

September  
2016

# Declining Water Deliveries – How Rates and Bills will be Impacted

This paper reviews the water delivery quantities for California's Class-A Water Utilities and finds that they have been declining rapidly, at least since 2013. While the sudden reduction may be related to California's current drought and temporary, it appears that the long-term trend is downward, with significant implications for future costs and rates.

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## Introduction

Californians are using less water, and the water utilities that are jurisdictional to the California Public Utilities Commission (CPUC or the Commission) are implementing successfully the state’s policies regarding reducing the amount of water served each month. The Commission’s Water Division provides monthly reports to the Commissioners and relevant staff showing conservation targets of the Class-A water utilities and their achievements in “percent saved.”

Those monthly reports are helpful in evaluating the degree to which the water utilities are succeeding in meeting the requirements of the Governor’s executive orders and complying with drought regulations. The Commission also should be interested in water use reductions from a longer term perspective. Regardless of the progress of the current drought, California’s continuing economic growth and population growth indicate a future of conservation and care in water consumption. Incremental supplies of water will cost more than the state’s traditional sources. Recently, the CPUC documented examples of higher costs of “new” water from conservation and recycling measures as well as from desalination. Increases in efficiency in water use similarly, come at a cost.<sup>1</sup> There are engineering questions as well. Local mains and water systems generally have been designed with certain water flow quantities in mind. As customer use patterns change, there may be need for improvements to keep water systems operating properly and water quality high.

Finally, even if the total costs of water systems do not rise, there are questions of how the current costs will be collected through rates charged to customers when those customers use less. Even if customers cut back on water use to the degree that there are no new water supplies are needed, reduced consumption does not translate to lower water system costs. The annual costs associated with operating and maintaining water systems vary only slightly with changes in the quantities of water delivered to customers; most of the costs are related to operating the systems and to maintaining and improving the infrastructure. Such costs do not vary with water quantities. As quantities of water consumed fall off, the cost of water service *per quantity delivered* will rise. This is not a matter of costs or usage; it is a matter of arithmetic. Customer rates for service are set largely according to the amount of water they use. With little change in overall costs, smaller denominator yields a higher rate. This does not mean that customer bills will rise, only that if overall costs do not fall, bills will not decrease in the long run. Rates will rise to meet the revenue requirements necessary to pay the costs of the water systems.

This paper provides a review of the progress of the Class-A water utilities in reducing water consumption on a per-customer basis over years – not months. Based on a review of annual data from 2010 through 2015 (the most recent full-year statistics available), it shows that for most of the Class-A systems, water consumption reached a peak in 2013 and began falling in 2014 and 2015. Clearly the state’s short-term

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<sup>1</sup> *What Will Be the Cost of Future Sources of Water for California?* Stephen St Marie and Marzia Zafar, Policy and Planning Division White Paper, January 2016.



drought-related goals are being met. The annual data show an even stronger trend that has the appearance of continuing beyond the end of the current drought and the conclusion of monthly reporting.

In the longer term, water utility deliveries per customer may rise from their current levels. But they are unlikely to return to the pre-drought levels and, as discussed below, they may continue on a downward path. At the same time, costs of operating and sustaining water systems may decline only by a small amount if they decline at all. More likely, costs will stay constant or even rise. If so, collecting those constant costs on a smaller base of sales will require recalculation of rates, resulting in higher rates per unit of water delivered.

## Short-term and Long-term Usage Reductions

All of California's water servers, including those jurisdictional to the CPUC, are under Governor's Executive Orders to reduce water consumption.<sup>2</sup> The Governor's web page notes that "Californians have responded with unprecedented conservation efforts ...."<sup>3</sup> Most likely, some of the conservation response of Californians is a result of the urgency of the call, and when the urgency is reduced, the efforts will be reduced as well. That is, some of the reduction will be found to be temporary. Still, some changes in consumption patterns are likely to persist even after the urgency has worn off. Particularly, with the installation of water-efficient household fixtures replacing older water-inefficient ones, at least some reduction in water usage is likely to remain, at least until such fixtures are due for replacement once again.

In addition to the urgency of the drought regulations and Californians' willing response, there are longer term policies and trends under way. California adopted a California Water Action Plan, with updates over the last several years.<sup>4</sup> Sustainable management is a major goal, along with "reliability, restoration, and resilience." Over several years, and several updates, the California Water Action Plan has focused on assisting water agencies and customers to limit and reduce water use.<sup>5</sup> The Commission has its own

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<sup>2</sup> Governor Brown's Responses to the California Drought are presented at <https://www.gov.ca.gov/news.php?id=19191>. The Governor declared a drought state of emergency in January 2014. He followed up with a 25-percent statewide mandatory water use reduction and a series of actions to help save water. More information, including the underlying executive orders, is available at that web site.

<sup>3</sup> Noted on the same web page, <https://www.gov.ca.gov/news.php?id=19191>.

<sup>4</sup> The California Water Plan web page can be seen at [http://resources.ca.gov/california\\_water\\_action\\_plan/](http://resources.ca.gov/california_water_action_plan/).

<sup>5</sup> In particular, Chapter 3 of Volume 3 of the 2013 Update, "Urban Water Use Efficiency," provides various strategies for enhancing water use efficiency and providing incentives to conserve. It also contains a broad bibliography of sources for further research. <http://www.water.ca.gov/waterplan/cwpu2013/final/index.cfm>.



Water Action Plan, originally published in 2005 and updated most recently in 2010.<sup>6</sup> One of the six objectives of the Water Action Plan is to “Strengthen water conservation programs to a level comparable to those of energy utilities.” Prior to California’s current drought, the previous Governor initiated the 20x2020 Water Conservation Plan in 2008.<sup>7</sup> The CPUC’s Water Rate Case Plan, published in 2007, calls for conservation and efficiency, along with annual water use reductions.<sup>8</sup> Water utility general rate case decisions have continued to set goals for reductions in system water losses.<sup>9</sup> Water utilities have encouraged customers to modify their gardening practices to reduce water needs. They even have instituted programs to compensate customers that have removed grass lawns and replaced them with drought-tolerant landscapes.<sup>10</sup> These programs are resulting in water use reductions that are, at the least, persistent, though long-term water-use forecasts for large areas are hard to find.<sup>11</sup> Certainly, two drought-related effects will continue: the statewide emphasis on conservation pricing – that is, placing the bulk of the charges on volumetric usage – and the gradual increase in rates resulting from lower deliveries – are resulting in a continuing incentive to customers to be conservative in consumption.<sup>12</sup>

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<sup>6</sup> Water Action Plan, October 2010, California Public Utilities Commission, available for download at: <http://www.cpuc.ca.gov/General.aspx?id=6751>.

<sup>7</sup> See the State Water Resources Control Board page regarding the 20x2020 program at [http://www.swrcb.ca.gov/water\\_issues/hot\\_topics/20x2020/index.shtml](http://www.swrcb.ca.gov/water_issues/hot_topics/20x2020/index.shtml). There is a February 28, 2008 letter of Governor Schwarzenegger and a February 2010 published plan, along with follow-up actions extending through 2013.

<sup>8</sup> CPUC Decision D.07-05-062, May 24, 2007, Opinion Adopting a Revised Rate Case Plan for Class A Water Utilities. In addition, see, for example, CPUC Decision D.11-05-004, May 5, 2011. This decision “adopts a conservation goal of a 1-2% annual reduction in consumption, per service connection and customer class ....”

<sup>9</sup> In CPUC Decision D.09-07-021, the Commission provided an incentive regulation mechanism to California-American Water to provide “a strong financial incentive to reduce unaccounted for water.” See page 56.

<sup>10</sup> Several examples of conservation programs and their costs are presented in St Marie and Zafar, “What will be the cost of future water sources for California.” Specific programs and budgets are not found in the main body of CPUC decisions, but are in the appendixes and settlement documents.

<sup>11</sup> Long-term forecasts of urban water demand have been declining over time. Examples are shown in “A Community Guide for Evaluating Future Urban Water Demand,” by Matthew Herberger, Kristina Donnelly, and Heather Cooley, Pacific Institute, August 2016. <http://pacinst.org/rethinking-future-water-demand-blog/>.

<sup>12</sup> The State Water Resources Control Board web page on “Conservation Water Pricing” begins with the sentence, “Conservation Pricing is an effective tool to prevent wasteful water use.” [http://www.waterboards.ca.gov/waterrights/water\\_issues/programs/drought/pricing/](http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/pricing/).



## Review of Class-A Water Utility Annual Reports

The CPUC-jurisdictional water utilities are required to file reports annually that show their financial and physical results for the year. The Commission posts these public documents on the CPUC web page.<sup>13</sup> Annual reports dating back to the year 2000 are available on the web page. This analysis begins with the year 2010.

The annual reports include information on the companies' balance sheets, income statements, Capacity and non-tariffed services, and much more. This analysis relies on two schedules:

- Schedule D-4 – Number of Active Service connections; and
- Schedule D-7 – Water Delivered to Metered Customers by Months and Years.

Information is presented in standardized form, facilitating comparison from year to year, and from utility company to utility company. The number of meters is reported as of December 31 of each year. Water deliveries – monthly numbers as well as annual totals – are reported in standardized units, such as “CCFs,” which means “hundreds of cubic feet.” The filer has the option of reporting in another standard measure, but must indicate clearly what form of unit is reported. That makes it possible for a reviewer to convert all of the numbers to a common standard regardless of the filer’s original submission.

One difficulty in evaluating use per customer is that not all residential units have their own water connections to the utilities. Single-family homes, of course, are connected through water meters. But apartment buildings, at least historically, often have had a single connection to the water utility, with the result that there is no pure residential number reported or even known at the level of individual apartments. Consequently, the reports list a category called “Commercial,” which is domestic, including single-family connections and commercial buildings, including apartment buildings. While this number may not represent a pure domestic use number, it is the best we have. Using it facilitates comparison from year to year for a single filer, for the overall stock of homes and apartments is stable over time. However, comparisons between companies are less objective, for the degree of penetration of multi-unit buildings is different from company to company. Surely, more urban areas are likely to have a higher penetration of multi-unit connections, while more suburban and rural areas are likely to have a smaller percentage of such multi-unit connections. And the characteristics of single-family homes and lots may vary from locale to locale.

Table 1 presents 2015 results for the California water utility companies whose reports were analyzed regarding both the quantities of water delivered and the number of connections – a proxy for the number of customers.<sup>14</sup> It also provides a snap-shot of the relative sizes among the companies. Class-A

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<sup>13</sup> CPUC Web Page: <ftp://ftp.cpuc.ca.gov/waterannualreports/>.

<sup>14</sup> The Annual Reports combine Residential (which in most cases means individually metered single-family units) and Commercial (which may include apartment buildings, unlikely to be separately metered per apartment). Not included are industrial sales, sales public authorities, and irrigation sales. Public fire hydrants are also not



Water utilities are those with more than 10,000 connections. These firms range in size from a low number of about 20,000 residential and commercial customers (Apple Valley Ranchos Water Company) to over 400,000 residential and commercial customers (California Water Service). That is a ratio of about 20-to-one, and it shows the diversity within the group.<sup>15</sup>

Table 1

California's Class-A Water Utilities			
Residential and Commercial Deliveries and Connections in 2015			
<u>Company</u>	<u>Deliveries (CCF)</u>	<u>Connections</u>	<u>Use per Customer</u>
Apple Valley Ranchos Water	3,414,735	19,757	173
California Water Service	91,648,000	437,408	210
California-American Water	27,921,373	166,809	167
Golden State Water	47,871,271	249,727	192
Great Oaks Water	3,061,669	20,404	150
Park Water	3,732,256	26,936	139
San Gabriel Valley Water	22,175,915	91,131	243
San Jose Water	23,960,923	198,953	120
Suburban Water	12,447,934	61,236	203
Sum of All Class-A Utilities	236,234,076	1,272,361	186

While several of the utilities serve multiple districts and file individual reports for each district, this analysis reviews the overall totals for the companies, not the districts. This analysis covers the years 2010-2015, the most recent year on record.

Table 2 shows how each company’s deliveries per residential/commercial customer have changed over time, from 2010 until the most recent full-year data available, 2015. Each company’s pattern is unique, but there is a larger industry-wide pattern beginning in 2014 as the state of California began to react sharply to the ongoing drought.

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included. San Jose Water Company provided a consistent series of “Residential” numbers for deliveries and number of connections for the period for 2010-2015. Therefore, the usage numbers for San Jose Water Company are Residential. For the rest they are Residential and Commercial combined.

<sup>15</sup> While the Class-A Water utilities account for about 95-percent of the urban water deliveries under CPUC jurisdiction, they are a small portion of the number of CPUC-jurisdictional water utilities. The CPUC’s web site provides a list of 108 water utilities. Besides the nine Class-A utilities (over 10,000 connections), there are five Class-B utilities (over 2,000 connections), 24 Class-C utilities (over 500 connections), and 70 Class-D utilities (500 or fewer connections). The list can be downloaded here: <http://www.cpuc.ca.gov/water/>. Of course, the CPUC is responsible for regulation only of the investor-owned water utilities. According to the State Water Resources Control Board, its Field Operations Branches are responsible for monitoring the performance of 7,500 public water systems. [http://www.swrcb.ca.gov/drinking\\_water/programs/index.shtml](http://www.swrcb.ca.gov/drinking_water/programs/index.shtml).



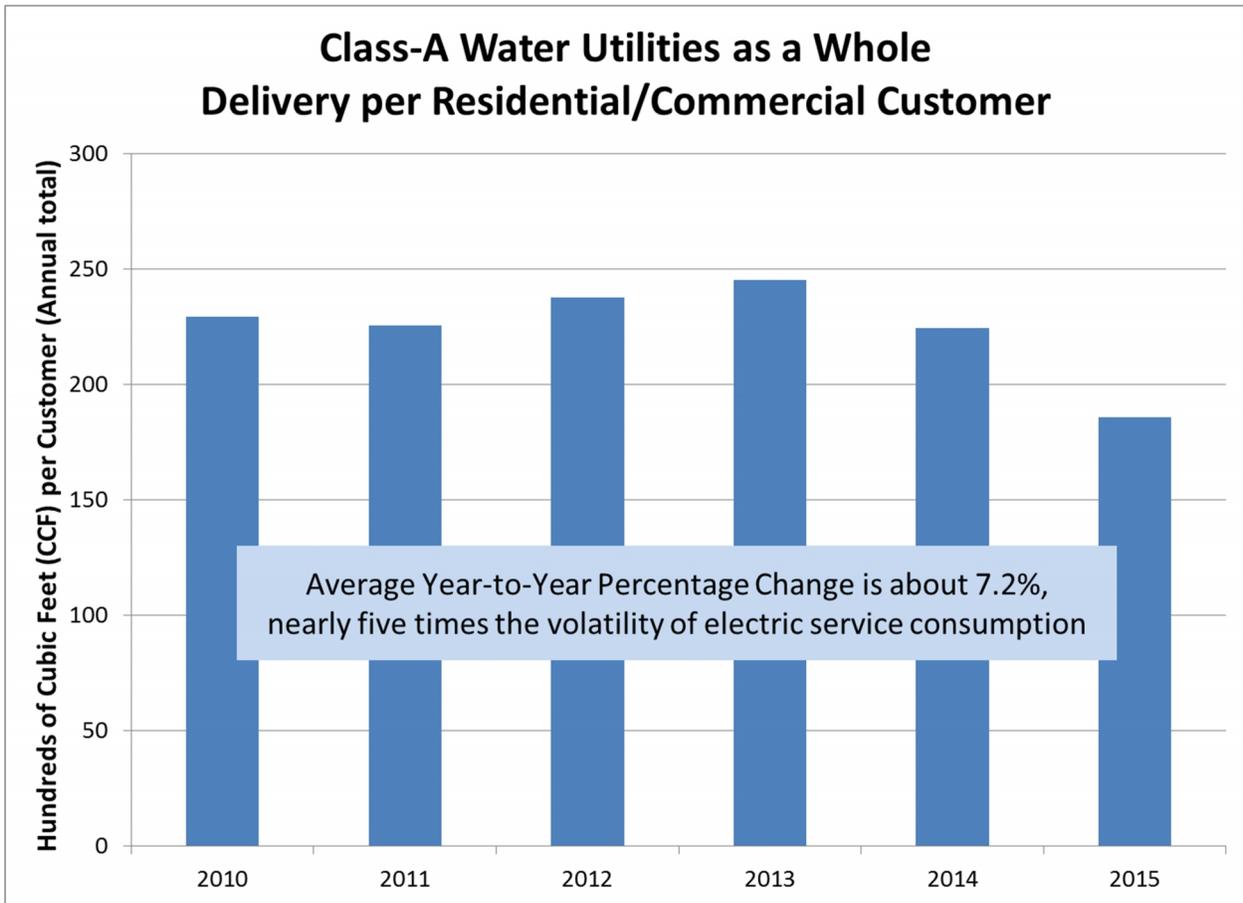
Table 2

<u>California Class-A Water Utilities Annual Deliveries Per Residential/Commercial Customer</u>						
	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>
	(CCF per Residential/Customer)					
Apple Valley Ranchos Water	248	232	237	227	220	173
California Water Service	258	254	268	290	252	210
California-American Water	210	207	220	216	199	167
Golden State Water	236	227	237	237	228	192
Great Oaks Water	198	197	209	212	190	150
Park Water	167	163	168	167	159	139
San Gabriel Valley Water	291	284	297	295	292	243
San Jose Water	164	164	175	177	157	120
Suburban Water	217	215	231	248	246	203
Class-A Utilities in Total	229	225	237	245	224	186
Percentage Change Year-to-Year		-1.7%	5.4%	3.3%	-8.5%	-17.3%

The numbers for the individual utilities shown in Table 2 may be difficult to interpret on their own, and even a chart of the individual company results may not be informative about the state of the industry. Still, put together in the form of an aggregated total for all of the Class-A Water utilities together, the results are dramatic. Chart 1 presents the deliveries pattern for the aggregated total, that is, for the Class-A water utilities as a whole. It provides a view of how the deliveries were on a slow ascent from 2011 through 2013 and then dropped off sharply in 2014 and 2015.



Chart 1

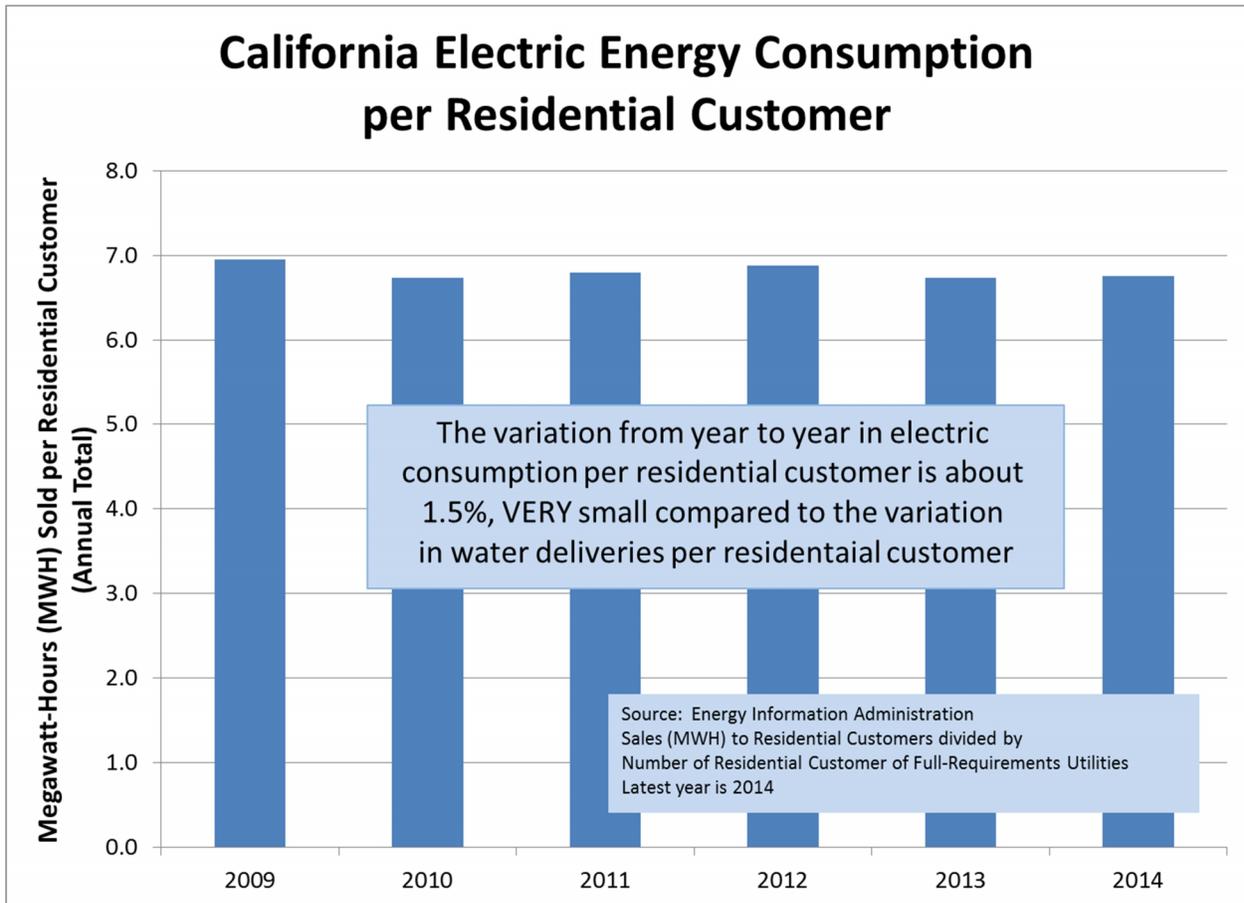


Overall, the results are astounding. Of course, it is to be expected that with the Governor’s declaration of drought conditions in January or 2014, the results for 2014 would be lower than for 2013, the last year that could be considered “normal” in California terms. Overall, taking into account the results for all nine Class-A water utilities, the results for 2014 were about 8.5-percent lower than for 2013. Even more dramatic is the overall result for 2015, about 17-percent below 2014’s already reduced result, and more than 24-percent lower than 2013.

It is difficult to overstate how dramatic these changes are. A comparison to California’s electric industry may help to make it clearer. Chart 2 shows electrical energy deliveries to California’s residential customers from full-service electric utilities over the years from 2009 through 2014 (the latest year available).



Chart 2

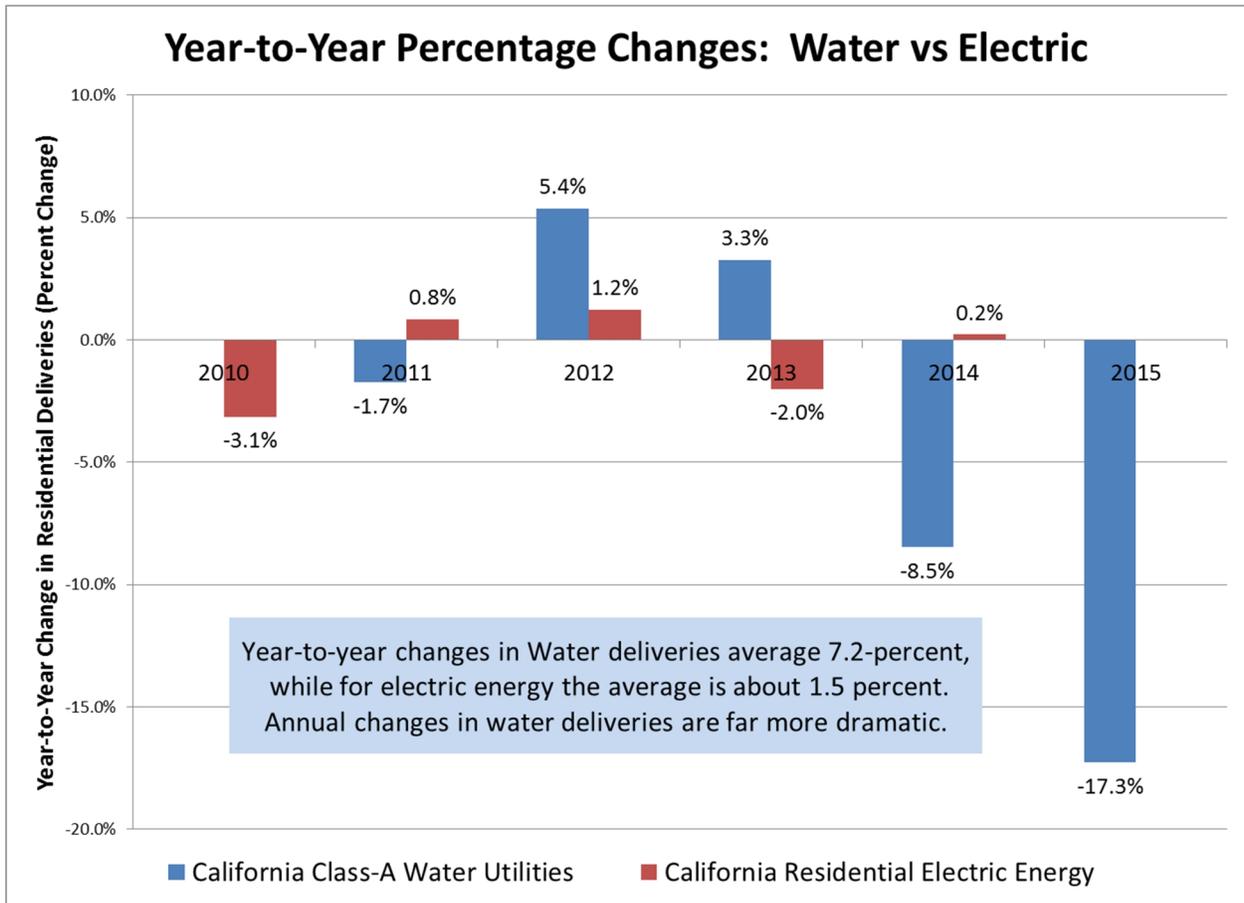


Average electric energy use per residential customer in California varied from just less than seven megawatt-hours (MWH) per year in 2009 to a minimum of just more than 6.8 MWH in 2010 and 2013, with the other years' results falling in between. The average year-to-year percentage change (in absolute value) was about 1.5-percent, with the largest single-year change being about 3.1-percent from 2009 to 2010. By contrast, for the California's Class-A water utilities, the average annual change (in absolute value) was about 7.2-percent, with the largest single-year change being the drop of more than 17-percent from 2014 to 2015.

Chart 3 presents a comparison of the year-to-year percentage changes in per-customer deliveries of water and electric energy. (Note that both electric and gas have the same number of bars, but they are not completely comparable because the most recent data for electric service deliveries extends only through 2014 and does not include 2015.) The results show that in every year the percentage change in water deliveries was greater than the percentage change in electric deliveries. In comparison to changes in electric energy consumption, water usage results have been very volatile.



Chart 3



## Indexing by Year – Adding Clarity

A more revealing review of the water company results comes from presenting the utility numbers not in quantities of water, but in percentages compared to a single point in time. Consider the time period of this analysis. California, along with the rest of the United States, was in a deep recession in 2009. By 2010, the economy was expanding again. The economy has been expanding throughout the years of this analysis. Chart 4 compares the deliveries to the levels of 2010.



Chart 4

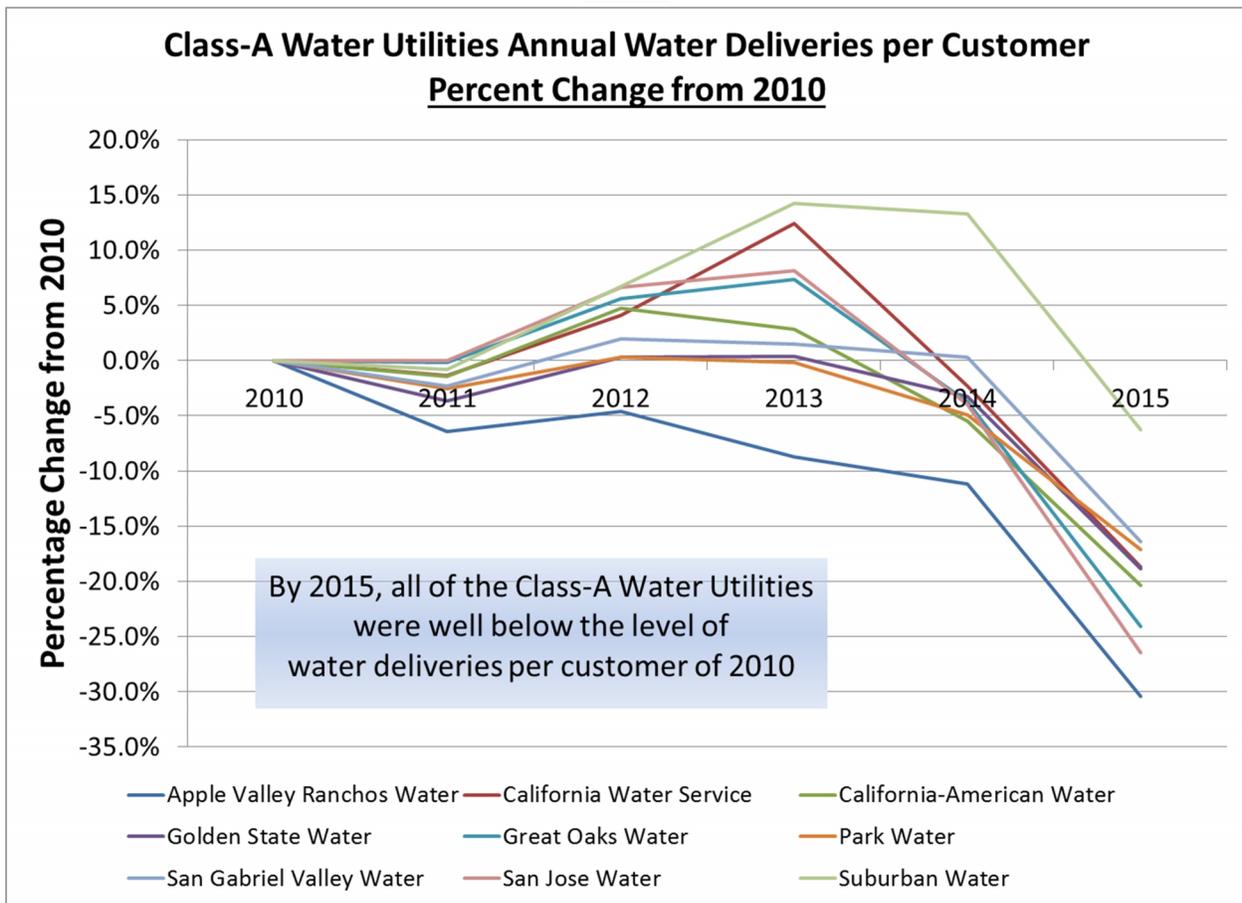
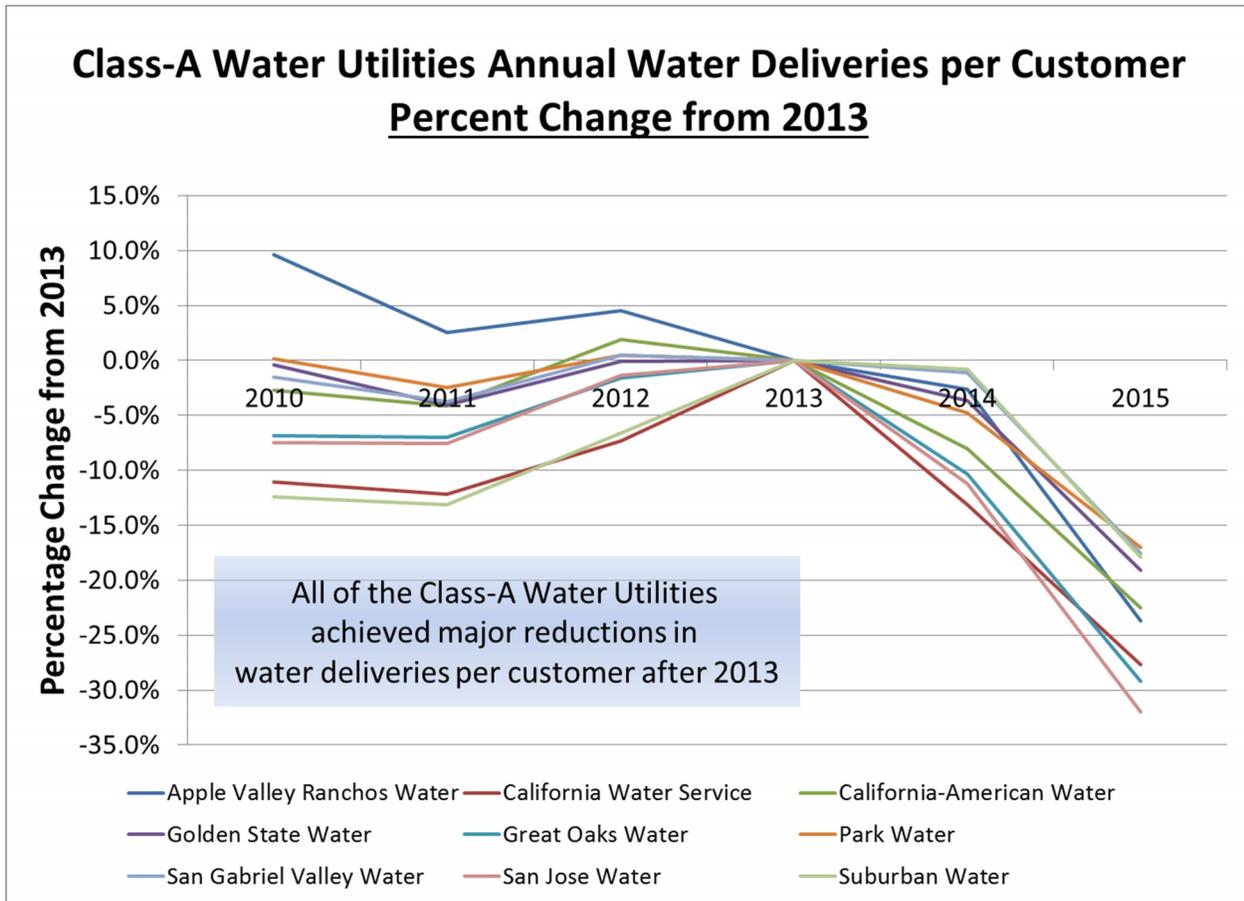


Chart 4 shows that for the most part, the water deliveries of the Class-A utilities were declining or about flat from 2010 to 2011, even as the California economy was growing. Growth in water deliveries proceeded in 2012 and 2013. 2013 was a dry year, and deliveries may have been high that year due to the increased need for outdoor watering for gardens and lawn. In retrospect, we can look back at 2013 as the last year in which there was little reason for consumers not to use as much water as needed or wanted. There were many programs at the state and local level to assist customers to use less water; but there was not anything like the state-wide effort that began in January 2014 with the Governor’s drought declaration. All the numbers for 2014 are lower than the 2013 numbers, indicating that conservation began in earnest in 2014. And then, we can see that in 2015 there were even steeper declines. Based on this recognition that 2013 looks like a good base point for the changes that followed, it is reasonable to make comparisons to 2013 instead of 2010.

Chart 5 moves the reference point to the year 2013, the last year before the Governor declared a drought emergency in January of 2014.



Chart 5



In Chart 5 we see the sudden commonality of direction of deliveries: Down! All the Class-A utilities delivered less water in 2014 than they did a year earlier, about six-percent less on average. Even more dramatic are the steep declines that followed in 2015, about 18-percent less than 2014, and about 23-percent less than 2013.

## Conservation Rates and the 70/30 rule

The CPUC is a member of the California Urban Water Conservation Council (CUWCC, or the Council), an organization that helps to promote conservation in water consumption. Its mission statement says that it is “dedicated to maximizing urban water conservation throughout California by supporting and integrating innovative technologies and practices; encouraging effective public policies; advancing research, training, and public education; and building on collaborative approaches and partnerships.”<sup>16</sup> Prominent among the many strategies the council favors to promote conservation is the idea that water rates should provide a strong conservation signal to customers: Use less to save money. The idea of “conservation rates” is more fully formed in the 70-percent rule, which states that 70-percent of the

<sup>16</sup> <http://www.cuwcc.org/About-Us>.



revenue of a water utility should come from volumetric charges, that is, from the turning of the meter. Only 30-percent should come from fixed charges, such as a monthly service fee. The 70-percent rule is defined in the Council’s Memorandum of Understanding,<sup>17</sup> originally signed by 120 urban water agencies and environmental groups in 1991, and now supported by the more than 400 members. In essence, conservation rates should include a strong conservation signal by putting 70-percent of the revenue requirement into the portion of the rate that corresponds with usage.

**Excerpt from the CUWCC Memorandum of Understanding  
Regarding Conservation Rates and the 70-percent Rule**

**Adequacy of Volumetric Rate(s):** A retail agency’s volumetric rate(s) shall be deemed sufficiently consistent with the definition of conservation pricing when it satisfies at least one of the following three options.

**Option 1:** Let V stand for the total annual revenue from the volumetric rate(s) and M stand for total annual revenue from customer meter/service (fixed) charges, then:

$$\frac{V}{V + M} \geq 70\%$$

This calculation shall only include utility revenues from volumetric rates and monthly or bimonthly meter/service charges. It shall not include utility revenues from new service connection charges; revenue from special rates and charges for temporary service, fire protection, or other irregular services; revenue from grants or contributions from external sources in aid of construction or program implementation; or revenue from property or other utility taxes.

While the algebra is clear with regard to the overall revenue of a water utility, the relationship to the rates charged to any one customer is more complex. As an example of how the 70-percent rule applies in practice at the California Public Utilities Commission, consider the residential “Schedule 1, General Metered Service” tariff of San Jose Water Company.<sup>18</sup> This is the rate that is applicable to most residential customers. Though the tariff itself is three pages long, the relevant portions are the following three parts:

<sup>17</sup> Memorandum of Understanding: <http://www.cuwcc.org/About-Us/Memorandum-of-Understanding>.

<sup>18</sup> San Jose Water Company provides its tariffs on line: [https://www.sjwater.com/for\\_your\\_home/home\\_customer\\_care/rates\\_regulations/tariff\\_book](https://www.sjwater.com/for_your_home/home_customer_care/rates_regulations/tariff_book).



- **Quantity Rates:** There is a three-tiered rate for water taken. For customers with the most common sizes of meters, the charges are:
  - For Total Monthly Usage from 0 to 3 CCF: \$4.05810/CCF
  - For Total Monthly Usage from 3 to 18 CCF: \$4.50900/CCF
  - For Total Monthly Usage over 18 CCF: \$4.95990/CCF
- **Service Charge:** Based on the size of the meter, there is a service charge. For this example, assume a standard 3/4-inch meter, which is associated with a monthly service charge of \$23.98.
- **Special Conditions:** Finally, the CPUC has authorized a series of “Special Conditions” for surcharges and surcredits associated with special projects, such as repayment of a “Safe Drinking Water State Revolving Fund Loan,” and the “Water Rate Assistance Program” (WRAP), which is a fund to assist low-income customers. Some of the Special Conditions charges are per-meter, and therefore are added to the service charge for this calculation. The per-meter surcharges sum to \$1.51 per customer. The remainder are volumetric surcharges and surcredits related to the amount of water taken, denominated in Hundreds of Cubic Feet (CCF). Those charges sum to \$0.08962/CCF.

Based on this information, a typical residential customer of San Jose Water Company taking 12 CCF per month<sup>19</sup> would receive a bill of \$89, of which \$25.49 would be fixed (service) charges, and \$63.51 would be variable (quantity) charges. The quantity charges for this typical customer are 71-percent of the total, in accordance with the 70-percent rule. The calculation is shown in Table 3.

Table 3 presents the results for a typical residential customer that uses the average quantity of water among the San Jose Water Company’s residential customers. The rate schedule provides a strong signal to a residential customer that cutting back even one CCF can save \$5.41, and using an additional CCF, likewise, would add \$5.41 to the bill.

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<sup>19</sup> California Public Utilities Commission Decision D.16-06-004, in Application A.15-01-002, Attachment C “Supplemental Settlement Agreement,” Attachment D, Table E. Average Sales per Residential Customer is reported to 147 CCF/year, equivalent for our purposes to 12 CCF/month.



Table 3

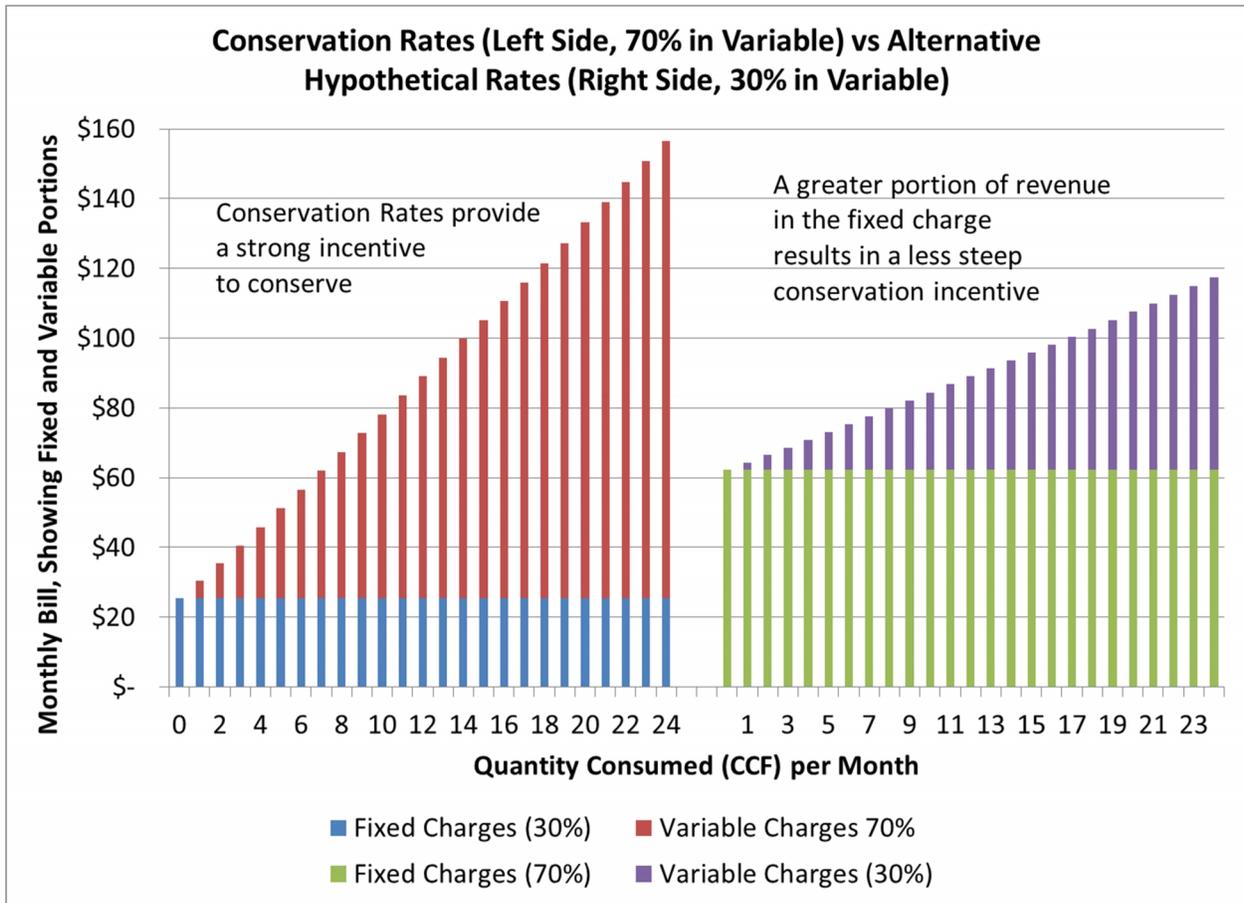
San Jose Water Company			
Schedule No. 1			
General Metered Service			
For Residential Customers with 5/8x3/4, 3/4 inch meters			
Monthly Charges -- Example for a Customer Using 12 CCF			
Charges Schedule		Monthly Bill for Customer Consuming 12 CCF	Percent Distribution
<b>Fixed Charges</b>			
<u>Service Charges</u>			
For 5/8x3/4" meter or 3/4" meter Service	\$ 23.98	\$ 23.98	
<u>Special Conditions Charges, Total</u>	\$ 1.51	\$ 1.51	
<b>Total Fixed Charges</b>	\$ 25.49	\$ 25.49	29%
<b>Use-Related Charges (Per Ccf)</b>			
<u>Tiered-Rate Charges</u>			
For Total Monthly Usage from 0 to 3 CCF	\$ 4.05810	\$ 12.17	
For Total Monthly Usage from 3 to 18 CCF	\$ 4.50900	\$ 40.58	
For Total Monthly Usage over 18 CCF	\$ 4.95990	\$ -	
<u>Use-Related Special Condition Charges Total</u>	\$ 0.89620	\$ 10.75	
<b>Total Variable Charges</b>		\$ 63.51	71%
<b>Total Bill</b>		\$ 89.00	100%

Consider the difference in the conservation signal to the customer if the CUWCC 70-percent rule were not in place, if, for example it were reversed. Imagine the customer signal if the rule were reversed, and 70-percent of the bill for a typical 12-CCF/Month customer were fixed charges, with only the remaining 30-percent based on quantity consumed. The fixed fee in the Alternative rate schedule would be \$62.30, and the quantity portion of the bill would be \$26.70. Applying the same ratios to the usage charges yields comparative lower usage rates for the three tiers and for the special charges.

A comparison of such alternative rates to the actual conservation-based rates is shown in Chart 6, below. The chart shows total bills calculated for usage levels from zero to 24 CCF/month for both San Jose Water Company's actual Schedule 1 tariff and under a hypothetical tariff employing the opposite criteria. The difference is dramatic.



Chart 6



In Chart 6 we see that a 12-CCF user would pay the same bill, \$89.00 under either tariff. But in the case of the Alternative tariff, there is very little to be gained from cutting back, and little additional cost from using more. By contrast, the actual tariff provides a stronger conservation signal.

## Implications for Customers, for Water Utilities, and for Regulators

When customers use less water, they expect to see lower water bills, for their bills for the most part are calibrated based on usage. This expectation is built into the tariffs of the water utilities, tariffs approved as just and reasonable by the Commission. Most water utility tariffs are based on rising tiers,<sup>20</sup> so any

<sup>20</sup> See, for example, the rising tiers in the General Metered Service rates of San Jose Water Company, shown in Table 3. The largest consumers, those that consume more than 18 CCF/month, pay a usage rate about \$0.90 higher than those customers in the first tier. If most of the savings from conservation are achieved by the high-tier users, the revenue effects are greater than if the conservation occurs among customers across all of the tiers.



decline in usage on the part of a customer in a high tier provides a decline in usage charges that is more than proportional. In the short run, customers who cut back in their water use are rewarded with dramatic savings on their bills.

The CPUC's policy has been to favor conservation rates. This policy, which is designed to promote resource conservation, gives customers a strong signal that their bills can be affected by their use. Use more and pay more, or use less and pay less.<sup>21</sup>

When all customers change in the same way, decreasing their consumption in response to a government initiative, the result of the sudden and dramatic decline in usage among customers is a similarly dramatic decline in revenue of the utilities, of course. Unfortunately, water system costs do not vary to a large degree with the amount of water delivered to customers. Most of the costs of water utilities are associated with the network of pipes and facilities that cost the same regardless of how much water is processed and delivered.

The Commission has adopted a revenue policy for water utilities that is the same as for the energy utilities: Decoupling of revenue from sales. For the energy utilities, this policy was adopted in the 1970s as a deliberate mechanism to remove any incentive on the part of the utility companies to encourage customers to use more. In more recent years, the Commission has turned to promoting conservation in water usage as well. Beginning in 2008, the Commission adopted a policy of Water Revenue Adjustment Mechanisms (WRAMs) and other special accounts designed to remove the same incentive to sell more that they had adopted for the energy utilities so many years before.<sup>22</sup> While the policy is the same, implementing the policy has been more dramatic for the water utilities due to the greater degree of year-to-year change in water delivered as shown in Charts 1, 2, and 3, above.

Under a WRAM policy, the result of sales below forecast levels is a calculation of lost marginal revenue to be collected later. For several years, the water utilities began to accrue large WRAM balances on their balance sheets – balances that sooner or later would have to be paid by consumers through the imposition of surcharges or higher rates. The utilities have relied on the CPUC's policies to protect their revenues, for water utility costs are largely invariant with changes in the amount of water delivered.

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<sup>21</sup> California Urban Water Conservation Council, Memorandum of Understanding, first adopted December 11, 1991, last amended, January 4, 2016. The memorandum is available from the CUWCC website: <http://www.cuwcc.org/About-Us/Memorandum-of-Understanding>. The CPUC is a member of the Council and subscribes to the definition of conservation pricing when at least 70-percent of revenue is derived from volumetric measures, with fixed charges accounting for 30-percent or less. A discussion of specific accounting methods begins on page 32 of the MOU.

<sup>22</sup> CPUC Decision D.08-02-036, February 28, 2008, for example, found that in order to implement conservation rates, the Commission should have Water Revenue Adjustment Mechanisms and Modified Cost Balancing Accounts (WRAMs/MCBAs), and accounting for those mechanisms should begin immediately.



The Commission has recognized the increasing WRAM balances and other account balances that were growing due to declines in water deliveries, and has taken action to get the rates in line with actual usage rates.<sup>23</sup> The Commission has aided the utilities by allowing revenues from excess-use charges to be accrued directly into the WRAM accounts. So, those customers paying excess use charges are helping to pay down the accrued revenue deficiencies resulting from the conservation practices of the general body of customers.

While the WRAM system of decoupling revenues from sales protects the water systems from revenue losses, it also speeds the process of final rate changes that must occur to keep revenue stable. Customers find themselves in the interesting position of saving a lot of water, but not saving so much money, for the total costs have not changed – only the amount of water delivered has declined. In the short run, customer bills decline, and the WRAM balances increase. In the longer run, the decline in sales results in higher rates for water usage. The most water-frugal customers will always have the lowest bills, but customers whose generous water use continues unabated may find themselves with significantly higher bills. Overall, the total of customer bills will not change as much as water consumption does.

In the future, it is likely that water consumption will stabilize at some new lower level. Eventually, the just and reasonable rates authorized by the Commission will catch up with the new usage levels, and the WRAM system will go back to its original purpose of accounting for small differences between forecast and actual sales and stabilizing revenues that otherwise would be affected by changes in consumption levels. They will continue to remove the incentive that would otherwise cause the utility companies to avoid encouraging conservation on the part of their customers.

## Summary and Conclusion

The current drought in California and our conservation policies are resulting in dramatic reductions in the water delivered by California's Class-A water utilities. To some degree, the most dramatic cut-backs may not persist once the urgency of the present situation begins to fade. But, to a large and significant degree, the new usage patterns may persist for years. Changes such as the installation of water-efficient household appliances and low-water gardens, removal of water-thirsty lawns, and the adoption of new water-use patterns by residential customers across the state are going to persist and are unlikely to be reversed, even over the long run.

Moreover California, because of its continuing population growth, is unlikely ever to see water surpluses or discover any reason to reduce the emphasis on water conservation. Therefore, on a customer-by-customer basis, we should expect to see continued low usage, and likely even lower usage in the future.

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<sup>23</sup> CPUC Decision D.12-04-048 of April 19, 2012 set caps on the rate of amortization and required that a more vigorous review of WRAMs/MCBAs be conducted in each Class-A utility's pending or next general rated case.



The Commission receives monthly reports of the success of the water utilities in meeting the targets set by the Governor for water conservation. Those short-term monthly reports are important, and they provide the information the Commissioners need to judge the efficacy of the utilities' efforts in cutting excess usage. But those short-term results are only part of the picture.

This report shows a longer term result. It shows that the patterns of usage were barely increasing in the economic recovery from 2010 to 2013. And in the last two reported years, the declines in usage have been dramatic across the board.

This paper presents the longer term perspective as a way to indicate that in the future the Commission will have to deal with lower deliveries as a factor in setting future water rates. Bills may decline in the short run, but over time, bills will align with costs. The rates will begin to increase not primarily as a matter of increasing costs of the utilities, though it is likely that costs will increase with the development of new water sources that are more expensive than traditional sources. The rates will have to increase as a result of facing a declining base of sales and deliveries. This is not a matter of policy but a matter of arithmetic, as the units of sales have decreased and are continuing to decrease, and as they are not likely to recover or rise much in the years ahead.