



Central Basin
Municipal Water District

CENTRAL BASIN
MUNICIPAL WATER DISTRICT

WATER USE EFFICIENCY
MASTER PLAN

2011

Table of Contents

Section 1 - Executive Summary	3
Section 2 – The Plan Process and General Overview	7
Section 3–Customer Demand and Water Savings Potential.....	10
Data Sources	10
Water Accounts and Demand by Sector	11
Indoor Residential Opportunities	12
<i>Single Family Indoor Water Using Devices.....</i>	<i>13</i>
<i>Multi-family Indoor Water Using Devices.....</i>	<i>14</i>
<i>Device Saturation Model Background.....</i>	<i>14</i>
<i>Data Parameters for Saturation Modeling</i>	<i>15</i>
<i>Saturation Calculation Methodology.....</i>	<i>17</i>
Other Measure Opportunities	17
Overall Opportunities and Targets.....	19
Section 4–AWE Tracking Tool Program Evaluation Modeling.....	20
Model Description.....	20
<i>Model Structure</i>	<i>22</i>
<i>Activity Library</i>	<i>22</i>
<i>Economic Terms Used in the Model.....</i>	<i>22</i>
<i>Economic Analysis.....</i>	<i>23</i>
<i>Water Resources Analysis.....</i>	<i>24</i>
<i>Future Program Tracking.....</i>	<i>24</i>
Section 5– Water Use Efficiency Programs and Analyses	25
Potential Programs	32
Analysis of Potential Programs	34
Economic Evaluation.....	35
Ranking of Activities by Cost per Acre-foot	35
Additional Program Evaluation	36
Section 6 -Analyses and Final Program Selection.....	38
Implementation Schedule.....	39
Agency Roles	40
<i>Central Basin’s Role.....</i>	<i>40</i>
<i>Retail Agency Roles.....</i>	<i>40</i>
Program Implementation Strategy	41
MWD Member Agency Administered Funded Programs	43
Activities Implemented by Year	44
Water Savings	45
<i>Water Savings by Sector</i>	<i>46</i>
<i>Savings by Year by Activity.....</i>	<i>47</i>

<i>Programmatic Savings</i>	48
<i>Passive vs. Active Savings Assumptions</i>	49
Budget by Year	50
Central Basin Costs and Benefits	52
Partnership Funding Opportunities	52
<i>Metropolitan Water District</i>	53
<i>California Department of Water Resources</i>	53
<i>United States Bureau of Reclamation</i>	54
<i>Other Federal Sources</i>	54
Plan Updates	54

Section 1 - Executive Summary

Current Situation

As the regional manager and wholesale supplier of water for the area, Central Basin has assumed a role of coordinating the region's activities and programs to reduce demand for potable water. Central Basin Municipal Water District, along with its retail agencies and 24 member cities have been working collaboratively to bring about long-term solutions for secure and reliable water supplies.

To meet the water needs of its diverse population of more than 2 million people, Central Basin has developed an extensive network of local, state and federal partnerships to pull people and resources together to deliver successful water resource solutions. New supplies of water, secured through water recycling, water use efficiency programs, education and groundwater quality protection, will be needed to serve an increasing demand. ***Of these options, water use efficiency is the most cost-effective new source of water.***

In 2006, Central Basin adopted a 5-Year Water Conservation Master Plan (CMP). The Plan recommended an action plan with ten programs to be implemented over the 5 years. Central Basin successfully implemented the CMP saving over 28,678 acre-feet of water.

The five year Conservation Master Plan will be ending in 2011. Standards, legislation, saturation levels, limitations in available funding and other factors have changed the dynamics of conservation throughout the last few years. Even the standard industry name of "Conservation Master Plan" has been changed to "Water Use Efficiency Master Plan". This plan serves as an update to the 2006 plan and is to be used as a blueprint to help Central Basin and its member agencies comprehensively plan for and implement future water use efficiency programs.

Purpose of the WUE Plan

- Create the strategy and blueprint to meet per capita water demand reduction goals.
- Deliver the customized tools required to track performance and make future changes.
- Ensure compliance with water reduction goals and regulatory requirements.

General Strategy

- Target the largest users.
- Utilize program measures with the highest water savings potential.
- Build a program portfolio that includes the most cost effective programs.

Program Tactics

Utilizing economic modeling, water use efficiency analyses, and market saturation research, specific program tactics have been created to meet the goals for the general strategy. Based upon the results of much research and analysis, the following tactics will be utilized over the next five years:

- ***Seek out all non-efficient toilets.*** Estimates show that there still is a remaining opportunity to retrofit up to 231,078 residential non-efficient toilets in the Central Basin service area.
- ***Leverage outside funding opportunities*** to drive up cost-effectiveness. Central Basin will exhaust funding for existing grants; secure maximum MWD funding as available; and support member Retail Agency Programs.
- ***Transition to landscape programs.*** Landscape measures, across all sectors, offer the highest water savings opportunity at 333,683 in acre-feet in potential savings. With a number of cost-effective emerging technologies, Central Basin recognizes the need to segue programs away from indoor plumbing measures in order to capture the significant landscape savings opportunities.
- ***Design programs with flexibility in mind.*** As technologies and markets shift over time, Central Basin will review program effectiveness on a continual basis and make the changes necessary to deliver maximum water savings for the lowest possible cost.
- ***Continue to review commercial measures for future consideration.*** At present, commercial opportunities, such food service equipment replacement, have some water savings potential but at a much higher cost than programs selected for the WUE Plan. Central Basin needs to continually evaluate new technologies and delivery mechanisms in the commercial market that offer significant and cost effective savings.

Water Reduction Goals and BMP and Regulatory Compliance

The strategies and programs included in the plan are designed to meet the requirements of the:

- Governor's call for 20% per capita water use reduction by 2020
- California Urban Water Conservation Council's Best Management Practices
- Assembly Bill 1420 Statute

On February 28, 2008 Governor Schwarzenegger presented a plan to achieve a 20 percent reduction in per capita water use statewide by 2020 (commonly known as 20x2020) , with an incremental milestone of 15 percent reduction by year 2015. This initiative was incorporated into law as Senate Bill 7 (SBx7-7). Although Central Basin is not subject to the State's 20% by 2020 goal as a wholesale water agency, each of Central Basin's retail customers must comply with this state mandate.

Additionally, Central Basin and its member agencies are long-standing members of the California Urban Water Conservation Council (CUWCC) and were one of the first signatories of the Memo of Understanding, committing to implementation of Best Management Practices (BMPs) for more efficient use or conservation of water. This commitment requires that Central Basin and its member agencies maintain the staffing, funding and priority levels necessary to achieve the level of water savings called by the BMPs and report performance accordingly.

Lastly, Assembly Bill 1420 became effective in January of 2009 stating that issuance of state loans or grant funding be conditioned on implementation of the DMMs described in Water Code Section 10631. DWR equates the DMMs with the CUWCC BMPs.

In response to these compliance obligations, Central Basin developed this Water Use Efficiency Master Plan to detail a strategy for their wholesale service territory to meet the aforementioned requirements in the most cost-effective manner feasible. Below is a chart showing the compliance requirements and associated strategies for each:

Compliance Requirements

<i>Regulatory Agency or State Organization</i>	<i>Requirements</i>	<i>Approach</i>
DWR - 20x2020	Reduce per capita water use by 10% by 2015 AND Reduce per capita water use by 20% by 2020	By implementing effective water use programs, Central Basin and its agencies are projected to be on track to meet per capita water reduction goals for both target years.
CUWCC– BMPs	Fulfill Best Management Practice Requirements and Practices Outlined by the CUWCC MOU	Central Basin will use the standard BMP reporting method, which offers a straight-forward foundational reporting methodology to track compliance. (See below chart for breakout.)
AB 1420 - DMM	Fulfill BMP commitments	Lines up with the actions taken to meet CUWCC BMP compliance.

Below is a breakout of the requirements for CUWCC’s BMP fulfillment as outlined by the Memorandum of Understanding committed to by Central Basin:

BMP Compliance Breakout

<i>BMP</i>	<i>Practice</i>	<i>Central Basin Compliance</i>
BMP 1.1	Operations Practices -Conservation Coordinator -Wholesale Agency Support	In compliance
BMP 2.1	Public Outreach	In compliance
BMP 2.2	School Education	In compliance

Although the current goals for each of the regulatory agencies and state organizations vary, all are moving to a *Gallons per Capita per Day (GPCD)* savings goal that is in line with the 20x2020 per Capita Water Use Reduction Goals.

Central Basin expects its member agencies to achieve the 20x2020 goal; for both the 2015 target and the 2020 target. This will be accomplished through regional and local actions utilizing water use efficiency measures that offer customers a program portfolio with cost-effective water use efficiency measures.

Section 2 – The Plan Process and General Overview

The Water Use Efficiency Plan

With major challenges ahead, Central Basin recognizes that a sound, fact-based plan is needed as a tool to guide water use efficiency program implementation over the upcoming years. Through using the Alliance for Water Efficiency (AWE) conservation tracking tool, a comprehensive programmatic approach has been developed for Central Basin.

Selected Programs

The selected programs include a variety of indoor and outdoor measures and target all customer segments. Due to their long-term water savings and cost effectiveness, high efficiency toilets still represent a significant focus for Central Basin Programs. Five of the 13 programs target toilets with estimated savings of 18,081 acre-feet or 56% of the total plan savings. Central Basin will also offer programs that target landscape water use including smart irrigation controllers and high efficiency nozzles. In an effort to transform the landscape market and educate customers on the regional appropriate plants, Central Basin will be installing demonstration gardens throughout the service area. Lastly, Central Basin will also continue to offer MWD regional programs due to their low cost and ease of implementation.

- *High Efficiency Toilet Distribution Program*
- *High Efficiency Toilet Direct Ship Program*
- *HELP HET Multi-family Direct Installation Program*
- *City of Maywood HET Direct Installation Program*
- *Shut your Tap! CARE HET Installation Program*
- *FreeSprinklerNozzles.com Nozzle Voucher Program (starting in 2013)*
- *Outdoor Large Landscape Water Savings Performance Program*
- *Smart Controllers for Public Sector Program*
- *MWD's SoCal Water\$mart Residential Incentive Program*
- *MWD's Save A Buck Commercial Incentive Program*
- *Commercial HET Direct Installation Program (starting in 2013)*
- *Urban City Makeover Program*
- *Demonstration Gardens*

These programs will deliver water savings through the 2015 and 2020 target years and beyond due to the long life for several of the measures being offered. Below is an overview of the lifetime water savings for each of the programs:

Lifetime Water Savings by WUE Active Programs

<i>WUE Active Program</i>	<i>Estimated Lifetime Water Savings (AF)</i>
High Efficiency Toilet Direct Mail Program	7,111
Save A Buck Commercial Incentive Program	4,991
HELP HET Multi-family Direct Installation Program	4,865
High Efficiency Toilet Distribution Program	3,555
Shut your Tap! CARE HET Installation Program	3,469
SoCal WaterSmart Residential Incentive Program	2,903
Commercial HET Direct Installation Program	2,550
FreeSprinklerNozzles.com Voucher Program	1,500
Outdoor Large Landscape Water Savings Performance Program	619
City of Maywood HET Direct Installation Program	468
Smart Controllers for Public Sector Program	232
Urban City Makeover Program	175
Demonstration Gardens	5
Total	32,443

The Plan is estimated to save over 32,443 acre-feet of water at a cost to Central Basin of \$29 per acre-foot. This falls well below Central Basin’s avoided cost to purchase water from MWD of \$869 per acre-foot (MWD’s Tier 2 rate for treated water). The avoided purchases equate to \$22.7 Million.

From 2005 – 2010, Central Basin programs saved an estimated 28,687 acre-feet over the life of the products. The new plan sets to save even more water at 32,443 acre-feet over the five years of program implementation. Although the plan, if implemented in its entirety, will require an investment from Central Basin of \$627,975 over the five years (see Plan Overview, page 9) , the investment is highly advantageous to Central Basin and its member agencies with avoided purchase of \$22.7 Million. Funding each year will be subject to Board approval as part of the District’s annual budget process. A primary factor requiring a budget increase from Central Basin is reduced funding from outside agencies. MWD and State agencies are no longer offering the level of funding as seen in previous years. Despite these market changes, the economic portfolio for this plan is still extremely favorable to Central Basin and its agencies.

Below are highlights of the plan:

<i>Plan Overview</i>	
Cost per Acre-foot	\$29 per acre-foot
Five-Year Water Savings	6,323 acre-feet
Lifetime Water Savings	32,443 acre-feet
Avoided Costs	\$22,722,188
Average Annual Budget	\$125,595
Five-Year Total Budget	\$627,975

Below is a snapshot of the Five Year Timeline for WUE Active Programs:

<i>WUE Active Program</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>	<i>Year 4</i>	<i>Year 5</i>		
High Efficiency Toilet Direct Ship	Pilot	→	→	→	→	→	→
Save A Buck	→	→	→	→	→	→	→
HELP HET Multi-family Direct Install*	→	→	Grant ends				
High Efficiency Toilet Distribution	→	→	→	→	→	→	→
Shut your Tap! CARE HET Install*	Pilot	→	→	→	→	→	→
SoCal Water\$mart	→	→	→	→	→	→	→
Commercial HET Direct Install				→	→	→	
FreeSprinklerNozzles.com	Initiate program in 2011		→	→	→	→	→
Landscape Water Savings Performance*	→	→	→	→	→	→	→
Maywood HET Direct Install *	→	→	Grant ends				
Smart Controllers for Public Sector*	→	→	→	→	→	→	→
Urban City Makeover *	→ Grant ends						
Demonstration Gardens*	→ Grant ends						
Projected Annual Water Savings (AF)	451	913	1,283	1,653	2,023		
Estimated Central Basin Budget	\$100,937	\$117,355	\$132,545	\$136,522	\$140,617		
Recommended Staffing	1.5	1.5	1.5	1.5	1.5		

*Denotes that program is administered by Central Basin

Section 3—Customer Demand and Water Savings Potential

In order to complete the required tasks for the WUE Plan, a comprehensive data collection and analysis process was undertaken. The sources of data utilized in the Plan are identified in this section along with relevant statistics that characterize Central Basin's service area. In addition, this chapter presents data analysis results for future water use efficiency measures with the highest potential for success in reaching Central Basin's regional water savings goals.

Data Sources

In developing the Plan, it was critical to utilize reliable and appropriate sources of data to characterize and analyze all aspects of the past, present and future conditions of the service area. Wherever possible, data was confirmed through multiple sources to ensure maximum accuracy and consistency. In selected cases, complete data was not available and it was necessary to blend data and apply professional assumptions. In these cases, it is identified and the method of data collection and analysis is provided.

The five principal data sources utilized were:

1. *Central Basin 2006 Water Conservation Master Plan*— In June of 2006, Central Basin completed a Water Conservation Master Plan. The plan detailed end-use data by customer sector, water conservation opportunities in Central Basin's territory, and a set of recommended programs, budgets, staffing as well as a detailed operational plan. These measures are still applicable, and were used as a base to generate the 2011 Master Plan.
2. *Central Basin's Draft 2010 Urban Water Management Plan*. The UWMP provides projected demands used in accessing the amount of conservation needed as well as overall WUE opportunity.
3. *California Urban Water Conservation Council Best Management Practices Reports*— The CUWCC reports are comprised of a base year report with annual reporting thereafter. The base year report documents each agency's demographic information and is used to determine coverage requirements. These reports summarize the agency's programs and budgets for water use efficiency activities during the prior two years. The reports were used to assess device saturation.
4. *Program Reports* – Data from past programs was collected. These reports typically provide program production including all MWD supported programs such as SoCal Water\$mart and Save A Buck and grant programs such as the Multi-family Direct Installation Program. The reports were used to assess device saturation as well as effectiveness of rebates for specific markets and measures.

5. *California Department of Finance* – The Department of Finance publishes regular reports containing census-based housing and demographic data. Data utilized from these reports include:
 - Housing types, persons per household averages and occupancy rates
 - Residential device inventory
 - Population projections and estimates

6. *Los Angeles County Assessor* –The County Assessor publishes tax assessment reports. These reports were utilized to determine:
 - Parcel sizes and percent landscaped

7. *Dunn and Bradstreet Marketplace Business Database* –Dunn and Bradstreet produces databases that categorize business and industry types in regions. The reports utilize Standard Industrial Codes (SIC) to classify businesses from general industry types to specific business descriptions (such as restaurant, school). This data was utilized to better understand and quantify:
 - CII business and industry types in the Central Basin service area and projections of their water demand

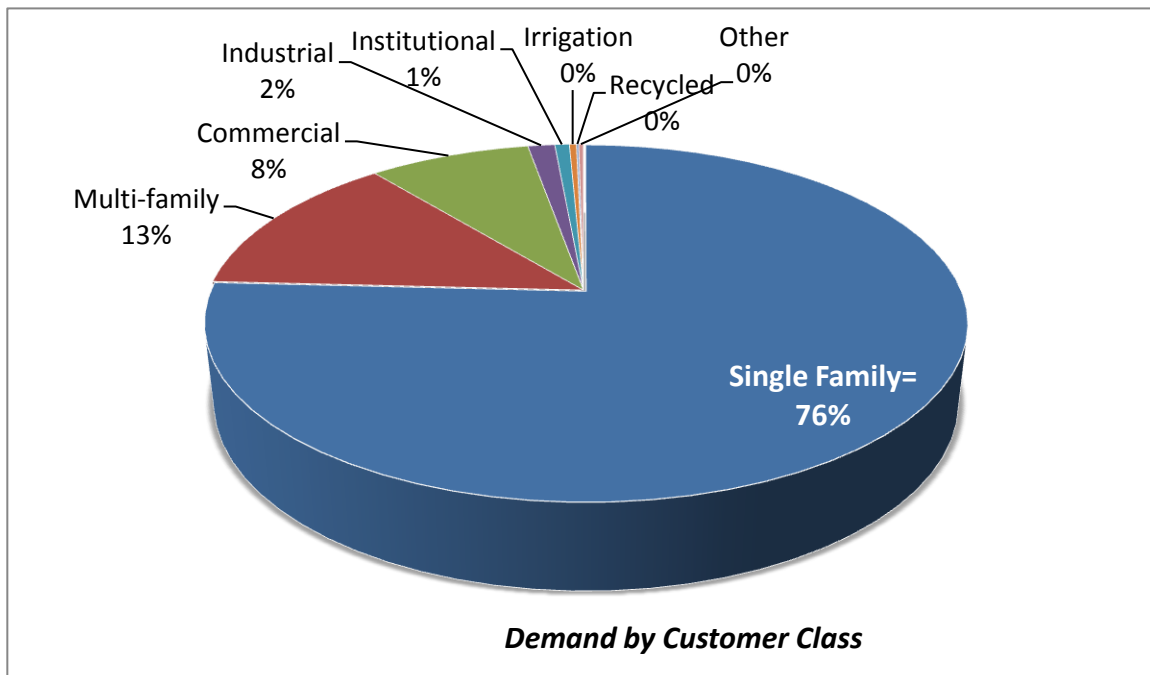
Water Accounts and Demand by Sector

This section provides a complete breakdown of the total water service accounts and demand across the Central Basin service area. The tables below presents the number and type of accounts (connections) for the entire Central Basin region in 2010. Data was derived from the Central Basin 2010 Urban Water Management Plan.

Customer Class	Number of Accounts	Annual Demand (acre-feet)
Single Family	114,096	185,256
Multi-family	50,035	32,381
Commercial	35,909	19,910
Industrial	17,671	3,317
Institutional	6,964	1,795
Irrigation	2,209	856
Recycled	6,351	293
Other	4,636	586

As presented in the table above, Central Basin delivered 244,393 acre-feet in 2010. At 75%, the highest demand was from the single family sector.

When designing and developing programs, it's key to focus on the largest customer segment and largest demand. Key targets would be: remaining non-efficient toilets, high efficiency clothes washer and outdoor water use. Although the number of commercial, institutional and industrial (CII) accounts and overall demand are lower than other categories the per site demand can be much higher, therefore the opportunity can be larger. CII water use efficiency measures and their potential will be discussed further in this chapter.



Indoor Residential Opportunities

This section examines the saturation level and future market potential for indoor water use efficiency devices in both single and multi-family sectors. For purposes of water use efficiency program design, the residential sector is divided into single and multi-family categories. This distinction acknowledges the different demographic, economic and physical development patterns that distinguish single from multi-family homes and their occupants. For example, the number of people per household is higher in multi-family units than in single family homes thereby offering higher savings per conservation measure.

Although the primary focus of the saturation modeling is centered on toilets, clothes washers and showerheads were included as well. The residential device saturation provide an overview of residential indoor water using measures including the following:

- Total inventory within Central Basin’s entire service territory
- Number of conservation devices
- Remaining potential and respective saturation
- Water savings potential if all remaining non-conserving devices were retrofitted

Single Family Indoor Water Using Devices

As shown in the table below, a market saturation of 69% has been achieved in the replacement of non-efficient toilets in single family homes. Of the 544,423 calculated inventory of toilets in single family homes in Central Basin’s service area, approximately 300,000 were replaced passively. Passive replacement refers to those devices that were naturally replaced due to equipment failure and where more efficient devices were installed as a result of improvements made to the plumbing codes (i.e., the 1992 Energy Policy Act requirement for ultra low flush toilets). Active water conservation programs are activities such as toilet rebate and installation programs. The remaining 75,655 toilets were replaced through Central Basin, retail agencies and MWD active programs.

<i>Single Family Toilets</i>	
Total Devices	544,423
Remaining Non-efficient Devices	168,697
Devices Actively Retrofitted	75,655
Devices Passively Retrofitted	300,000
Saturation	69%
Total Water Savings Potential	5,998 acre-feet/year

There are an estimated 258,212 clothes washers in single family residences within Central Basin’s service area, of which 247,755 remain non-efficient (nearly 96%). Of those replaced with efficient devices, nearly twice the number of high efficiency washers were replaced via passive or natural replacement compared to active programs.

<i>Single Family Clothes Washers</i>	
Total Devices	258,212
Remaining Non-efficient Devices	247,755
Devices Actively Retrofitted	3,877
Devices Passively Retrofitted	6,580
Saturation	4%
Total Water Savings Potential	8,204 acre-feet/year

Multi-family Indoor Water Using Devices

Central Basin has achieved 71% market saturation for multi-family toilets. Of the estimated 213,211 total inventory of toilets, 62,381 are remaining to be retrofitted.

<i>Multi-family Toilets</i>	
Total Devices	213,211
Remaining Non-efficient Devices	62,381
Devices Actively Retrofitted	30,033
Devices Passively Retrofitted	120,797
Saturation	71%
Total Water Savings Potential	3,622 acre-feet/year

Of the 42,356 clothes washers currently in multi-family units, only 2.7% have been replaced by high efficiency devices.

<i>Multi-Family Clothes Washers</i>	
Total Devices	42,356
Remaining Non-efficient Devices	41,193
Devices Passively Retrofitted	836
Saturation	2.7%
Total Water Savings Potential	1,421 acre-feet/year

Device Saturation Model Background

The Device Saturation Model used for this report calculates the number of devices (inventory) and the percentage of the inventory that are conserving devices. The devices are defined below:

Conservation Device Definitions

Conservation Device	Market	Definition
Ultra Low Flush Toilet (ULFT)	Single Family	1.6 gallons per flush – code since 1992
Ultra Low Flush Toilet (ULFT)	Multi-Family	1.6 gallons per flush – code since 1992
High Efficiency Toilet (HET)	Single Family	1.28 gallons per flush – will be code in 2014

Conservation Device Definitions

Conservation Device	Market	Definition
High Efficiency Toilet (HET)	Multi-Family	1.28 gallons per flush – will be code in 2014
Low Flow Showerhead	Single Family	2.5 gallons per flush – code since 1992
Low Flow Showerhead	Multi-Family	2.5 gallons per flush – code since 1992
High Efficiency Clothes Washer	Single Family	4.0 water factor – 4 gallons per wash cycle
High Efficiency Clothes Washer (in residence not common area)	Multi-Family	4.0 water factor – 4 gallons per wash cycle
ENERGY STAR® Dishwasher	Single Family	Energy Star labeled 5 – 10 gallons per cycle
ENERGY STAR® Dishwasher	Multi-Family	Energy Star labeled 5 – 10 gallons per cycle

Figure 1: Saturation Model Conservation Device Definitions

The sections below provide an overview of the methodology used for the saturation calculations as well as the corresponding data sources.

Data Parameters for Saturation Modeling

Data was collected from the District, the California Urban Water Conservation Council, and from the California Department of Finance as well as the AWARF Residential End Uses of Water Study, Orange County Saturation Study and the EBMUD Market Penetration Study to complete the device saturation modeling. Collected data includes housing units, conservation activities, growth rates and other relevant items. Past active conservation (devices previously installed or distributed through active programs) was collected from the District and MWD regional programs.

The table below shows parameters drawn from either 1) the District’s BMP Base Year data or 2) from empirical studies when not available otherwise.

Parameters	Value	Source
Single Family Showers per Household	2.33	AWARF 1999 Residential End Uses of Water Study (REUWS)
Single Family Percentage of Households with Clothes Washers	99.6%	AWARF 1999 Residential End Uses of Water Study
Single Family Toilets pe	2.51	CUWCC BMP Base Year Data and REUWS

<i>Parameters</i>	<i>Value</i>	<i>Source</i>
Structure		
Single Family Percentage of Households with Dishwashers	89.3%	AWARF 1999 Residential End Uses of Water Study
Multi-family Showers per Households	1.1	EBMUD 2002, Market Penetration Study
Multi-family Percentage Households with Clothes Washers	26.0%	EBMUD 2002, Market Penetration Study (15%), OC Saturation Study 2002 (25.6%)
Multi-family Toilets per Structure	1.5	CUWCC BMP Base Year Data
Multi-family Percentage of Households with Dishwashers	48.0%	EBMUD 2002, Market Penetration Study (30%), OC Saturation Study 2002 (65.8%)

Figure 2: Saturation Model Parameters, Values and Sources

The table below shows the assumed rates of natural replacement for each of the included water consuming devices. These figures show assumptions that are based on expected product life spans.

Natural Replacement Rates per Measure

Measure	Market	Natural Annual Replacement Rate
High Efficiency Toilets	Single and Multi-family	4%
Ultra Low Flush Toilets	Single and Multi-family	4%
High Efficiency Washers	Single and Multi-family	3%
Low Flow Showerheads	Single and Multi-family	5%
ENERGY STAR® Dishwashers	Single and Multi-family	3%
Low Flow Faucets	Single and Multi-family	4%

Figure 3: Saturation Model Natural Replacement Rates per Measure

The category entitled **Existence/Adoption/Compliance Rate** refers to the percent of conserving devices chosen or mandated at the time of replacement or new construction. For example, if the plumbing code requires conserving devices, 100 percent of the devices installed are assumed to be conserving devices whether replacing existing fixtures or new construction.

<i>Measure</i>	<i>Market</i>	<i>Existence/Adoption/Compliance Rate</i>
High Efficiency	Single and	The use of HETs is assumed to be 0 percent until 2001 when 2

<i>Measure</i>	<i>Market</i>	<i>Existence/Adoption/Compliance Rate</i>
Toilets	Multi-family	percent of toilets are HETs, increasing by 4% linear per year until 2014 when 100% of toilets replaced or in new construction are required to be HETs.
Ultra Low Flush Toilets	Single and Multi-family	100% from 1992 to 2001 when it is assumed that 2 percent were HETs rather than ULFTs, and decreasing by 4 percent per year until 2014. In 2014 it is 0 percent because HETs will be required.
High Efficiency Washers	Single and Multi-family	Starting at 2 percent in 1997, the market share is assumed to increase by 2.5 percent per year.
Low Flow Showerheads	Single and Multi-family	100% from 1992 to present.
ENERGY STAR® Dishwashers	Single and Multi-family	Starting in 1997 at 2% of market share and increasing by 2.5 percent of market share thereafter.
Low Flow Faucets	Single and Multi-family	Starting in 1997 at 2% of market share and increasing by 2.5 percent of market share thereafter.

Figure 4: Saturation Model Measure Existence, Adoption and Compliance Rates

Saturation Calculation Methodology

The saturation calculation takes the number of housing units for single family and multi-family sectors and multiplies them by the number of devices per household. The end result is the inventory of devices for the entire sector from the base period starting in 1990 and running to the end of the planning period. Using the rates of natural replacement and the total inventory, the model then calculates the number of existing fixtures that are replaced each year. The model separately calculates the number of fixtures from new construction to determine the number of conservation devices that are required by plumbing code in new construction.

Other Measure Opportunities

Central Basin’s service area hosts a diverse range of commercial, industrial and institutional (CII) activities and landscape opportunities.

Below is a chart calculating the remaining water conservation opportunities within Central Basin’s territory. For these purposes, a “*measure*” is defined as a specific approach or device that achieves water savings (such as a residential high efficiency toilet or a smart controller) but does not identify the actual program, which would include a delivery mechanism. A *program* is defined as a measure plus a delivery mechanism.

To ensure that every reasonable measure received initial evaluation, all water conservation measures were considered. The analysis was complete without regard to any detailed consideration of the financial or programmatic obstacles or restrictions that may otherwise discourage implementation of

a measure. Additionally, most measure’s savings potential was calculated based upon achieving 100% market saturation for that measure. Although not realistic, this approach allows for a more “apples-to-apples” analysis. Below is a listing of the top measures and their respective water savings potential ranked from highest to lowest:

<i>Measure</i>	<i>Remaining Non-Efficiency Units</i>	<i>Remaining Water Savings Potential (acre-feet)*</i>
Large Landscape Smart Controllers	30,272	187,444
Ultra Low Volume Urinals	66,852	164,054
Single Family High Efficiency Toilets	168,697	119,960
Single Family High Efficiency Washers	237,621	114,856
Commercial High Efficiency Toilets	133,703	113,648
Commercial Smart Controllers	30,272	93,722
Multi-family High Efficiency Toilets	213,211	72,440
Public Sector and Institutional Urinals	20,055	49,216
Cooling Tower pH Controllers	3,207	29,424
Single Family Smart Controllers	57,048	23,644
Single Family High Efficiency Nozzles	1,140,960	22,819
Multi-family High Efficiency Washers	41,193	19,894
Cooling Tower Conductivity Controllers	3,027	9,748
Commercial High Efficiency Nozzles	302,720	6,054

It is acknowledged that complete market saturation for any measure is largely unachievable, but it is instructive to begin the analyses with an understanding of the measures with the highest water savings potential, as listed above.

When looking at the measure potential by market segment, a clear picture emerges showing that landscape usage is the primary opportunity.

- **Landscape Measures** (across all sectors) = 333,683 potential acre-feet savings
- **Commercial Measures** = 307,126 potential acre-feet savings
- **Single Family** = 234,816 potential acre-feet savings
- **Multi-family** = 92,334 potential acre-feet savings

The final measure analyses, which are presented in *Section 5: Water Use Efficiency Programs and Analyses*, include consideration of real-world financial, market and programmatic circumstances that further refine the prioritization of the most cost-effective and productive measures and programs. As will be discussed in Section 5, the final prioritized recommendations for various programs will shift from the more conceptual rankings presented above to a specific set of program recommendations.

Overall Opportunities and Targets

Potential opportunities were identified as a result of the data evaluation. The analysis of water demand by market type revealed the following:

- Toilets (from all sectors) still offer a high volume of savings despite their high saturation rate. The impact of the impending regulations must be factored, as well as the ability to target high volume units.
- Single family landscape represents the highest water use within all sectors at over 90,000 acre-feet per year.
- Smart controllers and high efficiency nozzles offer a high water savings potential.
- The commercial sector has some opportunity, but the cost of replacement for both the water agency and the customer need to be considered.
- Urinals appear to have a significant opportunity, but again the cost of replacement for both the water agency and the customer need to be considered.
- Public sector customers are a good prospect.
- Clothes washers afford a reasonable opportunity. The high adoption rate by customers currently needs to be considered when designing future programs.

Section 4–AWE Tracking Tool Program Evaluation Modeling

After reviewing numerous options, Central Basin chose the Alliance for Water Efficiency Tracking Tool to conduct its analysis as well as future program tracking. The Tracking Tool is an Excel-based model that can provide in-depth evaluation of program water savings and costs and benefits of conservation programs over time. The program was developed by the Alliance for Water Efficiency (AWE). The AWE is a stakeholder-based non-profit organization dedicated to the efficient and sustainable use of water.

Model Description

Over the past several years, conservation planning and implementation efforts have reached a point of complexity, sophistication and interconnection throughout the entire water industry, making transparent and defensible decision-making critical. To achieve these goals, it is necessary to comprehensively access and analyze complete program-by-program data, including water savings, budget and cost effectiveness, as well as environmental and societal impacts.

Using information entered electronically into the Tool from a water agency's system, the Tracking Tool provides a standardized methodology for water savings and benefit-cost accounting, and includes a library of pre-defined conservation activities from which users can build conservation programs.

The following is a listing of some of the key features of the Tracking Tool:

- *Multiple Analysis Perspectives* – The tool evaluates conservation program costs and benefits from three perspectives: (1) the utility's, (2) the program participant's, and (3) society's. Each perspective provides insight into a key aspect of conservation program planning and evaluation.
- *Flexible Modeling of Water Savings* – Water savings for an activity can be modeled as having a fixed life or as persisting indefinitely. A conservation activity's savings profile can include a decay process or it can be modeled as constant. Savings from conservation activities that interact with existing plumbing/energy codes, such as toilet, showerhead, and clothes washer replacement/rebate programs, can be disaggregated into program-related and code-related savings components.
- *Conservation Activity Library* – The tool includes a library of pre-defined, fully parameterized conservation activities that users can import into the model. At their option, users can use these activities as is or customize them to better match their service area conditions and program characteristics.
- *Water Savings Disaggregation* – The tool disaggregates water savings three different ways: (1) by water user classification, (2) between system peak and off-peak periods, (3) and between program-related and code-related water savings. The tool has built-in capability to

estimate service area water savings due to national toilet, showerhead, clothes washer and dishwasher water efficiency code requirements.

- *Demand Forecasting* – The tool can modify a baseline water demand forecast to account for both program-related and code-related water savings over time. The tool can also generate a simple baseline demand forecast if the user does not have one. The tool also allows for demand disaggregation for peak/off-peak demand and by customer sector.
- *Avoided Cost Analysis* – Users have the option to use their own forecasts of system avoidable costs, or they can use the tool’s avoided cost calculator to estimate avoidable system operating and capital costs due to conservation water savings.
- *Minimal Data Requirement* – Every effort has been made to minimize the tool’s data requirement so that users are not overburdened with data collection and input tasks.
- *Data Entry Assistance* – The tool includes custom data entry forms and dialogs to help users define or edit conservation activities, import conservation activities from the tool’s library, and save and retrieve scenarios. Data input cells are color coded to make them easy to spot. A brief message explaining the necessity for the information requested appears whenever a data entry cell is activated by the user.
- *Charting & Reporting Capability* – The tool includes dynamic charts and tables that automatically adjust to user settings and conservation program specifications. Charts are embedded within worksheets, but also can be displayed in their own windows with a click of a button (this feature is not available if you are using Excel 2007). Charts and reports can be easily copied into other documents for report generation.
- *Scenario Management*– Users can easily save scenarios and retrieve them for later use. This makes it easy to see how different program mixes or assumptions about water savings or program costs impact the overall results.
- *Open Source* – Users can examine the tool’s internal logic. Users can customize or extend the capabilities of the tool to meet their specific planning needs. Visual basic code used by the tool is transparent and extensively commented to make it easy to follow.

Water agency managers can use the Tool in a variety of ways to aid their water resource planning and operations:

- Quickly compare alternative conservation measures in terms of their water savings potential, impact on system costs, and potential benefits to the utility, its customers and the environment.
- Develop long-range conservation plans.
- Construct conservation portfolios containing up to 50 separate conservation program activities.

- Track the implementation, water savings, costs and benefits of actual conservation activities over time.
- Evaluate a water agency's changing revenue requirement with conservation.
- Track and graph the benefits of actual conservation activities over time.

Model Structure

The Tracking Tool is structured with two sections: data entry and model results. The data entry section allows the user to define basic modeling assumptions, specify future water demand projections and utility costs, and define specific conservation activities to be modeled. The model results section provides a complete series of economic and water savings summaries.

Activity Library

The model also provides a library of pre-defined activities from which to choose. The measures are drawn from agencies across the country and provide an excellent foundation for planning in agencies without an extensive history of conservation activities. For purposes of this plan, we concluded that the analysis would benefit from a Central Basin-specific library of conservation activities based upon Central Basin's program activity and specific territory needs.

Economic Terms Used in the Model

Because water conservation activities are funded with limited resources, economic analysis is a critical component of program modeling and comparison. Programs are often rolled out over several years during which the value of the dollar can vary. This is also true for the value of water saved and the avoided costs. To properly appraise a long-term project, there must be an "apples-to-apples" cost and benefit comparison. By converting all program costs into the present value of the dollar, long-term projects can be accurately assessed.

It is important to understand the language of the economic modeling performed by the Tracking Tool. To assist, we have provided economic terms and their definitions used in the Tracking Tool to analyze Central Basin's programs. Probably the most useful categories for assessing water conservation programs are "Net Present Value" and "Benefit-to-Cost Ratio."

Economic Term Definitions

- Total Costs (*Total Costs*) - The amount of money spent over the course of the program.
- Present Value Total Costs (*PV Total Costs*) - Present value reflects the "time value of money." Central Basin's analysis uses an inflation-adjusted discount rate of 2% per year. This reflects the real growth of money accrued over time. It demonstrates how it matters if money is spent over a span of time vs. all up front. The money not spent up front can gain interest.
- Lifetime Savings in Acre-feet (*Lifetime Savings AF*) - Total water savings over the life of the water conservation measure per product.

- Present Value Lifetime Savings in Acre-feet (*PV Lifetime Savings AF*) - The value of water saved over a period of time. The same discount rate was used for water savings as with money spent. By using present value of water savings it allows the comparison of savings in future time periods with savings in the present time period.
- Present Value in Dollars / Present Value of Acre-feet Saved (*PV\$/PVAF*) - Present value of the total cost divided by the present value of the water saved represented in a dollars per acre-foot.
- Present Value of the Benefits (*PV Benefits*) - By eliminating water purchases, Central Basin avoids spending those dollars (avoided costs). The “present value benefits” illustrates those savings in dollars and represents them in today’s value.
- Net Present Value (*NPV*) - Present value of the benefits minus the present value of the costs.
- Benefit to Cost Ratio (*B/C*) - Present value of the benefits divided by the present value of the costs. A value of “1” or above is deemed cost effective. A “1” means that for every dollar you spend you get a dollar back. The higher the number over “1,” the more value.

Economic Analysis

The Tracking Tool provides modeling results in two categories: financial/economic impacts, and water savings results. Together, these outputs comprise a complete set of information and data to confidently undertake strategic decision-making about future conservation programming activities.

To describe the financial impacts of each measure, the model outputs three cost-benefit calculations, including analysis for the utility service provider, the customer and society in general.

The utility cost-benefit analysis evaluates the impact of conservation programs from the utility’s perspective. It examines the utility’s cost of implementing a conservation program as compared to the accrued benefits from avoided supply and capacity requirements as well as avoided wastewater costs.

The utility and rates analysis summarizes the overall impacts of conservation programs throughout future years on the utility’s revenue requirements, on an average customer’s bill and on water rates. Note that the model is not set up to calculate the revenue impact at the wholesaler level.

The customer cost benefit calculates and summarizes the economic impacts based upon the customer’s perspective. The per unit value of saved water and the value cost of conservation activities are compared to the benefits of reduced water, gas, electricity and sewer costs. The analysis recognizes the basis of each of these related customer expenditures to water use and calculates the value of avoiding them through water conservation.

Society cost benefit captures all of the costs and benefits from a water conservation measure that is shared throughout a community. The societal (or total resource) perspective compares the resources used to produce the conservation activity to the resources saved as a result of the activity. On the

cost side, it includes all costs incurred by the utility and its participating customers to produce the conservation savings. On the benefits side, it includes the net savings of actual resources, as measured by avoided water and wastewater consumption.

Water Resources Analysis

The Tracking Tool provides two outputs which describe the planned measures' impact on water demand: an activity savings profile, and a water savings summary. The Activity Savings Profiles output allows the reader to visually inspect the temporal pattern of water savings for each defined activity. It also provides a table and chart depicting both the lifetime and average annual water savings for each measure

The Water Savings Summary output summarizes water savings from the defined activities and from code-driven replacement of toilets and clothes. It also shows the tool's calculation of the benefits from deferred and avoided infrastructural capacity.

There are several water savings summary outputs. Per Capita Demands Table converts the demands from the Service Area Demands table to per capita demands using the population forecast from the Common Assumptions worksheet. The Service Area Water Savings Table shows water savings from code requirements, water savings from program activity, and total water savings. The Customer Class Water Savings Table shows how total water savings are divided among customer classes.

Future Program Tracking

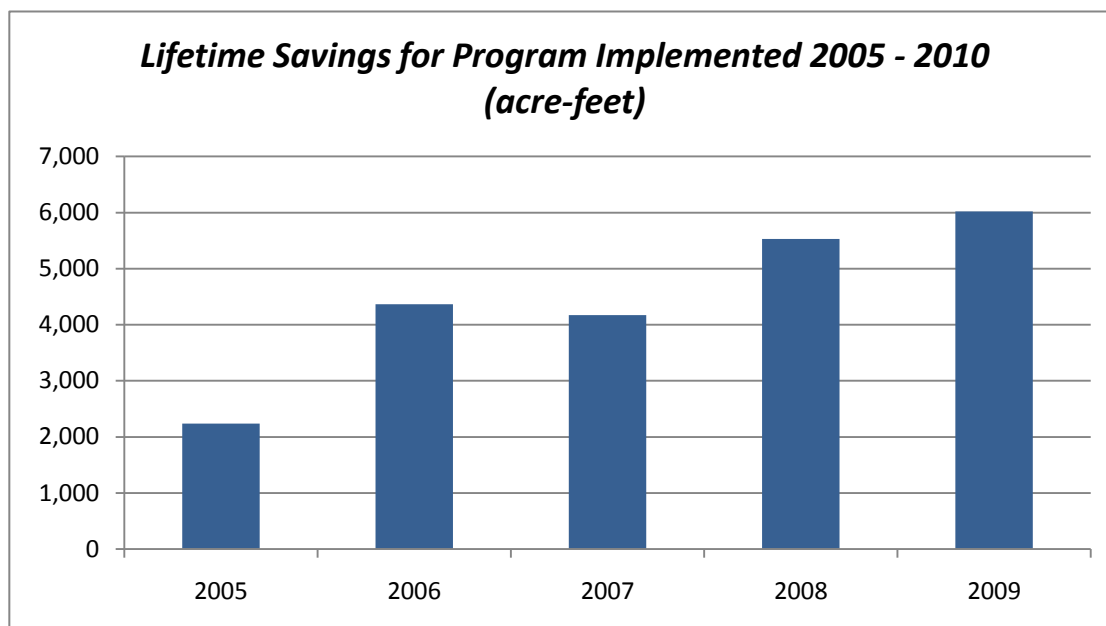
The Tracking Tool provides not only the ability to select water conservation programs for implementation based upon a thorough analysis of the program's anticipated impacts, but also allows for the tracking of future program performance. The model can be adapted and adjusted at any time and impacts re-calculated based upon real world program performance.

Section 5– Water Use Efficiency Programs and Analyses

Over the past two decades, Central Basin has been successful delivering high volume water savings at an extremely low cost. During this period, over 126,000 acre-feet of water has been saved at almost no cost to Central Basin. The following section reviews some of the most recent programs.

In June of 2006, Central Basin completed a Water Conservation Master Plan. The plan detailed end-use data by customer sector, water conservation opportunities in Central Basin’s territory, and a set of recommended programs, budgets, staffing as well as a detailed operational plan. The Plan estimated programs implemented from 2005 – 2010 to save 4,755 acre-feet in lifetime savings. Central Basin implemented eight of the ten programs described as well as three additional programs. **Savings from these programs has resulted in lifetime savings of 25,716 acre-feet.** This is virtually 5 times the projected savings from the 2005 plan. Below is chart depicting lifetime savings generated each year.

Year	Lifetime Savings
2006	4,367
2007	4,175
2008	5,531
2009	6,019
2010	5,624



There are thirteen water efficiency programs that are currently being offered, or have recently been offered, to Central Basin customers. Eleven of the programs have quantifiable water savings

associated with their implementation. The remaining two are educational programs with modest or non-quantifiable savings such as demonstration gardens and landscape workshops. Water savings per program is depicted in the chart below.

<i>Program</i>	<i>Number of Devices</i>	<i>Lifetime Water Savings for Devices Retrofitted 2005-2010 (acre-feet)</i>
Save A Buck	See list on pg. 27	8,791
HET Distributions	8,642	7,357
SoCal Water\$mart	See list on pg. 27	3,606
HELP Multi-family HET Direct Installations	3,966	3,378
Zero Consumption Urinal Direct Installation	1,107	2,039
HE Clothes Washers and HETs Rebates through Oldtimers	2,647 HECWs 637 HETs	1,662
Maywood HET Direct Installations	1,280	1,090
HET Direct Ship	400	243
Outdoor Large Landscape Water Saving Performance Program (Water 2 Save)	20	217
Shut your Tap! CARE Program HET Direct Installation Program	200	142
Urban City Makeover	See list on pg. 27	122
Smart Controller for Public Sector	20	40

Below are detailed program descriptions followed by a table illustrating the past and current program offerings, their measures, funding mechanisms and years operated.

Save A Buck Commercial Incentive Program - One of Central Basin’s key programs, the regional wide Commercial Save a Buck Program sponsored by MWD, has grown over the years to include 11 different measures being offered to Central Basin customers. MWD hires a regional vendor to operate the program. This program is subject to the funding issues of MWD. MWD budgets are limited with a first come, first served funding format. The program used to offer multi-family high efficiency toilet incentives and this along with ultra low volume urinals made the Save A Buck Program Central Basin’s best performing program in the past yielding over 14,000 acre-feet since the year 2000. Since 2005, the program has saved an estimated 8,791 acre-feet.

SoCal Water\$mart Residential Incentive Program –The SoCal Water\$mart Program offers residential customer incentives for a range of indoor and outdoor devices. After Save a Buck, the SoCal Water\$mart Program delivered the highest volume of savings of all past programs. As with the Save A Buck Program, MWD hires a regional vendor to operate the program. This program is also subject to the funding issues of MWD. MWD budgets are limited with a first come, first served funding format. With seven program measures, the program has saved over 3,606 acre-feet since 2005.

High Efficiency Toilet Distribution Events – For the past several years Central Basin has held single day events offering free high efficiency toilets to customers. Customers are responsible for installing the new toilet and returning the old fixture as proof of replacement. Through partnering with retail service agencies to promote and administer the events Central Basin has received positive public recognition from the community. Since 2005, Central Basin has distributed 8,642 toilets and saved 7,357 acre-feet.

HELP District Wide HET Multi-family Direct Installation Program - Through a grant provided by the California Department of Water Resources, Central Basin administers this program. The program offers free product and free installation to qualifying multi-family locations throughout Central Basin’s service territory. The Program has installed 3,966 toilets with an estimated savings of 3,376 acre-feet. There are a remaining 6,000 toilets to be replaced under this grant.

HELP Landscape Workshops – Through the receipt of an Enhanced Conservation Program (ECP) Grant from MWD of \$88,350, Central Basin provided 600 residents Residential California Friendly Landscaping Classes. The program targeted customers without an in-ground irrigation system. In addition to the class, residents received an irrigation kit including a set of high efficiency MP Rotators, a stand for the rotators and a hand-operated watering timer to connect to their hose. Customers also received garden gloves, seeds, plants and other promotional items. The Program was designed as an educational program and savings have not been estimated for the electronic timers.

High Efficiency Clothes Washer and Toilet Rebate Program – Between 2005 – 2008, Central Basin offered its customers rebates of \$110 - \$125 for high efficiency clothes washers. The program was operated by Oldtimers Foundation and resulted in 2,647 rebates being generated for high efficiency washers. In addition, Central Basin offered its customer rebates for high efficiency toilets in 2007 also processed by Oldtimers Foundation. 637 HETs rebates were distributed. Program savings are estimated at 1,662 acre-feet.

Smart Controller for Public Sector Program (End Use Management Study) – Working together with local cities and schools, Central Basin is conducting a study to determine the capabilities of centralized water systems to perform water deliveries under drought, emergency and peak conditions. The program provides smart irrigation (weather-based) irrigation controllers to local cities and schools. Active partners include the cities and Downey, Pico Rivera and South Gate as well as the El Rancho and Lowell School Districts.

Outdoor Large Landscape Water Saving Performance Program – This outdoor landscape water savings performance program provides wireless control equipment to high water using large landscape commercial sites. The equipment is installed and programmed according to local site conditions and savings/performance is monitored. Central Basin is administering the program and working with large commercial water users and their respective retail water agencies to provide large landscape irrigation management and more efficient irrigation technologies for large landscape sites. Program installations to date are estimated to save 85 acre-feet.

Maywood HET Direct Installation Program – In partnership with the City of Maywood, Central Basin is administering a grant from the California Department of Water Resources to install high efficiency toilets in qualified residencies throughout the City. Central Basin administers the program including hiring an installation vendor and managing their services. The installations so far have saved an estimated 2,891 acre-feet.

Shut your Tap! CARE Program HET Direct Installation Program – The Shut your Tap! CARE HET Program provides free product and installation of HETs to qualified CARE customers. A pilot of 200 units was conducted in FY 2010/11. Due to its success and target of CARE customers, several of Central Basin's water retailers, specifically Park Water, San Gabriel Valley MWD, Suburban Water Systems and Golden State Water, are interested in continuing the program and doubling production. The pilot installations are estimated to save 142 acre-feet.

Urban City Makeover Program – Through the DWR Prop 50 Urban City Makeover Program, grant funding was awarded in the amount of \$113,746. The program provides nine disadvantaged cities with HETs, zero consumption urinals, native plants, smart controllers and water brooms. Since the grant award, the participating cities have chosen to eliminate the urinals because the footprint of existing urinals are larger than the zero consumption urinals available in the market today. Central Basin is considering offering .25 or one pint urinals. The participating cities are: Bell Gardens, Commerce, Cudahy, Hawaiian Gardens, Huntington Park, Lynwood, Maywood, Paramount, and South Gate. The funding agencies are: DWR, MWD and Central Basin. Installations to date have estimated savings of 122 acre-feet.

Zero Consumption Urinal Direct Install Program – Through a grant provided by the California Department of Water Resources, Central Basin administered a direct installation of zero consumption urinals. The program provided free urinals and free installation. The customer was responsible for on-going maintenance including cartridge purchases. The program ended in 2008 and resulted in an estimated 2,039 acre-feet of water savings.

Demonstration Gardens Program – As part of the Large Landscape Water Conservation, Runoff Reduction and Educational Programs DWR Prop 50 Grant, \$50,000 is allocated for five large community demonstration gardens. Central Basin is partnering with local public agencies such as cities and school districts to create Demonstration Gardens that enrich the environmental awareness of the community and promote the benefits of water efficient gardens. The cities currently working

with Central Basin on constructing a demonstration garden are: Cerritos, Cudahy, South Gate and Whittier.

Program	Type of Program	Measures	Market	Administrator	Funding Agencies	Years Implemented	Lifetime Water Savings
SoCal WaterSmart	Regional Incentive Program	<ul style="list-style-type: none"> High Efficiency Washers Smart Controllers High Efficiency Nozzles Synthetic Turf High Efficiency Toilets 	Single and Multi-family	MWD	MWD Central Basin	2008 – Present	3,606
Save A Buck	Regional Incentive Program	<ul style="list-style-type: none"> High Efficiency Toilets High Efficiency Urinals Smart Controllers HE Nozzles Large Rotary Nozzles Waterbrooms Conductivity Controllers Food Steamers Air Cooled Ice Machines Dry Vacuum Pumps HE Washers 	Commercial and Multi-family	MWD	MWD	1997 – Present	8,791
HET Distribution Events	Distribution of HETs at Single Day Events	High Efficiency Toilets	Single Family	Central Basin	Retail Agencies MWD MAAF	1990s – Present	7,357
HET Direct Ship Program	Home Delivery of HETs	<ul style="list-style-type: none"> High Efficiency Toilets Low Flow Showerheads Low Flow Faucet Aerators 	Single Family	Retail Agencies (Park Water conducted pilot)	Retail Agencies MWD MAAF	Pilot in 2011	243
High Efficiency Clothes Washer & Toilet Rebates	Rebates	<ul style="list-style-type: none"> High Efficiency Washers High Efficiency Toilets 	Single Family	Central Basin	Central Basin Retail Agencies	2005 - 2008	1,662
Smart Controllers for Public Sector (End Use Mgmt Study)	Distribution of Smart Controllers	Smart Controllers	Commercial	Central Basin	Central Basin MWD MAAF	2010 – Present	40
HELP Landscapes - Conservation Workshops	Distribution of Irrigation Timers at Educational Workshops	Electronic Irrigation Timers	Single Family	Central Basin	Central Basin MWD	2008	Not quantified

Program	Type of Program	Measures	Market	Administrator	Funding Agencies	Years Implemented	Lifetime Water Savings
Outdoor Large Landscape Water Savings Performance Program	Installation of Wireless Smart Controllers and Monitoring of Water Savings	Smart Controllers – Performance Based	Commercial	Central Basin	Central Basin MWD MAAF	2010 – Present	217
Maywood HET Direct Install	Direct Install	High Efficiency Toilets	Single and Multi-family	Central Basin	Retail Agencies MWD MAAF	2009 – Present	1,090
HELP HET Multi-family Direct Install	Direct Install	High Efficiency Toilets	Multi-family	Central Basin	Retail Agencies MWD	2007 – Present	3,376
Shut Your Tap! Care HET Direct Install	Direct Install	High Efficiency Toilets	Single and Multi-family	Central Basin	Retail Agencies MWD MAAF	Pilot in 2011	142
Urban City Makeover	Direct Install	High Efficiency Toilets Zero Consumption Urinals Smart Controllers Waterbrooms Native Plants	Public Sector	Central Basin	DWR	2009 - 2012	122
Zero Consumption Urinal Direct Install Program	Direct Install	Zero Consumption Urinals	Commercial	Central Basin	Central Basin MWD DWR	2004 – 2008	2,039

Central Basin’s past water use efficiency efforts have been successful at achieving a high level of water savings through retail agency partnership opportunities, as well as MWD and other grant funding. These successful programs in years past have provided Central Basin with quantifiable results while maintaining low staffing and budgetary overhead within the agency.

However, the recent increases in regulation of water use efficiency as well as the continual lowering of incentives offered by MWD are cause for Central Basin to move forward with a new strategy. To maximize programmatic offerings and partnership opportunities, Central Basin needed to take the next step and evaluate potential programs that would ensure compliance for themselves and their retailers with 2015 and 2020 mandated savings goals.

Potential Programs

The next step in the process was to create a comprehensive list of programs and measures that corresponded to Central Basin’s water demand and measure potential as an efficiency solution. At this stage of the process all possibilities were listed. Central Basin retailers polled each of its retailers to build the potential list of programs.

The remaining market opportunities were examined, including the predominant customer segments, technologies available and retail water agency needs. Because many of the existing programs continue to be successful and have remaining market opportunity, most of the existing programs were evaluated.

The Potential Programs are listed below alphabetically:

<i>Program</i>	<i>Why Considered?</i>
<i>Demonstration Garden*</i>	⇒ Funded grant ⇒ Customer education and awareness will begin to transform landscape market
<i>FreeSprinklerNozzles.com Nozzle Voucher Program</i>	⇒ Other MWD agencies have demonstrated success ⇒ Largest opportunity for outdoor water savings in Central Basin’s service territory ⇒ Easy administration through Western MWD ⇒ MWD provides over 90% of program costs
<i>HELP District-wide HET Multi-family Direct Installation Program*</i>	⇒ HETs provide long-term savings ⇒ Existing grant ⇒ Direct install can target low income and households with higher ratio of “people per toilet”, therefore higher savings ⇒ Direct install ensures only high volume toilets are replaced
<i>HET Direct Ship Program*</i>	⇒ HET provide long term savings

Program	Why Considered?
	<ul style="list-style-type: none"> ⇒ Requested by retailers ⇒ Easy implementation ⇒ Vendor handles turn-key ⇒ Supported by Central Basin’s member agencies
HET Distribution Events*	<ul style="list-style-type: none"> ⇒ HET provide long-term savings ⇒ Distribution events target low income and households with higher ratio of “people per toilet”, therefore higher savings ⇒ Has been successful program year-after-year ⇒ Good public relations ⇒ Supported by Central Basin’s member agencies
Industrial Process Water Audits and Incentives	<ul style="list-style-type: none"> ⇒ Significant opportunity in Central Basin territory ⇒ Targets industrial market, not previously targeted ⇒ MWD Performance Based Incentive Program likely to be funded for FY11-12
Maywood HET Direct Installation Program*	<ul style="list-style-type: none"> ⇒ HETs provide long-term savings ⇒ Grant pays for entire project ⇒ Program targets low income households with higher ratio of “people per toilet”, therefore higher savings ⇒ Direct install ensures only high volume toilets are replaced
Outdoor Large Landscape Water Savings Performance Program*	<ul style="list-style-type: none"> ⇒ Existing successful program ⇒ Targets largest water users ⇒ Incentives are based upon true water savings ⇒ Turn key offer from vendor
Save A Buck*	<ul style="list-style-type: none"> ⇒ Low cost – MWD pays base incentive, administration and marketing ⇒ Central Basin can add additional incentives for targeted technologies ⇒ Easy administration through MWD’s vendor ⇒ Able to leverage trades to market program ⇒ Targets commercial market where significant opportunity still exists
Shut your Tap! CARE Program HET Direct Installation Program*	<ul style="list-style-type: none"> ⇒ HETs provide long-term savings ⇒ Program targets CARE, low income qualified customers, again targeting higher ratio of people per device therefore higher savings ⇒ Central Basin’s member agencies support program
SoCal Water\$smart*	<ul style="list-style-type: none"> ⇒ Low cost – MWD pays base incentive, administration and

Program	Why Considered?
	<ul style="list-style-type: none"> marketing ⇒ Central Basin can add additional incentives for targeted technologies ⇒ Easy administration through MWD’s vendor ⇒ Marketing done through MWD’s vendor ⇒ Significant potential for high efficiency washers and smart controllers
Smart Controllers for Public Sector Program*	<ul style="list-style-type: none"> ⇒ Public sector customers require significant program subsidies such as free product (and installation if possible) ⇒ Public sector are some of the largest landscape sites in Central Basin’s territory and many times are not irrigated efficiently ⇒ Study will demonstrate potential for central smart irrigation controllers to offer additional benefits to manage water use during droughts and other emergencies
Urban City Makeover*	<ul style="list-style-type: none"> ⇒ Existing grant ⇒ Not implemented ⇒ Offers water use efficiency products to cities in need of lower water bills ⇒ Project will provide comprehensive retrofits: toilets, smart controllers, water brooms and native plants ⇒ Cities will now become models of efficiency

**denotes an existing program*

Analysis of Potential Programs

Potential Central Basin programs can be measured through different elements of success. Some elements such as water savings are tangible; while other elements provide intangible successes. Intangible successes can be just as valuable as water savings when applied to Central Basin’s relationships with its member agencies and the public/community climate. In evaluating past, current and potential programs Central Basin considered the following criteria:

- *Cost effective avoided water purchases* – The program provides economical water savings.
- *Lifetime water savings potential* – The program yields a high volume of water savings over the measure life.
- *Certainty of water savings* – The program uses “tried and true” measures that have proven savings.
- *Customer receptivity* – Customers respond well to the program and give high customer satisfaction marks for the service or products provided.

- *Ease of operation* – The program is not burdensome for Central Basin and its retail agencies to operate.
- *Drives market transformation* – The program helps to forge the way into a specific market (such as landscape) so that vendors offer water use efficiency measures and customers make water use efficiency upgrades on their own.
- *BMP or regulatory compliance* – The program fulfills one of the CUWCC’s Best Management Practices or satisfies a regulatory requirement.
- *Outside funding potential* – There is a possibility of third-party funding or grant money, which would reduce overall program costs and increase Central Basin’s benefit-to-cost ratio.
- *Equity for all agencies* – The program serves customers within each of the member agency’s territory.

Economic Evaluation

Program selection was not a cut-and-dry process. Some of the water efficiency possibilities would not meet the market need or overall program budget dollars. The evaluation also recognizes the need to take advantage of MWD funding and grant opportunities that may be available.

With possible solutions listed, the next action was to run each measure through the economic analysis model.

With \$869 cost to purchase imported Tier 2 water from MWD, possible programs should come below this cost threshold. Although cost was not the only consideration, it was obviously a critical evaluation component. The lower the cost per acre-foot, the more attractive the program. The ideal program would possess the following economic attributes:

- Low overall costs
- High acre-foot lifetime savings
- Low cost per acre-foot
- Value of the benefits
- Benefit to cost ratio higher than 1

Ranking of Activities by Cost per Acre-foot

A key measurement of a program’s economic value is its cost per acre-foot. As stated above programs should fall below Central Basin’s avoided supply cost of \$869. The lower the cost per acre-foot the more advantageous the program is to Central Basin. The calculations used to evaluate the economics are documented in the AWE Model User Guide. The estimated costs and savings for each activity are documented in the Central Basin version of the AWE model. On the following chart is a list of the potential programs and their respective cost per acre-foot ranked from lowest to highest.

Activity Ranking by Cost per Acre-Foot	
<i>Water Efficiency Activity</i>	<i>Central Basin Cost per Acre-Foot</i>
High Efficiency Toilet Distribution Event Program	\$3
FreeSprinklerNozzles.com Nozzle Voucher Program	\$13
SoCal WaterSmart Residential Incentive Program	\$13 for HEWs \$29 for HETs
Commercial HET Direct Installation Program	\$29
Shut your Tap! CARE HET Direct Installation Program	\$75 for single family \$44 for multi-family
Outdoor Large Landscape Water Savings Performance Program	\$421
Smart Controllers for Public Sector Program	\$733
Industrial Process Water Audits and Incentives	\$7,256

With the exception of administration/staff time, the following programs have zero costs to Central Basin, therefore very low cost per acre-foot. The costs do not include Central Basin’s internal cost such as staff time to administer the programs.

- Maywood HET Direct Installation Program
- Urban City Makeover
- HELP HET Multi-family Direct Installation Program
- HET Direct Ship Program
- Save A Buck Commercial Incentive Program

Although the Demonstration Gardens have some savings, the goal of the gardens is education and therefore the program is not evaluated from a cost per acre-foot or benefit-to-cost basis.

As depicted in the chart above, all of the programs except the Industrial Process Water Audits and Incentives fall below Central Basin’s cost to purchase water from MWD of \$869. Due to the expense of the Industrial Process Audits and Incentives, the program was eliminated from further evaluation.

Additional Program Evaluation

As stated earlier in this document, costs are not the only consideration in selecting water use efficiency programs. Each potential program was evaluated against a set of criteria as described earlier in this section. Following is a chart listing each program and whether they meet specific criteria or offer additional benefits.

Programs	Cost Effective Avoided Water Purchases	Lifetime Water Savings Potential	Certainty of Water Savings	Customer Receptivity	Ease of Operation	Drives Market Transformation	BMP or Regulatory Compliance	Outside Funding Potential	Equity for all Agencies
SoCal WaterSmart	High	High	High	High	High	Yes	Yes	All programs have outside funding	Yes
Save A Buck	High	High	High	High	High	Some products	Yes		Yes
HET Distribution Events	High	Low	High	High	Low	No	Yes		Requires co-funding
HET Direct Ship	High	Low	High	High	High	No	Yes		Requires co-funding
Smart Controllers for Public Sector	Medium	High	Medium	High	Medium	Yes	Yes		Yes
Outdoor Large Landscape Water Savings Performance	High	High	High	High	High	Yes	Yes		Yes
Maywood HET Direct Installation	High	Low	High	High	Medium	No	Yes		Only Maywood
Urban City Makeover	High	Low	High	High	Medium	Low water use plants do	Yes		Only participating cities
HELP HET Multi-family Direct Installation	High	Low	High	High	Medium	No	Yes		Yes
Shut you Tap! CARE HET Direct Installation	High	Low	High	High	Medium	No	Yes		Required co-funding
Industrial Process Audits & Incentives	No	Medium	High	Increasing	Low	Yes	Yes		Only certain agencies have industrial process
FreeSprinklerNozzles.com Vouchers	High	High	Medium	High	High	Yes	Yes		Yes
Demonstration Gardens	Low	High	Medium	Medium	Low	Yes	Yes	Only participating cities	

Section 6 -Analyses and Final Program Selection

Based upon the analysis conducted of potential programs, all existing 11 programs were considered of great value to the customers within Central Basin's service territory. Commercial HET installations and free high efficiency sprinkler vouchers were added to the program mix. The only eliminated program was industrial process audits and incentives due to the high cost. This analysis recognizes that not all programs provide a large water savings return on investment but rather intangible gains for Central Basin. Programs that help community, local schools and government provide benefits beyond water savings for water purveying authorities.

The final program list is:

- *High Efficiency Toilet Distribution Program*
- *High Efficiency Toilet Direct Ship Program*
- *HELP HET Multi-family Direct Installation Program*
- *Maywood HET Direct Installation Program*
- *Shut your Tap! CARE Program HET Installation Program*
- *FreeSprinklerNozzles.com Nozzle Voucher Program*
- *Outdoor Large Landscape Water Savings Performance Program*
- *Smart Controllers for Public Sector Program*
- *MWD's SoCal WaterSmart Residential Incentive Program*
- *MWD's Save A Buck Commercial Incentive Program*
- *Commercial HET Direct Installation Program (starting in 2013)*
- *Urban City Makeover*
- *Demonstration Gardens*

During the development of this document, the exact water savings goal to reach the per capita reduction of 20% by 2020 was not developed. SB7x7 requires urban retail water suppliers to achieve a 20% water use reduction by 2020 with a milestone of 10% by 2015. As a wholesale water supplier, Central Basin is under no legal obligation to achieve this reduction. Central Basin's retail agencies are each responsible for complying with requirement. However Central Basin is in full support of its member agencies and developed the plan to achieve the highest water savings at the lowest costs.

Highlights of the plan are:

<i>Plan Overview</i>	
Cost per Acre-foot	\$29 per acre-foot
Five-Year Water Savings	6,323 acre-feet
Lifetime Water Savings	32,443 acre-feet
Avoided Costs	\$22,722,188
Average Annual Budget	\$125,595
Five-Year Total Budget	\$627,975

Implementation Schedule

Budgets are fairly well determined for next year but program planning will always be a fluid process. On a regular and ongoing cycle, program plans and schedules will need to be revised and updated.

The launch dates for fiscal year 2011/2012 are documented below. As with the implementation plan, there may be some minor modifications as final details come to light.

<i>Program</i>	<i>Start Date</i>	<i>End Date</i>
HET Distribution Event Program	Ongoing Program.	Projected to run through 2015.
HET Direct Ship Program	Pilot in 2010 – expanding in 2011.	Projected to run through 2015.
HELP Multi-family HET Direct Installation Program	Ongoing Program.	2012
Maywood HET Direct Installation Program	2011	2012
Shut your Tap! CARE HET Direct Installation Program	Began 2011 – expanding in future years.	Projected to run through 2015.
SoCal WaterSmart Residential Incentive Program	Ongoing MWD program.	Projected to run through 2015.
Demonstration Gardens	Existing grant.	2012
FreeSprinklerNozzles.com Voucher Program	Scheduled to start Fall 2011.	Projected to run through 2015.
Urban City Makeover Program	Ongoing Program.	2011
Save A Buck Incentive Program	Ongoing MWD program.	Projected to run through 2015.

<i>Program</i>	<i>Start Date</i>	<i>End Date</i>
Smart Controllers for Public Sector Program	Ongoing Program.	Projected to run through 2015.
Commercial HET Direct Installation	Scheduled to start 2013.	Project to run from 2013 – 2015.
Outdoor Large Landscape Water Savings Performance Program	Began in 2010 – Phase 2 in 2011.	Projected to run through 2015.

Agency Roles

Central Basin's Role

Over the upcoming years, Central Basin's role is to act as liaison between MWD and Central Basin member agencies. Since MWD funding is limited and often based on a first-come/first-serve basis, Central Basin will need to be aggressively positioned with MWD to ensure placement in the funding queue. In order to maximize the success of MWD's programs, Central Basin will want to work more actively with member agencies to:

- ⇒ Design and propose programs for funding under MWD Member Agency Administered (MAA) Program funding ensuring that all project requests are in line with MWD goals and are submitted in time to receive funding.
- ⇒ Aggressively implement MAA funded programs to ensure full use of funds as well as ability to secure funds not used by other agencies.
- ⇒ Generate a list of prime customer targets and initiate regional marketing of SoCal WaterSmart and Save A Buck Incentives.

In addition, Central Basin will administer several of the regional programs. This role will encompass several duties including:

- Securing outside funding through local, state and federal grants.
- Obtaining outside vendors when necessary.
- Developing operation plans, procedures and schedules for each program.
- Monitoring start up and on-going activities for each program.
- Tracking and reporting production and progress towards goals for each program.

Retail Agency Roles

With the retail agencies carrying the responsibility to meet the 20x2020 per capita water use reduction, they have a vested interest in aggressively pushing forward with a plan that builds on Central Basin's regional plan. In addition to Central Basin's regional efforts, retail agencies will need to implement and administer local programs if they are to achieve the 20% mandated water savings by 2020. To bolster the success rate of the regional plan, retail agencies need to post programs on their website, print literature and promote the program vigorously. Additionally, developing targeted lists and direct marketing should be initiated to further increase program participation.

In the chart below are the several of the proposed programs for 2011 that are to be implemented by several of the retail agencies. All agencies will continue to participate in the regional programs such as SoCal WaterSmart and Save A Buck Programs.

Locally Implemented Programs to be Implemented in 2011

- School Education Classes
- High Efficiency Water Product Distribution (showerhead and aerators)
- Residential, CII, and Large Landscape Water Audits
- Demonstration Gardens
- Landscape Classes
- Community and City Events
- National Theatre School Education
- FreeSprinklerNozzle.com Program

Program Implementation Strategy

There are three main administrators for the programs being implemented under Central Basin’s plan, Central Basin, MWD and the local retail agencies. Due to staffing limitations and specific expertise required for certain programs, several of the programs are outsourced to industry vendors. Below is a chart listing the administrator and implementation company.

<i>Program</i>	<i>Administrator</i>	<i>Implementation Company</i>
HET Distribution Event Program	Central Basin	Niagara Conservation
HET Direct Ship Program	Local Retail Agencies	Niagara Conservation
HELP Multi-family HET Direct Installation Program	Central Basin	South West Environmental
Maywood HET Direct Installation Program	Central Basin	Oldtimers Foundation
Shut your Tap! CARE HET Direct Installation Program	Central Basin	WaterWise Consulting
SoCal WaterSmart Residential Incentive Program	MWD	Electric Gas Industries Assoc. (EGIA) and Resource Solution Group (RSG)
Demonstration Gardens	Central Basin	Eco-Tech Services
FreeSprinklerNozzles.com Voucher Program	Central Basin	Western MWD

<i>Program</i>	<i>Administrator</i>	<i>Implementation Company</i>
Urban City Makeover Program	Central Basin	Martins-Montstone Landscape Services, Inc.
Save A Buck Incentive Program	MWD	Honeywell Inc.
Smart Controllers for Public Sector Program	Central Basin	Pending
Commercial HET Direct Installation	Central Basin	RFP to solicit vendors in 2012 for 2013 implementation.
Outdoor Large Landscape Water Savings Performance Program	Central Basin	Water 2 Save

MWD Member Agency Administered Funded Programs

Central Basin is projected to receive \$374,000 in Member Agency Administered (MAA) Program funding from MWD in FY 2011/12. Because single family and multi-family high efficiency toilets are not incentivized any longer under MWD's SoCal WaterSmart and Save A Buck programs, Central Basin is proposing to use the majority of member agency funds for these programs. HETs still prove to be cost effective for Central Basin and they address the underserved low income market, therefore Central Basin has decided to continue with several residential programs.

These member agency administered dollars will fund the programs outlined below. At the current time \$346,000 of the \$374,000 has been allocated. The remaining \$28,000 is to be used for program overruns.

<i>Program</i>	<i>FY 2011/12 MWD Fund Allocation</i>	<i>Program Measure and Customer Segment</i>	<i>Retail Agency Participating</i>	<i>FY 2011/12 Program Activity Goal</i>
HET Distribution Event Program	\$50,000	Single Family High Efficiency Toilets	<ul style="list-style-type: none"> • Suburban Water • Golden State • San Gabriel Valley 	1,000 HETs
HET Direct Ship Program	\$100,000	Single Family High Efficiency Toilets	<ul style="list-style-type: none"> • Park Water • Suburban Water 	2,000 HETs
HELP HET Multi-family Direct Installation Program	\$100,000	Multi-family High Efficiency Toilets	All agencies	2,000 HETs
SoCal WaterSmart Incentive Program*	\$10,000	High Efficiency Toilets	All Agencies	103 HETs
Shut your Tap! CARE HET Direct Installation Program	\$20,000	Low Income Single and Multi-family High Efficiency Toilets	<ul style="list-style-type: none"> • Park Water • Suburban Water • Golden State • San Gabriel Valley 	400 HETs
FreeSprinklerNozzles.com Voucher Program	\$45,000	Single Family and Commercial High Efficiency Nozzles	All agencies	15,000 Nozzles
Outdoor Large Landscape Water Savings Performance Program	\$12,000	Smart Irrigation Controllers	All agencies	20 Controllers
Smart Controllers for Public Sector	\$9,000	Smart Irrigation Controllers	All agencies	15 Controllers
Total	\$346,000 (out of \$375,000 total)			

**HET incentives are no longer funded through the MWD regional incentive funds however Central Basin can utilize MAA funds for HETs. Central Basin is responsible for the incentive and the administrative fee charged by the vendor.*

It is important to note that MWD Member Agency Administered Program funding fluctuates from year to year. The amounts reflected above will not be consistent in future budgetary cycles; but they are reflective of amounts granted in years past. In the future, it will be important to re-analyze which programs being administered through MAA funds are proving to be the most cost effective to Central Basin and its retail agencies in order to effectively distribute the MWD MAA funds.

Activities Implemented by Year

The projected number of activities to be implemented per year is shown below. Please note that the program mix may shift depending on necessity, and many of the 13 selected programs consist of multiple activities. For example, the SoCal WaterSmart Program consists of high efficiency clothes washers, high efficiency nozzles, smart controller (with data subscription) and smart controllers (no data subscription). For conducting the cost and benefit analysis, it is necessary to evaluate activities with different savings and costs separately including a participants cost such as a data subscription for controllers. As stated earlier, implementation volumes will be adjusted over time as industry changes occur.

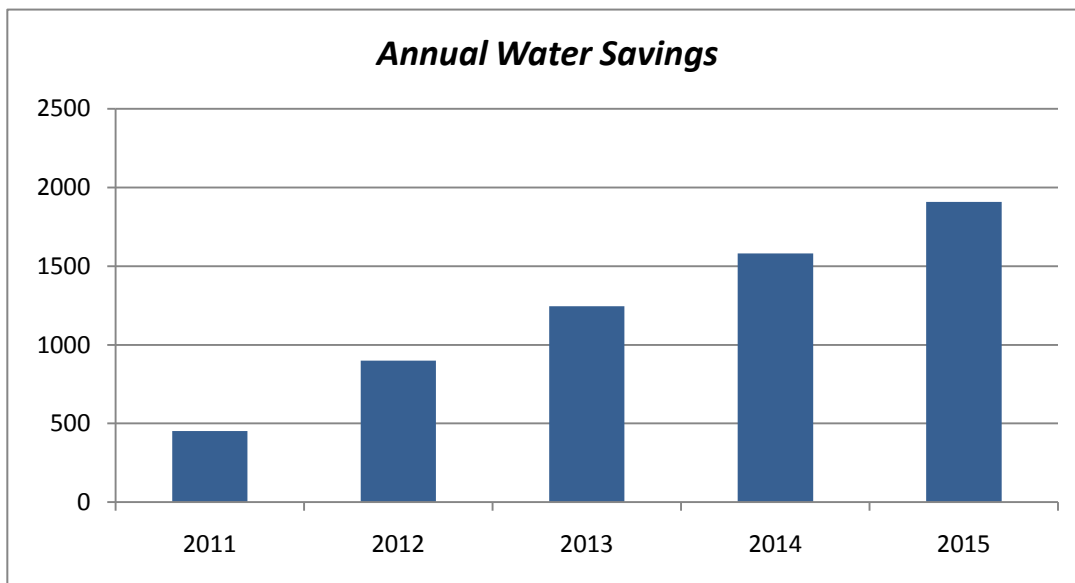
Projected Number of Activities Implemented per Year

<i>Class</i>	<i>Activity Name</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>Total</i>
Single Family	FreeSprinklerNozzles.com Voucher	15000	15000	15000	15000	15000	75000
Multi-family	HELP HET Direct Installation	2000	2000	0	0	0	4000
Single/Multi Family	Shut your Tap! CARE HET Direct Installation	400	800	800	800	800	3600
Single Family	HET Direct Ship	2000	2000	2000	2000	2000	10000
Commercial	Save A Buck HE Nozzles	1778	1778	1778	1778	1778	8890
Single Family	SoCal WaterSmart HE Nozzles	1079	1079	1079	1079	1079	5395
Single Family	HET Distribution Event Program	1000	1000	1000	1000	1000	5000
Single Family	SoCal WaterSmart HEWs	1000	1000	1000	1000	1000	5000
Single/Multi-family	Maywood HET Direct Installation	485	485	0	0	0	970
Commercial	Save A Buck HETs	761	761	761	761	761	3805
Commercial	Commercial HET Direct Install	0	0	1000	1000	1000	3000
Single Family	SoCal WaterSmart HETs	103	103	103	103	103	515
Commercial	Save A Buck Ultra Low Volume Urinals	87	87	87	87	87	435
Commercial	Save A Buck Smart Controller	26	26	26	26	26	130

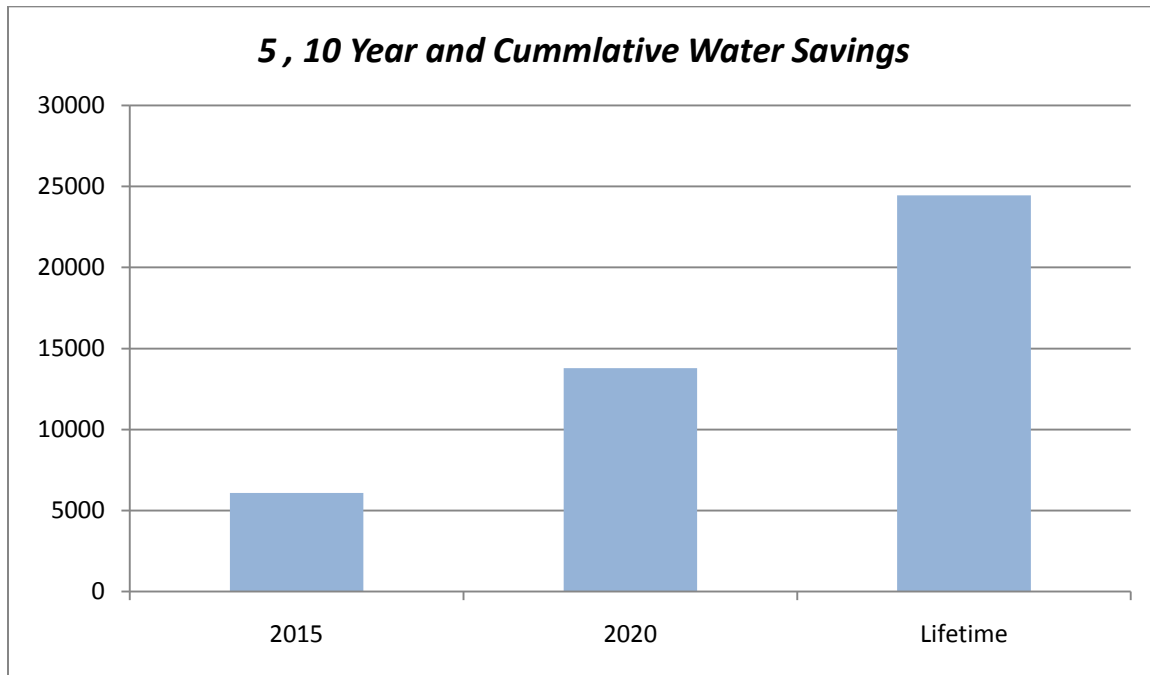
<i>Class</i>	<i>Activity Name</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>Total</i>
Commercial	Outdoor Large Landscape Water Savings Performance Program	20	20	20	20	20	100
Commercial	Smart Controllers for Public Sector Program	15	15	15	15	15	75
Single Family	SoCal WaterSmart Smart Controllers	6	6	6	6	6	30
Commercial	Save A Buck Cooling Tower Conductivity Controller	3	3	3	3	3	15
Commercial	Save A Buck Cooling Tower pH Controller	1	1	1	1	1	5
Commercial	Save A Buck Connectionless Food Steamers	1	1	1	1	1	5
Commercial	Demonstration Gardens	2	3	0	0	0	5
Commercial	Urban City Makeover HETs	170	0	0	0	0	170
Commercial	Urban City Makeover Smart Controllers	8	0	0	0	0	0
Commercial	Urban City Makeover (Demo Gardens)	2	2	0	0	0	2

Water Savings

The following chart depicts the annual savings for the five year implementation Fiscal Year 2010/11 – Fiscal Year 14/15.



The table below represents savings by 2015 and 2020 as well as lifetime savings.

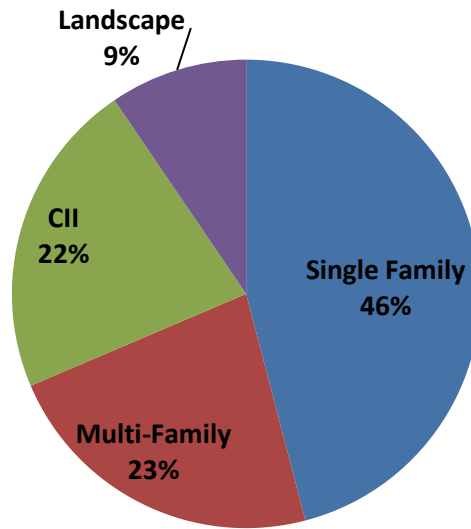


Water Savings by Sector

The tables below depict the lifetime water savings by sector. The majority of savings will come from the single family sector. This directly matches up with Central Basin’s largest demand sector, single family.

<i>Customer Class</i>	<i>Lifetime Water Savings (acre-feet)</i>	<i>% of Total Savings</i>
Single Family	14,901	46%
Multi-Family	7,350	23%
Commercial, Industrial and Institutional	7,108	22%
Landscape	3,084	9%

Lifetime Water Savings by Customer Class



Savings by Year by Activity

The tables below present the acre-feet of water savings by activity for each year of the planning period. The two top performing programs are the HELP HET Multi-family Direct Installation Program and the HET Direct Ship Program. The third highest savings comes from Central Basin’s new FreeSprinklerNozzle.com Voucher Program.

<i>Annual Water Savings by Activity by Year</i>						
Activity Name	Annual Water Savings (acre-feet)					Total 5 Year Savings
	2011	2012	2013	2014	2015	
HELP HET Multi-family Direct Installation Program	121.6	243.3	243.3	243.3	243.3	1094.6
HET Direct Ship Program	71.1	142.2	213.3	284.4	355.5	1066.6
FreeSprinklerNozzles.com Voucher Program	60	120	180	240	300	900
HET Distribution Event Program	35.6	71.1	106.7	142.2	177.8	533.3
SoCal Water\$mart HEWs	34.5	69	103.6	138.1	172.6	517.9
Save A Buck HETs	32.3	64.7	97	129.4	161.7	485.1
Shut your Tap! CARE HET Direct Installation Program – Multi-family	12.2	36.5	60.8	85.1	109.5	304.1
Shut your Tap! CARE HET Direct Installation Program –	7.1	21.3	35.6	49.8	64	177.8

<i>Annual Water Savings by Activity by Year</i>						
Activity Name	Annual Water Savings (acre-feet)					Total 5 Year Savings
	2011	2012	2013	2014	2015	
Single Family						
Commercial HET Direct Installation Program	0	0	42.5	85	127.5	255
Outdoor Large Landscape Water Savings Performance	12.4	24.8	37.2	49.5	61.9	185.8
Save A Buck ULVZ Urinal	10.7	21.3	32	42.7	53.4	160.1
Save A Buck Smart Controller	8	16.1	24.1	32.2	40.2	120.7
Save A Buck HE Nozzles	7.1	14.2	23.1	28.4	35.6	106.7
Smart Controllers for Public Sector Program	4.6	9.3	13.9	18.6	23.2	69.7
Maywood HET Direct Installation	7.4	14.7	14.7	14.7	14.7	66.4
SoCal Water\$mart HE Nozzles	4.3	8.6	12.9	17.3	21.6	64.7
SoCal Water\$mart HETs	3.7	7.3	11	14.6	18.3	54.9
Urban City Makeover	10	10.3	10.3	10.3	10.3	51.2
Maywood HET Direct Installation	4.3	8.6	8.6	8.6	8.6	38.8
Save A Buck Incentive Cooling Tower pH Controllers	1.9	3.9	5.8	7.8	9.7	29.2
Save A Buck Cooling Tower Conductivity Controllers	1.9	3.9	5.8	7.7	9.7	29
Demonstration Gardens	0.4	1	1	1	1	4.4
Save A Buck Incentive Food Steamers	0.3	0.5	0.8	1	1.3	3.8
SoCal Water\$mart Smart Controllers	0.2	0.5	0.7	1	1.2	3.7
Total	451	913	1,283	1,653	2,023	6,323

Programmatic Savings

As stated earlier, programs often consist of multiple activities. The table below presents the estimated savings rolled up for the selected eight programs.

<i>Annual Water Savings for Selected Programs</i>						
Activity Name	Annual Water Savings (acre-feet)					Total 5 Year Savings
	2011	2012	2013	2014	2015	
HELP HET Multi-family Direct Installation Program	121.6	243.3	243.3	243.3	243.3	1094.6
HET Direct Ship Program	71.1	142.2	213.3	284.4	355.5	1066.6
Save A Buck Commercial Incentive Program	62.3	125	187	249	311.5	935

<i>Annual Water Savings for Selected Programs</i>						
FreeSprinklerNozzles.com Voucher Program	60	120	180	240	300	900
SoCal Water\$mart Residential Incentive Program	43	85.5	128	171	214	641
HET Distribution Event Program	35.6	71.1	106.7	142.2	177.8	533.3
Shut your Tap! CARE HET Direct Installation Program	19.3	57.8	96.4	134.9	173.5	481.8
Commercial HET Direct Installation Program	0	0	42.5	85	127.5	255
Outdoor Large Landscape Water Savings Performance	12.4	24.8	37.2	49.5	61.9	185.8
Maywood HET Direct Installation Program	11.7	23.3	23.3	23.3	23.3	105.2
Smart Controllers for Public Sector Program	4.6	9.3	13.9	18.6	23.2	69.7
Urban City Makeover Program	10	10.3	10.3	10.3	10.3	51.2
Demonstration Gardens	0.4	1	1	1	1	4.4
Total						6,323

Passive vs. Active Savings Assumptions

Some of the most significant water savings measures in California have come, not from local active program efforts, but rather 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 from local agencies. For example, code requirements such as flush volumes for toilets, first adopted nationally in 1992, re-shaped the residential and commercial plumbing industry and encouraged the development of new technologies at a pace not seen in decades. The following are some of the most impactful codes, responsible for significant passive water savings:

- The United States Energy Policy Act specifies maximum flow rates for many plumbing devices, including toilets, showerheads and faucets.
- United States Environmental Protection Agency Energy Star® Program certifies individual devices for water and energy efficiency standards.
- The California Energy Commission establishes water efficiency standards for clothes washers
- Effective January 1, 2014, California Assembly Bill 715 requires the installation of high-efficiency toilets and urinals in all new residential construction.

It is necessary to calculate the passive savings from activities, such as the natural replacement of clothes washer with high efficiency models. For the purposes of this plan, passive savings were calculated for the following measures and are included in the total savings.

- Single Family and Multit-family High Efficiency Toilets (HETs)
- Single Family High Efficiency Washers (HEWs)
- Commercial HETs

Budget by Year

Central Basin prepares annual budgets with line items dedicated to water conservation activities. The annual budget for each year of the five-year planning period, based upon the plan, is below. The budget amounts shown reflect the financial commitment only of Central Basin and are exclusive of MWD or other financial contributions.

<i>Program Year</i>	<i>Annual Program Budget (\$/Yr)</i>
2011	\$100,937
2012	\$117,355
2013	\$132,545
2014	\$136,522
2015	\$140,617
5 Year Total	\$627,975

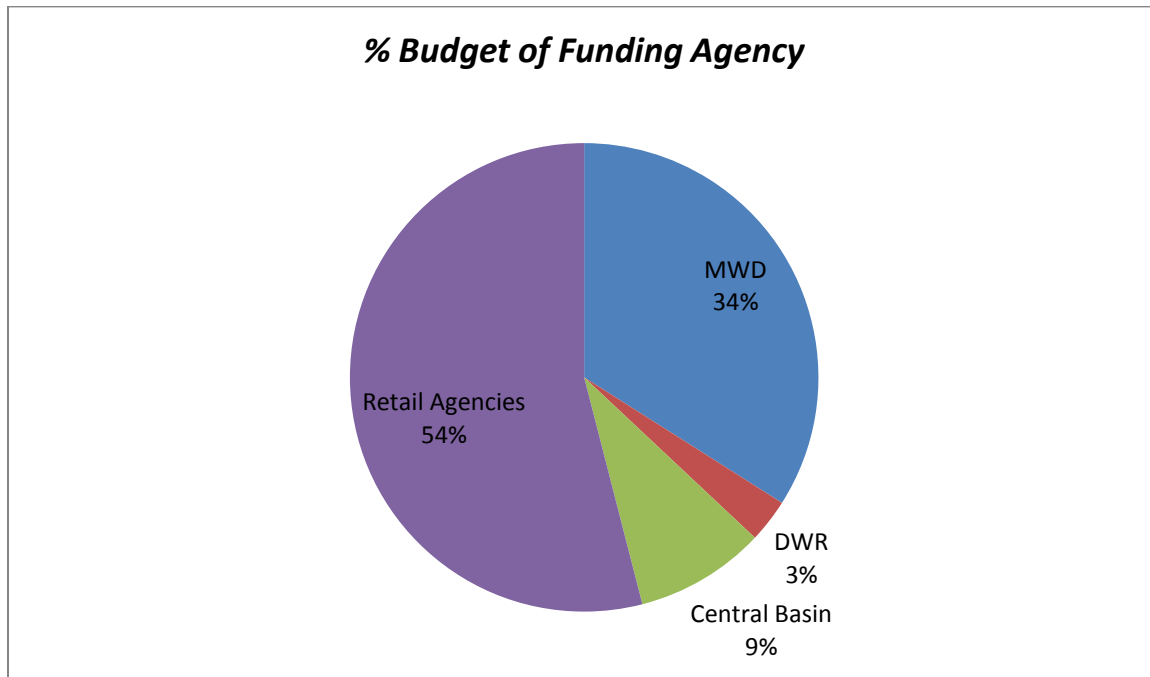
Below is a chart depicting the budget by year by program as funded by Central Basin.

<i>Program</i>	<i>FY 11/12</i>	<i>FY 12/13</i>	<i>FY 13/14</i>	<i>FY 14/15</i>	<i>FY 15/16</i>	<i>Total</i>
Outdoor Water Savings Performance	\$46,000	\$47,380	\$48,801	\$50,265	\$51,773	\$244,220
Smart Controllers for Public Sector	\$30,000	\$30,900	\$31,827	\$32,780	\$33,765	\$159,274
Shut Your Tap! HET Direct Install	\$12,000	\$24,721	\$25,462	\$26,225	\$27,012	\$115,419
Commercial HET Direct Install	\$0	\$0	\$14,853	\$15,298	\$15,757	\$45,908
SoCal WaterSmart	\$6,187	\$6,372	\$6,563	\$6,760	\$6,963	\$32,845
FreeSprinklerNozzles.com	\$3,750	\$3,863	\$3,978	\$4,098	\$4,221	\$19,909
HET Distribution Events	\$1,000	\$1,030	\$1,061	\$1,093	\$1,126	\$5,309
Demonstration Gardens	\$2,000	\$3,090	\$0	\$0	\$0	\$5,090

Central Basin has been extremely successful in the past securing outside funding through MWD incentives and other programs as well as the grants through the California Department of Water Resources. In addition several of Central Basin's retail agencies, specifically the investor owned

utilities, provide program funding. Below are charts documenting the annual funds provided through MWD, DWR, Central Basin and the retail agency and the respective percentage of the total budget. Please note that the MWD numbers include MWD Member Agency Administered Program as well as the incentives for SoCal WaterSmart and Save A Buck. Note that the majority of retail agency budgets are funding the various HET programs.

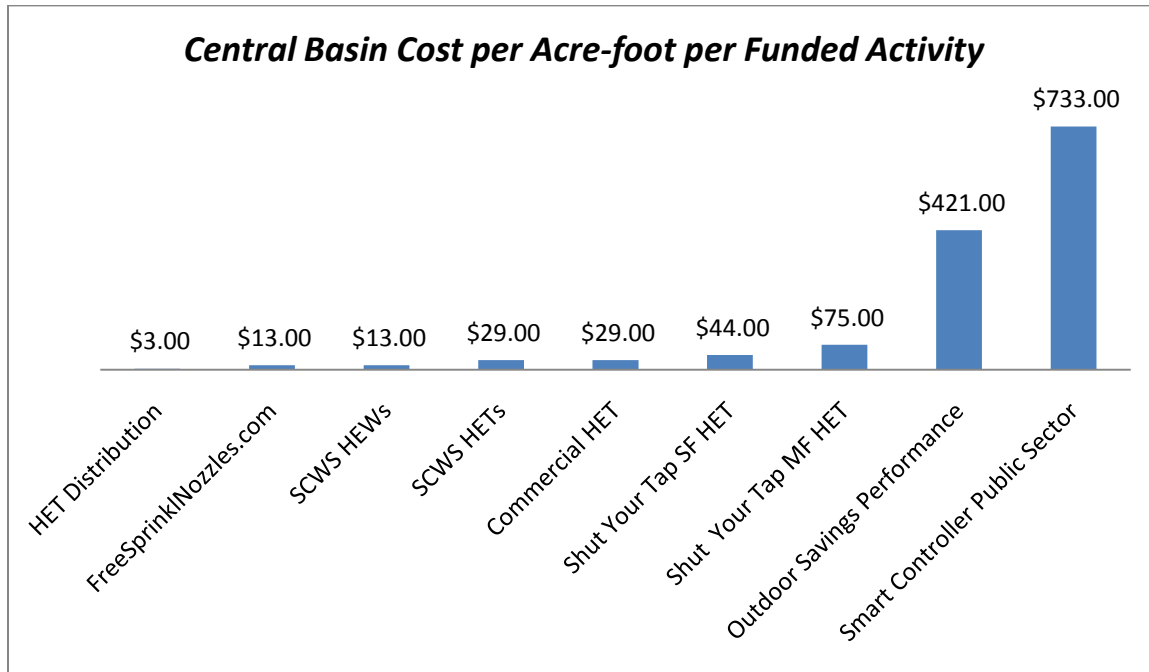
<i>Program Year</i>	<i>MWD</i>	<i>DWR</i>	<i>Central Basin</i>	<i>Retail Agency</i>	<i>Total</i>
2011	\$531,341	\$121,717	\$100,937	\$889,000	\$1,642,995
2012	\$542,201	\$102,989	\$117,355	\$967,000	\$1,729,545
2013	\$480,076	\$0	\$132,545	\$721,000	\$1,333,621
2014	\$480,076	\$0	\$136,522	\$721,000	\$1,337,598
2015	\$480,076	\$0	\$140,617	\$721,000	\$1,341,693
Total	\$2,513,770	\$224,706	\$627,976	\$4,019,000	\$7,378,452



Central Basin Costs and Benefits

The Plan is estimated to save over 32,443 acre-feet of water at a cost to CBMWD of \$29 per acre-foot. This falls well below Central Basin's avoided cost to purchase water from MWD of \$869 per acre-foot. The avoided purchases equate to \$22.6 Million. These results are highly advantageous to Central Basin and its member agencies as the economic portfolio is extremely favorable. On the following pages are details of the economic analysis.

Below is a graph showing the cost per acre-foot per activity:



As shown in the above graph, there are a many of **zero-cost** water saving activities for Central Basin. The number of zero-cost programs illustrated above highlights the effective strategy of Central Basin in both the past and present to actively seek out available funding for efficiency measures. Given the increased competition for grant and MWD member agency funds, Central Basin has successfully built a diverse program portfolio catering to its retail agency needs.

All the programs fall below MWD Tier 2 rate of \$869.

Partnership Funding Opportunities

Partnership funding sources have provided critical financial support to local water conservation programs for several decades. Regional, state and federal agencies have a long history of making funds available to local water agencies for the implementation of prioritized programs. In the form of incentives, grants and loans, these financial mechanisms underscore the shared goals of water conservation and efficiency within California's water industry. Central Basin has a long history of success in accessing these funds to support implementation of its numerous programs. Central Basin

will to continue to pursue all grants and financial incentives through the planning period and expects to offset a significant portion of program costs.

As the state and national economies continue in a recovery phase into the foreseeable future, the availability of outside funding will likely be less consistent and more competitive. Therefore, it is important that Central Basin have a clear understanding of the outside funding possibilities that includes realistic expectations of their availability. This section provides a description of current outside funding sources as well as brief projections as to their availability in the near future.

Metropolitan Water District

MWD has been a consistent source of outside program funding to its member agencies for many years. Their support has come in numerous forms and Central Basin has consistently utilized these funds for program implementation. For Fiscal Year 11/12, MWD offers the following financial support opportunities to local agencies.

- **SoCalWater\$mart:** provides direct rebates to single family and multi-family residential customers for the installation of high efficiency toilets, high efficiency clothes washers, smart landscape controllers, and high efficiency nozzles.
- **Save A Buck:** provides direct rebates to commercial, industrial and institutional customers for a menu of water savings devices.
- **Agency Administered Programs:** Each MWD member agency will be allocated a specific budget for locally implemented programs. It is anticipated that MWD's contribution to CBMWD's conservation programs next year, which are not related to MWD's menu of programs will be an estimated \$374,000.

In regards to the future, MWD has recently indicated that they anticipate reducing funding support for their regional conservation programs. As recently as two years ago, an estimated \$60 million was expended by MWD for conservation programs across the region. For fiscal year 2011/12, they have made \$19 million available to fund both regional urban and agricultural programs. Funding levels for fiscal year 2012/13 and beyond are uncertain.

California Department of Water Resources

In recent years, the State's primary funding contribution to conservation programs has come from Proposition 50, the Water Security, Clean Drinking Water, and Coastal & Beach Protection Act of 2002. Given the slow pace of the economic recovery in California, it is unknown whether Prop 50 funds will be available in the foreseeable future. At this time, it is advisable to develop local conservation plans for the next two years absent expectations of any significant state financial contribution.

United States Bureau of Reclamation

Federal financial contributions to local agency water conservation programs have come primarily from the United States Bureau of Reclamation (USBR). USBR currently offers two water conservation grant opportunities under the WaterSMART program: the Challenge Grant and Water and Energy Efficiency Grants.

Other Federal Sources

The American Recovery and Reinvestment Act of 2009 has recently made over \$35 million dollars available in California for energy and water conservation rebates. It is not known at this time whether the program will be extended.

The United States Environmental Protection Agency currently offers financial assistance to local agencies for watershed, water quality and water distribution/treatment systems upgrades. At this time, financial support is not available for water conservation/efficiency programming.

Plan Updates

The plan is a working document and, as such, must be modified and updated as changes occur and program years roll out. It is encouraged that CBMWD and its member agencies regularly review the plan and make adjustments accordingly.

Changes and/or reviews of the business plan should take place in line with the following conditions:

- When programs are added, subtracted or modified
- As grants are received, put on hold or denied
- On a yearly basis in order to meet the annual reporting requirements
- Every 5 years to meet the Urban Water Management Plan report cycle