NATIONAL SURVEY OF CII WATER EFFICIENCY PROGRAMS

A Survey of Commercial, Industrial and Institutional (CII) Programs conducted by the AWWA Water Efficiency Programs and Technology Committee

December 18, 2015
Prepared by: Ben Dziegielewski
Purpose of the CII Survey

- To obtain information about common practices, programs, data collection and analytical methodologies currently employed by utilities with active CII programs, and specifically:
  - to identify the design and effects of the existing CII efficiency programs
  - to compile existing principles and practices for planning, implementing, and evaluating CII water use and conservation potential
  - to provide a basis for development of best management practices, educational efforts, and conducting additional research on water use efficiency in the CII sector
Survey of Water Utilities

- Survey Dates: July 27, 2015 to September 2, 2015
- Questionnaire: 53 questions w/skip patterns
- Implementation: SurveyMonkey® (online)
- Response Count: 383 (U.S. — 350, Canada — 33)
- Geographies: 40 states (+DC/Guam)/ 7 Canadian provinces
- Representation: Medium and large size utilities
Overview

- Availability of Conservation and CII Efficiency Programs
- Reasons for Program Adoption and Support
- Selection of Program Participants
- Program Delivery Mechanisms and Incentives
- Efficiency Equipment and Devices
- Promoting Programs to Customers
- Program Evaluation
- Barriers to Participation
- Options to Improve Programs
- Key Findings and Recommendation
Are Conservation/CII Programs Available?
Water Conservation Programs

Q1. Does your utility have a formal water conservation or water use efficiency program?

- Yes: 282
- No: 74
- In Development: 20
- No In-house Program: 4
- Not Active: 3

N = 383
Q7. Does your conservation and efficiency program include subprograms or components directed to the CII subsector?

N = 282

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>81</td>
</tr>
<tr>
<td>No</td>
<td>98</td>
</tr>
<tr>
<td>In Development</td>
<td>21</td>
</tr>
<tr>
<td>Discontinued</td>
<td>4</td>
</tr>
<tr>
<td>No answer</td>
<td>78</td>
</tr>
</tbody>
</table>
Why are Programs Adopted and How are they Supported?
Q2. What are the primary reasons for establishing water conservation or water use efficiency program(s) at your utility?

- Utility stewardship and sustainability: 77%
- Regulatory compliance: 57%
- Reduction of O&M costs and/or energy costs: 30%
- Deferral/avoidance of infrastructure investments: 29%
- Exceeding safe yield of water supply source(s): 26%
- Demand approaching capacity of water treatment: 17%
- Approaching capacity of wastewater treatment: 8%
- Other reasons: 14%

N = 264
Q33 -- What are the primary reasons for not having (or discontinuing) a water conservation and/or CII program?

- CII use is not significant enough to warrant a program: 33%
- Not enough staff: 21%
- Need information on how to establish/maintain a program: 16%
- Not enough funding: 10%
- Other: 19%

N = 205
Adoption of programs is motivated by “stewardship and sustainability” and regulatory compliance.

Non-adoption due to low CII conservation potential and lack of resources.

Allocation of staff and funding are generally low, on average 1 FTE and $1/capita/year or less.

Programs are financed mostly from operating budgets.

Estimated CII program savings up to 3 mgd but frequently less than 1.0 gpcd.

Comment 1: “Not enough time in my day to put a program together.”

Comment 2: “Political sensitivity to providing incentives to for-profit entities.”
Who do the Programs Target?
### Q11 -- What CII sectors are eligible for (or targeted by) your CII conservation and efficiency program(s)?

<table>
<thead>
<tr>
<th>Customer Type</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>All CII customers</td>
<td>74%</td>
</tr>
<tr>
<td>Multifamily customers</td>
<td>23%</td>
</tr>
<tr>
<td>All commercial customers</td>
<td>22%</td>
</tr>
<tr>
<td>All institutional customers</td>
<td>18%</td>
</tr>
<tr>
<td>All industrial customers</td>
<td>16%</td>
</tr>
<tr>
<td>Select groups of CII customers</td>
<td>14%</td>
</tr>
</tbody>
</table>

N=74
Approaches to Select Participants

Q13 -- What approaches does your utility use to target participants or conservation efforts?

- **Largest water users**: 73%
- **Ease of implementation**: 44%
- **Customers with a large dominant end use of...**: 41%
- **High profile customer class (by public...)**: 38%
- **By directive (political or regulatory)**: 28%
- **Through information obtained through...**: 16%
- **Does not use specific approaches to target...**: 16%
- **Other**: 19%

N = 69
Q12 – Eligible (Targeted) CII Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent of Respondents Selecting CII Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government and municipal buildings</td>
<td>90%</td>
</tr>
<tr>
<td>Large landscape areas</td>
<td>86%</td>
</tr>
<tr>
<td>Schools and/or colleges</td>
<td>86%</td>
</tr>
<tr>
<td>Office buildings</td>
<td>82%</td>
</tr>
<tr>
<td>Food and beverage service</td>
<td>81%</td>
</tr>
<tr>
<td>Lodging and hospitality</td>
<td>82%</td>
</tr>
<tr>
<td>Mixed use (commercial and residential)</td>
<td>73%</td>
</tr>
<tr>
<td>Health care facilities</td>
<td>70%</td>
</tr>
<tr>
<td>Laundries and laundromats</td>
<td>67%</td>
</tr>
<tr>
<td>Religious buildings</td>
<td>67%</td>
</tr>
<tr>
<td>Retail outlets</td>
<td>64%</td>
</tr>
<tr>
<td>Manufacturing plants</td>
<td>64%</td>
</tr>
<tr>
<td>Retirement/nursing homes</td>
<td>61%</td>
</tr>
<tr>
<td>Auto service and car washes</td>
<td>60%</td>
</tr>
<tr>
<td>Food and beverage processing</td>
<td>59%</td>
</tr>
<tr>
<td>Public pools and water parks</td>
<td>57%</td>
</tr>
<tr>
<td>Golf courses</td>
<td>56%</td>
</tr>
<tr>
<td>Warehouses</td>
<td>53%</td>
</tr>
<tr>
<td>Justice centers</td>
<td>28%</td>
</tr>
<tr>
<td>Military facilities</td>
<td>15%</td>
</tr>
<tr>
<td>Other</td>
<td>19%</td>
</tr>
</tbody>
</table>

N= 16 - 61

Q12. Rate the degree of success in program participation.

<table>
<thead>
<tr>
<th>Category</th>
<th>Degree of Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools and/or colleges</td>
<td>82</td>
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<tr>
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<td>76</td>
</tr>
<tr>
<td>Lodging and hospitality</td>
<td>74</td>
</tr>
<tr>
<td>Public pools and water parks</td>
<td>68</td>
</tr>
<tr>
<td>Justice centers</td>
<td>67</td>
</tr>
<tr>
<td>Government and municipal buildings</td>
<td>64</td>
</tr>
<tr>
<td>Food and beverage service (restaurants)</td>
<td>62</td>
</tr>
<tr>
<td>Health care facilities</td>
<td>57</td>
</tr>
<tr>
<td>Religious buildings</td>
<td>57</td>
</tr>
<tr>
<td>Golf courses</td>
<td>56</td>
</tr>
<tr>
<td>Food and beverage processing</td>
<td>53</td>
</tr>
<tr>
<td>Office buildings</td>
<td>52</td>
</tr>
<tr>
<td>Laundries and laundromats</td>
<td>50</td>
</tr>
<tr>
<td>Military facilities</td>
<td>50</td>
</tr>
<tr>
<td>Manufacturing plants</td>
<td>49</td>
</tr>
<tr>
<td>Retirement/nursing homes</td>
<td>49</td>
</tr>
<tr>
<td>Auto service and car washes</td>
<td>42</td>
</tr>
<tr>
<td>Warehouses</td>
<td>36</td>
</tr>
<tr>
<td>Retail outlets</td>
<td>29</td>
</tr>
</tbody>
</table>

Degree of Success:
1 = Poor
2 = Fair
3 = Good
4 = Very Good
5 = Excellent
Majority of utilities make all CII customers eligible for their programs

If “targeting” is used, it typically includes the largest water users and/or CII segments offering easy implementation

Most frequently targeted CII customer categories:
- Government & municipal buildings/facilities
- Schools and/or colleges
- Large landscape areas
- Food and beverage service (restaurants)
- Office buildings
- Lodging and hospitality

Comment:
“There are a variety of strategies that work. Often one stakeholder group is particularly active when a new technology comes along. We work with professional associations, with individual property managers, and through general marketing.”
Programs/Incentives Delivered and Equipment/Devices Offered
Delivery Mechanisms/Incentives

Q14. Use of Delivery Mechanisms/Incentives

- Information and education programs: 95% use
- Free surveys and water audits: 88% use
- Free landscape irrigation evaluations: 77% use
- Traditional customer rebates or vouchers: 76% use
- Onsite technical assistance: 69% use
- Conservation rate design incentives: 59% use
- Direct distribution and/or installation: 53% use
- Water budgets: 41% use
- Recycled water incentives: 38% use
- Recognition incentives: 28% use
- Vendor, distributor and contractor...: 12% use
- Efficiency financing options: 6% use
- Other: 0% use

Total respondents: 18

Percent of Respondents Using Mechanism/Incentive

Q14. Rate the degree of success of the delivery mechanisms and/or incentives (1-poor to 5-excellent success)

- Conservation rate design incentives: 90% rate as excellent
- Water budgets: 80% rate as excellent
- Onsite technical assistance: 75% rate as excellent
- Free landscape irrigation evaluations: 70% rate as excellent
- Information and education programs: 65% rate as excellent
- Vendor, distributor and contractor incentives: 60% rate as excellent
- Traditional customer rebates or vouchers: 55% rate as excellent
- Free surveys and water audits: 50% rate as excellent
- Direct distribution and/or installation: 45% rate as excellent
- Efficiency financing options: 40% rate as excellent
- Recognition incentives: 35% rate as excellent
- Recycled water incentives: 30% rate as excellent

Percent of Respondents with Rank >= 3
Takeaways - Delivery Mechanisms/Incentives

- Information and education programs are universally used to promote water conservation.

- Most frequently used mechanisms/incentives:
  - free surveys and water audits,
  - free landscape irrigation evaluations,
  - traditional customers’ rebates

- Top ranked 3 incentives in terms of their success:
  - conservation rate designs,
  - water budgets, and
  - onsite technical assistance

- But all 12 types of incentives were ranked as “3” or higher by more than 70 percent of the respondents.

Comment: Custom rebates are effective. A combination of reasonable regulations, education and incentives works to change practices and equipment over time.
CII Efficiency Equipment

Q15. Use of Efficiency Equipment Groups

- Plumbing fixtures and products: 65%
- Irrigation efficiency products: 59%
- Commercial kitchen equipment: 47%
- Commercial laundry equipment: 42%
- Cooling tower retrofit equipment: 41%
- Process water conversion equipment: 30%

Percent of Respondents

Q15. Ranking of Success of Equipment Groups

- Irrigation efficiency products: 80%
- Plumbing fixtures and products: 71%
- Process water conversion equipment: 61%
- Commercial kitchen equipment: 57%
- Cooling tower retrofit equipment: 50%
- Commercial laundry equipment: 42%

Degree of Success:
1 = Poor
2 = Fair
3 = Good
4 = Very Good
5 = Excellent

Selected Percent of Respondents with Rank >=3
CII Efficiency Devices

Q 15. Use of efficiency devices

- Faucet aerators
- Toilets
- Showerheads
- Pre-rinse spray valves
- Urinals
- Irrigation nozzles and heads
- Irrigation controllers
- High-efficiency clothes washers
- Irrigation sensor devices (SMS)
- Multi-load washers
- Flow control valves
- Drip irrigation equipment
- Connectionless food steamers
- Makeup and blowdown water meters
- Conductivity controllers
- Flow sensors
- High-pressure low-volume sprays
- pH meters
- Irrigation conduit repair/replacement
- Counter-flow washing systems

Percent of Respondents Using Device

Q 15. Rate the degree of success.

- Toilets
- Drip irrigation equipment
- Faucet aerators
- Showerheads
- Urinals
- Irrigation controllers
- Flow sensors
- Irrigation nozzles and heads
- High-efficiency clothes washers
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- Pre-rinse spray valves
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- Counter-flow washing systems
- Flow control valves
- Makeup and blowdown water meters
- pH meters
- Connectionless food steamers
- Conductivity controllers

Degree of Success:
1 = Poor
2 = Fair
3 = Good
4 = Very Good
5 = Excellent

Percent of Respondents with Rank >=3
Takeaways - Efficiency Equipment and Devices

- Plumbing fixtures and irrigation efficiency products
  - most frequently used types of equipment
  - highest success ranks
- Top four most frequently used efficiency devices include:
  - faucet aerators
  - toilets
  - showerheads
  - pre-rinse spray valves
- 50% or more respondents also used: urinals, irrigation nozzles and heads, irrigation controllers, and high-efficiency clothes washers
- Toilets are “universally” successful and prevalent

Comment:
“We do not offer indoor fixtures any longer due to near saturation after many years of free product and installation. We do irrigation smart water management systems for large sites in custom rebates but do not give variances for watering “to ET.” We have had recent acceleration of landscape and irrigation changes in our market with steady drops in irrigation water usage at commercial properties.”
How are Programs Promoted and Evaluated?
Promoting Programs to CII Customers

Q18 -- How does your utility promote programs to CII customers?

- Direct mail: 63%
- Presentations to professional organizations: 61%
- Industry/association meetings and gatherings: 47%
- Customer bill insert: 42%
- Facility manager solicitation: 40%
- Newsletters: 39%
- Telephone solicitation: 35%
- Incentives to CII consultants/firms: 21%
- Other: 29%
Q22 -- How does your utility assess the effectiveness of its CII programs?

- Water savings to customer: 73%
- Participation rates: 71%
- Customer satisfaction and awareness: 65%
- Water savings to utility: 62%
- Financial (payback period, ROI): 48%
- Cost savings: 33%
- We do not assess the effectiveness: 8%
- Other: 5%
Takeaways - Promoting Programs to Customers and Program Evaluation

- Multiple methods to promote programs:
  - Direct mail and presentations to professional organizations
  - Presentations at industry/association meetings
- 70% of respondents use program participation rates and customer water savings to evaluate performance
  - Customer satisfaction and awareness are also important
- 75% of respondents use trend analysis (water use before and after) to measure water savings
- > 50% of respondents use benefit-cost analysis
  - But only 30 percent use cost as a performance criteria

Comment: “We have a total acre foot goal for conservation for the year. In the future we will also be tracking a metric of average bill per CII customer to continue to steady downward trend.”
What are Program Barriers and Opportunities to Improve?
Barriers to Program Participation

Q30. Rate the importance of each Key Barrier to CII program participation.

- Difficulty in customers getting high-level buy-in within organization: 90
- Lack of sufficient capital improvement monies in customers' budgets: 88
- Costs of retrofits to the participant versus incentive offered: 86
- Perception of inadequate return on investment (long paybacks): 80
- Low general interest from customers / lack of programs: 76
- Complexity of upgrade or change: 73
- Smaller customers don't have the time to evaluate options: 71
- Low cost of water and wastewater services: 66
- Investing in energy efficiency first: 63
- Legal/ownership/landlord-tenant restriction: 61
- Customer perception of product performance: 50
- Customers perceive too many bureaucratic hurdles to participation: 50
- Technology not proven/available: 37
- Other: 67

Ratings:
1 = Unimportant
2 = Slightly Important
3 = Important
4 = Very Important
5 = Critical

Percent of Respondents Ranking =>3

28
Takeaways - Barriers to Implementation

- Ten different barriers were rated as “important,” “very important” or “critical” by more than 60% of respondents.
- Potential barrier of “technology not proven/available” received the lowest score (least important).
- The key barriers are not technological but financial and economic or related to the lack of commitment to achieving water-use efficiency:
  - Difficulty in customers getting high-level buy-in within their organizations.
  - Lack of sufficient capital improvement monies in customers’ budgets.
  - Costs of retrofits to the participant versus incentive offered.

Comment:
“The majority of businesses are not water account customers, and as such, they do not receive a utility bill directly. Many businesses occupy a unit in a larger complex, as with retail, office, shopping centers, and medical buildings. In addition, most businesses are not directly responsible for managing their outdoor water use.”
Suggestions to Improve CII Programs

Q31. Please indicate how you think your utility's CII program could be improved?

- Improve marketing/outreach strategies: 69%
- Change value of incentive: 49%
- Additional examples/case studies demonstrating ROI and performance: 39%
- Change type of incentive: 34%
- Make simpler/streamline/less paperwork: 29%
- Move to online submission of forms vs. paper: 20%
- Other: 15%

N = 59
Takeaways - Options to Improve Programs

- 70% believe their utility's CII program could be improved by refining their marketing and outreach strategies
  - Direct mail and presentations to professional organizations
  - Presentations at industry/association meetings
- Many wished to change (presumably increase) the value of incentives
  - Costs of retrofits to the participant versus incentive offered
- Survey responses and comments point out the need for:
  - Additional examples/case studies
  - Streamlining of CII custom rebates
  - Creating standardized incentive descriptions and program names for utility adoption

Comment:
Need for “case studies that can be used as ‘cookie-cutter’ basis for rebates, i.e. upgrade of condenser in x type of business saves x gpd and costs about x, so rebate should be X. It means customer doesn’t need to track down all that data and flat rebate is defined, so as long as they can show invoice for work that exceeds rebate amount - done.”
Key Findings/Observations and Recommendations for Future Work
Key Findings and Observations

1. Water conservation and improvements in water-use efficiency generally accepted among water utilities.
   - Availability of CII water conservation/water efficiency programs <20%
   - Availability of staff and budgets to support CII programs is low.

2. Although utilities typically target the largest water users, the most frequently targeted CII categories include:
   - Government and municipal buildings
   - Large landscape areas
   - Schools and colleges
   - Also, office buildings, restaurants and hotels

3. Information/education programs are universally used alongside
   - free surveys and audits / landscape irrigation evaluations
   - traditional customer rebates
Key Findings and Observations, cont.

4. CII programs tend to focus on indoor fixtures/domestic uses.
   ▶ The complexity of some CII end uses likely affects the nature of the equipment and incentives used in the design of the CII programs
5. Approaches used to evaluate program success focus on water savings to customers and participation rates.
6. Data on CII facilities useful for evaluating program success are obtained directly from customers and less frequently from external sources.
7. Expansion water conservation/efficiency programs to include CII customers must confront a number of barriers:
   ▶ Difficult obtaining a high-level buy-in within customer organizations
   ▶ Lack of sufficient capital improvement monies in customers' budgets
   ▶ Inadequacy of incentives offered relative to costs to the participant
Recommendations

1. “Streamlining” or “standardizing” program design and implementation
   ▶ To enhance adoption of CII efficiency programs by utilities.

2. More data is needed on costs and expected/achieved water savings from water-efficient equipment found in CII sector
   ▶ To help inform CII program design and build customer demand.

3. A follow-up research should be undertaken to collect program-specific information about existing CII efficiency programs
   ▶ To help better understand and overcome perceived barriers and utility recommendations for program improvements.

4. Future surveys of utility CII Efficiency programs should explore the reasons for selection of program participants, delivery mechanisms/incentives and efficiency devices and equipment.
AWWA Water Efficiency Programs and Technology Committee (WEPTC)

- Lindsey Geiger, AWWA Project Manager
- Lauren Wasserstrom, AWWA Project Manager
- Lisa Krentz, Hazen & Sawyer, Project Manager
- Veronica Blette, U.S. EPA, Project Manager
- Bill McDonnell, Metropolitan Water District of Southern California
- Frank Kinder, Colorado Springs Utilities
- Kent Sovocool, Southern Nevada Water Authority
- Mary Ann Dickinson, Alliance for Water Efficiency
- Robert Wanvestraut, South Florida Water Management District
Thank you

For more information please contact:

Lindsey Geiger, AWWA Project Manager, American Water Works Association
lgeiger@awwa.org
Lisa Krentz, WEPTC Chair and Project Manager, Hazen & Sawyer
lkrentz@hazenandsawyer.com
Veronica Blette, WEPTC Project Manager, US EPA
Blete.Veronica@epa.gov