

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com



Get REAL Savings!

Energy & Water Utilities Team on CII Water Efficiency

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Agenda

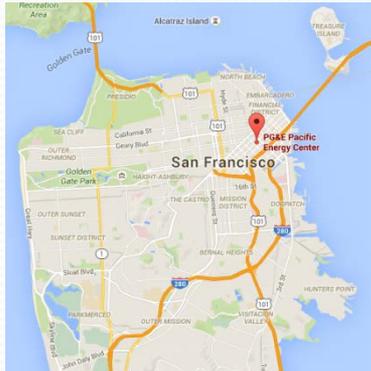
1. How Do We Save Water?
 - Strategy to evolve water/energy utilities partnerships
 - Strategy for water audit training
2. Real Data – Current Efficiencies of CII Businesses
3. Additional Related Items
 - Strategy to involve businesses and fund CII projects

PG&E Pacific Energy Center

PG&E's demonstration and education center, established to help building and design professionals understand and implement state-of-the-art energy-efficient technologies

Free Services:

- Classes
- Advice
- Tools



www.pge.com/pec



PG&E Energy Centers

Energy education resources

Our energy classes, energy measurement tools, expert consultations and other resources are available to help architects, designers, contractors and customers create energy-efficient, safe and comfortable environments.



Education programs

Whether you're a student, educator, contractor or design professional, you can benefit from our free classes on a range of energy-related topics. View our list of offerings and sign up for a class today.

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Energy measurement tools lending library

Do you need a tool for a specific project or course of study? Browse our lending library catalog and borrow tools at no cost to you.

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Relationship of Water and Energy in CA



Statewide supply
(transmission)

~4%

+



Local water and
wastewater agencies
(distribution)

~2%

+



Agricultural pumping
and irrigation

~3%

+



Industrial,
Residential,
Commercial End users

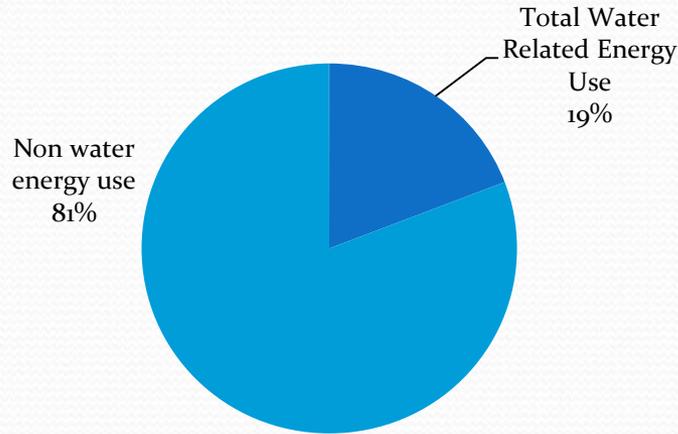
~11%

= ~19% (Statewide kWh)

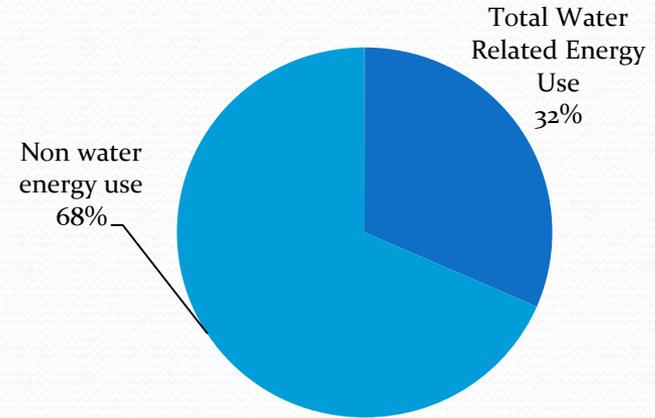
(~32% of Therms)

California Energy/Water Connection

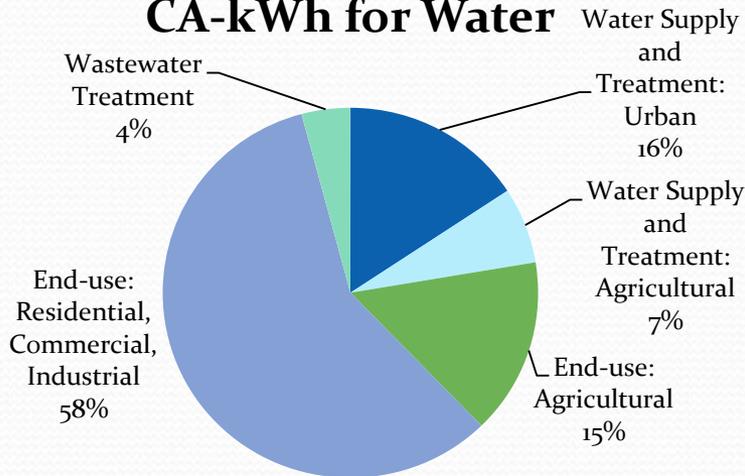
CA-kWh



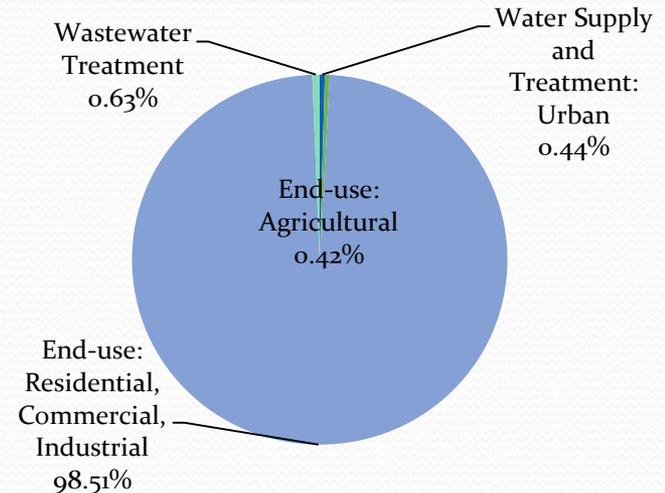
Therms



CA-kWh for Water



CA-Therms for Water



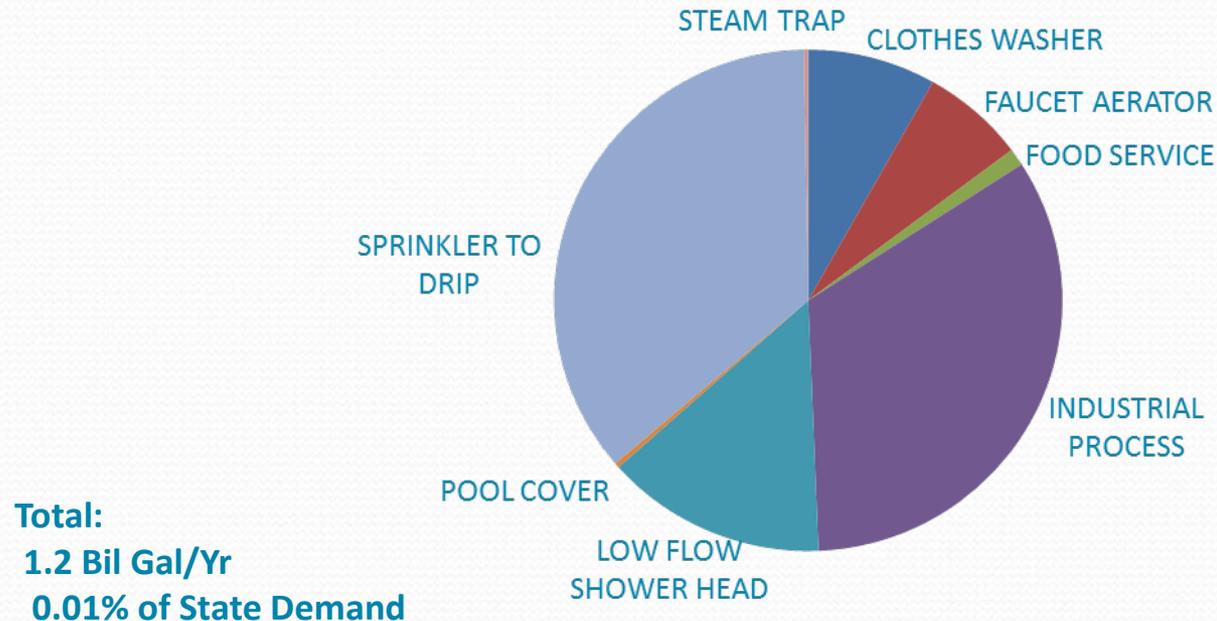
Established Agency Relationships

In Energy Efficiency (EE) programs, PG&E interacts with water agencies in multiple ways:

- **As customers** – to invest in efficient equipment and operations
- **As partners** – to help mutual customers save energy and water

PG&E has helped customers save water through efficiency.

2015 EE Programs Water Savings by Measure



Successful Partnership: Clothes Washers (CW)

High-Efficiency Clothes Washer Rebate

Qualifying high-efficiency clothes washers must be purchased and installed between January 1, 2015 and December 31, 2015

Your local water agency and PG&E are offering

UP TO
\$150

CASH BACK ON ENERGY STAR[®] MOST EFFICIENT 2015 MODELS

ELIGIBILITY

- You must be a customer of PG&E and a participating water agency.
- Verify that the clothes washer you are going to purchase and install qualifies for the rebate.
- The model must be on the [ENERGY STAR Most Efficient 2015 list](http://waterenergysavings.com), available at waterenergysavings.com, or contact a PG&E representative at 1-800-933-9555 to find a qualifying clothes washer or to confirm that the model you are considering qualifies for the rebate.

PURCHASE AND INSTALLATION

- You must purchase and install your qualifying product(s) between January 1, 2015 and December 31, 2015. (Term duration may be subject to change.) Product(s) must be installed and operational before submitting your application.

HOW TO APPLY

- Complete and submit** the attached application, or apply online at pge.com/myhome/erebates within 60 days of purchase and installation. You will need to refer to your PG&E and water agency bills and proof(s) of purchase. Incomplete applications cannot be processed.
- Include** a copy of proof(s) of purchase. Please retain the original for your records. For online applications, you will need to upload a PDF or JPG of the product invoice when you submit your application.
- Sign** the application form.
- Make copies** of all documentation for your records.

- Mail** your completed application and enclose the proof(s) of purchase as soon as possible. Rebates are limited and awarded on a first-come, first-served basis. **All rebate applications must be postmarked or received online no later than 60 days after purchase and installation. Limit: One water agency rebate per five-year period.**

A rebate check is generally mailed six to eight weeks after PG&E receives a completed application, including all required documentation. Log in to pge.com/rebates, and click the **Rebate Status** button to check the status of your rebate using your account number and zip code.



Need more help?

For more information on this program, please call PG&E's Smarter Energy Line at 1-800-933-9555, Monday to Friday, 8:00 a.m. to 5:00 p.m., or visit waterenergysavings.com.

• Partnership with 34 Bay Area water agencies in 7 counties serving 2.2M residential customers

- Program began in 2008
- \$50 incentive from PG&E
- \$100 incentive from water agency
- ~25,000 incentives/year

• Single application and check

- Eligibility for e-rebates

• Cost-share

- Split \$20 cost per application
- Share marketing costs (program website www.waterenergysavings.com and in-store point of purchase materials)

• Program expansion underway

- Midstream incentive
- Increase eligible CW models from 25 to 139 and drive volume
- Adding new WA partners

Building Upon Success



- Agriculture: technology, behavioral programs
 - *Potential Partners*: National Resources Conservation Service, Farmers Associations, Colleges and Universities
- Water leaks: detection and repair on customer or utility side of meter
 - *Potential Partners*: California Department of Water Resources, local agencies
- Commercial and industrial equipment and irrigation: new technologies and financing
 - *Potential Partners*: Local agencies
- Residential: behavioral programs offer potential
 - *Potential Partners*: Local agencies

How can we leverage existing relationships with energy utility customers to do water audits?

- Utilities have direct customer relationship
- Water audits can produce water AND energy savings
- Leverage incentives from all utilities
- Report water and energy saved



What are the challenges for getting CII buildings involved in water efficiency?

- Cost of water – water is cheap so makes replacements/ROI challenging – a harder sell to businesses
- Interruption to business/cash flow to do upgrades
- Fear of “violation” if facility access is allowed

What are key findings of training & audits that can make it easier for businesses to replace fixtures?

- Slip and fall hazards – lawsuit potential
- Costly leaks
- Funding opportunities
- Relationship building with water and energy utilities to promote support and rebates
- Simple benefit-cost story
- User-friendly resources for accessing/ordering the efficient fixtures and devices

What are successful strategies to teach water auditors how to perform audits?

- Webinars to present background information and tools
- Classroom presentations with Q&A and mock simulations, as well as networking and partnership/resource building between participants
- Small group live audit modules in a “real” CII setting



Evaluating a commercial dishwasher



Evaluating an irrigation controller

Water Audits Training: Agenda

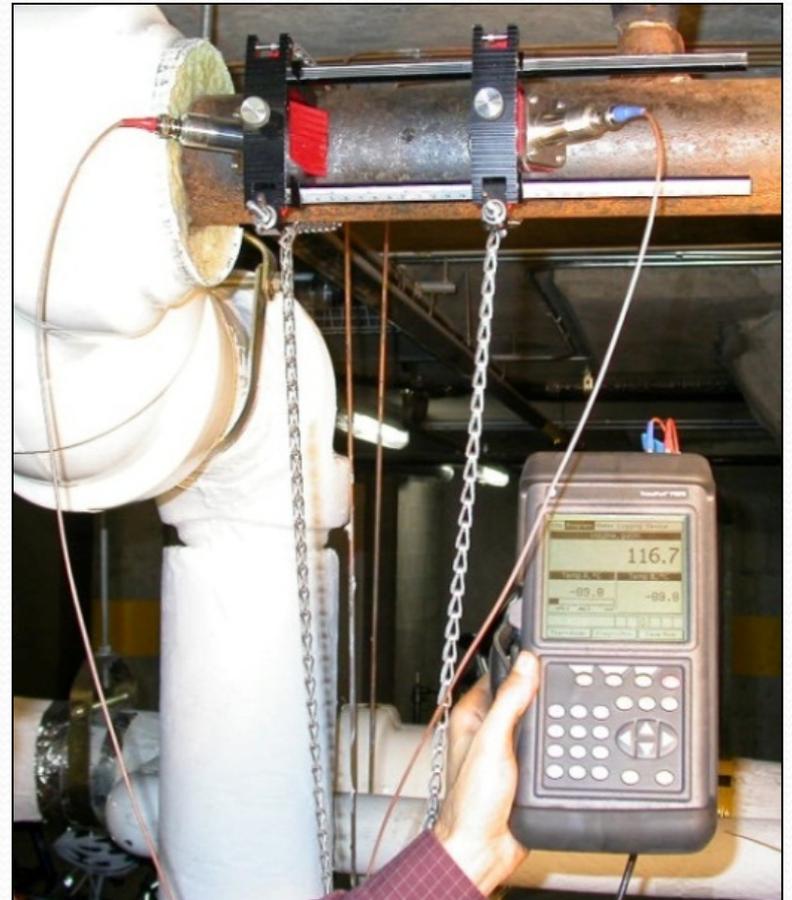
- Introductions
- Water/Energy Nexus
- Overview of Water Audits
- Meters and Measurement
- Restroom Opportunities
- Lab Rotation #1
 - Restroom: toilets
 - Restroom: sinks and showers
 - Meters and measurement
- Reporting and Payback (Software Demo)
- Landscape Opportunities
- Kitchen Opportunities
- Lab Rotation #2
 - Kitchen
 - Landscape
 - Working with AMI data
- Other Opportunities
- Wrap-up



Restroom Evaluations



Metering and Measurement



Kitchen Opportunities

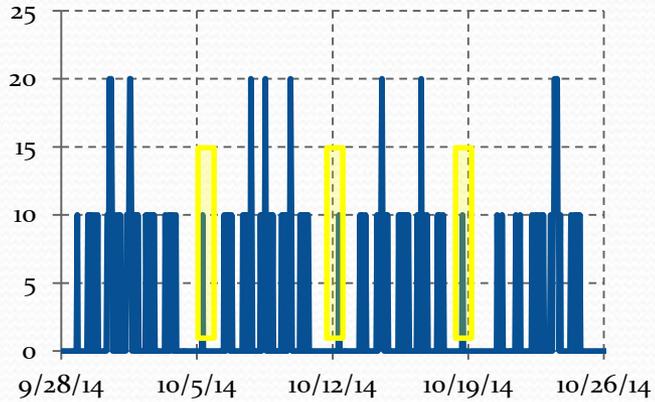


Flow Testing

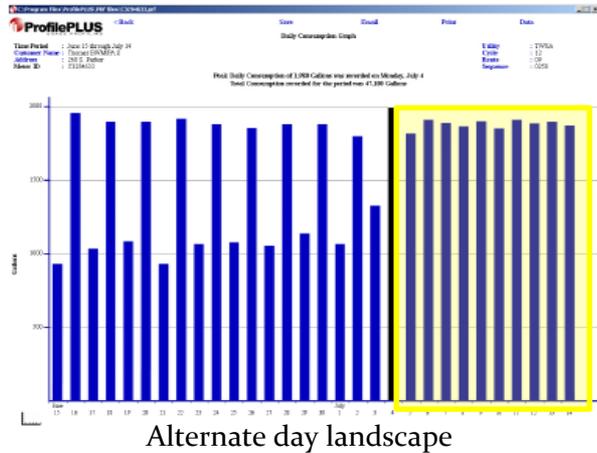


Processing AMI Data

Daily Water Use
PG&E Pacific Energy Center

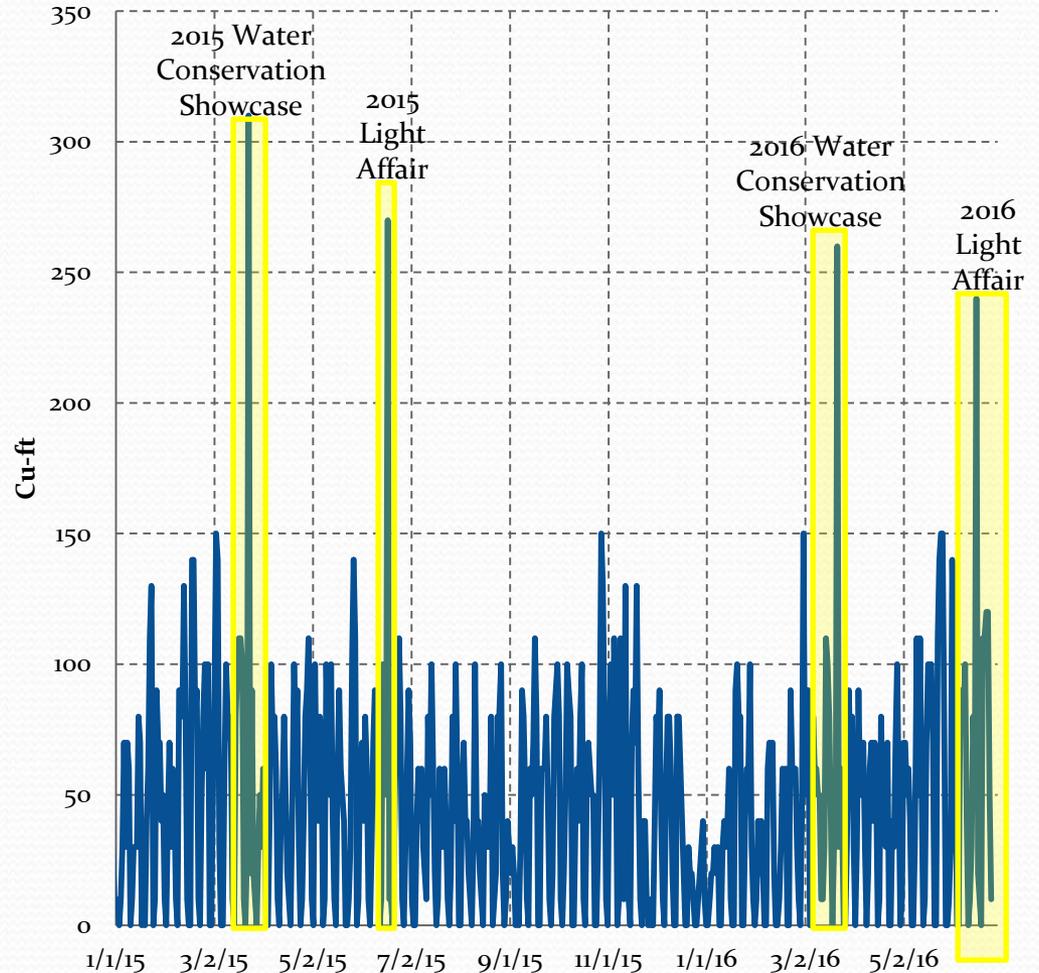


Saturday and Sunday water use

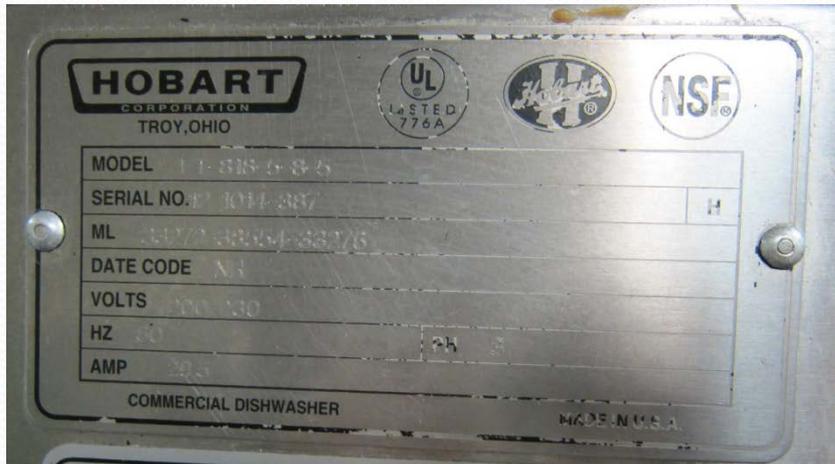


Alternate day landscape irrigation policy violated

Daily Water Use PG&E Pacific Energy Center



Gathering Nameplate Data



Ways to enable field auditors to be time efficient?

- Prepare before the site visit!
- Call the site manager to:
 - Get as much background information on the site
 - Get access to water-using equipment (cooling towers, dishwashers, etc.) at a convenient time
- Audit teams of two or more
 - Minimizes time at site (less inconvenience to business)
 - Can measure and document fixture water use faster
- Use Electronic Data Entry via tablet

Step 1: Enter Basic Site Data



Water Audit Tool v2.4

Start Audit

Getting Started

Troubleshooting

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Facility Name

Santa Barbara Community College

Date Audited	May 9 2013			
Customer Billing Category	Institutional			
Green Business Type				
Average Monthly Water Use				
Meter Numbers				
Date Account Opened				
Water connection size (inches)				
Number of Employees Working in Building				

Contact(s)

Name				
Title				
Address				
Company				
E-mail				
Telephone				

Step 2: Select Room/Area Type

Back to Interview

Rooms

Restroom	Laundry Room	Maintenance	Laboratory	Landscape Area	Other Room/Area
Food Service	Fitness Room	Janitorial	Exam Room	Pool/Spa Area	
Hotel Room	Locker Room	Mechanical	Classroom	Water Feature	Payback Analysis
Salon/Barber/Spa		Roof			Project List

Facility Name

Santa Barbara Community College

Room	Type	Description	Room #	Floor	Actions		
Room1	Classroom	Drama Music - Garvin	0	1	Edit	Copy	Delete
Room2	Food Service	Snack shop business communication	0	1	Edit	Copy	Delete
Room3	Other	Conference center	0	1	Edit	Copy	Delete
Room4	Laboratory	LRC break room	0	1	Edit	Copy	Delete
Room5	Classroom	Earth biology science	various	1	Edit	Copy	Delete
Room6	Laboratory	Physics	0	0	Edit	Copy	Delete
Room7	Classroom	ESL - English second language	0	1	Edit	Copy	Delete
Room8	Other	Student services	0	2	Edit	Copy	Delete

Step 3: Enter Equipment/Fixture Data

Restroom Tank Toilet Showerhead FV Toilet Faucet Urinal		Food Service Spray Valve Ice Machine Dishwasher Food Steamer Kitchen Faucet		Cooling Cooling Tower Vacuum Pump Distilled Water Swamp Cooler		Cleaning Autoclave Clothes Washer Janitorial Faucet		Landscaping Irr Controller Turf Area Shrub Area Hose Bib		Other Lab Faucet Other Faucet Pool / Spa Water Feature Other Device		Back to Rooms	
Rooms or Areas	RoomId	Description	Room Type	Room #	Floor/ Location	Building	Access	Use Lvl	Estimated #Visits/dy				
	3	Conference center	Other		1	Santa Barbara Comr		Low					
	Notes: Only staff 10-15 meetings per week - 2 semesters 17 weeks and 3-4 times per week during non peak												
Faucet	Position	Faucet Type	Manufacturer	Fill Sec	Gal Filled	Gallons per Minute	Leaking	Problem	Aerator	Automatic	WaterType	Listed Flow Rate	Delete
	1L	Restroom	Not Labeled	5.6	0.25	2.678571	No	None	Yes	No	Tap	2.2	
	Notes: For coffee												
Faucet	Position	Faucet Type	Manufacturer	Fill Sec	Gal Filled	Gallons per Minute	Leaking	Problem	Aerator	Automatic	WaterType	Listed Flow Rate	Delete
	1L	Kitchen	Kohler	6	0.25	2.5	No	None	Yes	No	Tap	2.2	
	Notes: High use												
FV Toilet	Position	Manufacturer	Toilet Type	Flush Time	Volume	Automatic	Leaking	Flush Time 2	Volume 2				Delete
	2L	American		1.6	11.7	5.35	No	No		0			
	Notes:												

REAL Trainings + REAL Audits = REAL Savings

- Been conducting audits and trainings since 2000
- Case studies highlight different types of audit trainings
 - California – college campuses & commercial & industrial
 - Hawaii – landscape & military bases
 - Canada – agriculture & industrial

Case Study: City of Santa Barbara, California

- City of Santa Barbara training and 7 audits completed:
 - 1 Large Laundry Facility
 - 2 Large Retirement Communities
 - Waterfront Marina
 - 1 Large Hotel
 - Santa Barbara City College
 - Zoo



Case Study: City of Santa Barbara, California

- Trained (2) two-person teams
- Created new “short reports” – 2-page reports and report generation
- Learned tablet screen size makes a difference. Screen sizes too small can be a challenge to work with and slow down data entry.



Case Study: Ft Shafter, Hawaii

- Training of Army Corps Staff to Conduct Survey of Army Base Facilities
- Base includes:
 - Military barracks
 - Irrigation
 - Offices
 - Golf course
 - Community center
 - Swimming pool
 - Kitchens
 - Bowling alley
 - Single family homes



Audit Training in Hawaii, July 2013

Case Study: Ft Shafter, Hawaii

- Trained a total of (5) two-person teams.
- Two-person teams are ideal, as one can test the fixtures and one can enter the data.
- Catch can tests can be used on unmetered landscape areas to help estimate irrigation water use.



Irrigation Audit Training in Hawaii, July 2013

Case Study: Abbotsford, BC, Canada

Agriculture/Industrial Audits

Largest bell pepper grower in North America

- Uses rainwater harvesting system
- Shipped all over United States



Bell peppers use rain capture from green houses and drip irrigation.



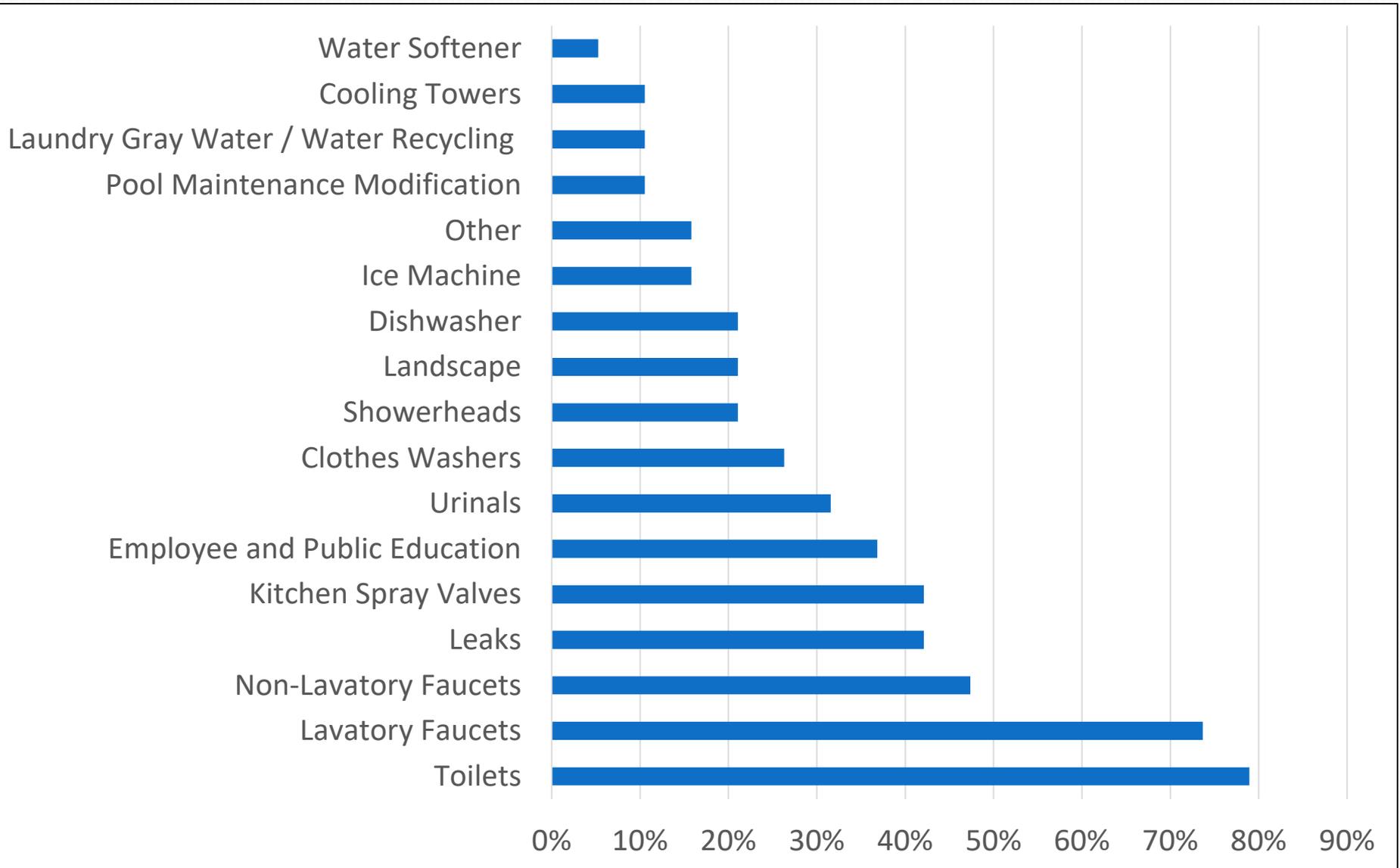
Bell peppers and cucumbers are grown in a green house on tall vines.

Real Data – Current Efficiencies of CII Businesses

- 20 sites audited
- Sites located in California and Canada
- Sites include: hotels, restaurants, industrial plants, long-term care facilities, schools, zoos, conference centers, etc.
- Estimated predicted water savings if recommended projects are implemented: **5%-25% savings** of normal water use

Real Data – Current Efficiencies of CII Businesses

Frequency of CII Project Recommendations



Concluding Remarks

- Partnering between Energy and Water for commercial audits can work!
- Estimated predicted water savings if recommended projects are implemented: **5%-25% savings** of normal water use.
- There are a LOT of remaining potential water savings at commercial sites.
- Using technology such as tablets and software can save time, money and improve audit data processing/report generation.

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