INLAND EMPIRE UTILITIES AGENCY

REGIONAL WATER USE EFFICIENCY

BUSINESS PLAN 2015–2020

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Section 1 – Executive Summary

Introduction

Inland Empire Utilities Agency (IEUA) and its regional water use efficiency (WUE) partners actively strive to increase regional sustainability through the development of local water supplies and reduced dependence on costly and increasingly unreliable imported water.

These efforts focus on using water more efficiently, eliminating water waste, and drought proofing the region through increased use of recycled water, groundwater, storm water and other local water supplies.

Water use efficiency is universally regarded as the most cost effective method in which to reduce water demand. As such, the region has heavily invested in water use efficiency initiatives over the years.

Water Conservation VS Water Use Efficiency

There is a major difference between ***water conservation*** and ***water use efficiency*** and it is important to understand the dissimilarity.

The objective of this plan is ***not*** to focus on ***water conservation*** with its short-term focus on current emergency conditions. This approach will not provide sustainable savings. As drought restrictions are lifted, per capita water use will gradually rebound upwards, although not as high as previously levels, as people breath a sigh of relief that the crisis is over and return to life as usual.

Instead the regional goal is to achieve ***water use efficiency,*** a sustainable reduction in water use, by creating a new resource value for water in the eyes of the end user.

For the most part, customers do not yet "get" water use efficiency. They believe that they're using water efficiently because they only water when requirements allow or don't wash their car. The State and the region must create a new reality about reasonable water usage for customers and show them the path to achieving it.

Optimizing Results

Traditional Water Use Efficiency (WUE) efforts characteristically offer programs to all customers without regard to their efficiency level. Often these program respondents are more sophisticated and aware of efficiency methods and measures – and are actually some of the most efficient users in the system.

The actual target should ***not be the "general responders"***, but instead, ***the inefficient water users***. To hit these target customers, the more sophisticated and effective strategies employ the rigorous use of data and analytics from GIS mapping, satellite imaging and disciplined water budget protocols, along with diligent measurement to ensure results. The results are broader and longer lasting across all market segments.

State Efficiency Standards Effectively Facilitate WUE

IEUA supports the reasonable and efficient use of water as defined by State standards. By creating broadly stated, but absolute, standards, the regional WUE partners can design programs that are tailored specifically to their customer base.

State water use efficiency standards are imbedded in both the SB X7-7 – requiring 20 percent per capita water use reduction by 2020 and Assembly Bill 1881, the Model Water Efficiency Landscape Ordinance (MWELO). Indoor efficiency is deemed to be 55 gallons per person per day (55 GPCD). Outdoor efficiency is levels are set at 80% of the local ET for existing landscapes.

This standard is supported by numerous agencies because it:

- Offers a more equitable method for considering conservation levels during drought.
- Will enable the State to consolidate the various conservation codes or actions into a single, impartial measurement.
- Provides a clear message to the public about what a reasonable amount of water to use is given their local conditions.
- Creates a single water management tool where efficiency targets can be ratcheted up or down as needed.

The use of water efficiency performance-based standards provides the foundation for more efficient regional and statewide water use that improves the resiliency of California's water supplies as we deal with population growth, future droughts and the serious impacts of climate change.

The Regional Water Use Efficiency Business Plan

The objective of the Regional WUE plan is to deliver a prolonged, increased level of water efficiency for a price far less than the region's cost to purchase water. To accomplish this, it is recommended IEUA and its regional partners seek out inefficient water use customers, educate them about WUE attainment, and provide a "road map" to accomplish this.

To create the WUE Business Plan, a thorough review of current, past and potential new programs was conducted, with calculations performed for costs, savings and overall benefits to the region. In addition, there was an evaluation of developing WUE trends, including emerging technologies such as Budget-Based Water Rates and Customer Engagement Software and Analytics. Potential Metropolitan Water District's (MWD) WUE funding availability and potential grants were additionally factored into the evaluation. A portfolio of recommended programs is presented in the WUE Business Plan. These are directly quantifiable and provide cost-effective water savings below the region's cost to purchase water from Metropolitan Water District.

It is important to recognize that IEUA's member agencies may elect to modify the design of one or more of the programs presented in the WUE plan. Each agency may choose to participate in all programs or opt in for a limited number only. IEUA will collaborate with all of the member agencies to continually evaluate and modify the plan to meet the goals and objectives of the region.

While it is up to each member agency to determine their specific course of action, IEUA encourages each agency to adapt new approaches and new technologies in order to increase the collective knowledge of *where* and *how* to best help end-users to use water efficiently and to keep water bills affordable.

Water Reduction Goals and Regulatory Compliance

The Regional Water Use Efficiency Business Plan is to be used as a blueprint to help the region to plan and implement WUE activities and programs over the next five years. The strategies and programs included in the plan are designed to meet the requirements of the:

- Assembly Bill 1420 Statute requiring BMP compliance
- SB X7-7 requiring 20 percent per capita water use reduction by 2020
- Governor's Executive Order and Emergency Regulation mandating a 25 percent statewide reduction in water use including individual targets set for each agency

Table 1 on the following page highlights these regulatory statues, their general requirements, the local approach to meeting the requirements and the current status.

WUE Regulatory Compliance Requirements

Table 1: WUE Regulatory Compliance

Regulatory Statute	Requirements	Approach	Status
Assembly Bill 1420	Mandatory BMP Compliance.	Lines up with actions taken to meet CUWCC BMP compliance	In compliance – requirement sunsets July 1, 2016.
20x2020 (SB X7-7)	Reduce per capita water use by 10% by 2015. AND Reduce per capita water use by 20% by 2020.	By implementing active WUE programs and policy Initiatives the Regional Alliance is projected to be on track to meet per capita reduction goals.	2015 Target = 226 2015 Reported = 188 2020 Target = 201 2020 Projected = 182
Governor's Executive Order Regulations	Mandatory statewide reduction of 25% of residential per capita water use. Each agency assigned local target of 4 – 36%.	Implement active WUE programs, enforce mandatory watering days and eliminate water waste.	Most agencies at or near mandated %. Collective % Goal = 28% Collective % Saved = 29.5%

The region is in compliance with the AB 1420 BMP requirements. Most agencies are currently at or near mandated conservation levels under the Governor's Executive Order. It is also expected that the region will exceed the 20x2020 goal. This will be accomplished through regional and local actions utilizing:

- **Water Use Efficiency Active Programs** – offering customers a program portfolio with cost-effective water efficiency measures,
- **WUE Passive Policy Initiatives –** including building codes and landscape ordinances,
- **Recycled Water Supply** – reducing demand for potable water by increasing recycled water supply.

Table 2 on the following page shows the anticipated GPCD reduction from the WUE activities and recycled water supply. The 2020 GPCD reduction estimates from WUE activities is shown as a range to represent the reduction with and without Budget-based Water Rate implementation. It is estimated that with 2 agencies implementing Budget-based Water Rates will represent a GPCD reduction of 11 by 2020 and without any agencies implementing the new rate it will be a reduction of 6.

Impact of WUE Activities and Recycled Water Supply

Table 2: Impact of WUE Activities and Recycled Water Supply

	YEAR	
	GPCD Reduction by 2015	**GPCD Reduction by 2020**
Projected GPCD reduction from WUE Active and Passive Activities	3	6 – 11*
Projected GPCD reduction from Recycled Water Supply	21	35
TOTAL Projected GPCD Reduction	24	41 – 46*
10 Year Baseline GPCD	**251**	
Regional GPCD Target	226	201
Regional GPCD Projected Achievement**	188	169 – 174*

**Range represents GPCD reduction with and without Budget-based Water Rate implementation.*
*** 2015 GPCD numbers are reported actuals*

In order to achieve the WUE active programs' goal, it is recommended IEUA and its regional partners implement nine active programs. The programs will deliver water savings through 2020 and beyond due to the life of the measures being offered. Table 3 below provides an overview of the lifetime water savings for each of the programs:

Lifetime Water Savings by WUE Active Programs

Table 3: Lifetime Water Savings by WUE Active Programs

WUE Active Program	Estimated Lifetime Water Savings (AF)
Budget-Based Water Rates	116,390
Turf Removal	16,900
FreeSprinklerNozzles.com Program	5,689
SoCal Water$mart Regional Rebate Program	3,262
Customer Engagement Software	3,093
High Efficiency Nozzle Direct Installation Program	1,101
Residential Smart Controller Upgrade Program	828
Residential Landscape Retrofit Program	447
Landscape Evaluations	126
Total	**147,836**

The plan, as designed with 2 agencies implementing Budget-based Water Rates, is estimated to save nearly 148,000 acre-feet of water at an expected cost to the region of $52 per acre-foot. This falls well below the region's avoided cost to purchase water from Metropolitan Water District of $1,122 per acre-foot[1] (MWD's Tier 1 rate for untreated water). The value of the avoided purchases of MWD imported equate to nearly $153 Million to the member agencies. If none of the agencies chose to implement Budget-based Water Rates, the plan is estimated to save over 31,000 acre-feet at a cost of $208 per acre-foot. This too falls well below the cost to purchase water from MWD.

Below are highlights of the plan with and without Budget-base Water Rate implementation:

Table 4: Plan Overview

Plan Overview		
	With Budget-Based Rates	**Without Budget-Based Rates**
Regional IEUA Cost per Acre-foot	$52 per acre-foot	$208 per acre-foot
Five-Year Water Savings (*active programs*)	33,554 acre-feet	16,095 acre-feet
Lifetime Water Savings (*active programs*)	147,836 acre-feet	31,446 acre-feet
Avoided Costs (NPV)	$152.7 Million	$28.9 Million
Five-Year Total Budget*	$7.5 Million	$7.5 Million

**Budget includes IEUA regional program costs exclusive of outside funding.*
**Budget includes $300,000 per year for education and outreach programs.*

Selected Programs

The Regional WUE Business Plan makes a number of recommendations moving forward. It is advised that the following changes be made:

- Scale and modify most of the existing programs
- Sunset several programs
- Incorporate new technologies and approaches for program outreach
- Implement a number of pilot programs

[1] The project team applied the CUWCC/WaterRF Avoided Cost Model to develop a forecast of avoided supply costs for IEUA. These avoided costs include the avoided variable operating costs of MWD's 2015 Tier 1 rate for full service treated water (923$/AF in 2015), an estimate of power costs past the point of imported water delivery (approximately 76$/AF) , plus MWD's Capacity Charge (approximately 67$/AF) with all costs adjusted upward for system loss. Tier 2 rates apply in 2020 as MWD's stated long run supply development costs. MWD's treatment costs embedded in the full service rate pertain as a reasonable proxy for long run avoided treatment costs. Since these costs do not include avoided Greenhouse Gas Emissions they can be considered as a lower bound. These costs are projected to increase in real terms during the forecast horizon.

The portfolio of programs included in the plan are directly quantifiable and provide cost-effective water savings below the region's cost to purchase water from Metropolitan Water District.

With 66% of demand being outdoor water usage, program offerings focus predominantly on landscape opportunities. An overview of the selected programs is below.

Budget-Based Water Rates or allocation-based rates have proven to be one of the most cost effective WUE programs. Each individual account is allocated an amount that would be required for efficient indoor and outdoor water use, adjusted to real-time actual weather and customer characteristics such as size of landscape area. Budget-based rates are also designed to recover necessary agency costs recognizing that customers will be more water efficient over time. Customers are able to compare their individualized water budget with their actual usage. The appropriate economic signal rewards efficient use. With a clear financial incentive, the customer is motivated to maintain efficient use patterns. Budget-based rates also, when properly designed, target revenue generation specifically toward those inefficient customers who are causing higher costs. Budget-based rates are a legal method to increase the agency's ability to fund cost reducing and cost-effective WUE programs.

Customer Engagement Software and Data Analytics – Customer engagement software and data analytics provide tools for water agencies to more accurately identify customers with excess water usage and communicate with customers on how their usage compares against accepted water use efficiency standards. It addition, the software offers the ability for a customer to track their usage against a budget through web-based and mobile interfaces and presents them with practical options to become a more efficient water user.

Landscape Evaluations – Comprehensive landscape evaluations provide customers education and information on landscape and irrigation system upgrades specific to each individual site. Intended to motivate customers to make improvements in their landscape irrigation efficiency, the evaluations direct customers to applicable programs. Landscape evaluations would be targeted towards large landscape sites with the most potential to save water, as identified through water budget data.

High Efficiency Nozzle Vouchers, Rebates, and Installations – Retrofitting pop-up spray heads with high efficiency nozzles is a low cost measure and delivers high water savings. The saturation rate of high efficiency nozzles is extremely low, and the sheer volume of spray heads offers a prime market opportunity.

Smart Controller Installations and Rebates – Smart controllers are cost-effective for over irrigated sites, as well as large landscape areas. By offering direct installation for residential sites and rebates for large landscape sites, significant and cost-effective water savings can be achieved.

MWD's SoCal Water$mart Regional Rebate Programs – The SoCal WaterSmart Program provides the region with continued funding and program administration for a variety of water use efficiency measures. Moving forward, IEUA and its regional partners would augment funding for landscape water use efficiency products to provide increased customer response.

Turf Removal – Although turf removal delivers extremely high water savings in most retrofit projects, it requires a significant incentive to motivate customers. At this time, turf removal has not been included in the program portfolio after fiscal year 2015/16. And although it is not yet deemed cost-effective for the region to fund the full incentive, IEUA and its regional partners will continue evaluating turf removal as a customer program. IEUA and its regional partners will seek MWD and other outside funding as available.

Education and Outreach Programs – IEUA and its regional partners will continue to provide regional educational and outreach programs. Current regional education and outreach programs include the following:

- National Theatre for Children Program
- Shows That Teach
- Regional Landscape Training Workshops
- Garden in Every School® Program
- WEWAC, The Water Education – Water Awareness Committee
- Water Saving Garden Friendly
- Water Softener Rebate Program

The table on the following pages lists the recommended programs, the reasoning for their selection and the associated savings. The list is ordered from highest volume of total water savings activity to lowest.

Table 5: Recommended Programs

Recommend Program and Water Savings	Reasoning for Selection
Budget-Based Water Rates: *116,390 Lifetime Water Savings* *79% of Total Savings*	- Sends strong price signal, rewarding efficient users and penalizing inefficient users - Motivates over-allocation customers to consider changes - Proven effective for revenue stability, increased WUE and positive customer relations
Turf Removal (All Measures): *16,900 Lifetime Water Savings* *11% of Total Savings*	- Targets large water use - Transforms landscape and irrigation market - Significant funding provided by MWD
FreeSprinklerNozzles.com Program: *5,689 Lifetime Water Savings* *4% of Total Savings*	- Cost-effective - Targets large water use - Huge potential and scalability
SoCal Water$mart Regional Rebates: *3,914 Lifetime Water Savings* *3% of Total Savings*	- MWD funding and administration - Ease of implementation
Customer Engagement Software: *3,093 Lifetime Water Savings* *2% of Total Savings*	- Technology based communication method - Allows retailers to send messaging & program links to high water users - Proven effective
High Efficiency Nozzle Direct Installation: *1,101 Lifetime Water Savings* *1% of Total Savings*	- Removes financial barrier of entry - Ensures quality installation - Huge potential and scalability
Residential Smart Controller Upgrade: *828 Lifetime Water Savings* *1% of Total Savings*	- Offering direct installation to smaller customer provides bigger pool of potential customers - Site visit verifies there will be savings - Education workshop ensures customer can program and maintain controller and therefore sustain savings
Residential Landscape Retrofit Program: *447 Lifetime Water Savings* *0.3% of Total Savings*	- Targets large water users - Site visit verifies there will be savings - Professional installation and programming of controller ensure savings

Recommend Program and Water Savings	Reasoning for Selection
Landscape Evaluations: *126 Lifetime Water Savings* *0.1% of Total Savings*	- Links customer with programs - Provides one-on-one customer education - Starts relationship with customer
Education and Outreach Programs: *Savings not estimated**	- Provides education to students at all levels - Equips customers with foundational information regarding value of water, water use and efficiency opportunities

**Many of the programs have water savings, but due to the variability of the savings they were not included in the assessment.*

The following sections of the Regional Water Use Efficiency Business Plan provide details of the region's usage patterns, specific market opportunities, strategies for reaching water savings goals, and recommended programs. The plan provides the following information:

Section 2 – Relevant Regulation and Policies provides a summary and analysis of current water use efficiency regulations and requirements expected to impact future water use within IEUA's service area.

Section 3 – Market Condition and Potential assesses potential for water savings across customer classes and water uses. Specific opportunities are identified as well as barriers to market penetration for those measures.

Section 4 – Implementation Strategy outlines the recommended strategies and tactics needed in order for the region to drive down demand and increase water use efficiency.

Section 5 – Potential Programs and Analysis examines a comprehensive list of programs and measures that correspond to the region's water demand and measure savings potential.

Section 6 – Selected Programs provides a final list of cost-effective programs recommended for implementation and includes the following: program descriptions, measure(s) offered, target customer segments, delivery mechanisms, annual activity, program costs, and economic evaluation results.

Section 7 – Five Year Plan presents the implementation details for the plan if two agencies implement Budget-Based Water Rates. This includes annual program activity estimates, annual budgets, water savings, cost and benefits, as well as energy savings and greenhouse emission reduction.

Section 2 – Relevant Regulations and Policies

As can be expected in a state with ongoing water resource issues, California's governing entities have issued a number of regulatory requirements and policies over the past several decades.

Some of the regulations and policies have successfully driven down California's per capita water usage and increased the manufacturing standards for a number of major water consuming products utilized across all markets. Other regulations are aimed at achieving a higher level of water conservation during times of severe drought through temporary water use cutbacks and associated reporting.

Listed in the charts below is a summary of the current state regulations and information about the designated implementer for each:

WUE Laws and Agreements

Table 6: WUE Laws and Agreements

Regulatory Statute	Requirements	Agency or Regional Implementation	Approach
Assembly Bill 1420	Mandatory BMP Compliance.	Implemented by Agencies & IEUA	Lines up with actions taken to meet CUWCC BMP compliance – sunsets July 1, 2016
20x2020 (SB X7-7)	Reduce per capita water use by 10% by 2015. AND Reduce per capita water use by 20% by 2020.	Implemented by the Regional Alliance	By implementing active water use efficiency programs and policy Initiatives the Regional Alliance are projected to be on track to meet per capita water reduction goals.
Governor's Executive Order and Emergency Regulation	Mandatory statewide reduction of 25% of residential per capita water use. Each agency assigned local target of 4 – 36%.	Implemented by each Agency	Implement active WUE programs, enforce mandatory watering days and eliminate water waste. All agencies are at, or near, compliance.

WUE Codes, Standards and Regulations

Table 7: WUE Codes, Standards and Regulations

Regulatory Statute	Requirements	Agency or Regional Implementation	Approach
AB1881 - Model Water Efficiency Landscape Ordinance (MWELO)	ETo Allowances Residential 0.55 Commercial 0.45	Implemented locally by city and/or county	Agencies need to educate customers and developers about ordinance requirements
Assembly Bill 715	Requires any toilet or urinal sold or installed in California cannot have a flush rating exceeding 1.28 and 0.125 respectively	Manufacturers, distributors, retailers, plumbers and customers must all adhere to new standards	Supply chain removes non-conforming fixtures from marketplace and supplies only efficient and conforming fixtures
Senate Bill 407	Requires existing buildings comply with 1992 standards	Implemented locally by city and county	Difficult to enforce. Could be added to current criteria for change of ownership inspections and reporting
CalGreen	20% reduction of water use prescriptively designated Irrigation controllers shall be weather- or soil moisture-based	Implemented locally by city and county	Difficult to enforce. Could be added to current criteria for change of ownership inspections and reporting
Senate Bill 555	Requires water agencies to submit annual water loss reports	Implemented by Agencies	Agencies compile data and submit report to DWR
Assembly Bill 1	City or county cannot fine customers for failure to water	Local agencies to follow requirements of the bill	Agencies need to communicate requirements with cities and counties
Assembly Bill 349	HOAs cannot prohibit installation of artificial turf and allows for turf removal and installation of low water use plants	Local agencies to follow requirements of the bill	Agencies need to work with HOA's and community groups to educate about the bill

The following section details current water use efficiency regulations and requirements. Divided into two parts, the first presents a comprehensive review of agreements, codes, and regulations guiding conservation by California urban water suppliers. The second part provides an assessment of the region's current and expected compliance status for each of these codes and regulations.

Existing Codes, Regulations, and Agreements

Existing codes, regulations, and agreements affecting the efficiency of water using fixtures and landscapes, and establishing water use reduction targets for urban water suppliers will continue to reduce per capita residential and non-residential water demands over the coming decades. These codes, regulations, and agreements can be divided into three broad categories:

- Codes and standards that dictate the maximum acceptable level of water use by newly manufactured water using fixtures and appliances. Examples include statewide standards for toilet and urinal water use enacted under AB 715 and federal standards for residential and commercial clothes washer water use promulgated by the U.S. Department of Energy under the Energy Policy and Conservation Act.
- Regulations that govern the maximum acceptable level of water use by water using fixtures, appliances, and landscapes installed in existing and new residential and non-residential properties. Examples include SB 407, which enacted plumbing fixture efficiency requirements in new and existing buildings, and AB 1881, which established landscape design and water use requirements.
- Laws and agreements that establish water use reduction goals and targets for urban water supply agencies. An example is SB X7-7, which set maximum allowable GPCD targets for urban water suppliers.

The codes, regulations, and agreements, falling into one of the above three categories, are described in the following sections.

Requirements for Newly Manufactured Plumbing Fixtures and Appliances

Toilets, Urinals, and Showerheads – AB 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014, cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not consume more than 0.125 gallons per flush, 75% less than the standard set by AB 715.

The 1994 amendments to the Federal Energy Policy and Conservation Act established a maximum flow rate for newly manufactured showerheads of 2.5 gallons per minute. However, as will be discussed in the next section, California's Green Building Standards Code (CalGreen), which became effective January 1, 2011, mandates a maximum flow rate of 2.0 gallons per minute for showerheads in newly constructed residential and commercial buildings.

Clothes Washers and Dishwashers -- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. The maximum water factor for residential clothes washers under current federal standards is 9.5.[2] In March of this year, the federal standard will reduce the maximum water factor for top- and front-loading machines to 8.4 and 4.7, respectively. In 2018, the maximum water factor for top-loading machines will be further reduced to 6.5. For commercial washers, the maximum water factors were reduced in 2010 to 8.5 and 5.5 for top- and front-loading machines, respectively. Starting this year, the maximum water factor for Energy Star certified washers is 3.7 for front-loading and 4.3 for top-loading machines. EPA estimates that Energy Star washers comprised more than 60% of the residential market and 30% of the commercial market circa 2011.[3] A new Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. Effective May 30, 2013, the federal standard for the maximum allowable water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.

Requirements for Existing and New Buildings and Landscapes.

Indoor Water Use -- SB 407, enacted in 2009, mandates all buildings in California come up to 1992 State plumbing fixture standards within this decade. This law establishes requirements that residential and commercial properties built and available for use on or before January 1, 1994, replace plumbing fixtures that are not water conserving, defined as "non-compliant plumbing fixtures" as follows:

- Any toilet manufactured to use more than 1.6 gallons of water per flush
- Any urinal manufactured to use more than one gallon of water per flush
- Any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute
- Any interior faucet that emits more than 2.2 gallons of water per minute

[2] Water factor equals the number of gallons used per cycle per cubic foot of capacity. Prior to 2000, the water factor for a typical new residential clothes washer was about 12.

[3] Energy Star Unit Shipment and Market Penetration Report Calendar year 2011 Summary. Accessed on January 28, 2015 from: http://www.energystar.gov/ia/partners/downloads/unit_shipment_data/2011_USD_Summary_Report.pdf

The compliance date for single family residential properties is January 1, 2017. For multi-family and commercial properties, the date is January 1, 2019. State law required, as of January 1, 2014, that when there are building alterations and improvements to residential and commercial properties, water-conserving plumbing fixtures replace all noncompliant plumbing fixtures as a condition for issuance of a certificate of final completion and occupancy or final permit approval by the local building department.

SB 407 also requires, effective January 1, 2017, that a seller or transferor of a single family residential property disclose to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing. Similar disclosure requirements go into effect for multi-family and commercial transactions January 1, 2019. SB 837, passed in 2011, reinforces the disclosure requirement by amending the statutorily required transfer disclosure statement to include disclosure about whether the property is in compliance with SB 407 requirements. Through these two laws, California has effectively adopted a statewide retrofit-on-resale requirement for single family residential properties effective January 1, 2017, and for multi-family and commercial properties effective January 1, 2019.

Although SB 407 allows for replacement of noncompliant toilets with toilets flushing no more than 1.6 gallons, noncompliant urinals with urinals flushing no more than 1.0 gallons, and noncompliant showerheads with showerheads using no more than 2.5 gallons per minute, the more stringent requirements in AB 715 and CalGreen Code supersede the equipment flow standards included in SB 407. Therefore, as of January 1, 2014, noncompliant toilets must be replaced with toilets flushing no more than 1.28 gallons, noncompliant urinals must be replaced with urinals flushing no more than 0.5 gallons, and noncompliant showerheads must be replaced with showerheads using no more than 2.0 gallons per minute.[4] As of January 1, 2016, noncompliant urinals must be replaced with urinals flushing no more than 0.125 gallons.

New construction and renovations in California are now subject to CalGreen Code requirements. Listed in Table 8 below are the CalGreen prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20% reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.

[4] As noted above, the CEC adopted new standards for urinals in April setting a maximum allowable flush volume of 0.125 gallons.

Table 8: CalGreen Fixture Code Requirements

Fixture/Fitting	Baseline Consumption	Maximum Allowed Under CalGreen
Toilets	1.6 gal/flush	1.28 gal/flush
Urinals	1.0 gal/flush	0.5 gal/flush
Residential showerheads	2.5 gal/minute	2.0 gal/minute
Residential bathroom faucets	2.2 gal/minute	1.5 gal/minute[5]
Kitchen faucets	2.2 gal/minute	1.8 gal/minute
Replacement faucet aerators	2.2 gal/minute	NA
Non-residential bathroom faucets	0.5 gal/minute	0.4 gal/minute
Metering faucets	0.25 gal/minute	0.2 gal/minute

Landscape Water Use -- For landscape water use, CalGreen requires that automatic irrigation system controllers, provided by the builder and installed at the time of final inspection, be weather- or soil moisture-based controllers designed to automatically adjust irrigation in response to changes in plant water needs as weather or soil conditions change.

In addition to CalGreen's mandatory requirements, further efficiencies are possible through application of voluntary tiers, as follows:

- Tier 1 Residential – kitchen faucet flow rate not to exceed 1.5 gallons/minute; potable water use for landscape not to exceed 65% of ETo; and incorporation of at least one other measure from a list of measures provided by CalGreen (e.g. waterless toilet, rainwater capture system).

- Tier 2 Residential – kitchen faucet flow rate not to exceed 1.5 gallons/minute; potable water use for landscape not to exceed 60% of ETo; dishwashers be Energy Star qualified and use no more than 5.8 gallons per cycle; and incorporation of at least two other measures from a list of measures provided by CalGreen.

- Tier 1 Non-Residential – aggregate indoor water use reduction of 30% from the established baseline or 30% reduction in individual water use for each of the plumbing fixtures listed in Table 8; potable water use for landscape not to exceed 60% of ETo; and incorporation of at least one elective measure from a list of measures provided by CalGreen (e.g. efficient ice maker, graywater irrigation system).

[5] On April 8, 2015, the California Energy Commission adopted new standards reducing the maximum flow rate of residential bathroom faucets to 1.2 gallons per minute.

- Tier 2 Non-Residential – aggregate indoor water use reduction of 35% from the established baseline or 35% reduction in individual water use for each of the plumbing fixtures listed in Table 8; potable water use for landscape not to exceed 55% of ETo; and incorporation of at least three elective measures from a list of measures provided by CalGreen.

Assembly Bill 1881 - The Water Conservation in Landscaping Act of 2006 - Assembly Bill 1881 has had several revisions in recent years. The initial requirements and current changes are chronicled below. AB 1881 requires cities and counties to either adopt the state's model landscape ordinance or their own ordinance that is at least as effective as the state's model ordinance by January 1, 2010. At that time, the Department of Water Resources prepared a Model Water Efficient Landscape Ordinance for use by local agencies. After January 1, 2010, the model ordinance (or the locally adopted ordinance) applies to all of the following landscape projects:

1. New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
2. New construction and rehabilitated landscapes which are developer-installed in single family and multi-family projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review; and
3. New construction landscapes which are homeowner-provided and/or homeowner-hired in single family and multi-family residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check, or design review.

For new and rehabilitated landscapes installed on or after January 1, 2010 and meeting the above requirements, the model ordinance establishes a maximum water use allowance equal to 70% of reference evapotranspiration. The maximum water use allowance for special landscape areas, which include recreational turf projects (parks, golf courses, ball fields), projects irrigated with recycled water, and edible landscapes is 100% of reference evapotranspiration.

For existing landscapes of one acre or more installed before January 1, 2010, the model ordinance also requires cities and/or counties to administer programs that may include irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing landscapes equal to 80% of reference evapotranspiration.

The model landscape ordinance is directed to cities and counties. However, a city or county may designate another agency, such as a water supplier, to assume some or all of

the responsibilities of enforcing the ordinance, provided the designated agency agrees to assume these responsibilities.

In 2006, IEUA and its regional partners developed the Inland Empire Landscape Alliance (IELA). The IELA spent two years working with local agencies to evaluate existing landscape policies and to provide information about all aspects of landscape water efficiency, through a series of educational newsletters, workshops and tours focused on plant palettes, irrigation materials and techniques, low impact development practices, and measures that cities are currently implementing within their communities to be wise water stewards.

When, in February 2008 the Department of Water Resources released the Model Water Efficient Landscape Ordinance, the IELA came together to evaluate and comment on the ordinance. Members found the February 2008 DWR Model Ordinance to be cumbersome. As a result, the IELA formed a Technical Committee that created the Chino Basin Water Efficient Landscape Ordinance in January 2009, incorporating the requirements of AB1881 while establishing regional consistency, and actively promoting the best interest of the region.

Governor Brown's Drought Executive Order of April 1, 2015 directed DWR to update the State's Model Water Efficient Landscape Ordinance (MWELO) through expedited regulation. The California Water Commission approved the revised MWELO Ordinance on July 15, 2015.

Local agencies had until December 1, 2015 to adopt the MWELO or to adopt a Local Ordinance which must be at least as effective in conserving water as MWELO. Local agencies working together to develop a regional ordinance had until February 1, 2016 to adopt, but they are still subject to the December 2015 reporting requirements. A local agency will either integrate MWELO into an existing ordinance or establish a new, separate program. To comply, a local agency must perform one of the following actions:

- Adopt by reference Sections 490-495, Chapter 2.7, Division 2, Title 23 in the California Code of Regulations
- Adopt the MWELO in detail - Sections 490-495, Chapter 2.7, Division 2, Title 23 in the California Code of Regulations
- Amend an existing or adopt a new local ordinance or regional ordinance to meet the requirements contained in the regulations
- Take no action and allow the MWELO to go into effect by default

A local agency may choose to allow MWELO to become effective by default and then adopt a local or regional ordinance at a later time. Subsequent reporting must include the details of local or regional ordinances.

Changes to MWELO

Projects Subject to the Ordinance **-** The size of landscapes subject to the ordinance has been lowered from 2,500 sq. ft. to 500 sq. ft. The size threshold applies to residential, commercial, industrial and institutional projects that require a permit, plan check or design review. To reduce the complexity and costs for the smaller landscapes now subject to ordinance, the revised MWELO has a prescriptive compliance approach for landscapes between 500 and 2,500 sq. ft. The size threshold for existing landscapes that are being rehabilitated has not changed, remaining at 2,500 square feet. Only rehabilitated landscapes that are associated with a building or landscape permit, plan check, or design review are subject to the Ordinance.

Water Efficient Worksheet and Water Budget - The maximum applied water allowance (MAWA) has been lowered from 70% of the reference evapotranspiration (ETo) to 55% for residential landscape projects, and to 45% of ETo for non-residential projects. This water allowance reduces the landscape area that can be planted with high water use plants such as cool season turf. For typical residential projects, the reduction in the MAWA reduces the percentage of landscape area that can be planted to high water use plants from 33% to 25%. In typical non-residential landscapes, the reduction in MAWA limits the planting of high water use plants to special landscape areas. The revised MWELO still uses a water budget approach and larger areas of high water use plants can be installed if the water use is reduced in the other areas provided the overall landscape stays within the budget. The use of special landscape areas was not changed in the revised MWELO.

ETo Allowance in MAWA (Proportion of ETo)

	MWELO 2010	MWELO 2015	Percentage Reduction
Residential	0.7	0.55	21.4%
Non-residential	0.7	0.45	35.7%

The revised ordinance also precludes the use of high water use plants in street median strips. Also because of the requirement to irrigate areas less than ten feet wide with subsurface irrigation or other means that produces no runoff or overspray, the use of cool season turf in parkways is limited.

Soil Management Report - For multi-lot projects, the revised MWELO added clarification that soil testing should be completed using a soil sampling rate of approximately 1 in 7 lots or 15 percent.

Landscape Design Plan - The following changes were made to Landscape Design Plan section: Prior to planting, 4 yards of compost must be incorporated per 1,000 sq. ft. of permeable area. Compacted soils must be transformed to a friable condition. The depth

of mulch required was increased from 2 to 3 inches. Graywater and storm retention components must be indicated on the landscape plan.

Irrigation Design Plan - Dedicated landscape water meters or submeters are required for residential landscapes over 5,000 square feet and non-residential landscapes over 1,000 square feet. Irrigation systems are required to have pressure regulation to ensure correct and efficient operation. All irrigation emission devices must meet the American National Standards Institute standard, American Society of Agricultural and Biological Engineers'/International Code Council's 802-2014 "Landscape Irrigation Sprinkler and Emitter Standard". Flow sensors that detect and report high flow conditions due to broken pipes and/or popped sprinkler heads are required for landscape areas greater than 5,000 square feet. Master shut-off valves that prevent water waste in case of large failures of irrigation systems due to breakage or vandalism are required on all landscapes except where sprinklers can be individually controlled. The minimum width of areas that can be overhead irrigated was increased from 8 feet to 10 feet; areas less than 10 feet wide must be irrigated with subsurface drip or other technology that produces no over spray or runoff. The revised update requires the irrigation auditor to be a local agency auditor or third party auditor to reduce conflicts of interest. All landscape irrigation auditors must be certified by one of the U.S. EPA WaterSense labeled auditing programs.

Graywater Systems - The revised MWELO added a graywater section that specifies that landscapes less than 2,500 square feet that are irrigated entirely with graywater or captured rainwater are subject only to the irrigation system requirements of the Prescriptive Compliance Option. Graywater is allowed throughout the state under the California Plumbing Code.

Stormwater and Rainwater Retention - A requirement was added that landscape area should have friable soil to maximize stormwater infiltration. Additional stormwater measures were recommended, but not required.

Reporting - Executive Order and the revised ordinance require that local agencies report on the implementation and enforcement of their single agency Local Ordinances to DWR by December 31, 2015. Local agencies developing a Regional Ordinance must report on adoption by March 1, 2016. Reporting for all agencies is due by January 31st of each year thereafter. The reporting requirement is a new addition to the MWELO.

In addition to the revised MWELO requirements and ordinance changes, there are several bills designed to increase state-wide performance standards and enhance water efficiency policies. Below are highlights of those requirements.

Senate Bill 555

Senate Bill 555 requires retail water suppliers to submit annual water loss audit reports starting October 2, 2017. The bill requires the Department of Water Resources to post the results of each agency's audit report to allow for comparison amongst water

suppliers. In addition, the bill requires the State Water Resources Control Board to set performance standards for volume of water losses by July 1, 2020.

Assembly Bill 1
AB 1 prohibits a city or county from imposing fines for a failure to water a lawn or having a brown lawn during a time in which the Governor has declared a State of Emergency based upon drought conditions.

Assembly Bill 349
AB 349 amends the Civil Code to state that homeowner associations can no longer prohibit the use of artificial turf or other synthetic surface that resembles grass. In addition, AB 349 prohibits associations from requiring the removal or reversal of water-efficient landscaping measures once the drought is declared over.

Now, under California law, an association's governing documents must:

- Allow artificial turf or other synthetic surface that resembles grass
- Allow at least some with low water-using plants
- Allow the replacement of existing turf with low water-using plants
- Not restrict an owner's compliance with a water-efficient landscape ordinance adopted by a local government or other restrictions on the use of water imposed by the state, a water agency or local government
- Not impose "a fine or assessment" against an owner for reducing or eliminating the water of vegetation or lawns during any period for which either the Governor or a local government has declared an emergency due to drought.
- Not require the removal or reversal of water-efficient landscaping measures installed in response to the drought once the Governor of California declares that the drought is over.

Water Demand Reduction Requirements for Urban Water Suppliers

The primary laws and agreements establishing water use reduction goals and targets for urban water supply agencies are the Water Conservation Act of 2009 (SB X7-7) and the Memorandum of Understanding Regarding Urban Water Conservation in California (California Urban Water Conservation Council MOU). SB X7-7 set a requirement for urban water suppliers to reduce their per capita water use by the year 2020. The overall goal is to reach a statewide reduction in per capita urban water use of 20% by December 31, 2020. The MOU is a voluntary agreement. Signatories to the MOU agree to make a good faith effort to implement a prescribed set of urban water conservation best management practices (BMPs) or to take other actions resulting in an equivalent level of water savings. While the MOU is voluntary, state law (AB 1420) conditions eligibility for certain state grants and loans on compliance with it. AB 1420 sunsets in June of 2016 to be replaced by each agencies 20x2020 target for meeting the intent of AB 1420.

SB X7-7 – Under SB X7-7 urban water suppliers were required to provide a target for per capita water use in 2020 in their 2010 UWMPs. The target must be calculated using one of four methods specified by the legislation. The four methods are:

1. Set the target to 80% of baseline per capita water use. The legislation dictates the method for calculating baseline per capita water use.
2. Set the target based on efficient water use standards for indoor residential water use, commercial, industrial, and institutional water use, landscape water use, and (optionally) agricultural water use.
3. Set the target to 95% of the applicable state hydrologic region target developed by DWR and published in the state's 20x2020 Water Conservation Plan.
4. Set the target based on expected reductions in residential and non-residential water use due to implementation of the MOU BMPs and other actions.

Urban water suppliers are required to calculate an interim GPCD target for 2015 from the 2020 target. The interim target is also reported in the 2010 UWMP. Urban water suppliers must report their compliance status with their interim and 2020 GPCD targets in their 2015 and 2020 UWMPs. Effective July 1, 2016, urban water supplier eligibility for water grants or loans awarded or administered by the state is conditional on compliance with these targets. Additionally, effective January 1, 2021, failure to meet the 2020 target can be used in administrative or judicial proceedings to establish a violation of state law by the urban water supplier.

Executive Order B-29-15 - With California facing one of the most severe droughts on record, Governor Brown declared a drought State of Emergency in January 2014 and directed state officials to take all necessary actions to reduce water use.

On April 1, 2015, Governor Brown mandated a 25 percent water use reduction for cities and towns across California. In May 2015, the State Water Resources Control Board (SWRCB) adopted an emergency regulation requiring an immediate 25 percent reduction in overall potable urban water use. The regulation uses a sliding scale for setting conservation standards, so that communities that have already reduced their R-GPCD through past conservation will have lower mandates than those that have not made such gains since the last major drought.

The SWRCB tracks water conservation for each of the state's larger urban water suppliers on a monthly basis, but compliance with individual water supplier conservation requirements and the statewide 25 percent mandate is based on cumulative savings. Cumulative tracking means that conservation savings will be added together from one month to the next and compared to the amount of water used during the same months in 2013.

Table 9 below provides the reduction targets for each IEUA member agency.

Table 9: Retail Agency Emergency Regulation Mandatory Reduction %

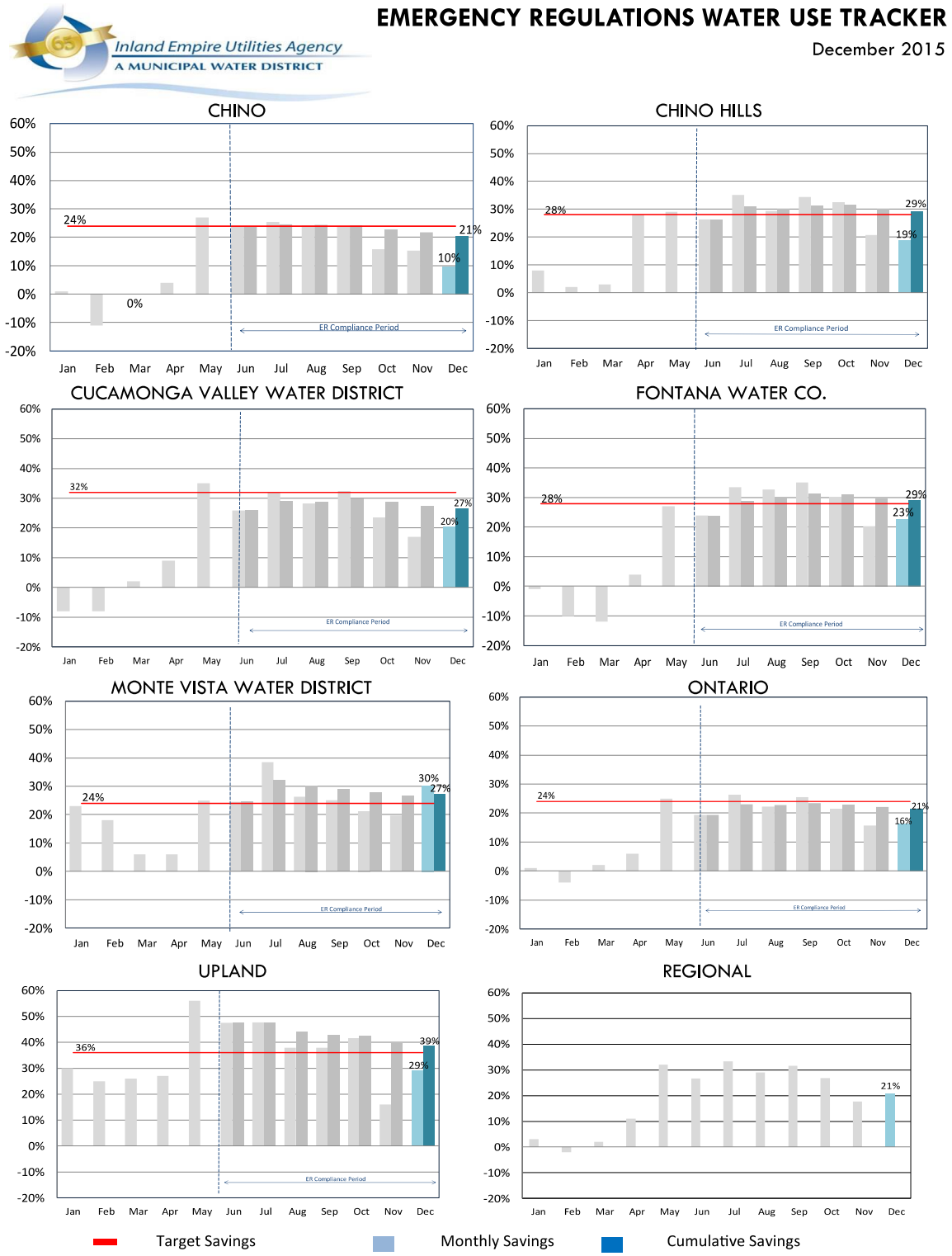
Retail Agency	Mandatory Reduction Percent
Chino, City of	24%
Chino Hills, City of	28%
Cucamonga Valley Water District	32%
Fontana Water Company	28%
Monte Vista Water District	24%
Ontario, City of	24%
Upland, City of	36%

Regional Compliance Status

As stated, IEUA and its regional partners are committed to meeting or exceeding all compliance requirements put forth.

Governor's Executive Order and Emergency Regulation Compliance
As stated above, the SWRCB approved an emergency regulation to implement a mandatory 25 percent statewide reduction in potable urban water use for the period between June 2015 and the end of February 2016. As of June 2015, member agencies are required to track monthly water use savings, as compared with 2013 water usage, and report the total potable water production to the SWRCB.

On the following page, Figure 1, is a copy of the December 2015 report submitted to the SWRCB. The report indicates that each water district exceeded or came close to meeting their respective reduction level for the June through December 2015 reporting period. The collective goal is 28% reduction and the collective saved through December is 29.5%.



◊ Monthly Savings compared to 2013 Water use

◊ Emergency Regulations of cumulative water use savings compliance begins June 2015

Figure 1: Retail Agency Emergency Regulation Water Use Tracker

SB X7-7 Compliance

IEUA and its regional partners, through their Regional Alliance, used method 1 to set its interim and 2020 GPCD targets. Because this method requires landscape area and population data in the compliance years (2015 and 2020) to calculate the targets, the targets reported in the Region's 2010 Urban Water Management Plan (UWMP) are estimates that will be updated in its 2015 and 2020 UWMPs. The estimated targets for 2015 and 2020 are 226 and 201 GPCD respectively.[6]

As shown in Table 10, measured GPCD within the Regional Alliance service area for the last five years has averaged 220 gallons, 3% less than the 2015 target. 2015 estimates show per capita use at 188 well below the 226 target. It is certain the region will comply with its 2015 interim target and absent a sharp rebound in per capita water use in the next five years, the odds are strongly in its favor that it will meet its 2020 target. The current projection for 2020 is reported GPCD of 169 - 174, well below the target of 201. The current numbers being used by IEUA's planning team shows a 6 GPCD reduction for WUE in 2020. The plan as projected in this document, assuming 2 agencies implement Budget-based Water Rates, estimates an 11 GPCD reduction for WUE.

Table 10 reports regional SB X7-7 compliance. In comparing per capita use to targets, the law allows accounting allowances for recycled water (RW) and water use efficiency (WUE) in the reported GPCD. Table 10 depicts this logic for showing how the per capita water use (Actual GPCD) is adjusted by WUE and RW to yield the reported GPCD.

Table 10: 20x2020 Regional Compliance

Fiscal Year	GPCD without WUE & Recycled Water	Water Use Efficiency	Recycled Water	Reported GPCD*
UWMP 2010 Baseline				**251**
2010	260	1	10	249
2011	215	1	12	202
2012	229	2	15	212
2013	237	2	18	217
2014	243	2	21	219
2015 Target				**226**
2015 Actual	212	3	21	188
2020 Target				**201**
2020 Projection*	215	6 - 11	35	169 - 174

***Projection: 2020 assumes 2.5% increase/year water use from FY2014/15.*

[6] IEUA updated its service area population estimates and GPCD calculations following the release of 2010 Census data. The targets reported here differ from the targets reported in IEUA's 2010 UWMP. IEUA will be updating its baseline GPCD, interim, and compliance GPCD targets in its 2015 UWMP.

California Urban Water Conservation Council MOU Compliance

In December 1991, IEUA, along with 120 other urban water agencies and environmental groups signed a historic Memorandum of Understanding and since then the California Urban Water Conservation Council (Council) has grown to over 400 members. Those signing the MOU pledge to develop and implement urban water conservation practices to reduce the demand of urban water supplies. During its 20-year history, the Council has successfully established itself as a collaborative forum within which water agencies and the environmental community work together to advance urban water conservation throughout the state.

As a part of regional water use efficiency programming, IEUA and its regional partners agree to allocate funding annually to pay membership dues and to support Council activities. In addition, IEUA also has a designated staff person who serves as a Group 1 - Board Member.

AB 715, SB 407, CalGreen, AB 1881 Compliance

IEUA does not have statutory obligations under AB 715, SB 407, CalGreen, and AB 1881, which govern the manufacture, sale, installation, and replacement of toilets, urinals, and faucets and the installation and rehabilitation of landscaping in California. The property inspection, plan approval, and construction permitting obligations of SB 407 and AB 1881 fall to cities and/or counties, not special water districts. The same is also true for adoption and enforcement of CalGreen building codes.

IEUA and its regional partners will continue to support and pursue new building codes and landscape measures which drive water efficiency including adding irrigation and landscape measures to local and state retrofit on resale regulations.

In addition, IEUA and its regional partners will work with developers and push for installation of premium toilets and ultra-high efficient development projects. This will require that IEUA and its regional partners actively interact with developers, homeowner associations, and the real estate industry in order to educate all parties, focusing on single family projects and appropriate design and product choices for water efficient back yards.

The region should also consider focusing on efforts to drive up standards for irrigation equipment being sold in California including: pressure regulation spray bodies with built-in check valves, high efficiency sprinkler nozzles, smart controllers and other efficiency equipment.

Section 3 - Market Condition and Potential

One of the first tasks undertaken in the WUE planning process was to collect and compile a database in order to disaggregate end-use data within the IEUA service area. Analysis of the region's customer demand is an important step in developing the WUE plan because it lays the foundation for understanding the potential for water savings from efficiency measures. For the purposes of this five-year plan, water consumption and inferred outdoor water use was used. The region's recent efforts with GIS mapping and analytics will provide significantly more accuracy regarding landscape area and irrigation use.

In addition, evaluating what's been achieved through past WUE activities helps assess the remaining potential. Lastly, appraising the market conditions and barriers to implementing WUE measures is necessary as they impact program feasibility and again potential to achieve water savings.

The following items were analyzed in order to determine remaining market potential in the IEUA's service area:

- Current Water Consumption
- Indoor and Outdoor Water Use
- Past Conservation and Device Saturation
- Market Conditions
- High Level Measure Potential

Regional Water Consumption

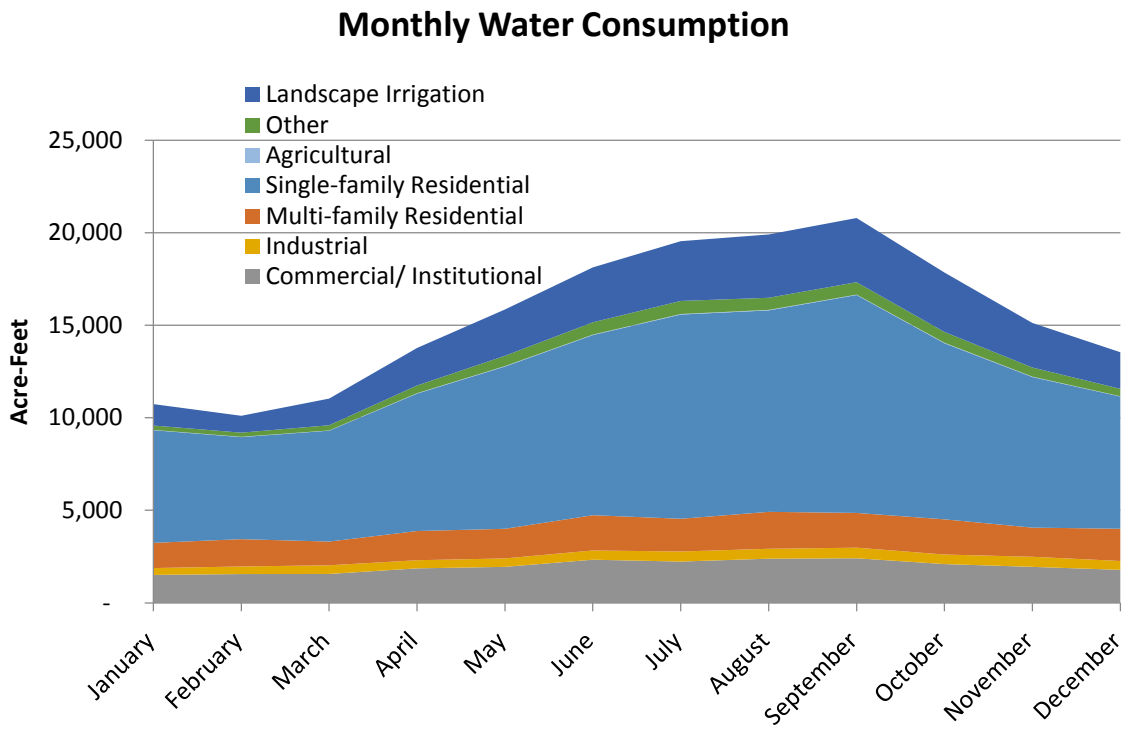
Table 11 shows the 2013 water consumption and number of water accounts by customer type for all seven IEUA member agencies combined.

Table 11: 2013 Regional Water Consumption

Customer Type	Number of Accounts in 2013 (PWSS)	Annual Consumption (Weather Normalized AF)	Customer Class Share of Total Demand
Single Family	171,309	112,171	48.5%
Multi-Family	7,286	27,818	12.0%
Commercial	12,912	25,668	11.1%
Industrial	870	6,342	2.7%
Landscape	5,332	31,119	13.5%
Other	599	27,893	12.1%
Total	**198,308**	**231,092**	

Figure 2 plots the monthly water consumption by month to reveal seasonal patterns by customer type. Note the pronounced seasonal variation with summer high deliveries approximately twice the level of winter deliveries. Single family and landscape irrigation show the largest seasonal variation. The graph is sorted with the highest seasonal variation presented on top. For example, landscape irrigation is the sector with the highest ratio of peak month to minimum month while commercial customers have the lowest.

Figure 2: Monthly Water Consumption by Customer Type



Indoor vs. Outdoor Water Use

WUE measures address either indoor or outdoor water use. For this reason, it is important to know how much water is used for each. Determining water usage indoors vs. outdoors can be difficult. Some outdoor end uses can be directly measured by dedicated irrigation meters. However, many types of water meters -- single family, multi-family, and commercial -- are "mixed," measuring both indoor and outdoor end uses. Therefore, agencies are forced to rely on inference to determine outdoor water usage.

Two methods can be used to estimate outdoor use across customer classes. The first method is the minimum month method that has seen wide use due to its ease of implementation. This method assumes that the month of minimum water demand is completely made up of indoor end uses; thus, any water consumption greater than the minimum month would be outdoor water use. To be accurate, this method requires that

at least one month per year (typically in the winter) has zero outdoor water usage. Because of the region's location, irrigation occurs even in the winter and makes this method ineffective.

The second method, termed "seasonal variation," develops an estimate of winter irrigation from dedicated irrigation meters and applies this seasonal variation to mixed meter customers. The seasonal variation method will result in a higher estimate of outdoor water use than using minimum month because it captures winter irrigation end uses. This method was chosen for the region's planning process because it more accurately captures the winter irrigation occurring in the region's arid climate.

Table 12 shows the estimated outdoor end use constituting **66%** (153,435 acre-feet) of the total volume of water use.

With this high percentage of outdoor water usage, it is important to recognize that, with just a 20% reduction each year, over 30,000 acre-feet of water can be saved annually.

Table 12 Inferred Outdoor Use

Inferred Outdoor Use			
Customer Class	Total Volume (AF/Year)	Seasonal Variation Method % Use	Estimated Outdoor Use (AF)
Single Family	112,171	62%	70,071
Multi-Family	27,818	33%	9,314
Commercial	32,010	47%	14,959
Landscape	31,199	100%	31,199
Other	27,893	100%	27,893
Total	**231,092**	**66%**	**153,435**

Past Achieved Conservation

It is necessary to understand past achieved conservation when determining remaining conservation potential. Data from the region's locally administered programs, as well as MWD's regional rebate programs, was collected from IEUA's fiscal year reports 2002 through 2015. The data was entered into the AWE Tracking Tool and is summarized in the Table 13.

The total lifetime water savings for all of the measures is estimated at 89,161 acre-feet. Toilets, both HET and ULFT, have provided the most significant savings at 49,347 acre-feet over the life of measures. This represents over 55% of the total water savings. Smart controllers provide savings of 8,581 acre-feet representing over 9% of total savings. Over

half of the smart controller savings came from central irrigation control system rebates through MWD's Public Agency Program.

Table 13: Lifetime Savings by Measure for Past Achieved Conservation

Measure	Lifetime Savings Acre-feet	% of Total Savings
High Efficiency and ULF Toilets (all markets)	49,347	55.35%
Smart Controllers (all markets)	8,581	9.62%
High Efficiency Clothes Washers (all markets)	6,669	7.48%
High Efficiency Nozzles (all markets)	5,966	6.69%
Fontana USD Retrofits	4,170	4.68%
Ultra Low Volume Urinals	4,155	4.66%
Residential Landscape Retrofits	4,104	4.60%
Turf Removal (all markets)	2,911	3.26%
Landscape Evaluations	1,855	2.08%
Water Brooms	416	0.47%
Pre-rinse Spray Valves	379	0.43%
X-ray Film Processors	304	0.34%
Cooling Tower Controllers	142	0.16%
Laminar Flow Restrictors	105	0.12%
Pool Cover	28	0.03%
Large Rotatory Nozzles	22	0.02%
Air-Cooled Ice Machines	5	0.01%
Rain Barrels	2	0.00%
Total	**89,161**	

Past Program Activity – Estimated Savings: FY2002 – 2015

In order to better understand activity and savings at a more granular level, Table 14 below displays the measures by market segment and delivery mechanism, if available. Of significance is that 23,395, or 26% of the total savings, came from ultra low flush toilets installed in multi-family sites through the region's locally administrated program. Other local programs with significant savings are:

- FreeSprinklerNozzles.com Program providing vouchers for free high efficiency sprinkler nozzles produced 4,696 acre-feet of savings.
- Fontana USD Retrofits, which provided free product and installation of high efficiency toilets and urinals as well as smart controllers and high efficiency sprinkler nozzles, shows savings of 4,170 acre-feet.
- Residential Landscape Retrofits providing free product and installation of smart controllers and high efficiency sprinkler nozzles delivered 4,104 acre-feet of savings.

Table 14: Lifetime Savings by Measure and Delivery Mechanism for Past Achieved Conservation

Measure	Lifetime Savings Acre-feet
Ultra Low Flush Direct Install (MF)	23,395
Ultra Low Flush Toilet Rebates (SF)	9,101
Smart Controllers Rebates (CII)	8,301
High Efficiency Clothes Washer Rebates (SF)	6,015
High Efficiency Toilets Rebates (MF and CII)	5,144
Fontana USD Retrofits	4,170
Ultra Low Volume Urinal Rebates	4,155
Residential Landscape Retrofits	4,104
High Efficiency Toilets Rebates (SF)	3,992
High Efficiency Toilet Direct Install (MF)	3,409
High Efficiency Toilet Direct Install (SF)	3,140
FreeSprinklerNozzles (MF and CII)	2,470
FreeSprinklerNozzles (SF)	2,226
Turf Removal Rebates (CII)	1,899
Phase III Landscape Evaluations	1,181
Ultra Low Flush Toilet Rebates (MF and CII)	1,166
High Efficiency Nozzles Rebates (CII)	1,111
Turf Removal Rebates (SF)	1,012
Landscape Evaluations	674
High Efficiency Clothes Washer Rebates (CII)	654
Water Brooms Rebates	416
Pre-rinse Spray Valves	379
X-ray Film Processors Rebates	304

Measure	Lifetime Savings Acre-feet
Smart Controllers Rebates (SF)	280
High Efficiency Nozzles Rebates (SF)	159
Laminar Flow Restrictors Rebates	105
Cooling Tower Conductivity Controller Rebates	84
pH Controllers for Cooling Tower Rebates	58
Pool Covers	28
Large Rotatory Nozzle Rebates	22
Air-Cooled Ice Machine Rebates	5
Rain Barrel Rebates	2

Past Program Activity – Estimated Savings: FY2010 - 2015

When evaluating past performance, it's also important to view activity and performance in the most recent years. This allows for better identification of trends and assessment of a given program's ability to deliver results.

Below in Table 15 are the savings by program for the last five fiscal years, FY2010/11 – FY2014/15. The total lifetime water savings is estimated at 30,856 acre-feet. These savings are nearly double what was projected in the 2010 Water Use Efficiency Business Plan with estimated savings of 16,055 acre-feet.

Table 15: Savings by Program - Last Five Fiscal Years

Measure	Lifetime Savings Acre-feet	% of Total Savings
High Efficiency Toilets (all markets)	8,413	27.3%
FreeSprinklerNozzles.com	5,679	18.4%
Fontana USD Retrofits	4,170	13.5%
Residential Landscape Retrofits	4,105	13.3%
High Efficiency Clothes Washers	2,826	9.2%
Turf Removal (all markets)	2,059	6.7%
Smart Controllers (all markets)	1,973	6.4%
High Efficiency Nozzle Rebates (all markets)	983	3.2%
Ultra Low Volume Urinals	775	2.5%

Measure	Lifetime Savings Acre-feet	% of Total Savings
Landscape Evaluations	674	2.2%
Laminar Flow Restrictors	105	0.3%
Cooling Tower Conductivity Controllers	71	0.2%
Air-Cooled Ice Machines	5	0.0%
Rain Barrels	2	0.0%
Total	30,856	

As with previous years, toilets still represented the most significant savings (27.27%), however, the locally administered programs, FreeSprinkerNozzles.com, Fontana USD Retrofits, and Residential Landscape Retrofits represented over 45% of combined savings. Each of these programs provided landscape and irrigation measures and was implemented through voucher and direct install delivery mechanisms vs the standard rebate-style program.

In the last two years, savings from turf removal increased significantly (over 300%) due to the increased incentive available through MWD's Regional Rebate Program.

Indoor Passive Water Savings and Saturation

Water agencies have promoted indoor water use efficiency since the early 90's. Indoor WUE has focused on upgrading high water use fixtures such as toilets, showerheads, and clothes washers. Examples of common programs are rebates to upgrade fixtures and direct installation programs (active conservation). In addition, water agencies have supported upgrading plumbing codes that require high efficiency fixtures (passive conservation). Both passive and active conservation has contributed to saturation of indoor measures. For future program planning it is important to understand the saturation and thereby the remaining potential.

The passive conservation engine from the AWE Tracking Tool was used to calculate device saturation for residential toilets and clothes washers to assess remaining use efficiency potential. Unfortunately, at this time there is not sufficient market information to conduct this analysis for commercial measures without significant investment. The AWE Tracking Tool creates a year-by-year inventory of water-consuming devices and the transformation over time to efficient devices driven by plumbing and building code.

Active conservation was then subtracted and thus, the remaining potential was calculated.

Single Family Homes: Saturation of High Efficiency Toilets and Clothes Washers

Table 16 shows the current saturation of high efficiency toilets and clothes washers in single family residences. "Efficient" toilets are defined as ULFT or better (saturation includes anything 1.6 gpf or better). Recent active programs have focused on high efficiency toilets (1.28 gpf) and current programs focus on "premium" fixtures (1 gpf or less).

For toilets, the saturation rate is a significant 79% percent. Of the inventory of 390,324 fixtures in IEUA's service area, there are approximately 83,383 non-efficient toilets remaining.

For high efficiency clothes washers, the saturation rate in single family homes is 53 percent. There are an estimated 161,925 clothes washers in the Region's single family residential sector. Of the inventory of fixtures in the IEUA service area, there are approximately 75,000 non-efficient clothes washers remaining. "Efficient" clothes washers have a water factor of 8 of better, which includes all residential front loaders and the most efficient of the newer top loaders.

Table 16: Single Family Market Potential: Saturation of Efficient Toilets and Clothes Washers

Single Family	Toilets	Clothes Washers
Total Devices	390,324	161,925
Remaining (Non Efficient) Devices	83,383	75,932
Devices Actively Retrofitted	18,940	15,359
Devices Passively Retrofitted	288,001	70,633
Saturation	79%	53%
Total Water Savings Potential	3,544 AFY	8,163 AFY

Multi-family Homes: Saturation of High efficiency Toilets and Clothes Washers

Table 17 shows the saturation in the multi-family sector. High efficiency toilet saturation is even higher at nearly 100% and saturation of high efficiency clothes washers is 44%. One reason for the high saturation rate for toilets is that the IEUA and its regional partners have been extremely aggressive implementing direct install programs for more than a decade.

Table 17: Multi-Family Market Potential: Saturation of Efficient Toilets and Clothes Washers

Multi-Family	Toilets	Clothes Washers
Total Devices	117,559	29,771

Remaining (Non Efficient) Devices	Very few	16,785
Devices Actively Retrofitted	31,534	Not categorized
Devices Passively Retrofitted	94,956	12,987
Saturation	Near 100%	44%
Total Water Savings Potential	NA	1,804 AFY

Remaining Potential for Toilets

Due to the high saturation rate of residential toilets as well as current code, it is recommended that the region no longer offer programs for toilet replacements.

Remaining Potential for Clothes Washers

There is still some market for high efficiency clothes washers. Future programs should offer incentives for the highest efficiency models because many customers are already choosing efficient models without incentives.

Market Conditions

As economic outlooks shift, so too do attitudes about major purchasing and upgrade decisions regarding homes and businesses. When economic indicators such as unemployment, interest rates, and property values are favorable, customers are much more likely to make longer term investments in their properties including WUE upgrades.

Figure 3 shows unemployment rates over the years for California and San Bernardino County:

Unemployment Rate San Bernardino County

June '11	14.0%
June '12	12.8%
June '13	10.4%
June '14	8.4%
June '15	7.1%

Source: BLS via CA DOF

Figure 3: Regional Unemployment Trend

Besides weathering California's drought emergency, IEUA's service area, like much of California, has experienced small steady improvements in its unemployment rate since the peak of the great recession. Median household income has also exhibited improvements since bottoming out in the recession. The real estate market has shown

upturns, with an increasing median price for single family homes and multifamily buildings, increasing occupancy and rents for commercial properties, and increasing single family housing new development.

The improving economic and real estate market conditions affect the different market segments targeted by WUE programs, and their drivers need to be considered when designing water use efficiency programs. Figure 4 *Market Conditions* address each market segment—broken into multifamily and HOA, Commercial/Industrial/Institutional (CII), and Single Family—for insights as to how market conditions can influence WUE program considerations.

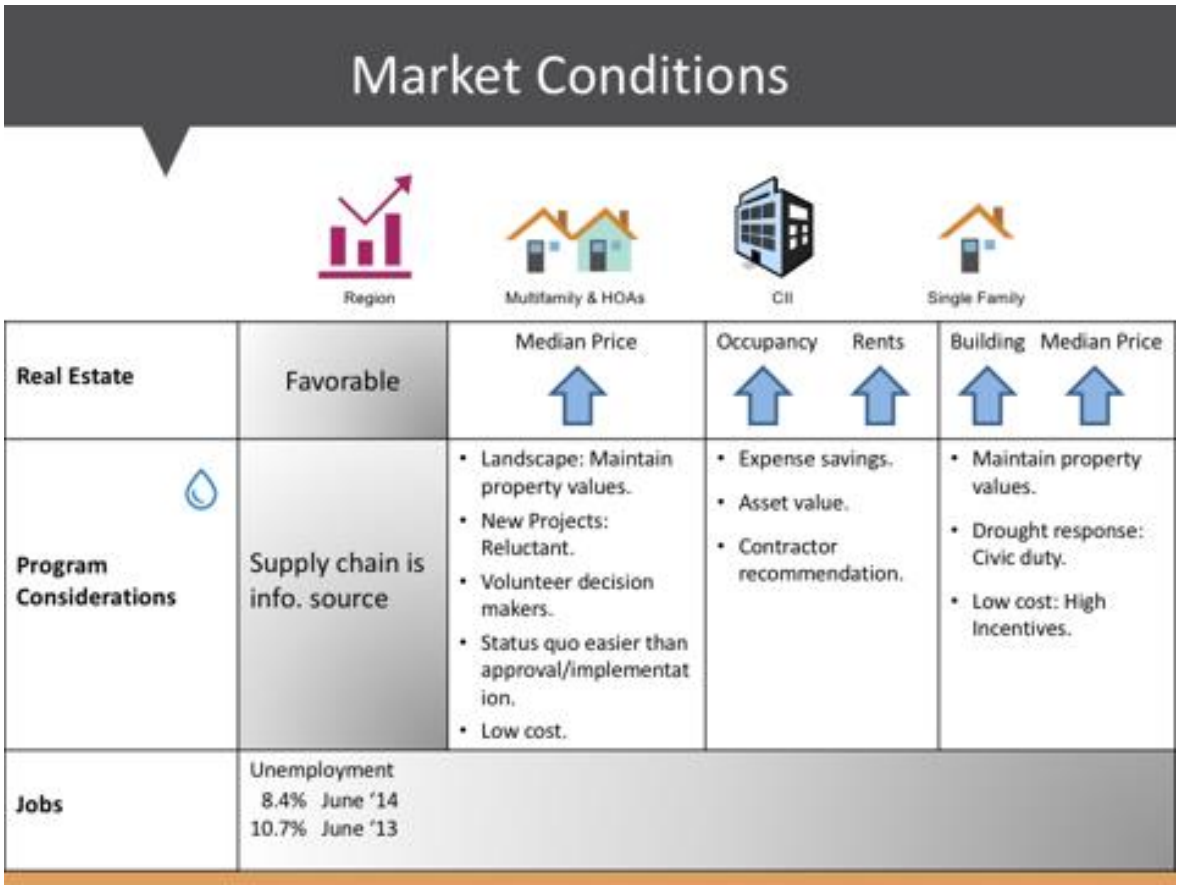


Figure 4: Market Conditions

The improving real estate market in the region gives new impetus for customers to make improvements to their properties. Since some landscape upgrades require fairly high up-front investments and longer term payback periods, customers need to believe that the real estate market will recognize the value of these investments.

The competitive multi-family and Homeowners Association (HOA) markets lead to customer's desire to have well-maintained and attractive landscapes to maintain property values. However, HOAs are typically governed by volunteer decision makers, and many are not willing to take risks or make investments in new technologies or alternative

landscape designs. As well, many HOAs lack the capital funds to make such improvements. They must plan years in advance to fund any large-scale project.

For commercial properties, business owners and managers have a known focus on the bottom line, requiring WUE measures to pay for themselves over a short time. Improving asset values is always a plus and contractors can have an inside edge in pushing new WUE technologies and practices due to years of developed business relationships.

The single family market sector is also characterized by customer demand for landscapes that maintains property values. However, single family customers take a more vested interest in maintaining their civic duty for drought response. Hence, messaging for support of community values such as drought response can have more traction. Increased new housing developments provides the opportunity to influence the highest efficiency fixtures, landscapes, and irrigation systems.

Significant economic incentives are motivating to all markets.

New Water Savings Approaches and Technologies

As new approaches and technologies become available in the market, or have proven savings, it is important to evaluate these opportunities. Two approaches being considered by the IEUA and its regional partners are Budget-Based Water Rates and Customer Engagement Technologies.

Budget-Based Water Rate Opportunities

Budget-based water pricing is a type of increasing block rate structure in which the block sizes vary according to household-specific characteristics (# of residents, irrigated area, local weather) and the use of indoor and outdoor efficiency standards (as a benchmark). Customers who manage their water consumption within their efficient allocation/water-budget pay a lower water rate; customers who exceed their efficient allocation/water-budget pay higher water rates.

The emphasis on account-by-account water use efficiency requires, with a budget-based design, that agency fixed costs be collected in large part on a fixed service charge and the remaining fixed costs are imbedded in the customers “efficiency” tiers. This helps protect the agency from losing necessary fixed revenues when customers save or use less water. Agencies with well-designed budget-based rates weather water demand changes associated with wet years, drought restrictions and economic downturns.

A recent UC Riverside study[7] of the impact of implementing budget-based water rate structures found a pronounced effect that this type of rate reform can have, specifically in a nearby service area, Eastern MWD (EMWD).

Examining more than 12,000 residential customer's consumption records from January 2003 through September 2012, the analysis arrived at the following findings:

- Average prices rose less than 4% under water budgeting, but would have had to rise 34% under flat rate pricing to achieve the same reduction in customer water use.

- EMWD's budget-based rate structure resulted in at least a **15% reduction in residential water use,** controlling for the effects of inflation and the recent economic downturn.

Comparison of Observed Demand Against Model Predictions

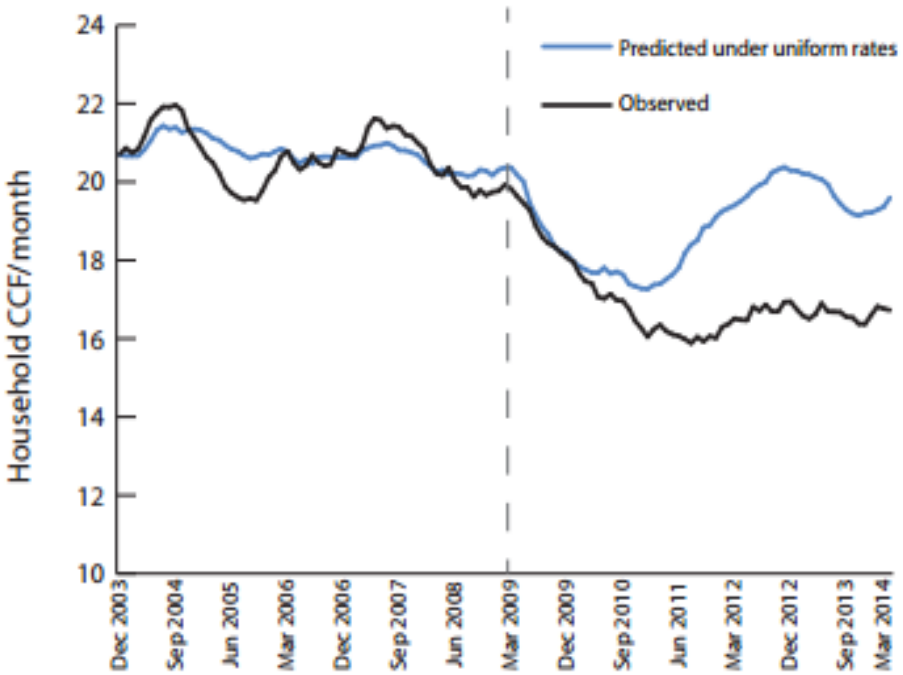


Figure 5: EMWD BBR Demand Against Model Predictions

There is also evidence that budget-based water rates are more desirable from a customer perspective especially when conservation targets must be achieved. Another UC Riverside Study[2] found that EMWD customers were better-off under budget-based water rates

[7] Baerenklau, Kenneth A., Kurt A. Schwabe and Ariel Dinar. 2014a. "The Residential Water Demand Effect of Increasing Block Rate Water Budgets." Forthcoming in Land Economics 90(4): 683-699. Baerenklau, Kenneth A., Kurt A. Schwabe, and Ariel Dinar. 2014b. "Allocation-Based Water Pricing Promotes Conservation While Keeping User Costs Low." Agricultural and Resource Economics Update 17(6): 1-4.

rates than under either a uniform price increase or a uniform curtailment that would achieve the same levels of conservation and agency revenues. Of the three policies examined, budget-based rates were the only policy that improved average customer welfare relative to the old pricing policy, and the only policy that effectively rewarded water use efficiency.

Depicting Rate Change Savings

For the purposes of this plan and savings modeling, budget-based water rates were depicted as a WUE activity in the AWE Tool by contrasting different numbers of the IEUA's member agencies rolling out the new rate over the 5-years of the implementation plan—either 2 or all of the member agencies. The agency-level savings assumption in Table 18 below is derived by translating the water use per account (AF/Account) into a weighted average water savings per account.

The econometric estimate of water savings includes the effect of the budget-based rates, increased customer outreach, and implemented water use efficiency measures. Another recent econometric study estimated customer engagement technology and associated increase in participation of water use efficiency programs to have resulted in a 4.6% reduction in a random sample controlled evaluation design.[8] To avoid double counting, a water savings assumption of 11% was determined to be a reliable savings estimate solely attributable to budget-based rates and directly applied to single family accounts. Multi-family accounts are typically composed of mostly indoor uses and only 40% of the level of single family savings was assumed to apply. The 11% water savings was also applied to irrigation accounts. A volumetrically weighted savings per account across these three customer classes was then obtained and is presented in the last row of the table below.

Table 18: BBWR Water Savings Assumptions

Customer Type	AFY/ Account	Savings %	Savings AFY/Acct	Notes
Single Family	0.79	11%	0.09	Direct Effect of BBRS Implementation, Reliable Est.
Multi-Family	3.67	4.4%	0.16	MF mostly indoor, assume 40% of SF savings
Irrigation	7.19	11%	0.79	CIII - CII not affected, Irrigation affected
Weighted Use in AF/Account	1.09		0.11074	Weighted Average Savings (SF + MF + Irrig.) in AFY/ Acct
			Savings Gallons /Acct	(x325851 gallons/AF)

[8] Mitchell, David and T.W. Chesnutt, *Evaluation of East Bay Municipal Utility District's Pilot of WaterSmart Home Water Reports,* Prepared for California Water Foundation & East Bay Municipal Utility District, December 2013.

Customer Type	AFY/ Account	Savings %	Savings AFY/Acct	Notes
			36,085	Weighted Average Savings (SF + MF + Irrig.) in Gallons/ Acct

Two additional member agencies rolling out budget-based rate structures was translated into two-sevens of the 183,927 applicable accounts (SF+MF+Irrig.) or 52,551 accounts. An all agency rollout was also modeled using all 183,927 accounts.

These per account savings translate into total annual savings for each model of:

- Two agency implementation of budget-based water rates: 5,820 AF
- Region-wide agency implementation of budget-based water rates: 20,368 AF

Customer Engagement Technology Opportunities

Customer Engagement Software is used to better inform customers of their real time water use and possibilities for improving water use efficiency. As discussed above, a recent study estimated customer engagement software and increased participation in water use efficiency programs to have resulted in a 4.6% reduction in water use.[9]

Table 19 below provides the savings assumption used for savings directly attributable to Customer Engagement Software (excluding the effect of increased participation in WUE programs.)

Table 19: Customer Engagement Software Water Savings Assumptions

Customer Class	AFY/ Account	Assumed Savings %	Savings AFY/Acct	Notes
Single Family	0.79	2%	0.0158	Direct Effect of Customer Engagement Software, Reliable Estimate
			Savings Gallons /Acct	(x325851 gallons/AF)
			5,148 Gallons per Year	Avg Savings (SF) in Gallons/ Acct

High Level Measure Potential Assessment

In order to select measures for further evaluation, it is necessary to understand the high level potential of specific measures within each market segment. Table 20 summarizes

[9] Mitchell, David and T.W. Chesnutt, *Evaluation of East Bay Municipal Utility District's Pilot of WaterSmart Home Water Reports,* Prepared for California Water Foundation & East Bay Municipal Utility District, December 2013.

sources of remaining water use efficiency potential by market sector. Within each sector the table lists sources of water use efficiency, the stage of programmatic development (early to late), and the qualitative range (low to high). This broad overview acts as a guide in selecting measures for further consideration.

Table 20: High Level Market Potential by Measure

Sector, Measures, End Uses	Stage	Description of Potential	
Residential Indoor			
Toilets	Late	Small number 3.5gpf, ULF to HET less savings	Low
Faucets, Aerators, Flow Restrictors	Late	Small remaining potential	Low
Showerheads	Late	Very low flow rates existing fixtures	Low
Clothes Washers	Mid	Medium saturation - many freeriders	High
Pressure Regulating Valves	Pilot	Covers all end uses	High
Surveys, Education, Outreach	Ongoing	Gateway program	Low-Mid
Budget-Based Water Rates	Early	Covers all end uses	High
Landscape			
Controllers	Early	SF Residential large remaining potential	High
Nozzles	Early	Large remaining potential	High
Turf Replacement, Low Water Plants	Early	Large technical potential; small economic potential	High
Artificial Turf	Early	Large technical potential; small economic potential	High
Pressure Regulating Valves	Pilot	Covers all end uses	High
Landscape Management	Ongoing	Gateway program	High
Surveys, Education, Outreach	Ongoing	Gateway program	Low-Mid
Budget-Based Water Rates	Early	Covers all end uses	High
CII (Non-Landscape)			
Toilets	Mid	Small number 3.5gpf, valve type expensive replacement	Mid
Urinals	Mid	High traffic sites could be target	Mid
Faucets, Aerators, Flow Restrictors	Late	Small remaining potential	Low
Showerheads	Mid	Sports facilities, accommodation could be target	Mid
Food Service Equipment	Mid	Limited number of food steamers, offer upstream incentives	Mid
Laundry	Mid	Limited number in region	High
Industrial Processes and Manufacturing	Mid	Limited number in region	High
Cooling	Mid	Limited number in region	High
Pressure Regulating Valves	Pilot, Research	Covers all end uses	High
Surveys, Education, Outreach	Ongoing	Gateway program	Low-Mid
Budget-Based Water Rates	Early	Covers all end uses	High

Outdoor Water Savings Opportunities

Comprising an estimated 66% of the region's total demand, outdoor water use is clearly the prime opportunity for water savings.

Outdoor water efficiency is focused on reducing irrigation needs for landscapes by upgrading either the irrigation system or planted landscape to more water use efficient options. Examples of device upgrades for irrigation systems are high efficiency nozzles, micro and low precipitation irrigation, smart controllers, irrigation repairs, and pressure regulation. Turf removal and replacement with a more sustainable landscape is an example of an "upgrade" to a traditional landscape.

To determine the best water savings opportunities, the plan looks at two factors:

1) Sectors and customers with the highest outdoor water use and highest potential savings;
2) Available devices and programs with highest market potential.

Opportunities by Customer Type

The analysis of water usage by account type found that the account types with the highest total volume of water usage in the region, single family, multi-family and landscape accounts, also have the largest percentage of outdoor water use. These accounts use over an estimated 171,108 acre-feet of water per year and an estimated 110,584 acre-feet per year just for irrigation. A reduction of 10% could yield over 11,000 acre-feet in water annual water savings.

These account types should be targeted when pursuing outdoor water conservation programs.

Opportunities by Measure

There are several existing outdoor water efficient technologies that have a high potential for water savings.

High Efficiency Nozzles and Low Precipitation Systems

Most customers in the region, no matter their type, have some irrigated area within their property. These areas are typically irrigated by in-ground systems with inefficient nozzles (ex: pop-up spray heads). There are virtually millions of nozzles in the region. These irrigation systems can be easily retrofitted with high efficiency nozzles or micro or low precipitation systems. Market studies show that only around 20% of irrigation purchases are for high efficiency products. This low market saturation, coupled with the incredibly

high number of nozzles within the region, provides a high potential for increased efficiency.

Smart Controllers

The majority of customer sites also utilize standard timers to operate their irrigation system. There are tens of thousands of timers throughout the region. As with nozzles, less than 20% of controllers purchased are smart controllers. Smart controllers can be a great water saving measure for sites over irrigating as well as large landscape areas. When offering smart controller programs, IEUA and its regional partners needs to incorporate potential savings verification into the program design.

Turf Removal

The square feet of irrigated turf within the region is estimated at 434 million square feet for single family residential parcels (OmniEarth aerial imagery). GIS data calculating irrigated area will be made available to every IEUA member agency. It is clear that cutting across all sectors with landscape, turf replacement has enormous potential. Turf is the predominant landscape in Southern California and the potential for turf removal within the Inland Empire market is high.

Pressure Regulating Devices

Excessive water pressure in an irrigation system can cause increased and unnecessary water output from nozzles, and can also increase the chance of damage or leaks in the system. It is unknown how many customers suffer from excessive water pressure, however, it is known that most customers do not install outdoor pressure regulating devices. Regulating pressure is a potential area of high water savings worth further exploration through pilot studies.

Irrigation Repairs

Irrigation repairs are also an area that could assist customers with ongoing excessive water use. Using customer level water budget data can help identify sites with leaks. It is unknown how many customers have irrigation leaks, but the potential for savings is high.

Section 4 – Recommended Implementation Strategy

As discussed in the Executive Summary, there is a major difference between ***water conservation*** and ***water use efficiency*** and it is important to understand the dissimilarity.

The objective of this plan is ***not*** to focus on ***water conservation*** with its short-term focus on current emergency conditions. This approach will not provide prolonged savings. As drought restrictions are lifted, per capita water use will gradually rebound upwards as people breath a sigh of relief that the crisis is over and return to life as usual.

Instead the goal is to achieve ***water use efficiency,*** a sustainable reduction in water use, by creating a new resource value for water in the eyes of the end user.

The Regional WUE Business Plan proposes a five-year strategy to seek out inefficient water use customers, educating them about WUE goal attainment, and providing a "road map" to accomplish this.

It is important to understand that, while IEUA and its regional partners strive to offer an array of valuable programs and services, it is the retail water agency that ultimately determines the final design and level of participation for programs offered within their service area.

Proposed Strategy for Customer Interactions

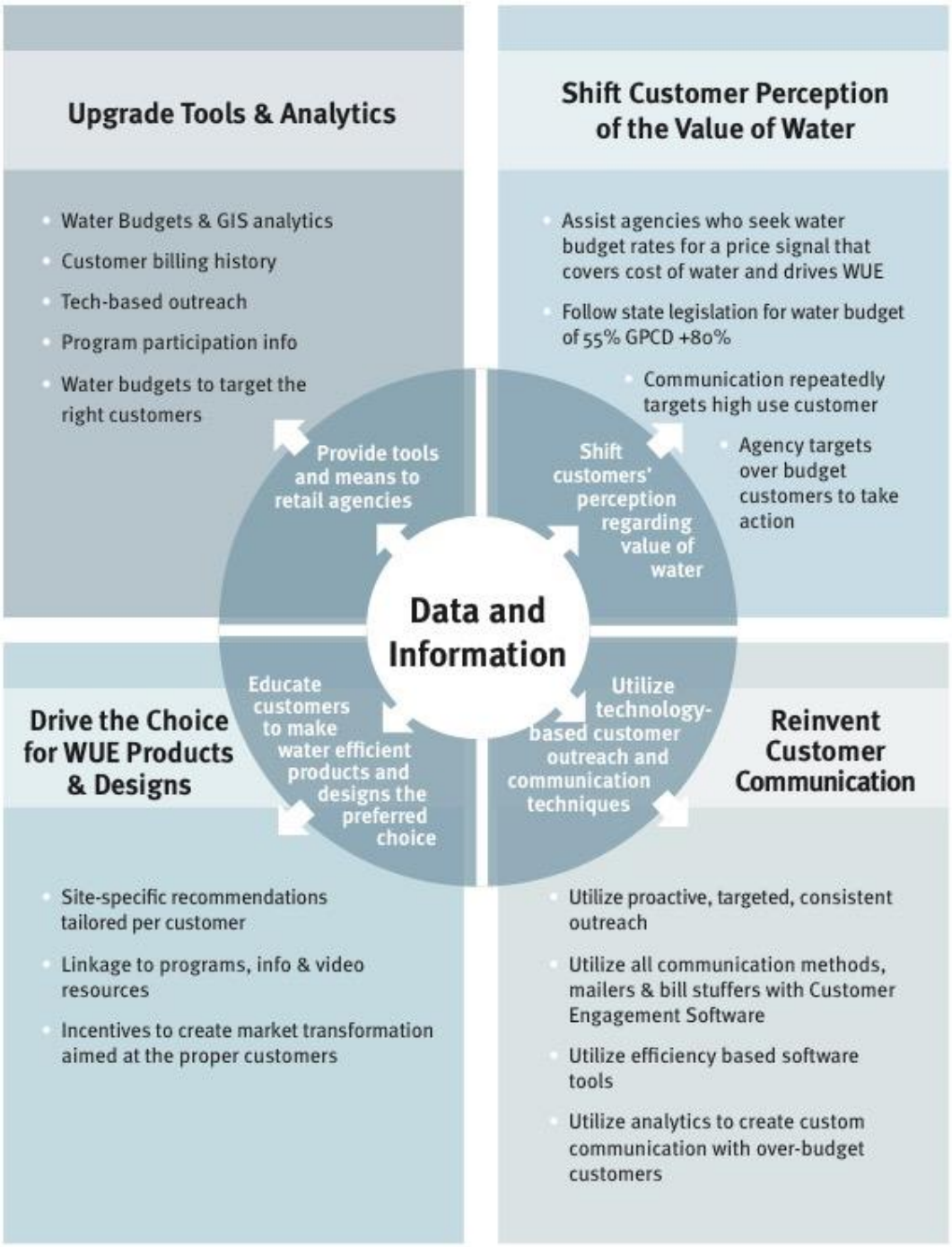
In order to achieve efficient water use, it is recommended IEUA and its regional partners conduct the in the following:

1. **Provide the tools and means** for retail water agencies to motivate the end use customers to meet reasonable and efficient water use targets. Personalized information, based on actual customer water use, measured against accepted State efficiency standards is necessary.
2. Accomplish this by **shifting customers' perception regarding acceptable levels of usage.**
3. Assist customers to **make water-efficient products and landscape designs the preferred choice.**
4. **Utilize technology outreach and communication techniques** to provide refined and individualized communication with each customer.

Figure 6 illustrates the four major changes, over traditional plans, which should be considered in order for the region to achieve reasonable and efficient water use.

Four Major Changes to Achieve Efficient Regional Water Use

Figure 6: Major Changes Required to Achieve Efficient Regional Water Use



As illustrated in the chart above, there are a number of new, tech-based services and applications available to support WUE goals. These include:

Geographic information systems (GIS) designed to capture, store, analyze, manage, and present an array of geographical data.

Customer engagement software designed specifically for utilities to connect and communicate with their customers via web and mobile devices.

Water budgeting software that provides parameters for efficient water usage per billing period and compare customers' actual usage.

Adaptors of these technologies are seeing a number of positive outcomes. Utilities have more robust data for strategic WUE program targeting and greater ability to manage supplies and distribution. Additionally, the end use customer receives accurate and personalized information about water usage at their site as well as steps to eliminate excessive water use.

It is recommended that IEUA and its regional partners consider utilizing the new tech-based software. The benefits of enhanced customer engagement for an agency can be achieved through implementation of a plan composed of eight strategic elements. Each was selected, as shown in the chart on the following page, because they provide an important piece of the puzzle for a successful customer engagement process:

Eight Strategic Elements of the Regional Plan

Strategic Element:	→	**Reason Selected:**
Provide satellite-based COMPUTER MAPPING DATA for each retail agency	.....	Delivers valuable site-specific data on all customers that can be used to target inefficient water users.
Encourage retail agencies to utilize WATER EFFICIENCY PRICING SIGNALS	.....	Proven to be equitable and effect change at least cost to the agencies. Helps agencies achieve revenue and conservation balance.
Focus on OUTDOOR water use	.....	Outdoor use is 66% of total water demand.
Use TECHNOLOGY-BASED SOFTWARE designed to engage, educate, and motivate customers	.....	Provides convenient, interactive connection with customer via mobile device or computer.
Implement WUE CODE requirements for new construction	.....	Lowest cost opportunity for lifetime water use efficiency.
TARGET OVER-ALLOCATION CUSTOMERS and offer ACTIONABLE water saving solutions	.....	Best opportunities for cost effective savings .
Provide INCENTIVE-BASED & Regional INFORMATION-BASED Programs for IRRIGATION & LANDSCAPE MEASURES	.....	Drives customers to act on their own and pushes market transformation.
TRACK WUE RESULTS & MAKE ADJUSTMENTS when necessary	.....	To meet changing regional demand reduction goals.

Figure 7: Strategic Elements of the Regional Plan

Section 5 - Potential Programs and Analysis

With opportunities and markets identified for specific technologies and a recommended strategy developed, the next step in the WUE planning process was to evaluate all programs—both new and existing. A list of programs and measures was created and compared with the region's water demand and measure savings potential. At this stage of the process numerous possibilities were listed, with the understanding that many of these programs would not make the final cut.

The List of Potential Programs and the reasoning for consideration are shown in Table 21.

Table 21 Potential Programs and Reasons for Consideration

Program/Measure	Reasons for Consideration
SoCal WaterSmart Rebate Program	- Majority of funding from MWD. - Ease of operation.
High Efficiency Toilet Incentives and Direct Installation Programs	- Has provided long-term cost effective water savings in the past.
Turf Removal Incentives and Direct Installation	- Abundant opportunity that results in market transformation.
Smart Controller Direct Installation Programs	- Targets large use outdoor water and verifies savings will occur.
High Efficiency Nozzle Voucher and Direct Installation Programs	- Large number of pop-up heads to be retrofitted. - Program is easily scalable.
Landscape Evaluations	- Targets over-allocation landscape customers and motivates them to make water use efficiency improvements.
Submetering Incentive Program	- Saturation is low and potential water savings are high volume.
Graywater Incentive Program	- High water savings potential.
Pressure Regulation Incentives	- Known issue with homes and irrigation system.
Irrigation Repair Incentives and Direct Installation	- Addresses fundamental issues. Issues are exasperated with installation of efficiency measures.
Leak Detection and Flow Monitoring Incentives	- Could save huge amounts of water and reduce damage at properties.
Drip Irrigation Incentives	- Currently most efficient and viable method for irrigation.

Program/Measure	Reasons for Consideration
Budget-Based Water Rates	- Sends strong price signal, stable agency revenue recovery, and provides excess revenue for local agency programs - Drives over-allocation customers to consider changes, with little impact to low-income (UCR; Baerenklau) - Proven effective for long-term water demand reduction
Customer Engagement Software	- Technology based communication method - Allows retailers to send messaging & program links to over-allocation customers - Proven effective elsewhere for reducing demand

As importantly, it is necessary to understand the issues and possible risks when considering a potential program and/or measure. Table 22 lists these other considerations.

Table 22: Potential Programs and Other Considerations

Program/Measure	Consideration
SoCal WaterSmart Rebate Program (multiple measures)	- MWD controls measures to be incentivized, incentive levels, and budgets. - Marketing is not consistent.
High Efficiency Toilet Incentives and Direct Installation Programs	- Saturation is high. - Code requires high efficiency fixtures. - Premium fixtures are not easily available and provide only incremental savings.
Turf Removal Incentives and Direct Installation	- Expensive and not cost effective. - Quality of installations vary. - Drip systems have maintenance issues. - Requires a significant amount of resources to manage a “best practices” program.
Smart Controller Voucher and Direct Installation Programs	- Cost is higher than traditional controllers. - Many contractors have not bought into technology. Customers are unfamiliar with technology. Can be complicated to install and program. - Many customer under-irrigate.

Program/Measure	Consideration
High Efficiency Nozzle Voucher and Direct Installation Programs	- More expensive than traditional nozzles. - Many customers do not know what a nozzle is.
Landscape Evaluations	- Duration of behavioral savings are unknown. - Measure savings are usually associated with another program.
Submetering Incentive Program	- Extremely expensive. - Reading meters and billing is complicated.
Graywater Incentive Program	- As a retrofit option, graywater is not cost effective. Re-plumbing is costly.
Pressure Regulation Incentives	- Savings are not known. Hard to set average incentive. - Requires more extensive installation. All installations are different.
Irrigation Repair Incentives and Direct Installation	- Savings are not known. Hard to set average incentive. - Requires digging, additional equipment, etc. All installations are different. - Potential liability for water agency if repairs conducted by staff or contractor.
Leak Detection and Flow Monitoring Incentives	- Savings are not known. Breaks are different sizes therefore different savings. Hard to set average incentive. - Many solutions require extensive digging. Could create more liability for water agency.
Drip Irrigation Incentives	- Drip systems can have maintenance issues. - Savings are not known. Hard to set average incentive.
Budget-Based Water Rates	- Requires significant investment of time, resources and dollars - Must be clearly communicated to customers
Customer Engagement Software	- Duration of savings may be limited

For each program, a high level of costs and water savings were estimated. Additionally, each program was assessed for its ability to deliver desired outcomes.

Program selection was not a cut-and-dry process. Some of the water efficiency possibilities would not meet other regional criteria for selection such as customer

acceptability or market need. Others could meet regional goals to achieve market transformation, although they were not cost-effective. IEUA and its regional partners also needed to take advantage of MWD funding and grant opportunities.

After the first pass, several programs were removed or otherwise not selected and are listed below:

- ***Toilet Replacement Programs.*** As discussed in the previous chapter, efficient toilets have a saturation of 80% in single family and nearly 100% in multi-family sites. Based on this evidence as well as the current code, it is recommended that IEUA and its regional partner not implement direct installation programs or offer enhanced incentives.
- ***Submetering Incentive Program.*** Submetering individual apartment units or landscape use for residential and mixed-use meters has proven to reduce water use. However, installing, maintaining and reading those meters is complicated and costly from both a water agency and customer perspective. Therefore, submetering was deemed not feasible or cost effective.

In addition, several programs were tabled for later consideration because although they have potential for significant savings there is not sufficient information on savings and costs necessary to conduct a comprehensive evaluation. These programs are:

- Graywater Incentiive Program
- Irrigation Repair Incentives and Direct Installation
- Leak Detection and Flow Monitoring Incentives

Cost-Effectiveness Analysis

The next action was to run each of the remaining program measures through the economic analysis model and compare against the region's overall strategy to better examine the pros and cons of each. The AWE Tracking Tool v3 was utilized to conduct the analysis.

In order to determine the cost-effectiveness threshold for a program, it is first necessary to determine the avoided costs of supply. The significance of the avoided costs is that for each acre-foot of water savings, IEUA and its regional partners can avoid the variable costs, which include power costs and purchasing MWD water.

The region's avoided cost ranges from $1,122 in 2015 to $1,285 in 2020 and $2,231 in 2040.

The portfolio of programs being considered should fall below the current $1,122 avoided cost.

Cost-effectiveness analysis is the process of weighing the costs and benefits of a WUE program. For the regional plan, the relevant cost perspective for decision-making on WUE investments is the cost to IEUA and its member agencies alone. The benefits of the program are defined as the value of the water savings in dollar terms using the avoided costs estimates above. Finally, the dollar costs are compared to the dollar benefits. For sustainability purposes, the embedded energy savings and avoided greenhouse gas emissions calculated by the AWE Water Conservation Tracking Tool are also reported.

Table 23 shows the cost-effectiveness results for the potential program measures. A program such as SoCal WaterSmart has multiple measures and because each measure may have different savings and costs, it is represented on separate lines. Several measures are funded 100% by MWD or other grants and therefore have zero cost to the IEUA and its member agencies and are not listed in the table.

Table 23: Potential Program Cost per Acre-foot

Activity Name	Regional Cost to IEUA ($/AF)
Budget-based Water Rates*	$0
Residential Landscape Retrofit Program*	$0
Cooling Tower Controllers SCWS Rebate	$124
Technology Customer Engagement Software	$127
Smart Controllers SCWS Rebate (Commercial) $50 per Station	$130
Ultra-Low Volume Urinals SCWS Rebate	$148
FreeSprinklerNozzles.com Voucher (All Classes)	$185
High Efficiency Sprinkler Nozzles SCWS Rebate (CII)	$202
Smart Controllers SCWS Rebate (SF)	$221
High Efficiency Clothes Washers SCWS Rebate (SF)	$303
Air-Cooled Ice Machine SCWS Rebate	$744
Turf Removal $1.00	$879
HE Sprinkler Nozzle Direct Installation Program (All classes)	$931
Landscape Evaluation Program	$1,286
Turf Removal $2.00	$1,783
Residential Smart Controller Upgrade Program	$2,215

** Program has outside funding.*

Most measures, except the programs/measures below, fall below the region's current avoided cost of $1,122 per acre-foot.

- Landscape Evaluations
- Residential Smart Controller Upgrade (direct installation)
- Turf Removal Rebates of $2.00 per square foot

These programs offer other benefits and assist in moving the landscape and irrigation efficiency (L&I) markets forward.

- Landscape evaluations provide customers with education as well as direction in implementing measures.
- The direct installation of smart controllers introduce customers to the new technology, educates them on their specific site water needs and ensures correct installation and programming.
- Enhanced turf removal incentives overcome the initial cash outlay barrier and drive market transformation.

Additionally, a scorecard was created and the programs rated by its ability to deliver desired outcomes.

Table 24: Potential Program Qualitative Scoring

	Scalability	Impact on L&I Market Transformation	Speed of Implementation
Budget-Based Water Rates	High	High	Medium
Cooling Tower Controller SCWS Rebates	Low	Low	Immediate
Customer Engagement Software	High	High	Medium
FreeSprinklerNozzles.com Vouchers	High	Medium	Immediate
HE Clothes Washers SCWS Rebates (SF)	Low	Low	Immediate
HE Nozzle Direct Installations	High	Medium	Short
HE Sprinkler Nozzles SCWS Rebates (CII)	Medium	Medium	Immediate
Landscape Evaluations	Low	Medium	Immediate
Residential Landscape Retrofits	Low	Medium	Immediate
Residential Smart Controller Upgrades	Medium	Medium	Short
Smart Controllers SCWS Rebates (CII)	Low	Medium	Immediate
Smart Controllers SCWS Rebates (SF)	Low	Medium	Immediate
Turf Removal Rebates ($2.00)	High	High	Short
Ultra-Low Volume Urinals SCWS Rebates	Low	Low	Immediate

The above programs offer varying levels of scalability; ability to transform the WUE market, and feasibility of implementation. Despite the range of ratings, each program contributes a worthwhile volume of cost-effective water savings. This high level scoring can be used as a guide in the future as conditions change such a needing to scale program activity.

Section 6 - Selected Programs

With the analysis completed, it was clear that most of the current programs proved to be cost-effective and each provided significant benefits. Each program was next assessed for potential refinement.

The programs below are shown to deliver effective levels of water efficiency and are available whether or not an agency chooses to implement Budget-Based Water Rates or the Customer Engagement Software. Table 25 provides the final list of programs, along with the reasoning for selection and potential support actions to improve results.

Table 25: Selected Programs and Reasoning

Program	Reasoning	Support Actions
Budget-Based Water Rates	- Sends strong price signal - Drives over-allocation customers to consider changes - Proven effective at reducing water demand	- Member agency education - Rate evalution and implementation support through SAWPA grant
Customer Engagement Software	- Technology based communication method - Allows retailers to send messaging & program links to over-allocation users - Proven effective elsewhere for reducing demand	- Link new media and WUE programs with targeted customers.
Landscape Evaluations	- Links customer with programs - Provides one-on-one customer education - Starts relationship with customer	- Use water budget data to identify customers - Provide more visual report - Implement automated and consisent follow up - Provide more cost/benefit information - Modernize data collection and reporting
Residential Landscape Retrofit Program	- Target large water use - Site visit verifies there will be savings - Professional installation and programming of controller	- Provide electronic follow up with customer to ensure sustained savings.

Program	Reasoning	Support Actions
Residential Smart Controller Upgrade Program	- Offering to smaller customer provides bigger pool of potential customers - Site vistis verifies there will be savings - Education workshop ensures customer can program and maintain controller and therefore sustain savings	- Use water budget and potential savings to show return on investment - Consider customer co-pay option to lower costs.
FreeSprinklerNozzles.com Program	- Cost effective - Targets large water use - Hugely scalable - Gateway measure	- Target largest users and over-allocation users to maximize savings and MWD funding - Market more aggressively
SoCal Water$mart Regional Rebate Program	- MWD funding - MWD administration - Ease of implementation	- Continue to add dollars to priority measures - Market locally
High Efficiency Nozzle Direct Installation Program	- Removes financial barrier of entry - Ensures quality installation - Hugh potential and scalability	- Implement aggressive marketing campaign - Hire additional contractors - Offer multiple nozzle manufacturerers

In addition to the nine selected active programs, IEUA and its regional partners will continue to provide regional educational and outreach programs. Current regional education and outreach programs include the following:

National Theatre for Children Program National Theatre for Children (NTC) delivers a package of live theatre, student curriculum and teacher guides to elementary schools throughout the region.

Shows That Teach Shows That Teach (STT*)* provides educational and motivational school assembly programs that focus on water education.

Regional Landscape Training Workshops In this series of regional sponsored courses; residential landscapers learn the latest ways to reduce water usage through workshops. The courses cover information on the basics of efficient irrigation systems, the benefits of properly watering and fertilizing landscaping, landscape design techniques and plant identification.

Garden in Every School® Program Grants are awarded to elementary schools within IEUA's service area for the establishment of a water-wise gardens. In addition, a blog is available for educators, parents, and community members to follow the development of the gardens, acquire gardening tips, curriculum tips and water savings tips at ieuagies.blogspost.com.

Water Discovery Field Trip Program Free educational field trips are provided at the Chino Creek Wetlands and Educational Park to promote the public understanding of the value of natural treatment wetlands, the creation of habitat for endangered/sensitive species and environmental stewardship. A busing mini-grant is offered to schools within the state of California to take part in the field trip program, partially funded by the California Department of Parks and Recreation.

IEUA Water Softener Rebate Program The IEUA Water Softener Rebate Program is part of the third phase of the IEUA's Salinity Reduction Program that is addressing the impacts of automatic water softeners on IEUA's recycled water. The goal of this project is to demonstrate the transferability of a financial incentive "rebate" for the removal of residential self-regenerating water softeners within the service area of IEUA.

Water Saving Garden Friendly The Water Saving Garden Friendly program was founded in 2011 to provide local communities with conservation-based educational opportunities, as well as information and access to climate-appropriate plants. Through partnerships with sponsors like Home Depot, Scotts Miracle Grow and others, the program hosts events, workshops, and other educational and "do-it-yourself" opportunities for local residents to learn about and enjoy sustainable landscaping. The Garden Friendly program is a public-private partnership that welcomes the participation of all members of the public as well as interested landscape retailers.

Recommended Program Summary Pages

Implementation details for each recommended program including: program descriptions, measure(s) offered, target customer segments, delivery mechanisms, annual activity, program costs and economic evaluation results are included on the following pages.

Budget-based Water Rates	
Target Customer Customers exceeding their water budget	A budget-based water rate design identifies efficient and inefficient water users. The rate, as designed, then sends an economic message to over-allocation water users. Customers are provided a context for efficient water use and driven to make efficiency improvement. Budget-Based Water Rates provide the retail agency with the most cost-effective means to reduce demand. As depicted by university studies, the pace and longevity of achieving water use efficiency is significantly enhanced with budget-based rate implementation. At least two IEUA member agencies are expected to utilize the SAWPA grant and IEUA assistance for Budget-Based Water Rate implementation. Typical costs for agencies the size of those in the region range from $250,000 - $350,000. The SAWPA grant provides all single family residential landscape square footage and ET data for use by the local agency. Ongoing costs are similar to any tiered rate structure design. Agency costs for implementation are expected to be recovered within 3 months for every $1,000,000 dollars of agency revenue loss being incurred. In addition, IEUA provides support for rate design, staff training, public outreach and Prop 218 assistance. *Benefits* - Customer educated on their specific water efficiency - Sends strong price signal - Drives over-allocation customers to consider changes and implement water use efficiency measures - Proven effective at reducing demand and stabilizing agency revenue - Water budgets, based on State efficiency standards, gives the local agency a defensible rate design and efficiency benchmark
Potential for the Region High	
Estimated Activity 52,551 residential accounts	
Water Savings 11-15% average savings across the agency *Program*: 5,819 AF over 5-year Lifetime	
Costs Implementation: Average of $300,000 per agency $5.7 per account Paid for by grants or local agencies Zero regional costs to IEUA	
Funding Source SAWPA GRANT	
Other Benefits Customer engagement and education	

FreeSprinklerNozzles.com Voucher Program	
Target Customer All customers with pop-up spray irrigation systems.	There are millions of pop-up spray nozzles being used in IEUA's service area in all types of landscapes. These nozzles are installed as part of an in-ground irrigation systems and can be easily upgraded with high efficiency (HE) nozzles or rotating nozzles. When correctly installed, high efficiency fixed spray and rotating nozzles can have an immediate and drastic impact on outdoor water efficiency. All customers, even those with average or below average water usage, can see a reduction by upgrading to HE nozzles. However, many customers without knowledge of their irrigation systems are intimidated by HE nozzle retrofits because the product is relatively unknown and more expensive than standard nozzles. The FreesprinklerNozzle.com program is designed to assist customers in gaining knowledge about HE nozzles and overcoming the initial cash outlay barrier. *Program Delivery* The FreeSprinklerNozzle.com program is a web-administered program that provides vouchers for free high efficiency nozzles to all eligible customers. Customers must first view online videos explaining how the nozzles work with their irrigation system, how to survey their landscape to determine which nozzles are needed, and how to install and adjust the nozzles. Customers are then given a voucher for free nozzles. These vouchers can be redeemed at participating irrigation stores. Residential customers can receive up to 25 free nozzles. Commercial customers can receive as many nozzles as needed for their site. *Benefits* The most common barriers to purchase and installation of HE nozzles are: 1) lack of knowledge on how to choose, purchase, and install the appropriate nozzles; and 2) cost of nozzles. FreeSprinklerNozzle.com addresses both of these barriers with a voucher and required educational component. FreeSprinklerNozzle.com is a multi-agency program, administered by Western MWD. IEUA and its regional partners benefits from the economies of scale and ease of implementation.
Potential for the Region High Millions of pop-up spray nozzles with all customer types.	
Estimated Activity 60,000 nozzles/year	
Water Savings *Device*: 757 gpy per nozzle *Program*: 5,689 AF over Lifetime	
Costs *Device*: $2.75 *Per AF savings:* $185	
Funding Source • IEUA and its regional partners • MWD	
Other Benefits • Reduced runoff • Customer education • Market transformation	

SoCal Water$mart Rebate Program	
Target Customer All customers classes	SoCal Water$mart (SCWS) is MWD's regional rebate program offering incentives for a menu of indoor and outdoor water saving measures for both residential (RES) and commercial/industrial/institutional (CII) customers. Current incentives include: • High Efficiency Sprinkler Nozzles (CII, RES) • High Efficiency Clothes Washers (RES) • Premium High Efficiency Toilets (MF 1.0 gpf/less) • Smart Controllers (RES, CII) • Cooling Tower Conductivity & pH Controllers (CII) • Rain Barrels (RES) • Air-Cooled Ice Machine (CII) • Soil Moisture Sensors (RES, CII) • Drip Irrigation (RES, CII) –*Available in 2016* Member and retail agencies have the option of adding additional incentives onto MWD's base incentive. The region will add additional incentive dollars to several devices including: • Residential high efficiency clothes washers • Residential and commercial smart controllers • High efficiency sprinkler nozzles • Air-cooled ice machines *Benefits* SoCal Water$mart provides regional rebates to all Regional customers reducing customer confusion regarding availability in their specific area. The Region benefits from MWD paying for the majority of the incentive dollars as well as administration. *Estimated Annual Activity* • High Efficiency Sprinkler Nozzles - 10,750 across all markets per year • High Efficiency Clothes Washers – 500 per year • Smart Controllers (commercial sites) – 100 year 1, 50 years 2 - 5 • Smart Controllers (single family sites) – 50 per year • Cooling Tower Controllers – 10 per year All other measures have negligible participation and no additional funding from the Region.
Potential for the Region High Multiple measures available for all customers.	
Estimated Activity See Estimated Activity in Table	
Water Savings 3,254 AF over Lifetime	
Costs *FY16*: $1 Million for Turf Year 1 + $400,000 for devices *FY17-20*: $100,000	
Funding Source • IEUA and its regional partners • MWD	
Other Benefits • Runoff reduction • Waste water savings • Market transformation	

Customer Engagement Technology and Data Analytics Program	
Target Customer Customers exceeding their water budget **Potential for the Region** High **Estimated Activity** 131,376 residential accounts **Water Savings** *Device*: 4.6% per account *Program*: 3,093 AF over Lifetime **Costs** *Device*: $3.05 per account. *Per AF*: $190 *Estimate include $.75 per GIS mapping SF account for all agencies for 2 years plus $2 per SF account for 2 agencies for 5 years for DropCountr.* **Funding Source** SAWPA GRANT IEUA and its regional partners **Other Benefits** Customer engagement and education	OmniEarth is a new technology that combines physical characteristics of parcels collected through aerial/satellite imagery (ex: size, land cover type) with customer information (ex: current and historical water usage) to create water budgets for each customer. The program compares water budgets with actual usage to identify customers who are exceeding their water budget and have the most room for efficiency. This information is then consolidated and presented in layered maps and easy to understand graphs. DropCountr is a complementary program that can share OmniEarth's information directly with customers. DropCountr utilizes OmniEarth's customer water budget information to show customers how their usage compares to households with similar geographic and household qualities. Customers can also track their usage and budget information through web-based and mobile interfaces. To maximize this information, DropCountr also provides personalized conservation tips. *Program Delivery* If a retail agency opts in, the Program utilizes OmniEarth to target high yield customers, identify geographic areas of highest water use for targeted marketing, and match customers with best-suited WUE programs. *Benefits* OmniEarth provides vital information for both targeting customers and executing efficient programs such as: - logical and defendable water budgets for each customer - Identification of over-allocation customers with high savings potential - Geographical location of over-allocation customers for identifying trends DropCountr takes this information to the next step by interacting directly with the customer.

High Efficiency Nozzle Direct Installation Program

Target Customer

High water use customers across all classes with pop-up spray head irrigation systems.

Potential for the Region

Medium-

For high water use customers only

Estimated Activity

10,000 nozzles/year

Water Savings

Device:
757 gpy per nozzle

Program:
1,101 AF over Lifetime

Costs

Device: $6

Per AF savings: $931

Funding Source

IEUA and its regional partners

MWD

Other Benefits

Reduced runoff

The largest water consumption in the region is outdoor landscape usage. Retrofitting existing systems with high efficiency (HE) nozzles is an easy way to increase efficiency of irrigation systems and reduce water usage. HE nozzles can be used to replace any inefficient standard pop-up sprinkler head creating instant water savings. However, the majority of customers are not aware of HE nozzles, where to purchase them, or how to install and maintain them.

Program Delivery

The goal of the HE Nozzle Direct Installation Program is to target high water use customers and assist them in overcoming any barriers to HE nozzle installation at their site. This program would be free to customers and executed by a contractor who would:

- Work with retail agencies to identify the highest water use customers.
- Market the program directly to high water use customers.
- Perform on-site visits to ensure customers have functional irrigation systems and meet other eligibility requirements.
- Schedule and perform retrofit of pop-up sprinkler heads with HE nozzles.
- Educate the customer while on-site about how to identify, install, adjust, and maintain the HE nozzles.
- Provide educational materials on HE nozzles and other water saving resources

Benefits

There are many benefits from a direct installation program including:

- Ability to target specific customers or sectors
- Assurance that HE nozzles were installed and not just purchased
- Guarantee that nozzles are installed correctly
- Opportunities for on-site customer education.

Residential Smart Controller Upgrade Program

Target Customer

Residential customers with 500 sq ft – ¼ Acre of irrigated area

Potential for the Region

Medium

Estimated Activity

500 per year

Water Savings

Device: 13,490

Program: 828 AF over Lifetime

Costs

Device: $800

Per AF: $2,215

Funding Source

IEUA and its regional partners

Other Benefits

- Runoff reduction
- Customer education
- Market transformation

Smart controllers adjust irrigation based on weather, plant type, and other factors. These controllers save water by automatically adjusting irrigation to meet plant needs with minimal customer intervention.

Program Delivery

The Residential Smart Controller Upgrade Program will be offered to residential customers with 500 square feet to ¼ acre of irrigated area. The program will be implemented by a vendor and contains several steps.

- First, a site survey of the customer's property would be performed by a contractor to confirm that they have an eligible irrigation system and will in fact see water savings.
- Second, customers would attend a workshop to learn about the maintenance and use of their controller.
- Third, a contractor would install a smart controller at the customer's home and program it to meet the property's needs. Controllers and installation would be provided free of charge to the customer.

Benefits

There are several barriers stopping many residential customers from installing smart controllers including:

- complex installation process
- need for initial set-up/programming to meet site specific zones
- lack of knowledge on adjusting the automated controller

This direct installation program is designed to address all of these barriers. It ensures correct installation of the product and an opportunity for property-specific training by the installing contractor on the maintenance of the product.

Residential Landscape Retrofit Program	
Target Customer Residential customers over ¼ Acre of irrigated area	The largest water consumption sector in the region is single family residential landscape and irrigation. Single-family site with large landscape provide a significant opportunity to reduce water use. The goals of the Residential Landscape Retrofit Program is to reduce use through the installation of smart controllers and high efficiency (HE) sprinkler nozzles. Smart controllers adjust irrigation based on weather, plant type, and other factors. These controllers save water by automatically adjusting irrigation to meet plant needs with minimal customer intervention. High efficiency nozzles reduce use through reduced water flow. *Program Delivery* The Residential Landscape Retrofit Program is offered to residential customers with ¼ acre or more of irrigated area. The program is implemented by an outside contractor. The contractor conducts a site visit to verify eligibility. The contractor then installs the smart controller and nozzles at no cost to the customer. *Benefits* There are several barriers stopping many residential customers from installing smart controllers including: - complex installation process - need for initial set-up/programming to meet site specific zones - lack of knowledge on adjusting the automated controller This direct installation program is designed to address all of these barriers. It ensures correct installation of the product. The program is funded by MWD and a grant from USBR requiring no funding from IEUA and its regional partners.
Potential for the Region Low	
Estimated Activity 150 per year	
Water Savings *Device*: 13,490 gpy *Program*: 447 AF over Lifetime	
Costs *Device*: $800 *Per AF*: $0	
Funding Source • MWD • USBR Grant	
Other Benefits • Runoff reduction • Customer education • Market transformation	

Landscape Evaluations	
Target Customer Large landscape customers, residential and commercial	Customers with large landscapes require proportionally larger amounts of water to maintain the health of the landscapes. In addition, many large landscape sites are hard to irrigate such as turf located in street medians. Major areas of opportunities include: repairs to existing system, micro-zone planting, removal of non-functional turf, improvements to the distribution uniformity and finally hardware upgrades. Site surveys or customer audits are an effective tool for determining the best opportunities at a specific site and assisting the customer in evaluating the opportunity and moving forward with the measures. *Program Delivery* The Landscape Evaluation Program offers customers a comprehensive outdoor water use evaluation. Note that there are large landscape surveys offered by Metropolitan Water District. These are abbreviated versions of the evaluations conducted by the IEUA and its regional partners. The Landscape Evaluations are free to customers and provide an assessment of a site's irrigation system, including the controllers, valves, heads, layout, and performance including: • Pressure testing • Valve operation per controller • Distribution uniformity tests The auditor also evaluates landscape design, vegetation types and local conditions for potential reductions in water use. The customer receives a written report that outlines recommended water efficiency measures and available programs and incentives. *Benefits and Recommendations* Landscape evaluations are an important tool in customer outreach and education. Recently, many energy and water audits have taken advantage of automation to reduce the time needed to survey the site or produce an customer report. A contractor utilizing an automated audit system could provide customers with immediate results and feedback while on-site. They would also have the opportunity to walk the customer through their options and answer any questions face-to-face. In addition, the customized reports should contain customer-friendly visuals, graphs, and aids that help customers understand their water usage and opportunities for efficiency. Utilizing an automated audit system coupled with more comprehensive follow-up could significantly improve implementation of recommended water saving measures.
Potential for the Region Low	
Estimated Activity 200 Year 1 150 Years 2 - 5	
Water Savings *Device*: 25,742 GPY *Program*: 126 AF	
Costs *Device*: $200 *Per AF*: $1,286 over Lifetime	
Funding Source IEUA and its regional partners MWD	
Other Benefits • Runoff reduction • Customer education • Market transformation	

New Programs and Pilots Summary Pages

IEUA and its regional partners will continue to test new technologies and program delivery mechanisms. A pilot scheduled for implementation in 2016 is the Home Pressure Regulator Pilot described below.

Residential Pressure Regulator Rebate Pilot Program	
Target Customer Residential customers with high water pressure	Pressure regulators are compact valves installed on water pipes to reduce the speed, or pressure, of water as it flows into a home or irrigation system. Water pressure in the distribution system can vary widely. Ten water districts in Southern California were surveyed in 2013 and found water pressure to range from 63 pounds per square inch (psi) to 113 psi. The ideal pressure for fixtures and irrigation systems at a residential home is 45 to 60 psi. A properly installed regulating valve at the main line into a residential property can reduce water flowing into irrigation systems and indoor fixtures to 60 psi or below. Regulating water pressure saves water by: - Reducing the "push" of water coming out of fixtures and irrigation systems, and thus the amount of water per second. Even low-flow fixtures will have increased water use at higher pressures. Reducing water pressure ensures that every fixture lives up to its water conserving potential. - Preventing slow leaks caused by increased wear and tear on fixtures, pipes, and irrigation systems. - Reducing pipe breakages caused by elevated pressure. *Program Delivery* The pressure regulator rebate pilot program will provide a rebate for customers who install qualifying pressure regulating systems on their main line that will reduce pressure to both outdoor irrigation systems and indoor fixtures. IEUA would contract with a vendor to market the program, review rebate applications, verify eligibility, and issue incentives to qualifying customers. Site inspections of a set number of customers may take place. *Benefits* Not many customers know their water pressure or the importance of maintaining a proper pressure. This Pilot Program will create customer awareness of pressure regulators and proper pressure. It will also provide more information to the IEUA and its regional partners on the importance and effectiveness of pressure regulation within their service area.
Potential for the Region TBD	
Estimated Activity 110 pressure regulating valves/year over	
Water Savings Device: 57,050 gallons per year. Program: 962 AF over Lifetime	
Costs $30 - $140 per regulator	
Funding Source • IEUA and its regional partners • MWD	
Other Benefits • Customer education	

Section 7 – Five Year Plan

At the inception of the Regional WUE Business Plan development the exact water savings goal and budgets had not yet been determined. Due to this uncertainty and as part of the initial Integrated Resource Planning (IRP) process, five levels of WUE budgets and productivity were modeled. These were conducted as a preliminary test to explore the impact varying amounts of water savings would have on water resources programs. Below are the modeled tiers estimated savings and costs. Details on the different models are described in Technical Memo, *IEUA Preliminary Test of WUE Tiers for IRP*, provided as an appendix.

IEUA Preliminary Test of WUE Tiers for IRP Process		
Tier Name	**Estimated Peak Annual Savings** (AF/Year)	**Estimated Annual Cost** (IEUA+Outside)
Tier 1: Current Path	3,700 AF by 2020	$1.5M
Tier 2: New Programs	6,000 AF by 2020	$3.5M
Tier 3: High WUE Implementation	10,000 AF by 2029	$6.5M
Tier 4: 20% reduction (WUE Active Programs Alone)	48,000 AF 2035	$30M
Tier 5: 40% reduction (WUE Active Programs Alone)	98,700 AF by 2035	$79M

It is important to note that WUE projects included in the IRP were structured differently than in the WUE Business Plan. Project categories in the IRP which included WUE devices, turf removal, budget-based rates, recycled water demand management, and advanced metering technologies will be refined and updated in the portfolio building and modeling tools per the project specifications during the IRP Phase 2.

In addition, as part of the WUE Business Plan planning process and detailed in Section 3, Budget-Based Water Rates were depicted as a WUE activity by contrasting different levels of IEUA's member agencies rolling out the new rate structure—either 2 member agencies or region-wide implementation.

This plan is estimated to produce peak annual water savings of 11,000 acre-feet (active and passive savings) in fiscal year 2019/20. The annual peak savings are estimated at half the cost projected through the IRP process. This is because the majority of estimated savings, 5,820 acre-feet per year, are derived from Budget-Based Water Rates at zero cost to IEUA. The plan assumes the costs associated with implementing the new rates would be covered under the SAWPA grant. Table 26 presents an overview of the plan if 2 agencies implement Budget-based Water Rates.

Table 26: Plan Overview with Budget-Based Water Rates

Plan Overview With Budget-Based Water Rates	
Regional IEUA Cost per Acre-foot	$52 per acre-foot
Five-Year Water Savings (*active programs*)	33,554 acre-feet
Lifetime Water Savings (*active programs*)	147,836 acre-feet
Avoided Costs (NPV)	$152.7 Million
Five-Year Total Budget*	$7.5 Million

**Budget includes IEUA regional program costs exclusive of outside funding.*
**Budget includes $300,000 per year for education and outreach programs.*

Table 27 presents an overview if none of IEUA's member agencies elect to implement Budget-based Water Rates.

Table 27: Plan Overview without Budget-based Water Rates

Plan Overview Without Budget-Based Water Rates	
Regional IEUA Cost per Acre-foot	$208 per acre-foot
Five-Year Water Savings (*active programs*)	16,095 acre-feet
Lifetime Water Savings (*active programs*)	31,446 acre-feet
Avoided Costs (NPV)	$28.9 Million
Five-Year Total Budget*	$7.5 Million

Implementation Schedule and Activities per Year

Table 28 displays the projected annual activity for each measure. Toilets are being phased out in FY2015/16. As of October 2015, MWD only provides rebates for premium efficiency fixtures at a much discounted incentive. The model includes toilet activity prior to the change. Turf removal was not modeled after FY2015/16. It is likely that MWD will lower the current turf removal incentive and impose caps. If the regional partners chose

to offer turf removal incentives more than likely they would have to fund the program themselves.

Table 28: Annual Activities by Measure

Activity Name	Measure Metric	FY16	FY17	FY18	FY19	FY20
	Sites Evaluated	200	150	150	150	150
Cooling Tower Controller Rebates	Cooling Tower Controllers	10	10	10	10	10
FreeSprinklerNozzles.com	HE Nozzles	50,000	50,000	50,000	50,000	50,000
High Efficiency Clothes Washer Rebate	HE Clothes Washers	500	500	500	500	500
HE Nozzle Direct Install	HE Nozzles	--	30,000	30,000	30,000	30,000
High Efficiency Nozzle Rebate (all markets)	HE Nozzles	10,750	11,000	11,000	11,000	11,000
High Efficiency Toilet Rebates (all markets)	HE Toilets	2,600	0	0	0	0
Premium Efficiency Toilet Rebate (MF)	HE Toilets	750	0	0	0	0
Rain Barrels	Rain Barrels	50	50	50	50	50
Residential Landscape Retrofit	Turf Removed (sites)	200	250	250	250	250
Residential Smart Controller Upgrade	Smart Controllers	0	500	500	500	500
Smart Controller Rebate (SF)	Smart Controllers	50	50	50	50	50
Smart Controller Rebate (CII)	Smart Controllers	100	50	50	50	50
Technology Customer Engagement Software	Customer Accounts	0	131,376	131,376	131,376	131,376
Turf Removal Rebate (CII)	Turf Removed (SF)	11.5 M	--	--	--	--
Turf Removal Rebate (SF)	Turf Removed (SF)	1.5 M	--	--	--	--
Ultra Low Volume Urinals	ULV Urinals	5	--	--	--	--
Budget-Based Water Rates (2 Agencies)	Customer Accounts	--	--	52,551	--	--

Water Savings

The following chart depicts the annual savings from active water use efficiency activities for the five-year implementation FY2015/16 – FY2019/20.

Table 29: Annual Water Savings

Annual Water Savings	
Fiscal Year	**Annual Water Savings (AF)**
2015/16	1,975
2016/17	3,083
2017/18	9,206
2018/19	9,502
2019/20	9,788

Water Savings by Sector

Table 30 below depicts the water savings by sector. Eighty-four percent of the projected savings will be procured from the single family sector predominately through landscape measures. When you add the savings from the program targeted at dedicated irrigation customers, nearly 99% of the savings are derived from landscape measures.

Table 30: Water Savings by Sector

Sector	Lifetime Water Savings (Acre-feet)	% of Total Water Savings
Single Family	124,389	84%
Multi-family	103	0.07%
Commercial	835	0.55%
Irrigation	22,717	14.8%
Total	**147,836**	

Savings by Activity

Table 31 below presents the acre-feet savings by activity for the five-year period and the respective percent of total savings. Budget-Based Water Rates at 116,390 acre-feet or 79% is clearly the highest water savings.

Table 31: Water Savings by Activity

Activity Name	Lifetime Water Savings (AF)	% of Total Savings
Budget-Based Water Rates	116,390	79%
Turf Removal (CII)	14,950	10%
FreeSprinklerNozzles.com Voucher (All Classes)	5,689	4%
Technology Customer Engagement Software	3,093	2%
Turf Removal (SF)	1,950	13%
HE Sprinkler Nozzle Direct Installation Program (All classes)	1,101	0.6%
High Efficiency Toilet SCWS Rebate (All markets)	892	0.6%
High Efficiency Sprinkler Nozzles SCWS Rebate (All markets)	890	0.6%
High Efficiency Clothes Washers SCWS Rebate (SF)	863	0.6%
Residential Smart Controller Upgrade Program	828	0.5%
Premium Efficiency Toilet Rebate (CII)	561	0.4%
Residential Landscape Retrofit Program	447	0.3%
Cooling Tower Controllers SCWS Rebate	161	0.11%
Landscape Evaluation Program	126	0.09%
Smart Controllers SCWS Rebate (SF)	104	0.07%
Smart Controllers SCWS Rebate (Commercial)	39	0.03%
Ultra Low Volume Urinals SCWS Rebate	12	0.01%
Air-Cooled Ice Machines	2	0.00%
Rain Barrels	2	0.00%

Passive vs Active Savings Assumptions

Some of the most significant and cost-effective water savings in California have come from state or national updates to plumbing and building codes. These changes are referred to as "passive", simply because they require no active program efforts for local water agencies. The AWE Tracking Tool calculate the passive savings from activities including:

- Residential and commercial high efficiency toilets
- Single family and multi-family high efficiency clothes washers

Below is the estimated passive and active water savings to be achieved through the five-year plan.

Table 32: Estimated Passive and Active Water Savings

Water Savings Category	Five-Year Savings (AF)	Total Lifetime Savings (AF)
Passive Water Savings	3,150	146,933
Active Water Savings	33,554	147,836
Total	**36,704**	**294,769**

Budget by Year

IEUA prepares annual regional program budgets with line items dedicated to water use efficiency activities. The projected annual budget for each year of the five-year planning period is below. The budget amounts reflect the financial commitment only of IEUA and are exclusive of MWD or other financial contributions. The budgets presented below will not exactly line up with actual costs because they are based upon activity estimates which vary depending upon program participation rates.

Table 33: Annual Budgets

Program Year	Annual Budget ($/Yr)
FY 2015/16	$1,928,800
FY 2016/17	$1,394,335
FY 2017/18	$1,394,335
FY 2018/19	$1,394,335
FY 2019/20	$1,394,335
Total	**$7,506,140**

**Budget includes IEUA regional program costs exclusive of outside funding.*
**Budget includes $300,000 per year for education and outreach programs.*

Regional Costs and Benefits

The plan is estimated to save over 147,836 acre-feet of water at a cost to IEUA and its regional partners of $52 per acre-foot. This falls well below the region's avoided cost to purchase water from MWD of $1,122 per acre-foot. The avoided purchases equate to a net present value (NPV) of over $152 Million. The overall benefit to cost ratio is 27.9.

Figure 8 and Table 34 show the cost per acre-foot per activity. The amounts reflect the financial commitment only of IEUA and are exclusive of MWD or other financial contributions.

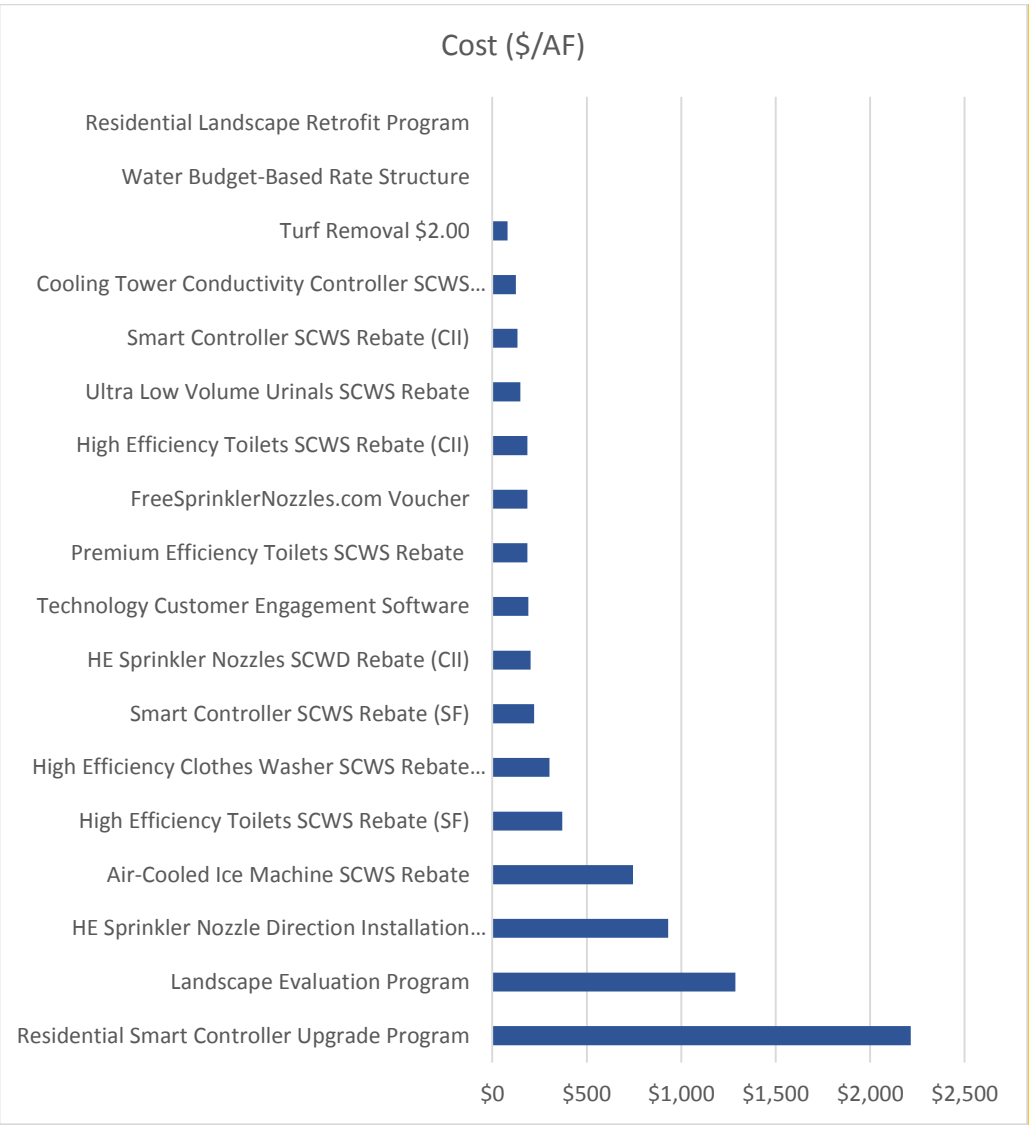


Figure 8: Cost per Acre Foot

Table 34 shows the cost-effectiveness for the selected program measures. A program such as SoCal WaterSmart has multiple measures and because each measure may have different savings and costs, it is represented on separate lines. Several measures are funded 100% by MWD or other grants and therefore have zero cost to the IEUA and its member agencies and are not listed in the table.

Table 34: Selected Programs - IEUA Cost per Acre-foot

Measure	IEUA Only Cost ($/AF)
Budget-Based Water Rates	$0
Residential Landscape Retrofit Program	$0
Turf Removal $2.00	$81
Cooling Tower Controller SCWS Rebate	$124
Smart Controller SCWS Rebate (CII)	$133
Ultra Low Volume Urinals SCWS Rebate	$148
FreeSprinklerNozzles.com Voucher	$185
High Efficiency Toilets SCWS Rebate (CII)	$185
Premium Efficiency Toilets SCWS Rebate	$186
Customer Engagement Software	$190
HE Sprinkler Nozzles SCWD Rebate (CII)	$202
Smart Controller SCWS Rebate (SF)	$221
High Efficiency Clothes Washer SCWS Rebate (SF)	$303
High Efficiency Toilets SCWS Rebate (SF)	$370
Air-Cooled Ice Machine SCWS Rebate	$744
HE Sprinkler Nozzle Direction Installation Program	$931
Landscape Evaluation Program	$1,286
Residential Smart Controller Upgrade Program	$2,215

The Net Present Value (NPV) is the sum of the benefits of the water use efficiency program for all units implemented minus the sum of the costs - “net benefits” or also known as Net Present Value. NPV is, perhaps, the most useful of the cost-effectiveness criteria in that is shows the absolute size of the program benefits not just the value of one acre-foot of savings. The Benefit/Cost (B/C) column contains the ratio of benefits to costs. For B/C ratios greater than one the program is cost effective. The higher the ratio the most cost effective.

The avoided purchases equate to a NPV of over $152 Million. The overall benefit to cost ratio is 27.9. Table 35 on the following page details the NPV and B/C for each program/measure.

Table 35: Benefits by Activity

Activity Name	NPV ($)	B/C Ratio
Budget-Based Water Rates	$123,792,926	NA
Turf Removal $2.00 (CII)	$15,475,316	15.7
FreeSprinklerNozzles.com Voucher (All Classes)	$5,373,192	7
Technology Customer Engagement Software	$2,863,880	6.3
Turf Removal $2.00 (SF)	$2,156,070	NA
High Efficiency Sprinkler Nozzles SCWS Rebate (CII)	$755,762	6.4
Premium High Efficiency Toilets SCWS Rebate (MF)	$502,097	7.4
High Efficiency Toilets SCWS Rebate (SF)	$530,605	3.7
Residential Landscape Retrofit Program	$491,254	NA
High Efficiency Clothes Washers SCWS Rebate (SF)	$493,107	4.2
HE Sprinkler Nozzle Direct Installation Program	$328,316	1.4
Cooling Tower Controllers SCWS Rebate	$156,512	9.9
High Efficiency Toilets SCWS Rebate (CII)	$94,591	7.3
Smart Controllers SCWS Rebate (SF)	$94,725	6
High Efficiency Sprinkler Nozzles SCWS Rebate (SF)	$85,163	NA
High Efficiency Toilets SCWS Rebate (MF)	$79,591	3.7
Smart Controllers SCWS Rebate $50 per Station	$38,231	9.9
Ultra Low Volume Urinals SCWS Rebate	$8,110	9.1
Rain Barrels SCWS Rebate (SF)	$2,637	NA
Air-Cooled Ice Machine SCWS Rebate	$886	1.8
Landscape Evaluation Program	-$10,117	0.9
Residential Smart Controller Upgrade Program	-$574,331	0.6
Total	**$152,738,523**	**27.9**

Energy and Greenhouse Emissions

The collection, distribution, and treatment of drinking water as well as wastewater treatment consume tremendous amounts of energy and release significant amounts of carbon dioxide (greenhouse emissions). Saving water reduces energy usage through out the water cycle and thereby greenhouse emissions. The following calculations as based on the energy embedded in delivering potable water through 2050, the region's five-year plan is expected to cumulatively save 182,555 MWh of electricity, 3,747 thousand therms of natural gas, and to avoid 505,983 tons of greenhouse emissions. Figures 9 -12 visually depict the annual savings and benefits. The embedded energy and avoided greenhouse gas emissions reflect all "upstream" embedded energy--source, conveyance, treatment, distribution pumping and pressurization. Wastewater flows and treatment that involve additional "downstream" embedded energy was not quantified.

Figure 9: Annual Electric Savings

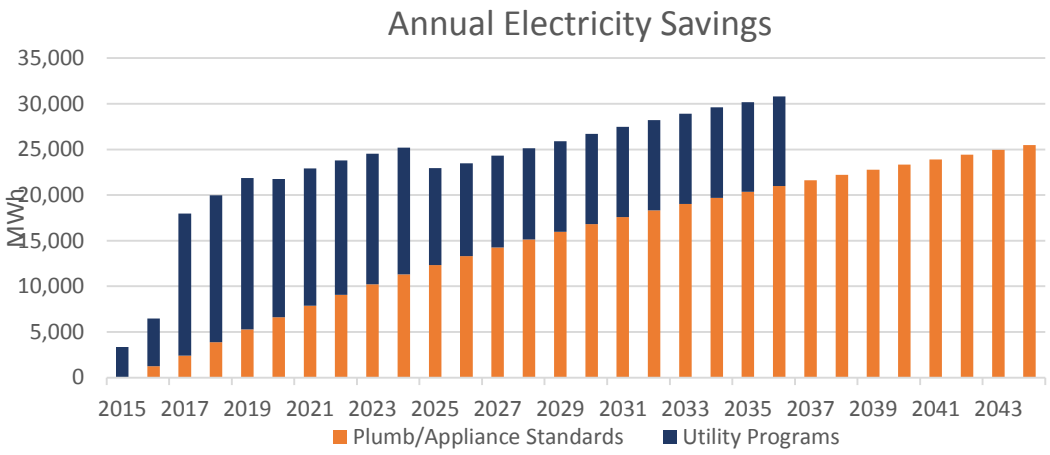


Figure 10: Annual Gas Savings

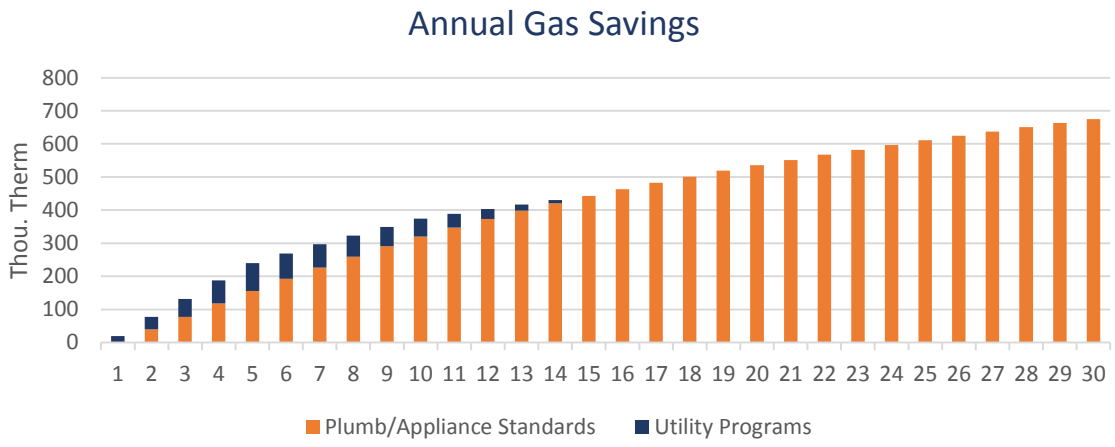


Figure 11: Annual CO2-Equivalent Emission Reductions

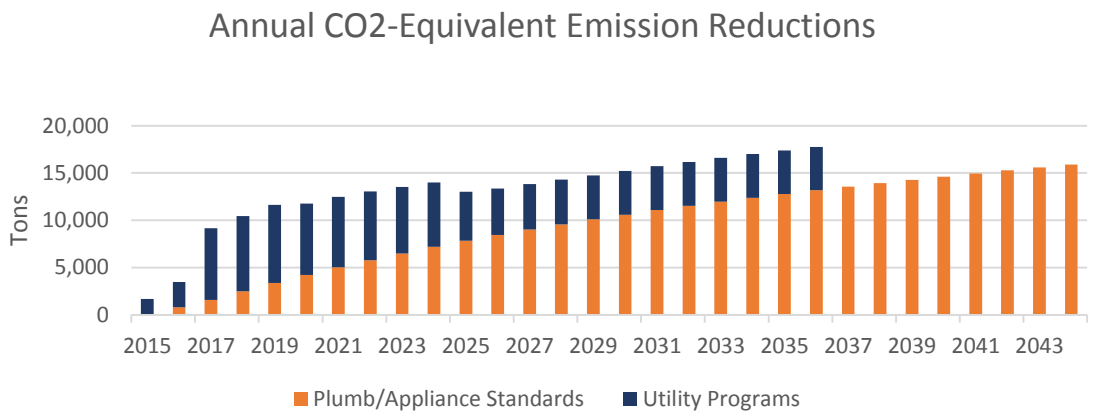
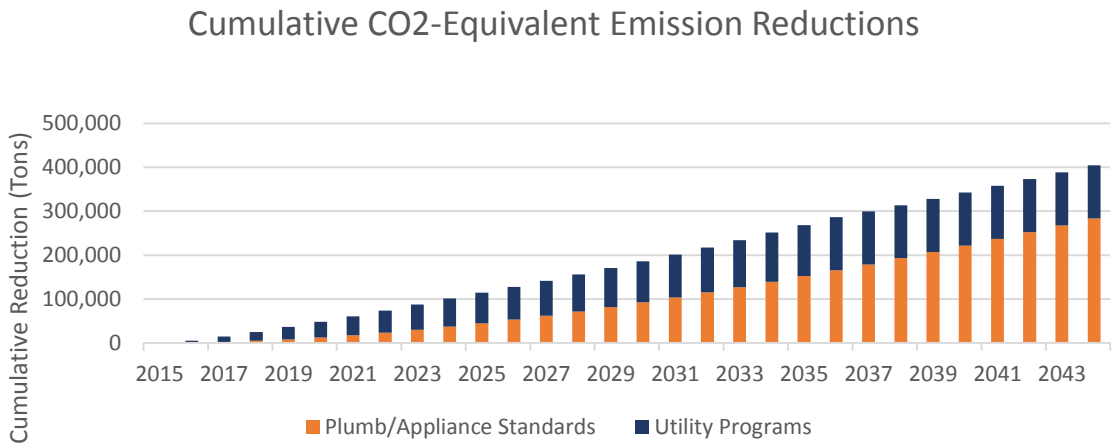


Figure 12: Cumulative CO2-Equivalent Emission Reductions



Sustainable Communities Strategy

Drawing from IEUA's 2015 Integrated Resources Plan, the water demand analysis underlying the WUE Business Plan incorporated alternative low impact development/smart growth scenarios from the Sustainable Communities Strategy outlined in the 2012 Regional Transportation Plan of Southern California Association of Governments (RTP-SCAG).

RTP-SCAG's Sustainable Communities Strategy provides the regional planning assumptions for Southern California that integrates land-use, transportation and housing policies to achieve the greenhouse gas emissions targets for the region (consistent with the requirements of SB 375, the Sustainable Communities and Climate Protection Act of 2008). SCG's strategies for sustainable communities embed higher-density housing,

sustainable landscaping, living soils, and stormwater capture into an integrated watershed approach for future development.

Three demand scenarios were considered using IEUA's IRP Scenario Manager from the Water Demand Forecasting Model (CDR data based on 2012 RTP-SCAG):

1. "Sustainable" Strategy: 40% of new growth is anticipated to be Multi-Family housing in Baseline along with 60% of new growth captured in smaller single family lot sized homes;
2. "More Sustainable" Strategy: 71% of new growth is anticipated to be Multi-Family housing, with 29% of new single family housing development weighted toward much smaller lot sizes as compared to more traditional older developments;
3. "Maximum Sustainable" Strategy: 96% of new growth is anticipated to be Multi-Family housing.

New mandatory landscaping requirements also occurred when Governor Brown issued an Executive Drought Order in April 2015 to update the State's Model Water Efficient Landscape Ordnance (MWELO) through an expedited regulation. The directive outlined five specific areas to address:

1. More efficient irrigation systems
2. Limiting the percentage of turf planted in landscapes
3. Onsite stormwater capture
4. Graywater Usage
5. Required reporting on the implementation and enforcement of the ordinance by local agencies

All revisions to the MWELO became effective December 1, 2015 with affected agencies provided with a February 1, 2016 deadline to adopt the new requirements.

The WUE Business Plan is the product of collaboration across jurisdictions involving multiple agencies and stakeholders in the development of regional programs. The WUE Business Plan reflects a suite of innovative water management approaches that includes but goes beyond traditional water efficiency rebates. The new program emphases in the WUE Business Plan approach, consistent with the 2015 IRP include:

- Multi-beneficial projects and programs that are linked together for improved synergy
- Integration of water use efficiency, water-energy nexus (with quantifiable avoided Greenhouse Gas Emissions attributable to water use efficiency), low impact development, run-off prevention, stormwater management, including onsite capture/recharge and low impact development, and water quality, among others;

- Proactive, innovative, and sustainable solutions;
- Sustainable landscaping in which every garden is viewed as a mini-watershed, holding on to or cleaning all the water that falls on it and supporting a diverse habitat of plants and insects.
- Integrated regional solutions supporting local water reliability and local priorities for water management, and
- Watershed approaches based project and programs that effectively leverage limited resources and maximize the greatest potential benefits.

A snapshot of the proposed programs and their integration with Sustainable Communities are highlighted in the chart below.

Table 36: Sustainable Communities - Program Integration

WUE Active Program	Multiple Benefits	Energy-Water Nexus	Run-off Prevention	Stormwater Mgmt	Sustainable Landscapes
Budget-Based Water Rates	√	√	√		√
Turf Removal	√	√	√	√	√
FreeSprinklerNozzles.com Program	√	√	√		√
SoCal Water$mart Regional Rebate Program	√	√	√	√	√
Customer Engagement Software	√	√	√		√
High Efficiency Nozzle Direct Installation Program	√	√	√		√
Residential Smart Controller Upgrade Program	√	√	√		√
Residential Landscape Retrofit Program	√	√	√		√
Landscape Evaluations	√	√	√	√	√
Regional Landscape Training Workshops	√	√	√	√	√
Water Saving Garden Friendly Program	√	√	√	√	√