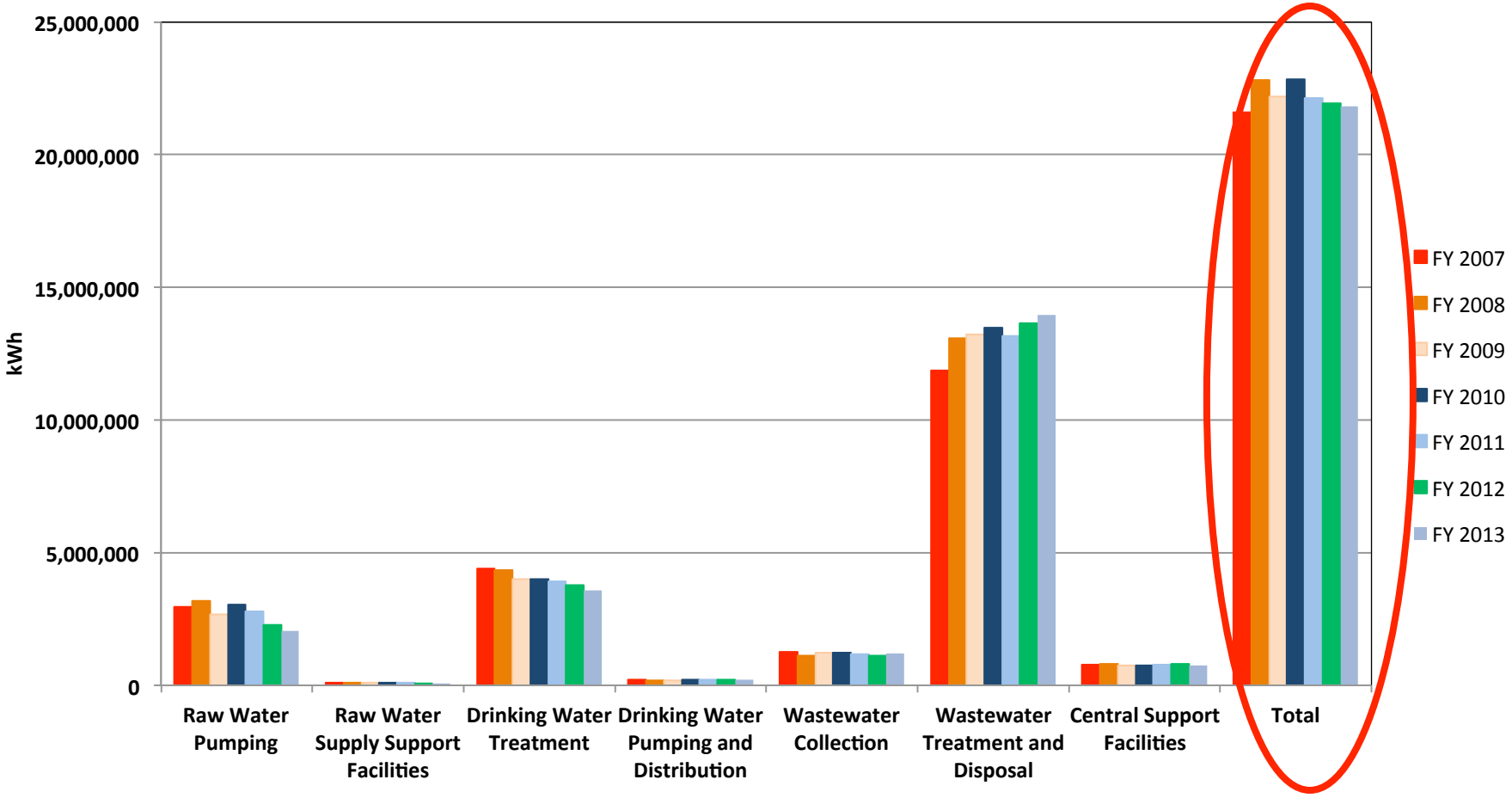
- Provide water, wastewater, and reclaimed water services to Carrboro, Chapel Hill and the UNC-Chapel Hill
- Do that consistent with local plans and policies
- "Cost-of-service" rates; "Benefiting" party pays for utility extensions
- Revenues are used for utility operation only
- Supported by user fees (water, sewer, and reclaimed water), not taxes

Our Energy Use

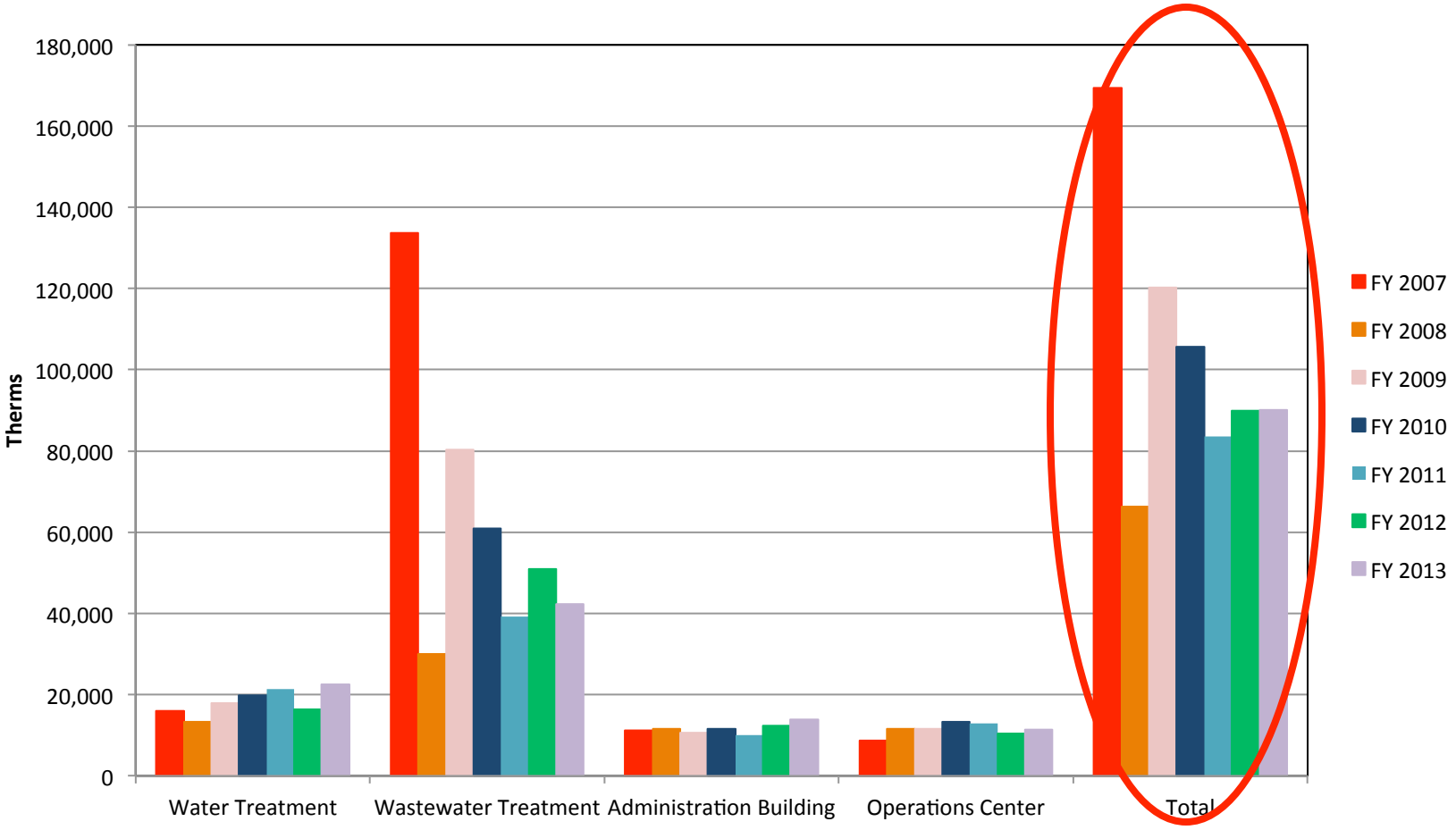
- **~ 40 electrical accounts**
  - 21.8 million kWh used in FY 2013
  - ~$1.36 million
  - WWTP accounted for ~65% of that use
- **8 natural gas accounts**
  - 90,054 therms used in FY 2013
  - ~$71,000

Mason Farm Wastewater Treatment Plant

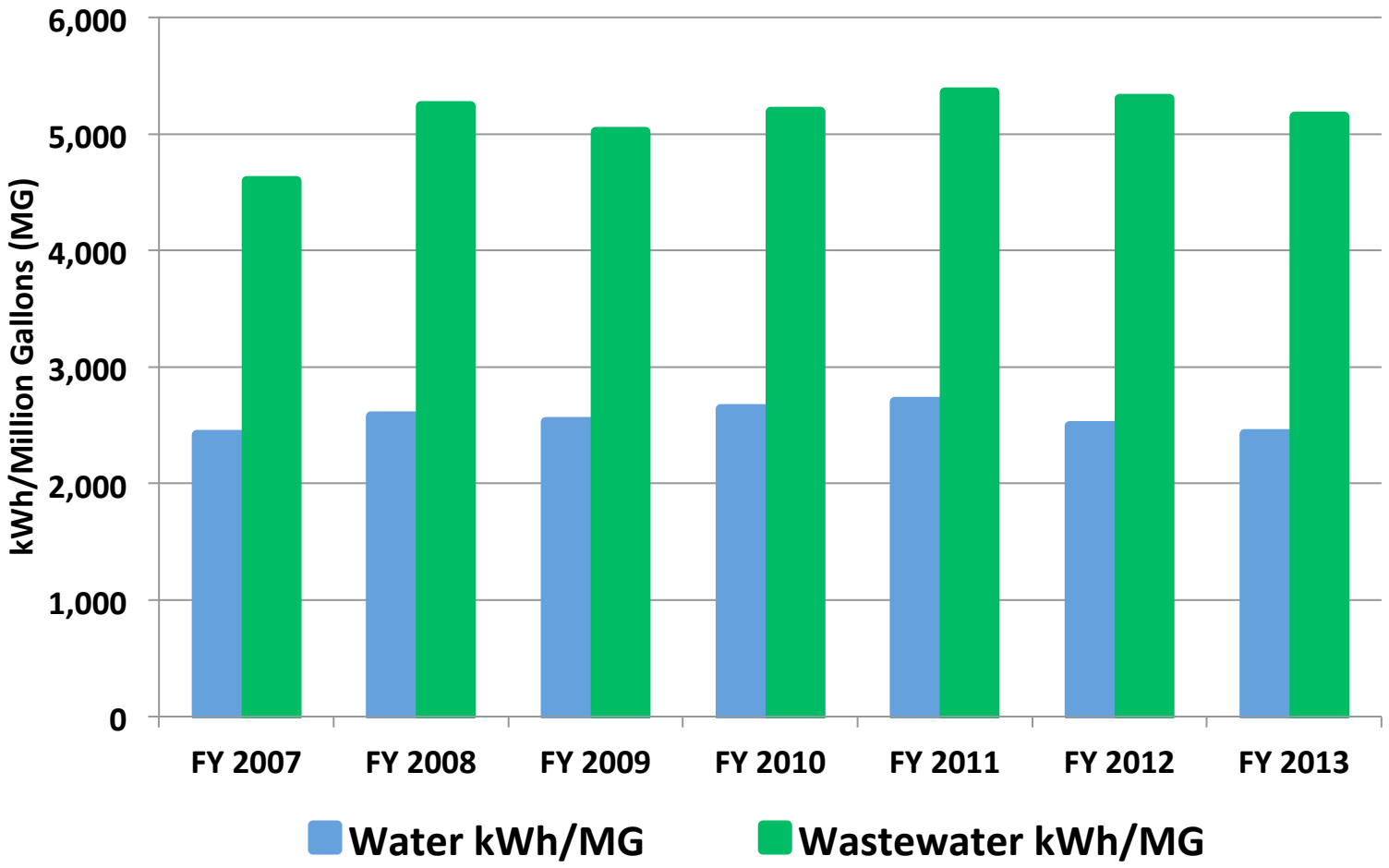
Electricity Use By Functional Area



Natural Gas Use By Functional Area



Energy Use Intensity*



* Excludes electricity use in support facilities such as offices, reservoir offices, etc. Wastewater value includes electricity use for reclaimed water system

Our Partnership With Duke Energy

- **Review of Use, Rates and Service Contracts**
  - Account-by-account review; energy use database update
  - Analysis of past use – modeling use assuming alternative rate schedules; informs contract/rate selection changes
- **Energy Rates Workshop for OWASA Staff**
  - Review of all rate schedules applicable to our operations
  - Largest 8 accounts have time-of-day/time-of-year rates
  - Specific examples of how increase/decrease in energy use affects our bills

Our Partnership With Duke Energy

- **Power Feed Arrangements**
  - Modified WWTP arrangements to avoid major increases in extra facilities charge
  - Avoided ~$60,000/year increase in fixed charges
- **Standby Power Generation**
  - $84,000 in Standby power generation credits in FY 2013
  - Advance notice from Duke Energy
  - Automatic activation

Our Partnership With Duke Energy

- **Energy Efficiency**
  - $168,000 Custom incentive for energy efficient blowers, mixers, and aeration system at WWTP
  - Technical assistance for audits
  - Pursuing rebate opportunities for other energy efficiency improvements

Jones Ferry Road Water Treatment Plant

Additional Opportunities

- **Renewable Energy**
  - Offered to host sites for Duke Energy solar PV projects (unsuccessful so far)
  - Requested Duke Energy financial support for 300-350 KW biogas-to-energy combined heat and power project at WWTP (unsuccessful so far)
  - Will continue to pursue
- **Customer Education Partnership** (awaiting response)
  - Water-Energy Nexus
  - Saving water saves energy – and saves money

Closing Thoughts

- Important to have an Account Manager
- Important to stay informed and involved
- Be persistent (custom incentive)
- Relationship will grow in importance
  - Carbon regulations
  - Renewable energy portfolio requirements
  - Economics

Thank You

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Audience Polling Question #2

If I could have your "partner" utility do one thing, it would be:

A. Increase their efficiency in the use of water/energy

B. Provide financial incentives for efficiency improvements/ renewables/reuse/etc.

C. Provide technical assistance for audits or employee education

D. Improve outreach to customers on water-energy issues

SAN ANTONIO'S WATER - ENERGY CONNECTION

PRESENTED BY: DORIS COOKSEY
MANAGER, WATER QUALITY & PLANNING

JUNE 19, 2014

CPS ENERGY works for you

AFFORDABLE • RELIABLE • INNOVATIVE

OUTLINE

- Background of water & electric utilities
- Proactive Partnerships
- Energy Utility Conservation Efforts
- Water Utility Conservation Efforts
- Shaping Policy

BACKGROUND & UTILITY STRUCTURE

LOCATED in SAN ANTONIO

- 7th largest City in U.S.
- 1.3 million people
- Hot & humid
- High demand for water & electricity

CPS ENERGY

- Largest municipally-owned electric & gas utility in the U.S.
- 717,000 electric customers
- 323,000 natural gas customers
- 7727 MW generation capacity

SAN ANTONIO WATER SYSTEM (SAWS)

- Serves 1.6 million people
- Water supply & wastewater provider
- 460,000 water customers
- 411,000 wastewater customers

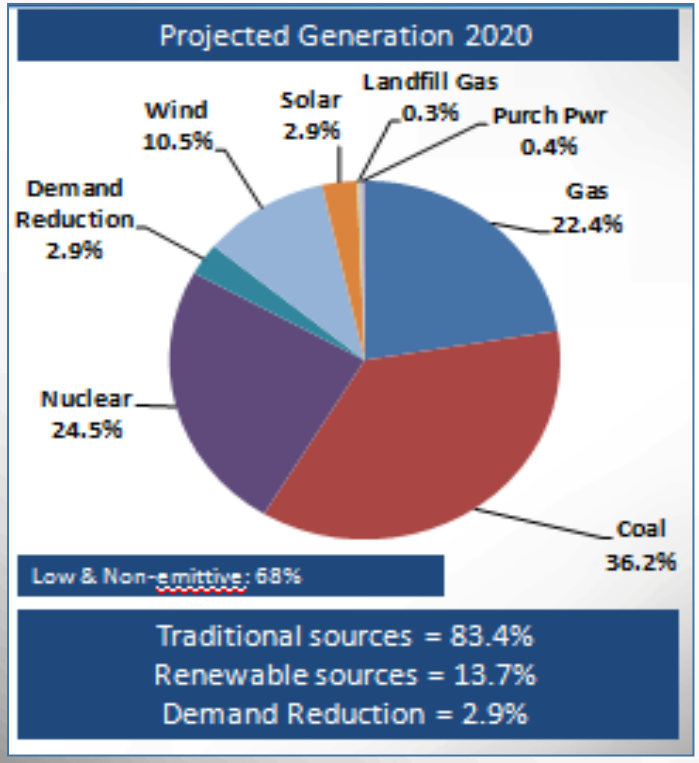
UTILITY SIMILARITIES

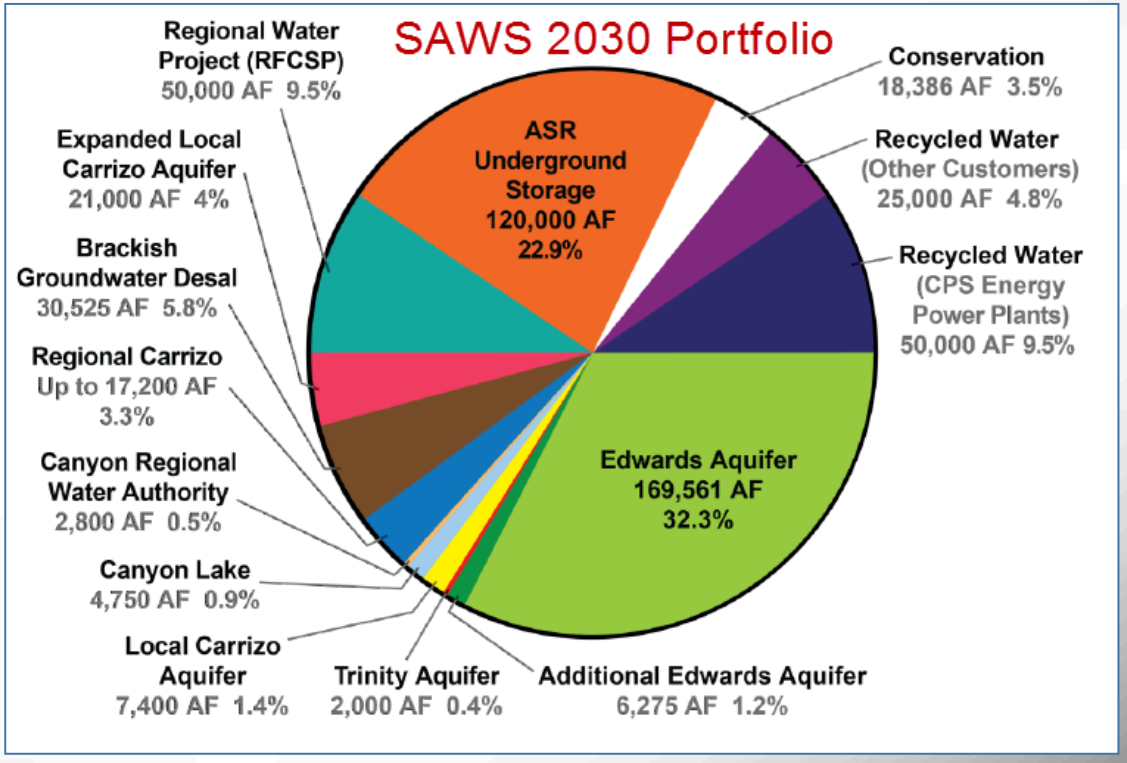
- City-owned
- Managed independently
- Innovative industry leaders
- Strong conservation programs
- Sizable customer rebate programs

Each utility is largest customer of the other

DIVERSIFICATION OF PORTFOLIOS

- Both utilities continue diversifying resources
- Move to sustainable resources
- "Save Water, Save Energy" & vice-versa





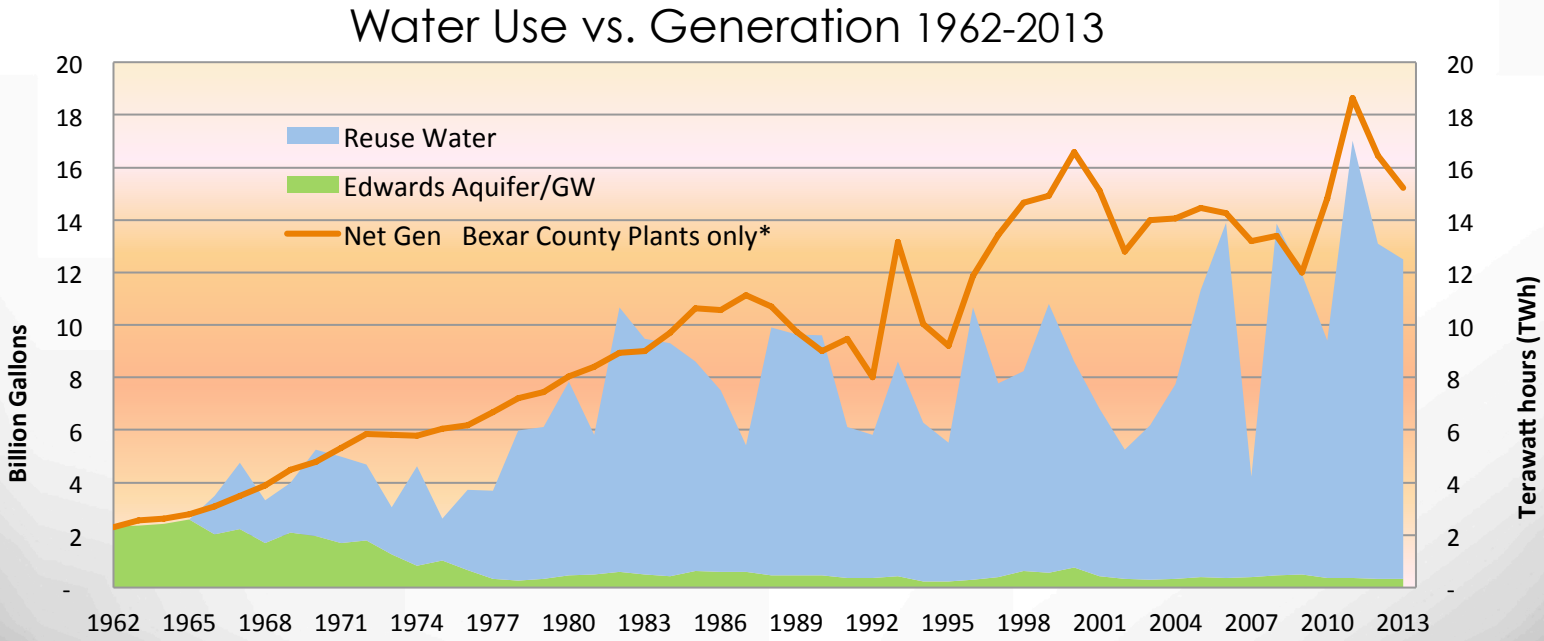
PARTNERSHIPS

- 1967 effluent reuse in power plants, 50,000 ac-ft contract
  - Income used to fund startup of recycled water system
- Solar farm installation on wastewater treatment plant site
- CPS Energy lease of 1,000 ac-ft of unused ground water right to SAWS
- Studying co-location of power plant at desalinization plant
- Smart Meter installation
  - Evaluating sharing of infrastructure for meter reads
    - Customers control energy use & conserve
    - Water leaks detected sooner
- Rebates: Take advantage of each other's programs when possible
- Collaboration boosts understanding of energy-water issues

EFFLUENT REUSE

Pioneered reuse of sewage effluent for cooling (1960's)

- 2 cooling lakes built for power plants
- Treated effluent transported via San Antonio River from treatment plant to lakes



CPS ENERGY'S WATER – ENERGY STRATEGY

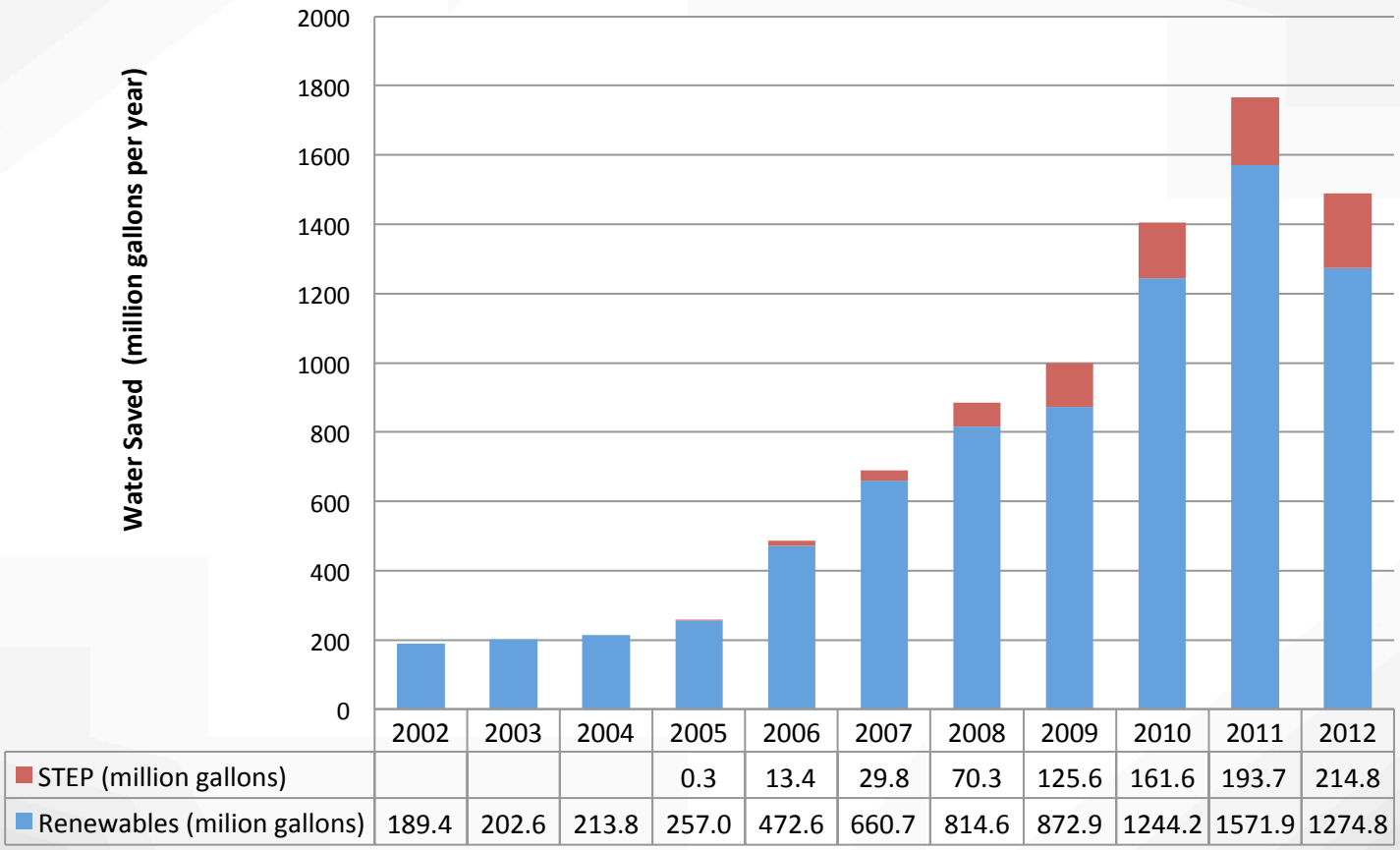
- Shift to less water intensive technologies
  - Gas Combustion Turbines
  - Early retirement of 2 coal units (2018)
- Aggressive path to diversify & reduce the carbon intensity of generation fleet (climate initiative)
- Demand reduction & energy conservation program
  - Save for Tomorrow Energy Economy Plan (STEP)
  - 771 MW by 2020
    - Off-set building new plant

CPS ENERGY'S WATER – ENERGY STRATEGY (CONT)

Shift to Renewables:

- Zero water use, zero carbon emissions
- 1500 MW (20%) by 2020
- Approx. 1200 MW currently in operation, via 3rd party contracts
- Wind, solar, landfill gas (contracted)
  - 1059 MW wind
    - largest amount in municipally owned utilities
  - 400 MW solar purchase agreement
    - Texas now 5th largest in nation for solar capacity
    - #1 solar utility in TX
  - 10 MW landfill gas
    - 4 MW under development

WATER SAVINGS: RENEWABLES & CONSERVATION PROGRAM



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
STEP (million gallons)				0.3	13.4	29.8	70.3	125.6	161.6	193.7	214.8
Renewables (milion gallons)	189.4	202.6	213.8	257.0	472.6	660.7	814.6	872.9	1244.2	1571.9	1274.8

Cumulative Historical Water Savings: Renewables and STEP 8.5 billion gallons (2002-2012)

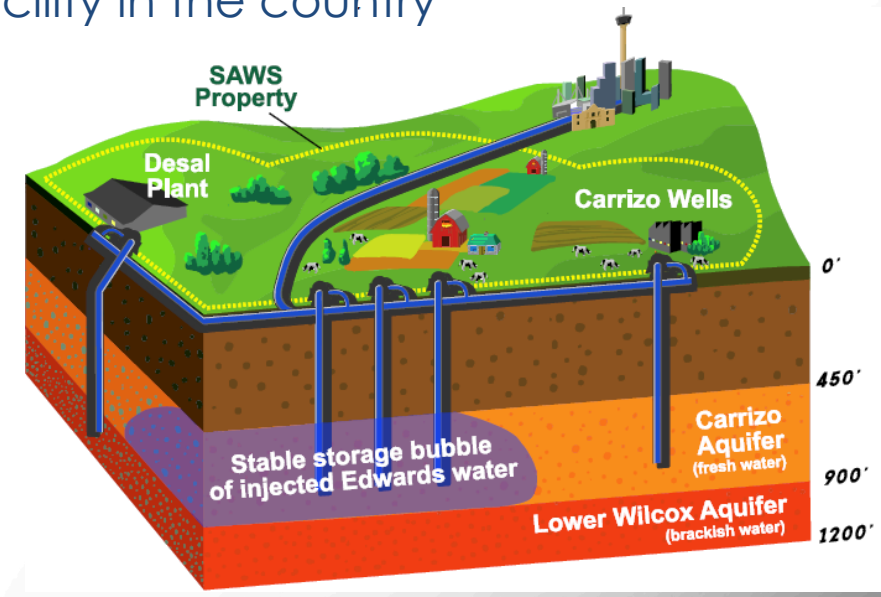
AFFORDABLE • RELIABLE • INNOVATIVE

CPS ENERGY'S WATER CONSERVATION EFFORTS

- Re-circulate cooling water in reservoir for reuse
- Recycle all wastewater streams - 99%
- Repair and maintain equipment to minimize water loss
- Pilot utilizing coal pile dust suppression chemistry to minimize water usage
- Use of new water treatment technologies
- Increased power plant efficiency projects
- Native landscaping , minimal irrigation

SAWS' INNOVATIVE WATER STRATEGY

- One of the country's leading water conservation programs
- Nation's largest direct recycled water system
- Diversified supply
- Aquifer Storage & Recovery (ASR)
  - 3rd largest underground storage facility in the country
  - 74,000 ac-ft currently in storage
  - Leasing a portion for endangered species habitat conservation plan
- Brackish groundwater DeSal plant under construction



SAWS ENERGY EFFICIENCY EFFORTS

- LED Lighting upgrades (rebates)
- Chiller upgrade (rebates)
- Bldg efficiency: Sleep mode on computers, etc.
- Comprehensive Energy Audit planned (CPS Energy assist)
- Participate in CPS Energy Demand Reduction Program, peak shaving
  - $270k/yr to reduce energy during peak electricity demand
- In-line generators under evaluation

Suggestions:

- **Develop a relationship with your electric utility counterpart**
  - **Often additional services for large customers**
- **Evaluate time of use for significant $$ savings**

SHAPING POLICY

- CPS Energy testified at state and national levels on sustainability / renewable energy
- Both involved in regional water planning & state stakeholder planning groups
  - Drought Planning & Management
  - Endangered species
  - Environmental flows

AFFORDABLE | RELIABLE | INNOVATIVE

CPS ENERGY
works for you

Audience Polling Question #3

In your opinion, which would provide the greatest benefit to your utility (or to a utility with whom you work)?

A. Improving the relationship with your water/energy utility counterpart

B. Upgrading equipment and operations to be more water/energy efficient

C. Offering internal training to staff about financial and environmental aspects of lowering energy/water footprint

D. Reaching out to customers or other external stakeholders (e.g., city/state officials) to educate them about water-energy issues

E. Not applicable/Don't know

Q & A

Thank You!

Next Webinar: July 24, 2-3pm

Effective stakeholder engagement on water and energy issues

Details to be posted:
http://www.c2es.org/science-impacts/adaptation/water-energy-webinar-series

Questions or Suggestions:

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ASSOCIATION OF METROPOLITAN WATER AGENCIES

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