Purchasing for Water Efficiency

November 8, 2011
Questions?

Please enter your questions at any time though the GoToWebinar box on the right-hand side of your screen.

We will use them during Q & A at the end.
Agenda

• Welcome and Introduction, **Phillip Kobernick**, Manager, Responsible Purchasing Network

• **Tara O'Hare**, Implementation and Recruiting Lead for WaterSense Program, US EPA

• **Cinnamon Black**, Water Conservation Specialist, Public Utilities, Raleigh, NC

• RPN’s “Greening Existing Buildings” Initiative

• Q & A, with all panelists and **Shirli Axelrod**, Senior Environmental Analyst, Seattle Public Utilities and **Al Dietemann**, Conservation Leader, City of Seattle, WA
RPN

Nonprofit, ~200 members

- States
- Local governments
- Federal agencies
- Colleges and universities
- School districts
- Businesses
- Non-profits

RPN Mission

“Promote and practice responsible purchasing by identifying best practices, developing effective purchasing tools, educating the market, and using our collective purchasing power to maximize environmental stewardship, protect human health, and support local and global sustainability.”
The Need for Water Efficiency

- Our national thirst for water is increasing.
- Demand coupled with climate change will increase stresses on water supplies.
- Water utilities may need to invest more than $500 billion to update aging infrastructure in the next 20 years.
Water Scarcity is a Reality

- Weather patterns change every year, but drought happens somewhere in the country every year.
- Climate change only exacerbates problems and increases uncertainty.
Not Just About Water

- Moving, treating, and heating water uses energy
  - Every gallon of water has an energy “footprint”

- Water sector energy use
  - Nationally - ~3-4%
  - California - ~20%
  - Municipal level - can be > 40%
  - System level - energy is one of the highest utility costs
How do we use water as a nation?

- Livestock: Less than 1 percent
- Self-Supplied Domestic: 1 percent
- Public Supply: 11 percent
- Thermoelectric Power: 49 percent

- Mining: 1 percent
- Aquaculture: 2 percent
- Self-Supplied Industrial: 4 percent
- Irrigation: 31 percent

USGS 2005 Water Use Report
How do we use water across the commercial sector?

Dziegielewski, et. al., Commercial and Institutional End Uses of Water, 2000
How is water used within commercial settings?

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Office Buildings</th>
<th>Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic/Restrooms</td>
<td></td>
<td>Domestic/Restrooms</td>
</tr>
<tr>
<td>Cooling &amp; Heating</td>
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<td>Cooling &amp; Heating</td>
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<tr>
<td>Landscaping</td>
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<td>Landscaping</td>
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<tr>
<td>Kitchen</td>
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<td>Kitchen</td>
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<td>Laundry</td>
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<td>Restaurants</td>
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<td>Hotels &amp; Motels</td>
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<td>Hotels &amp; Motels</td>
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</tbody>
</table>
What is WaterSense?

WaterSense is voluntary partnership and labeling program launched by EPA in 2006

- Addresses water efficiency and performance
- At least 20% water use reduction in products
- A label with integrity
Five Years of Savings

- 125 billion gallons of water have been saved from all WaterSense labeled products shipped
- Consumers saved $2 billion in water and energy bills
- Participation jumped to more than 2,100 partners
- More than 3,200 labeled plumbing fixture models
WaterSense Labeled Products

**Tank-Type Toilets**
Labeled since 2007
Over 900 labeled models

**Lavatory Faucets**
Labeled since 2007
Over 2,800 labeled models

**Flushing Urinals**
Labeled since 2009
90 labeled models

**Showerheads**
Labeled since 2010
Over 400 labeled models
WaterSense Labeled Products

New Homes
Labeled since 2010
55 labeled homes

Irrigation Controllers
Final spec released
11/3/11
Coming Soon!

Labeled products are listed at:
www.epa.gov/watersense/products/index.html
## Schedule for Evaluating WaterSense Products

<table>
<thead>
<tr>
<th></th>
<th>Complete</th>
<th>2011/2012</th>
<th>2012 and Beyond</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Irrigation</strong></td>
<td>Irrigation Controllers Professional Certification Programs</td>
<td>Irrigation Sprinklers Moisture Sensors Drip/Micro Technology</td>
<td></td>
</tr>
<tr>
<td><strong>Residential Plumbing</strong></td>
<td>Toilets Faucets Showerheads</td>
<td>Water Softening Systems</td>
<td>Water Treatment Systems</td>
</tr>
<tr>
<td><strong>Commercial Plumbing</strong></td>
<td>Urinals</td>
<td>Pre-rinse Spray Valves Flushometer Valve Toilets</td>
<td>Dipper Wells</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>New Homes</td>
<td></td>
<td>Autoclaves Glassware Washers Additional Professional Certifications</td>
</tr>
</tbody>
</table>

Significant opportunity for associated energy savings
WaterSense and Energy

- Water factors are included in many ENERGY STAR qualified products
  - Ice machines
  - Steam cookers
  - Dishwashers
  - Clothes washers

- Federal Energy Management Program designates water and energy efficient products
  - [http://www1.eere.energy.gov/femp/technologies/eep_purchasingspecs.html#covered](http://www1.eere.energy.gov/femp/technologies/eep_purchasingspecs.html#covered)
Water Efficiency and Green Building

- WaterSense and water efficiency are components of many green building programs, codes, standards, and specifications including:
  
  - US Green Building Council’s *Leadership in Energy and Environmental Design* (LEED) program
  
  - International Code Council’s (ICC) *Green Construction Code* (in draft)
  
  - International Association of Plumbing and Mechanical Officials (IAPMO) *Green Plumbing and Mechanical Code Supplement*
Water Management and Planning

- Measure water use with properly installed meters and sub-meters
- Set efficiency goals
- Conduct a facility water audit
- Incorporate water efficiency into procurement language and policies
Measurement is Key

You can’t manage what you don’t measure

ENERGY STAR’s Portfolio Manager can help track building water and energy use
Water-Efficient Technologies and Design

Designed Efficiencies
- Single-pass water
- Irrigation
- Alternate sources

Efficient Products
- Cooling Towers
- Sanitary Fixtures and Fittings
- Commercial Kitchen Equipment
Incorporate Water Efficiency
Best Management Practices

<table>
<thead>
<tr>
<th>EPA and FEMP Best Management Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Management Planning</td>
</tr>
<tr>
<td>Information and Education Programs</td>
</tr>
<tr>
<td>Distribution System Audits, Leak Detection &amp; Repair</td>
</tr>
<tr>
<td>Water-Efficient Landscaping</td>
</tr>
<tr>
<td>Water-Efficient Irrigation</td>
</tr>
<tr>
<td>Toilets and Urinals</td>
</tr>
<tr>
<td>Faucets and Showerheads</td>
</tr>
</tbody>
</table>

http://www1.eere.energy.gov/femp/program/waterefficiency_bmp.html
Case Study: Sanitary Fixtures
Holiday Inn, San Antonio, TX

- Holiday Inn Select in San Antonio, Texas upgraded toilets, faucets, and showerheads in 397 guest rooms

- Saved 7 million gallons (26.5 million liters) of water per year and $35,000 in water and sewer bills
Population growth and limited supply drive the need to use water wisely

U.S. EPA’s WaterSense Program helps consumers choose water-efficient, high-performing products

Water efficiency and WaterSense are becoming an important aspect to green building specifications

Water efficiency best practices can be cost effectively incorporated into existing buildings and new construction
Visit us on the web, Facebook & Twitter
More Information

- WaterSense Information
  - Web site: [www.epa.gov/watersense](http://www.epa.gov/watersense)
    - List of products
    - Partnership information
    - Educational fact sheets and resources
  - E-mail: watersense@epa.gov
  - Toll-free Helpline: (866) WTR-SENS (987-7367)
Water Efficiency for ICI

Cinnamon Āsiyih Black
Water Conservation Specialist
City of Raleigh, NC
Outline

• Where is the City of Raleigh
• Water Efficiency Check-ups
• Toilets, Showerheads and Aerators
• The Energy Star Label & Products
• City of Raleigh’s and Water-Efficient Projects
• Bidding Specifications
Where is Raleigh?

- North Carolina: 9,535,483
- Wake County: 900,993
- City of Raleigh Service Population: 403,892 (April 2010 Census)
Water Efficiency Check-ups

- Do you know how much water your company uses?
- The water efficiency checkup, WEC, (aka “water audit”) is the process of calculating how much water comes into a facility, and how much goes out.
  - from the meter, through the water –using activities to account for leaks and/or inefficiencies.
- The WEC places data into a worksheet or spreadsheet to details the variety of consumption and losses that exist in a facility.
  - Benefits from retrofitting can be extrapolated.
- AWWA Water Audit Software available at: www.awwa.org
Toilets are an inefficient use of potable water and a prime source of leaks.
Flushometers (Flush Valve) Toilets & Urinals

- The City also offers a $200 rebate to change out old commercial style, tankless, flushometer toilets with ones that use 1.28 gpf and have a MaP rating of 800 or higher.

- WaterSense labeled High Efficiency Urinals, and waterless urinals are also rebated.
Approximately 17 percent of indoor water usage can come from showering. Most showerheads use 2.5 gallons per minute (gpm) - using 25 gallons for a 10-minute shower!

High Efficiency 1.5 gpm showerheads can save 40%.
High Efficiency Aerators

Approximately 15 percent of indoor water usage can come from using the faucet; washing hands and brushing teeth. The average aerator uses 2.2 gallons per minute (gpm) or more.

1.5 and 0.5 gpm aerators for the kitchen and bath, respectively can half your water usage in these areas.
Don’t forget to look for...

The WaterSense Label

www.epa.gov/watersense
The Energy Star Label

www.energystar.gov
ENERGY STAR-qualified clothes washer

✓ Save up to $550 in operating costs.

ENERGY STAR bottled water dispenser

• Standard units can use more energy than a large refrigerator; approximately 4 billion kWh/year.

• ENERGY STAR models requires about half as much energy as a standard unit.
ENERGY STAR Commercial dishwashers
• 25 percent more energy efficient.
• 25 percent more water efficient.

ENERGY STAR Commercial Ice Machines
• 15 percent more energy-efficient.
• 10 percent more water-efficient.
Water Heating Technologies

Electric

Gas

Don’t forget Solar
ENERGY STAR-qualified boilers

• (AFUE) annual fuel utilization efficiency rating of 85% or greater.
• They achieve greater efficiency with improved features.
2011 Federal Tax Credits for Consumer Energy Efficiency

What You Need to Know

What is included in the 2011 Federal Tax Credit?

How do I apply for my Federal Tax Credit?

What is included in the Tax Credit?

**Tax Credit:** 30% of cost with no upper limit  
**Expires:** December 31, 2016  
**Details:** Existing homes & new construction qualify. Both principal residences and second homes qualify. Rentals do not qualify.

- Geothermal Heat Pumps
- Small Wind Turbines (Residential)
- Solar Energy Systems
- Water Heaters (non-solar)
- Windows & Doors
Special Offers and Rebates from ENERGY STAR Partners

To encourage customers to buy energy efficient products, ENERGY STAR partners occasionally sponsor special offers, such as sales tax exemptions or credits, or rebates on qualified products. Partners also occasionally sponsor recycling incentives for the proper disposal of old products. The search below is provided as a service to consumers to find such special offers or rebates where they exist, based on information that partners submit to ENERGY STAR.

Enter your zip code below to find out if there are any special offers or rebates currently available on ENERGY STAR qualified products in your area.

Special Offer/Rebate Finder
Your zip code:  
Product(s) you're looking for:
Appliances
☐ Clothes Washers
☐ Dishwashers
☐ Refrigerators & Freezers
☐ Residential Dehumidifiers
☐ Room Air Conditioners
☐ Water Coolers
Fans
☐ Ceiling Fans
☐ Residential Ventilation Fans
Heating and Cooling Equipment
☐ Boilers
☐ Ceiling Fans
☐ Central AC
☐ Electric Air-Source Heat Pump
☐ Furnaces
☐ Geothermal Heat Pumps
☐ Programmable Thermostats
Home Electronics
☐ Audio and DVD Products
☐ Audio/Video
☐ Combination Units
City of Raleigh’s Water-Efficient Projects
LEED & The City of Raleigh

• LEED – Leadership in Energy and Environmental Design
• All new City buildings over 10,000 SF are required to achieve LEED Silver certification
• LEED Silver Certification: NRWWTP Training and Administration building
• Pursuing LEED Silver certification: DE Benton WTP Administration Building
• LEED Silver Certification: Raleigh Convention Center
NRWWTP Training & Administrative Building

Building Cost - $2.47M
Size – 9,500 SF
Additional Cost for LEED Certification - $64,261 (2.6% Increase)
DE Benton WTP Administration Building

Building Cost - $3.4M
Size – 11,000 SF
Estimated Additional Cost for LEED Certification - $552,100 (16.2% Increase)
Raleigh Convention Center

- LEED Silver Certification
- 11-acre Downtown site
- Previous Brownfield
- 30% Water use reduction:
  - High Efficiency toilets, urinals and lavatories
  - This equates to an estimated water savings of more than 825,000 gallons per yr.
Partner’ Projects

• St Augustines’ College:
  – Replaced approximately 200 toilets: up to 5gpf to 1.28

• Trinity Properties:
  – Replaced approximately 803 toilets: up to 5gpf to 1.28

• Raleigh Housing Authority:
  – Performed Water Check-Ups
  – Replaced 1,300+ toilets: from 3.5-4.5 to 1.28 gpf
  – Replaced 600+ showerheads and aerators
• Replace approximately 3,000 2.2 gpm aerators to 0.5 gpm.
• Approximately 1000 kitchen aerator: 2.2 gpm to a 1.5 gpm.
• Approximately 2500 showerheads: 2.5 gpm to a 1.5 gpm showerhead.
• Replaced ALL tank-type toilets: 3.5 gallon flush to a 1.6 gallon flush.
• Replaced several hundred Flush Valve toilets prior to the rebate. 3.5 gpf with new 1.6 gpf toilets.
• Replaced Approximately 629 Flush Valve toilets: 3.5 to 1.28 gpf.
• In the process of changing out all old high consumption urinals with 1.0 gpf urinals.
Bidding Specifications

Remember, you can order to your specific needs:

- MaP Rating
- Dual-Flush, Single, Pressurized, Flapperless, etc.
- Manual flush versus automatic
- Rough-In, trapway, flushing mechanism.
- Highest efficiency rating:
  - 0.5 gpm for sinks
  - 1.28 - 0.8 for toilets
  - 1.5 gpm for kitchen and showers
- Timed sinks for shut off in 5 seconds
- WaterSense & Energy Star label
- Remember, bulk products equal greater savings
Queries? Comments?

Contact: Cinnamon Àsìyih Black
Water Conservation Specialist
City of Raleigh: www.raleighnc.com
Email: Cinnamon.Black@raleighnc.gov
### Calculate Water Savings During Product Production

**Lifecycle Environmental Impact**
The following is a break down of the environmental impact of your choices for different grades of paper.

<table>
<thead>
<tr>
<th></th>
<th>Baseline Paper</th>
<th>100% Recycled Paper</th>
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<tbody>
<tr>
<td><strong>Recalculate</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Paper</strong></td>
<td>Uncoated Freesheet (e.g. c)</td>
<td>Uncoated Freesheet (e.g. c)</td>
</tr>
<tr>
<td><strong>Quantity per year</strong></td>
<td>1000 Pounds</td>
<td>1000 Pounds</td>
</tr>
<tr>
<td><strong>% Postconsumer</strong></td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td><strong>Wood Use</strong></td>
<td>2 tons</td>
<td>0 tons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 tons less</td>
</tr>
<tr>
<td><strong>Net Energy</strong></td>
<td>15 million BTU's</td>
<td>11 million BTU's</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 million BTU's less</td>
</tr>
<tr>
<td><strong>Greenhouse Gases</strong></td>
<td>2,941 lbs CO₂ equiv.</td>
<td>1,711 lbs CO₂ equiv.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,230 lbs CO₂ equiv. less</td>
</tr>
<tr>
<td><strong>Wastewater</strong></td>
<td>11,109 gallons</td>
<td>5,186 gallons</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5,924 gallons less</td>
</tr>
<tr>
<td><strong>Solid Waste</strong></td>
<td>954 pounds</td>
<td>595 pounds</td>
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<tr>
<td></td>
<td></td>
<td>360 pounds less</td>
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[www.ResponsiblePurchasing.org](http://www.ResponsiblePurchasing.org)
Bottled Water: Calculator

This Bottled Water Calculator, developed by RPN, compares the cost and environmental impacts of 16.9 oz. bottles of water with tap water. Results are expressed in gallons of water, mega joules of energy, gallons of oil, pounds of CO2e, and dollars saved.

Edit the values below and click update.

How much water do you drink?
Enter the total number of 16.9 oz. bottles of water purchased by your organization in a year:

Cost of Tap Water per Gallon ($ per gallon):

(If you know your local cost, please enter - otherwise leave the national average.)

Cost of 16.9 oz Bottle of Water (typical is $1.50):

Impact
Total Water Drank:
Extra Water Required for Production and Purification:
Energy Required for Manufacturing:
Oil Required to Produce the Plastic Bottle(s):
CO2e to Manufacture Plastic Bottle(s):

Your Extra Cost for Bottled Water: $14,980.00
RPN Member Resources

• **Responsible Purchasing Guides** for 15 product categories
• Webinars on “green” procurement issues
• Quarterly newsletter highlighting “green” purchasing activities and resources
• Sustainable purchasing policies and specifications
• **Model Responsible Purchasing Report**
• Calculators and other tools
RPN’s Green Building Initiative

Projects may include:

• Creating “green” purchasing specifications

• Reviewing bid responses

• Facilitate cooperative contracting opportunities for green building products or services

• Other green building initiatives with measurable results

ELIGIBLE EPA REGIONS

1: Connecticut, Maine, Massachusetts, Rhode Island, Vermont, New Hampshire

4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee

7: Nebraska, Kansas, Missouri, Iowa

9: Alaska, California, Hawai’i, Nevada
Application details

• Download application at www.responsiblepurchasing.org/buildings

• Applications accepted until December 31, 2011

• Send to Phillip Kobernick at phillip@responsiblepurchasing.org

• Questions?
  Call us at 510.547.5475
Upcoming RPN Green Building Webinars

- High-performance Lighting Equipment
- Renewable Energy
- Green Cleaning
- Purchasing for LEED EBOM
Questions about RPN?

Phillip Kobernick
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510.547.5475

www.responsiblepurchasing.org
Join RPN
Because Every Purchase Matters.

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<th>Membership Benefits:</th>
<th>Consulting Services:</th>
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<td>▶ Model policies and specifications</td>
<td>▶ Custom green specifications</td>
</tr>
<tr>
<td>▶ Green purchasing webinars</td>
<td>▶ Green purchasing policies</td>
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<tr>
<td>▶ Certified green products database</td>
<td>▶ Life Cycle Analyses</td>
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<tr>
<td>▶ Expert sustainability speakers</td>
<td>▶ Green office audits</td>
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<tr>
<td>▶ Responsible Purchasing Awards</td>
<td>▶ Cost-saving green practices</td>
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www.ResponsiblePurchasing.org