

- **Board of Directors**  
**Water Planning and Stewardship Committee**

July 8, 2008 Board Meeting

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9-2

## **Subject**

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Review Potential Refinements and Additions to Metropolitan's Conservation Program

## **Description**

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A team of member agency and Metropolitan staff have assessed opportunities for updating Metropolitan's conservation measures through the Annual Program Review process. This letter reviews candidate actions that could lead to new incentives and refinements. The benefits of the refinements include increasing water savings and improving the effectiveness of Metropolitan's existing water conservation programs.

### **Annual Program Review Process**

Staff convened a Project Advisory Committee (PAC), comprised of member agency and retail agency conservation coordinators and Metropolitan staff, to develop recommendations for updating Metropolitan's conservation programs. The PAC met regularly over the past five months and reviewed more than 20 potential new devices and program refinements. The following criteria were used to assess potential additions:

- Reliable estimates of water savings
- Cost-effectiveness of the potential incentive
- Regional supply potential

Based on these criteria, the new devices and refinements listed below and described further in [Attachment 1](#) were evaluated to have high potential for inclusion in Metropolitan's core conservation rebate programs. Potential refinements that require more work with the member agencies are included in [Attachment 2](#). Items deferred by the PAC are listed in [Attachment 3](#).

### **New Device Incentives**

The following potential new device incentives, which are described further in [Attachment 1](#), would augment Metropolitan's current conservation programs:

Ice-making machines – \$300 per device (based on \$195 per AF) for high-efficiency, air-cooled commercial ice-making machines with average lifetime savings of 1.5 acre-feet per machine;

Central computer irrigation controllers – \$630 per acre (based on \$195 per AF) for commercial central computer irrigation controllers with average lifetime savings of 3.2 acre-feet per acre.

### **New Pilot Program**

The PAC assessed the potential for a turf replacement pilot program designed to showcase alternatives to traditional lawns. Metropolitan could offer incentives to homeowners and businesses that replace lawns with low-water use landscapes that are consistent with California Friendly® criteria. Implementation guidelines would be developed in consultation with the member agencies. Under existing policy, Metropolitan could offer an incentive of \$0.25 per square foot (based on \$195 per AF). However, staff believes that an incentive of \$1.00 per square foot, four-times the calculated incentive, would be necessary to obtain a meaningful customer response. The pilot would be capped at \$5 million, split evenly between homeowners and businesses.

## **Program Refinements**

The PAC also supports the following program refinements, which are described further in [Attachment 1](#):

Research and development programs – Metropolitan would combine the existing Enhanced Conservation Program (ECP) and Innovative Conservation Program (ICP) into annual programs offered under one competitive grant package. The ECP provides funding for research into new implementation approaches and is limited to member agencies. The ICP provides funding to conduct analysis of potential savings from new devices and is open to any applicant. The change would help reduce confusion over the timing and differences between the two programs, while increasing Metropolitan's responsiveness to member agency and third-party research requests. There is no proposed change in annual funding amounts.

High-efficiency toilet incentives – Metropolitan would offer incentives only for high-efficiency toilets that meet EPA WaterSense performance standards and phase out commercial ultra-low-flush toilet rebates of \$60 per device. Relying on WaterSense-certified high-efficiency toilet lists frees Metropolitan from the expense of generating and updating lists of qualified devices, and ensures Metropolitan's incentive goes towards reliable, high-performing toilets. Phasing out the commercial ultra-low-flush toilet (1.6 gallons per flush) incentive would allow Metropolitan to focus efforts on high-efficiency toilets (1.2 gallons per flush).

X-ray water recirculation device incentives – Metropolitan would phase out the x-ray water recirculation device incentive of \$3,120 per unit, since most medical practices are now converting to digital x-ray machines that do not require potable water.

## **Accelerated Public Sector Water Efficiency Partnership Demonstration Program**

The Public Sector Program, launched in August 2007, is designed to overcome barriers to conservation unique to government and public agencies. Response to the program has been robust, with applications exceeding the program budget of \$15 million. Based on information gathered from the member agencies, the program could exceed the initial savings estimates if the funding level is increased, which would allow more agencies to participate in the program and help the region achieve extraordinary conservation under the Water Supply Alert. Staff is currently performing a full assessment of the program and funding needs for the Board to consider.

## **New device incentives and program refinements requiring additional evaluation**

There is a high level of interest in soil moisture sensors and rain shut-off devices, which are currently undergoing performance testing by the Irrigation Association. Staff would return for board consideration after the performance testing is completed and when qualified products are available in the market place.

Other refinements that require additional work with the member agencies prior to board consideration are described in [Attachment 2](#) and include:

- Melded rebates of \$100 per unit for high-efficiency toilets with no pre-inspection of existing units;
- Improved implementation guidelines for commercial landscape surveys; and
- Conversion of commercial weather-based irrigation controller incentives from acre-based to valve-based measurements equivalent to \$630 per acre-foot.

## **Savings and Costs**

The new ice-making machines and central computer irrigation controllers have the potential to generate 440 acre-feet per year and 4,400 acre-feet lifetime savings at a cost of about \$850,000 after five years of implementation. The turf replacement pilot program could save 675 acre-feet per year and 6,750 acre-feet of lifetime savings after five years of implementation, and would cost \$5 million over the next three years if pursued.

## **Next Steps**

Staff will continue to work with the PAC and with the member agency managers through the Five-Year Supply Plan to develop final recommendations for the Board to consider. Staff may also bring other refinements and

recommendations resulting from the work on the Five-Year Supply Plan to the Board to respond to the Water Supply Alert condition.

**Policy**

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By Minute Item 47165, dated July 10, 2007, the Board authorized refinements to Metropolitan's water use efficiency programs

By Minute Item 46733, dated August 15, 2006, the Board authorized upgrades to the commercial and landscape water efficiency programs.

By Minute Item 46472, dated December 13, 2005, the Board set the incentive amount at \$195/AF of water conserved not to exceed 100 percent of product cost or one-half of a program cost.

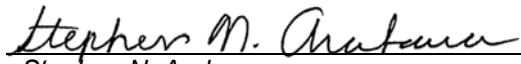
By Minute Item 45208, dated February 11, 2003, the Board adopted policy principles regarding water conservation activities

By Minute Item 37324, dated September 13, 1988, the Board adopted the Conservation Credits Program.

**Financial Impacts**

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The financial impacts could be \$1 million to \$6 million over three to five years depending on which additions and refinements are pursued.

  
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Stephen N. Arakawa  
Manager, Water Resource Management

6/25/2008  
Date

  
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Jeffrey Kightlinger  
General Manager

6/26/2008  
Date

**Attachment 1 – Conservation Program and Device Enhancements**

**Attachment 2 – New Incentives and Refinements Requiring Additional Evaluation**

**Attachment 3 – Deferred Items**

## CONSERVATION PROGRAM AND DEVICE ENHANCEMENTS

Through the Annual Program Review process, a Program Action Committee (PAC) of member agency conservation coordinator volunteers and Metropolitan staff met regularly to refine Metropolitan's conservation programs and incentives. The following potential refinements were developed by the PAC and summarized below.

### New Device Incentives

#### Ice-making machines (For retrofit and new construction)

Commercial ice-making machines are used extensively in the food service industry, hotels, hospitals, and for numerous other commercial and industrial applications. Ice-making machines use either air or water to remove the heat generated during the refrigeration process. Water-cooled ice-making machines are typically single-pass and use significant amounts of potable water, but older air-cooled machines may also use water inefficiently in the ice-making process. Metropolitan would offer \$300 for the installation of new machines that meet the Consortium for Energy Efficiency (CEE) Tier III standard, based on an average savings over water-cooled and inefficient air-cooled machines. The Tier III standard will ensure the machines reliably save water as well as energy. Ice-making machines cost between \$1,200 and \$5,000+ depending on the size and type of machine. Metropolitan's incentive would complement energy industry incentives for Tier III ice machines of between \$100 and \$500 per machine.

#### **Ice-Making Machines**

**Water Savings Study:** The PAC relied on research studies and data from the Food Service Technology Center, the Air-Conditioning and Refrigeration Institute and the California Urban Water Conservation Council.

**Cost-Effectiveness of Incentive:** Metropolitan's incentive, combined with energy incentives of \$100 to \$500 would pay for between 15% to 33%+ of the cost of a new machine.

**Regional Savings Potential:** According to a recent study, the existing number of ice machines in the service area is approximately 90,000 distributed among commercial establishments, leading to a high savings potential.

#### **Incentive Calculation**

Average savings for CEE Tier III ice machines: 50,300 gallons per year = 0.154 AF per year

Average device life = 10 years

Average lifetime savings = 1.54 AF

Calculated incentive at \$195 per AF = 1.57 AF \* \$195 = \$301= Round to \$300 per machine

#### **Savings Calculation**

Assume 150 machines per year over 5 years = 750 machines

Annual savings = 750 x 0.154 AF = 116 AFY

Lifetime savings = 750 x 1.54 AF = 1,157 AF

#### Central Computer Irrigation Controllers (For retrofit and new construction)

Central irrigation controllers are used for managing water use at very large commercial landscapes such as golf courses. They incorporate the benefits of weather-based irrigation controllers and other advanced control features. Metropolitan would offer a rebate of \$630 per acre, consistent with the water savings calculations for weather based irrigation controllers. Central controllers can cost \$50,000+ depending on the size and type of installation. Metropolitan's incentive would cover the various components relating to central controllers such as the controller, software, communication devices, weather stations, enclosures, and other equipment.

### **Central Computer Irrigation Controllers**

**Water Savings Study:** The PAC relied on prior evaluations of commercial irrigation controllers based on data from the Municipal Water District of Orange County, Los Angeles Department of Water and Power, and the Irvine Ranch Water District.

**Cost-Effectiveness of Incentive:** At \$630 per acre, Metropolitan's incentive could pay for between 15% to 40%+ depending on the cost of the controller and landscape area.

**Regional Savings Potential:** Central computer irrigation controllers could be used at golf courses, parks, homeowner associations and other large landscape or multiple-site applications across the service area.

#### **Incentive Calculation**

Average annual savings = 0.323 acre-foot per acre per year

Average device life = 10 years

Average lifetime savings = 3.23 acre-feet per acre

Calculated incentive at \$195 per AF =  $3.23 * \$195 = \$630$  per acre

#### **Savings Calculation**

Assume 2 controllers per year over 5 years = 10 units

Assume average acre per controller = 100 acres x 10 units = 1,000 acres (after five years)

Annual savings = 1,000 acres x 0.323 AFY = 323 AFY

Lifetime savings (10 year life) = 10 years x 323 AF = 3,230 AF

### **New Pilot Program**

In addition to device changes, the member agencies strongly supported pilot testing a turf replacement program with residential and commercial sector applications.

#### California Friendly<sup>®</sup> Thousand Yard Turf Replacement

Metropolitan would test a residential turf replacement incentive offering \$1.00 per square foot for replaced turf, with a potential maximum of 2,500 square feet per residence.

#### California Friendly<sup>®</sup> Commercial Turf Replacement

Metropolitan would test a turf replacement incentive for the commercial, industrial, and institutional sector offering \$1.00 per square foot for replaced turf, with a potential maximum of 10,000 square feet per property.

Using Metropolitan's \$195 per acre-foot incentive level, the incentive would be \$0.25 per square foot based on average savings of 44 gallons per square foot per year. However, the PAC considered temporarily increasing the incentive to \$1.00 per square foot in order to provide a meaningful incentive and to respond to the call for extraordinary conservation. The enhanced incentive would be four times Metropolitan's current policy. Staff would seek input from the member agencies on developing program requirements and implementation guidelines. Metropolitan could potentially cap the residential pilot test at 2.5 million square feet and the commercial pilot test at 2.5 million square feet.

### **Turf Replacement Program**

**Water Savings Study:** The PAC relied on savings data from existing turf replacement programs from the North Marin Water District and Southern Nevada Water Authority.

**Cost-Effectiveness of Incentive:** At \$1.00 per square foot, Metropolitan's incentive could pay for between 20% to 40% of the cost to the consumer for retrofitting existing landscape.

**Regional Savings Potential:** A regional pilot program capped at \$2.5 million for residential and \$2.5 million for commercial could save approximately 6,720 acre-feet lifetime at \$1.00 per square foot. Regionally, between 30% to 70% of single family water use is for outdoor irrigation.

#### **Incentive Calculation**

Average savings = 44 gallons per square foot per year

Average landscape life = 10 years

Average lifetime savings = 440 gallons per square foot

Calculated incentive at \$195 per AF: 440 gallons / 325,851 gallons per acre-foot = ~ \$0.25 per square foot

Recommended incentive: \$1.00 per square foot = ~ 4 x standard rate

#### **Savings Calculation**

Residential: 2,500,000 square feet retrofitted over 3 years ~ 338 acre-feet per year at \$1.00 per square foot

Commercial: 2,500,000 square feet retrofitted over 3 years ~ 338 acre-feet per year at \$1.00 per square foot

Total annual savings after 3 years = 675 acre-feet per year

Total lifetime savings (10 year life) = 6,750 acre-feet

### **Program Refinements**

The PAC also strongly supported these refinements to Metropolitan's incentives:

#### Research and development programs

Metropolitan would combine the Enhanced Conservation Program (ECP) and Innovative Conservation Program (ICP) competitive grant programs into one commonly managed request for proposals offered once a year. This would help reduce confusion over the timing and differences between the programs while increasing Metropolitan's responsiveness to member agency and third-party research requests. Metropolitan would also benefit from improved administrative efficiency. The funding levels and eligibility guidelines for each program would remain the same.

#### **Research and Development Programs**

**Water Savings Study:** Combining the ECP and ICP could increase the research available for evaluating new technologies and conservation approaches.

**Cost-Effectiveness of Refinement:** Managing the programs together could increase the efficiency and reduce confusion over the programs. The current programs are offered in alternate years under the following guidelines:

- Innovative Conservation Program: \$0.5 million every two years; open to all entities
- Enhanced Conservation Program: \$4.0 million every two years; open to member agencies

**Regional Savings Potential:** Offering the programs annually could help identify more potential devices and refinements for Metropolitan's existing programs.

#### Phase out commercial ultra-low-flush toilet retrofit incentives

Metropolitan's incentives for residential ultra-low-flush toilets (1.6 gallons per flush) will sunset in December 2008. Most large water agencies across the state and member agencies within Metropolitan's service area have also stopped rebating 1.6-gallon devices. Phasing out this incentive would allow Metropolitan to focus efforts on high-efficiency toilets. This refinement would establish a sunset date of July 1, 2009 for offering

commercial ultra-low-flush toilet incentives. The extra time allows for member agencies and retail agencies to transition ongoing programs.

#### **Phase Out Commercial Ultra-Low-flush Toilet Incentives**

**Water Savings Study:** Based on reported activity, most member agencies have stopped rebating on ultra-low-flush toilets (31 gallons per day) with less than 4,000 retrofitted over the past year.

**Cost-Effectiveness of Refinement:** Phasing out the incentive will allow Metropolitan and the member agencies to focus marketing efforts on high-efficiency toilets (1.2 gallons per flush).

**Regional Savings Potential:** This refinement will have minimal impacts to regional savings while streamlining Metropolitan's incentive programs.

#### EPA WaterSense list for high-efficiency toilets

The EPA, through its WaterSense program, tests water-conserving devices for reliability and performance. Metropolitan would only provide incentives for high-efficiency toilets that pass the EPA's WaterSense performance criteria. This will ensure that Metropolitan's incentives go towards toilets with reliable performance, and relieve Metropolitan from maintaining a list of approved devices.

#### **EPA WaterSense List for High-Efficiency Toilets**

**Water Savings Study:** Metropolitan would only offer rebates on EPA WaterSense-qualified toilets, ensuring the devices perform well and save 6 gallons per day over ultra-low-flush toilets and 37 gallons per day over non-conserving toilets.

**Cost-Effectiveness of Refinement:** Using EPA WaterSense list frees Metropolitan from generating and updating lists of qualifying high-efficiency toilets.

**Regional Savings Potential:** This refinement will help ensure Metropolitan's high-efficiency toilet incentive goes towards products that have a high savings potential across the region and in different water use sectors.

#### Phase out x-ray recirculation devices

Digital X-Ray machines are replacing film-based x-ray machines in the marketplace, leading to low participation in this incentive. The current \$3,120 incentive per device, based on 16 acre-feet of lifetime savings, would not be a meaningful incentive for digital x-ray machines, which typically cost more than \$200,000. Metropolitan would phase out the incentive on July 1, 2009 to allow member agencies and retail agencies time to adjust their conservation plans.

#### **Phase Out X-Ray Recirculation Devices**

**Water Savings Study:** X-Ray recirculation devices save 16 acre-feet of lifetime water savings. Over the past two fiscal years there has been no activity for this incentive due to digital machines replacing film-based machines.

**Cost-Effectiveness of Refinement:** Phasing out the incentive will allow Metropolitan and the member agencies to focus marketing efforts on other commercial incentives and avoid incentive payments of \$3,120.

**Regional Savings Potential:** X-ray technology is evolving from film-based technology to digital technology, generating additional savings automatically.

## NEW INCENTIVES AND REFINEMENTS REQUIRING ADDITIONAL EVALUATION

Through the Annual Program Review process, a Program Action Committee (PAC) of member agency conservation coordinator volunteers and Metropolitan staff met regularly to refine Metropolitan's conservation programs and incentives. The following devices and refinements either require further work with the member agencies or must pass Irrigation Association performance tests before board consideration.

### Devices

#### Soil moisture sensor irrigation controllers

Soil moisture sensors automatically adjust landscape irrigation schedules based on measurements of moisture in the soil. Like weather-based irrigation controllers, they ensure landscapes are not over-watered compared to evapotranspiration requirements. Soil moisture sensors are currently being tested by the Irrigation Association to develop a qualified list of devices that meet stringent performance requirements. The PAC showed a strong interest in adding this device to Metropolitan's incentive program. Once the testing is complete and a qualified list of devices is available, staff would bring this device for board consideration and potentially offer incentives for residential and commercial applications.

#### Rain shut-off devices for irrigation controllers

Rain shut-off devices turn irrigation controllers off when a certain level of rain is detected, and will typically interrupt the regular schedule for a day or more depending on the device. The shut-off devices complement automatic controllers already installed, including some of those that are weather based. Rain shut-off devices are currently being tested by the Irrigation Association to develop a list of devices that meet stringent performance tests. The PAC showed a strong interest in adding this device to Metropolitan's incentive program. Once the testing is complete and a qualified list of rain shut-off devices is available, staff would propose incentives for the Board to consider.

### Program Refinements

High-Efficiency Toilet incentives - Metropolitan currently offers high efficiency toilet (HET) incentives of \$30 for replacing ultra-low-flush toilet (ULFT) that use 1.6 gallons per flush and \$165 for replacing non-conserving toilets that use at least 3.5 gallons per flush. The two-level incentive is difficult to administer efficiently because it is expensive to verify what toilet is being replaced - over \$10 per toilet - and customers are frequently unable to distinguish between different types of toilets. Without pre-inspections, the potential for issuing \$165 incentives for toilets that only qualify for the \$30 upgrade is high.

The PAC considered an option of adding a melded rate of \$100 for retrofits without pre-inspections while still allowing the \$165 incentive with pre-inspections performed by the member agencies. However, the melded rate of \$100 raises issues with pre-existing member agency contracts based on the \$165 incentive and the appearance of lowering the incentive in a dry year. The PAC also considered temporarily increasing the melded incentive to \$165 without pre-inspections. Based on an estimate of the number of ULFTs in the service area, a melded rate of \$100 per toilet would be consistent with \$195 per acre-foot, while a rate of \$165 per toilet would be equivalent to \$330 per acre-foot. Because of member agency concern over the melded rate being lower than \$165, staff will continue to assess options for resolving this issue and develop a solution for the Board to consider. The calculation for the melded incentive of \$100 is contained in Table 1. The melded incentive would be updated periodically using this calculation.



Table 1. High-Efficient Toilet Melded Rate Calculation

<b>HET Melded Incentive Calculation</b>			
<b>1</b>	<b>Total Toilet Stock</b>		
	Total Households	5,973,000	
	Toilets per Households		2
	<b>Total Toilet Stock</b>	<b>11,946,000</b>	
<b>2</b>	<b>Pre-1992 Toilets (original)</b>		
	Total Households	5,212,000	
	Toilets per Household		2
	<b>Total Pre-1992 Toilet Stock</b>	<b>10,424,000</b>	
<b>3</b>	<b>Active ULFTs</b>		<b>2,500,000</b>
<b>4</b>	<b>Code-Based New Construction</b>		
	Total Toilets	11,946,000	
	Total Pre-1992 Toilets	10,424,000	
	<b>Total New Construction ULFTs</b>	<b>1,522,000</b>	
<b>5</b>	<b>Code-Based Natural Replacement</b>		
	Total Pre-1992 Toilets	10,424,000	
	- Active ULFTs (3)	2,500,000	
	Total Pre-1992 Toilets	7,924,000	
	<b>Replacement Rate</b>		<b>2%</b>
	Plumbing Code Years (2008 - 1992)		16
	<b>Total Natural Replacement ULFTs</b>	<b>2,188,600</b>	
<b>6</b>	<b>ULFT Saturation Rate</b>		
	Total ULFTs (3+4+5)	6,210,600	
	Total Toilets	11,946,000	
	<b>ULFT Saturation Rate</b>		<b>52%</b>
<b>7</b>	<b>Incentive Calculation</b>		
	HET Rebate (Non ULFT) - 38 gallons per day	\$165	<b>48%</b>
	HET Upgrade (Existing ULFT) - 7 gallons per day	\$30	<b>52%</b>
	HET Melded Rebate - 22 gallons per day	\$95	
	<b>Round to</b>	<b>\$100</b>	

Commercial landscape survey incentive

Metropolitan currently offers a commercial landscape survey incentive of \$215 per acre, based on \$195 per acre-foot for two years of savings resulting from the surveys. Survey recipients are subsequently barred from receiving device incentives of \$630 per acre for two years to avoid double payment of the same savings. The PAC identified the practice of preventing customers from receiving device incentives after receiving surveys as a barrier to achieving greater savings, and considered a number of options for resolving this issue. Staff will continue to work with the member agencies to resolve this issue.

Commercial Landscape Incentives

This potential refinement would convert commercial landscape incentives for irrigation controllers from an acre-based incentive to a valve-based incentive equivalent to \$630 per acre to simplify implementation. Measurement of property acreage is time-consuming and expensive versus verifying numbers of valves. Staff will work with the member agencies to collect landscape information to calculate the valve-based incentive consistent with the average number of valves-per-acre in the service area. The amount of savings would remain unchanged; however the incentive implementation would be simplified, leading to reduced staff time and greater efficiency in managing landscape programs.

### DEFERRED ITEMS

The following table describes devices and refinements that were considered by the PAC but deferred due to failing to pass one or more of the evaluation criteria. The PAC recommended that several devices be referred to the Innovative Conservation Program (ICP) or Enhanced Conservation Program (ECP).

Device / Refinement	Description	Cause for Deferral / Comment
Automatic flushing devices	Commercial dual-flush valves with automatically determined flush volumes	Lack of reliable savings study; recommended for ICP or ECP study
Irrigation pressure regulation devices	Controls irrigation system pressure to increase irrigation efficiency	Lack of reliable savings study; several national studies underway; strong interest from PAC
Rain barrels	Captures storm-water runoff from roofs for subsequent irrigation uses	Potential incentive not cost-effective and low regional savings potential; opportunity to partner with storm water agencies;
Sani-floors	Replaces rubber mats used in commercial kitchens which are rinsed by hose	Lack of reliable savings data; potential ICP or ECP study
Greywater and cistern systems	Systems that reuse certain household water streams for toilet flushing or irrigation use	Lack of reliable savings study and regional savings potential limited by state and local regulation; current ICP studies underway
Dishwashers	Residential and commercial dishwashers	Potential incentive not cost-effective
Commercial blender rinsing devices	Reduces water use for rinsing commercial blenders	Lack of reliable savings study; recommended for ECP study
Faucet flow control valves	Plumbing fixtures that reduce faucet flow rates	Potential incentive not cost-effective
Toilet leak prevention devices	Technology that senses and stops toilet leaks	Lack of reliable savings study; recommended for ICP study
Knee-operated faucet controls	Technology allowing operation of faucets using knees	Lack of reliable savings study
Hot water recirculation devices	Residential devices that reduce faucet use related to waiting for hot water	Latest ICP savings study not conclusive
Holistic residential landscape program	Offer incentives for landscape beyond devices such as design, plants and installation	Lack of reliable savings study, current ECP study underway