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The Natural Resources Agency
Department of Water Resources
Division of Statewide Integrated Water Management
Water Use and Efficiency Branch

Independent Technical Panel on Demand Management Measures

Report to the Legislature on Urban Water Management Plan Demand Management Measures Reporting and Requirements

A report to the Legislature pursuant to Section 106031.7 of the California Water Code

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Introduction

This report is being submitted pursuant to California Water Code §10631.7 which directs the Department of Water Resources (DWR) to convene an Independent Technical Panel (ITP) to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. DWR convened the ITP in May of 2013 and has held 12 meetings between May 2013 and February 2014. The ITP is submitting this initial report with recommendations on urban water management plan (UWMP) demand management measures in early 2014 to provide sufficient time for the implementation and inclusion of the recommendations in the 2015 UWMP, if enacted by the Legislature. The ITP will submit a second report in early 2015 with recommendations on other demand management measures (DMM) that are not connected with urban water management planning.

Background

Urban Water Management Planning Act

The Urban Water Management Planning Act[1] (Act) was first passed in 1983 partly in response to the 1976-77 drought. The impact of the 1976-77 drought on urban water suppliers varied greatly across the state, while some suppliers faced only minor reductions in supply, other suppliers were forced to impose severe water use restrictions. The UWMP Act was passed to better prepare for the next drought and ensure that local water suppliers were planning and implementing both water supply and demand management measures to improve water supply reliability.

The UWMP Act requires all water suppliers, who serve more than 3,000 customers or supply more than 3,000 acre-feet of municipal water annually, to adopt an UWMP in years ending in 0 and 5. DWR estimates that approximately 443 water suppliers are required to submit plans and these suppliers provide water to more than 90% of the State's population. As of December 2013, 398 urban water suppliers have submitted 2010 UWMPs to DWR.

The UWMP Act has been amended and revised a number of times since it was first passed in 1983. Some of the legislative changes dealt with contents of UWMPs while others conditioned receipt of State water management grants and loans on the implementation of demand management measures. Though not in the UWMP Act, Senate Bill (SB) X7-7 required water suppliers to report their baseline, target and compliance water use in the 2010, 2015 and 2020 urban water management plans[2].

The UWMP Act specifies a list of required content to be described in UWMPs. This report provides recommendations for two of the required UWMP sections: description of current and projected water use[3] and the demand management measures section[4].

[1] California Water Code §10610-10656.
[2] California Water Code §10608.
[3] California Water Code §10631(e)

The water use section requires water suppliers to quantify the past, current and projected water use in five year increments over a 20 year planning horizon among the following water use sectors:

a) Single-family residential
b) Multi-family residential
c) Commercial
d) Industrial
e) Institutional and governmental
f) Landscape
g) Sales to other agencies
h) Groundwater recharge, saline water intrusion barriers or conjunctive use
i) Agricultural

The demand management measure section[5] specifies that water suppliers must describe the implementation or plans for implementation for each of the following 14 DMMs:

(A) Water survey programs for single-family residential and multi-family residential customers.
(B) Residential plumbing retrofit.
(C) System water audits, leak detection, and repair.
(D) Metering with commodity rates for all new connections and retrofit of existing connections.
(E) Large landscape conservation programs and incentives.
(F) High-efficiency washing machine rebate programs.
(G) Public information programs.
(H) School education programs.
(I) Conservation programs for commercial, industrial, and institutional accounts.
(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

Water suppliers not implementing or planning to implement any one of the above measures must provide a cost-benefit analysis and an explanation for why the measure is not being implemented.

The UWMP Act[6] specifies that urban water suppliers who are members of the California Urban Water Conservation Council (CUWCC) and are in full compliance with the CUWCC's Memorandum of

[4] California Water Code §10631(f –g)
[5] California Water Code §10631(f)
[6] California Water Code §10631(j)

Understanding (MOU), including the reporting requirements, can submit their CUWCC biennial reports in lieu of describing the DMMs listed above.

The urban water conservation Best Management Practices (BMPs) in the CUWCC MOU were revised in 2008 to provide water suppliers more flexibility in implementing water conservation programs. The MOU now provides for three compliance options including: the listed BMPs, a flex track option that allows for alternative conservation measures which achieve equal or greater water savings than the BMPs, as well as, a gallons per capita per day (GPCD) water use reduction option.

SB X7-7 (Steinberg)

In 2009, the California Legislature adopted SB X7-7 with a number of urban and agricultural water conservation provisions[7]. Urban retail water suppliers were required to establish specific water use targets as part of the overall goal of reducing the State's per capita water use by 20% by 2020. Retail water suppliers are required to document their baseline, target and compliance water use in the 2010, 2015 and 2020 UWMPs. Effective 2016, urban retail water suppliers not in compliance with the urban per capita water use reduction requirements are not eligible for state water grants or loans.

[7] California Water Code §10608.

Independent Technical Panel on Demand Management Measures Organization and Process

ITP Purpose and Scope

The California Legislature passed Assembly Bill (AB) No. 1420 (2007) which amended the eligibility requirements for State water management grants or loans to be conditioned on urban water suppliers implementing specified water demand management measures[8]. AB 1420 also directed DWR to convene an independent technical panel by 2009 to provide information and recommendations to DWR and the Legislature on new demand management measures, technologies, and approaches. The ITP is directed to report to the Legislature every five years, starting in 2010. DWR is directed to review the ITP's report and include in the final report to the Legislature DWR's recommendations and comments regarding the panel process and the panel's recommendations.

Due to insufficient resources, DWR was unable to convene the ITP in accordance with the schedule specified in AB 1420. In January 2013, DWR, in consultation with the CUWCC, solicited nominations and subsequently selected members for the ITP. The ITP held its first meeting on May 2, 2013.

ITP Membership

AB 1420 specified that the ITP should have no more than seven members, and with at least one but no more than two representatives from the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. In accordance with AB 1420, members of the ITP were selected by a joint committee of DWR and CUWCC representatives, based on technical knowledge of demand management measures and geographic representation, and reflect a balanced representation of experts in each of the designated categories. The ITP members are listed below:

Name	Representation	Organization
Peter Estournes	Business	Gardenworks, Inc., Healdsburg, California
Penny M. Falcon, P.E.	Retailer	Los Angeles Department of Water and Power
David W. Fujino, Ph.D.	Academia	UC Davis, California Center for Urban Horticulture
William E. Granger	Retailer	City of Sacramento
Lisa Maddaus, P.E.	At large	Maddaus Water Management, Inc.
Edward R. Osann	Environmental	Natural Resources Defense Council
Jeff Stephenson	Wholesaler	San Diego County Water Authority

[8] California Water Code §10631.5, §10631.7, and §10644.

ITP Process

At its first meeting, the ITP adopted a charter that describes the scope and "rules of engagement" of the ITP[9]. The ITP is a legislatively-created state body and meetings were conducted in accordance with the Bagley- Keene Open Meeting Act (2004). Meeting notices and materials were posted on DWR's web site (http://www.water.ca.gov/wateruseefficiency/) at least 10 days ahead of each meeting. Every meeting or webinar was recorded and also posted on the web site.

A total of 12 meetings were held between May 2013 and February 2014. Six of the meetings were in-person meetings held alternatively in northern and southern California. The other six meetings were webinars held online and at publicly-accessible locations throughout the State. The ITP held a public workshop to receive comments on the draft Legislative report as part of its February 7th, 2014 meeting in Sacramento.

The ITP made decisions on administrative matters and on recommendations in accordance with the decision making methods described in the ITP Charter. Each of the DMM recommendations in this report was proposed, deliberated, and decided upon using the "consensus with accountability" method described in the ITP's Charter.

Roles and Responsibilities

The ITP is, true to its name, an independent technical panel in conducting its deliberations and decision making. ITP activities, however, were supported by DWR, the CUWCC, and a facilitator from the Center for Collaborative Policy. DWR provided both technical and administrative staff support to the ITP. CUWCC assisted DWR with project management and provided technical information to DWR and the ITP. The facilitator served as a neutral party in facilitating meeting dialogue and ensuring adherence to the Bagley Keene Open Meeting Act (2004). The specific roles and responsibilities of the parties were described in the ITP Charter.

As specified in AB 1420, DWR has an additional role of submitting comments and recommendations on the ITP report and on the ITP process to the Legislature. DWR's comments will be provided as a supplemental report to the Final ITP UWMP Report.

Public Participation

All of the ITP meetings and webinars were open to the public in accordance with the Bagley-Keene Open Meeting Act (2004). The facilitator solicited public comments during the open discussion period of each meeting agenda item and prior to ITP decisions. The draft report was posted for public review and comment for one month. All written comments received during the public comment period were

[9] The ITP Charter is located on DWR's ITP webpage: http://www.water.ca.gov/wateruseefficiency/sb7/committees/urban/u2/

posted and made available to the ITP prior to the February 7, 2014 Public Workshop. No public comments were received at the February 7th workshop.

At the February 7th meeting following the public workshop, the ITP considered the submitted written comments and made edits to the draft report. The ITP then voted unanimously to approve recommendations one through four as final. For recommendation #5: Voluntary Inclusion of Energy Intensity in Urban Water Management Plans, six members of the ITP voted to approve the recommendation as final, with one member voting not to approve the recommendation. The member voting in dissent provided a minority report attached as a supplemental report. After voting on each of the recommendations, the ITP voted unanimously to approve the report as a final document.

Recommendations on Urban Water Management Plan Demand Management Measure Reporting and Requirements

Introduction

At the second ITP meeting on May 21, 2013, the ITP received and discussed a list of potential DMM topics suggested by DWR's Urban Stakeholder Committee (USC) and the water use efficiency community at large[10]. At the third ITP meeting on June 17, 2013, the ITP received a briefing from DWR's Legislative Affairs Office on the legislative process and procedures for submittal of the ITP report to the Legislature. Based on information from these two meetings, the ITP decided to submit two reports to the Legislature. The first report would include only recommendations related to UWMPs and would be submitted in time for consideration during the 2014 Legislative Session. The second report to the Legislature would consist of recommendations on other DMMs not related to the UWMPs. The ITP then proceeded to select topics of discussion on UWMPs that were developed into recommendations in the first report.

Over a six-month period of deliberation, the ITP developed five recommendations on potential 2014 legislative changes and administrative action on the UWMP guidance development, as described in this report.

[10] The Urban Stakeholder Committee (USC) is convened by DWR to meet some of the public process requirements of SB X7-7. The USC is chartered to review technical material and documents, and to provide comments, data, and supporting information to DWR in implementing provisions of SB X7-7.

Recommendation #1: Amend the Urban Water Management Planning Act to Simplify and Update the Demand Management Measure Reporting Requirements

Urban water suppliers are currently required to describe the demand management measures (DMM) they are implementing or plan to implement in their urban water management plans, in accordance with a list of 14 DMMs described in the California Water Code Section 10631(f). This recommendation is to simplify, clarify and update the DMM reporting requirements listed in sections 10631(f) and (g).

Background

Currently, the UWMP Act requires an urban water supplier to include in its urban water management plan a description of each of the 14 DMMs that the water supplier is implementing or plans to implement[11]. Some of the 14 DMMs are outdated due to legislative or code changes, advances in water efficient devices or appliances, or improvements in technology and management practices. If one or more of the 14 listed DMMs is not being implemented or scheduled for implementation, the water supplier is required to provide a cost-benefit analysis and explanation as to why the DMM is not being implemented[12]. The UWMP Act allows water suppliers who are members of the CUWCC and are in full compliance with the CUWCC's MOU to submit Best Management Practice Coverage Reports in lieu of describing the DMMs[13].

The demand management measure section of an UWMP documents the water conservation and efficiency activities a water supplier is implementing or plans to implement to meet water supply reliability or state water conservation goals. For many water suppliers, the UWMP is the only public document that describes the supplier's water conservation plan and implementation activities. The demand management section informs the water supplier's board members and customers, regional planning agencies, and other interested parties.

In 2008, the CUWCC, recognizing that cost-effectiveness varied between suppliers, revised its list of BMPs to create seven foundational BMPs and seven programmatic BMPs. All member agencies are required to implement the foundational BMPs while the programmatic BMPs are optional, depending on the compliance track selected.

SB X7-7 requires water suppliers to set water use targets, but does not require specific water conservation measures to be implemented. Water suppliers may choose which activities to implement to meet their targets based on their unique circumstances. This flexibility helps ensure cost-effective programs are being implemented.

[11] §10631(f)
[12] §10631(g)
[13] §10631(j)

Recommended Action

The primary intent of this ITP recommendation is to update and streamline the DMM reporting requirements contained in the UWMP Act to reflect the legislative, management, and technological changes described above and make the DMM reporting less prescriptive. The existing water code requires water suppliers to describe programs currently being implemented or planned for implementation. The requirement to describe past implementation will provide more information on which measures have been implemented.

The ITP recommends that all water suppliers provide a narrative description on the implementation of seven DMMs, and describe any additional measures necessary for the water suppliers to meet water use targets. The seven DMMs to be included in the narrative description are listed below:

1. Water waste prevention ordinances.
2. Metering.
3. Conservation pricing.
4. Public education and outreach.
5. Programs to assess and manage distribution system real loss.
6. Water conservation program coordination and staffing support.
7. Other demand management measures that have a significant impact on water use as measures in Gallons Per Capita per Day, including innovative measures, if implemented.

The ITP further recommends that water suppliers describe the DMMs implemented in the previous five years. As per #7 above, DWR, working with the CUWCC, should develop a list of additional measures and programs that water suppliers could implement. DMMs on this list could include new technologies and approaches or measures used in other states or countries.

Water code sections 10631(f) and (g) should be rewritten to consolidate the 14 demand management measures to seven measures as defined in the suggested statutory language.

Recommended Statutory Language:

Modify sections 10631(f) and (g) of the Water Code as shown in strikeouts, underlined and italicized text below:

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
~~(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:~~
~~(A) Water survey programs for single-family residential and multifamily residential customers.~~

~~(B) Residential plumbing retrofit.~~
~~(C) System water audits, leak detection, and repair.~~
~~(D) Metering with commodity rates for all new connections and retrofit of existing connections.~~
~~(E) Large landscape conservation programs and incentives.~~
~~(F) High-efficiency washing machine rebate programs.~~
~~(G) Public information programs.~~
~~(H) School education programs.~~
~~(I) Conservation programs for commercial, industrial, and institutional accounts.~~
~~(J) Wholesale agency programs.~~
~~(K) Conservation pricing.~~
~~(L) Water conservation coordinator.~~
~~(M) Water waste prohibition.~~
~~(N) Residential ultra-low-flush toilet replacement programs.~~

(1) An urban water supplier, as defined under Water Code Section 10617, shall include a narrative description that addresses the nature and extent of each demand management measure implemented over the past five years and describe the demand management measures it plans to implement to achieve its water use target as determined under Water Code Section 10608.20.

(2) For urban retail water suppliers, the narratives shall include descriptions of the following demand management measures:

A. *Water waste prevention ordinances.*
B. *Metering.*
C. *Conservation pricing.*
D. *Public education and outreach.*
E. *Programs to assess and manage distribution system real loss.*
F. *Water conservation program coordination and staffing support.*
G. *Other demand management measures that have a significant impact on water use as measured in Gallons Per Capita Day, including innovative measures, if implemented.*

(3) For wholesale urban water suppliers~~,~~ the narrative shall include descriptions of the following demand management measures:

A. *Metering*
B. *Public education and outreach*
C. *Water conservation program coordination and staffing support*
D. *Distribution system asset management program*
E. *Wholesale supplier assistance programs*
F. *Other demand management measures that have a significant impact on water use as measured in Gallons Per Capita Day, including innovative measures, if implemented.*

~~(2) A schedule of implementation for all water demand management measures proposed or described in the plan.~~

~~(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.~~
~~(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.~~
~~(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:~~
~~(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.~~
~~(2) Include a cost-benefit analysis, identifying total benefits and total costs.~~
~~(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.~~
~~(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.~~

Recommendation #2: Require Distribution System Water Loss Reporting in Urban Water Management Plans

Currently urban water suppliers are required to report on past, current water use and projected water use by water use sectors in their UWMPs. This recommendation would add distribution system water loss as a new water use sector, in addition to the existing list of nine sectors[14].

Background

Urban water systems deliver treated water under pressure to customers through miles of pipes. These pressurized systems include large numbers of valves, joints and connections and incur some amount of unavoidable water losses. A 2009 report by Southern California Edison estimates ten percent of the total volume of water supplied statewide is lost to leaks, based on literature reviews and an analysis of water audit data from 17 water agencies throughout California[15]. In 2011, a multi-state evaluation showed that water losses ranged from 20 to 60 gallons per service connection per day in many water agencies in the US.[16] Optimum water management reduces these water losses to the extent cost-effective, saving resources as well as the chemical and energy costs associated with treatment and distribution of the water.

An important first step for water agencies looking to reduce distribution system losses is a water audit. Performing water audits raises the awareness of the level of real losses in water distribution networks, and motivates agencies to implement BMPs to curb their real loss volumes. In recent years the American Water Works Association (AWWA), working with the International Water Association, developed a new and more sophisticated water audit methodology, and a user-friendly software tool to perform water system audits. The AWWA Water Audit methodology is published in the M36 Water Audits and Loss Control Programs Manual (2009) [17]. The new auditing practices include conducting a "top-down" water audit and water balance, a "bottom-up" validation of meter accuracy of system data, and an analysis of system components. In this new approach, the AWWA moved away from earlier practices that emphasized 'acceptable' percentages of unaccounted-for water to focus on cost-effective water loss control. This approach generally results in lower water losses overall, but focuses on a water agency discovering the amount of water loss that is cost effective for them to recover. Operational practices include fixing reported and unreported leaks, pressure reduction, and meter calibration and replacement. Potential benefits of a water loss control program include water resource management improvements, increased revenue recovery, reduced system disruptions, and reduced risk of water contamination[18].

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[14] The nine sectors are: single-family residential, multi-family, commercial, industrial, institutional and governmental, landscape, sales to other agencies, groundwater recharge, and agricultural

[15] Southern California Edison. 2009. *Secondary Research for Water Leak Detection Program and Water System Loss Control Study.* San Francisco (CA).

[16] AWWA Water Loss Control Committee, 2011 Validated Data.

[17] AWWA. *M36: Water Audits and Loss Control Programs*, Third Edition. 2009.

The states of Georgia, Maryland, New Mexico, Tennessee, and Texas have requirements for water systems to complete water audits based on the AWWA Water Audit Software methodology. The CUWCC BMP 1.2 requires water utility members to complete the AWWA software annually. By incorporating this AWWA methodology into the UWMP reporting process, water loss control in California is expected to improve, helping individual water agencies to meet their overall water use efficiency goals and the state to meet the 20% by 2020 target.

Recommended Action

The ITP recommends that the Legislature revise the Urban Water Management Planning Act to require urban water suppliers in updating their UWMPs to include annual estimates of distribution system water loss. This recommendation would add distribution system water loss as a new water use sector, in addition to the existing list of nine sectors.

For the 2015 UWMP updates, urban water suppliers would only be required to provide distribution system water loss estimates for at least one year prior to 2015. All subsequent UWMPs would be required to provide distribution system water loss estimates for each of the five years preceding the plan update.

To ensure consistency in reporting, DWR would be directed to develop guidelines in consultation with the public, for the estimation and reporting of distribution system water loss. In developing the guidelines, DWR would require reporting of water loss audits based on the methodology developed by the AWWA. Water suppliers in reporting on water loss would be required to use the DWR guidelines and report audit outcomes using worksheets from the AWWA method.

Recommended Statutory Language:

Modify Section 10631(e) of the Water Code with the addition of a new subsection (1)(J) and new subsections (3) and (4), as shown in underlined and italicized text below:

10631 (e) (1). Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multi-family.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) For the 2015 Urban Water Management Plan update, the distribution system water loss shall be quantified for the most recent 12 month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.

(4) The distribution system water loss quantification shall be reported in accordance with a worksheet approved by or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology (water audit software) developed by the American Water Works Association.

Recommendation #3: Authorize the Department of Water Resources to Require Electronic Filing of Urban Water Management Plans, Including Standardized Forms

The intent of this recommendation is to amend the UWMP Act to require water suppliers to submit UWMP data in a consistent format to facilitate regional and statewide water planning.

Background:

The UWMP Act requires urban water suppliers to prepare and adopt UWMPs through a public process in accordance with a list of specified content. After plan adoption, urban water suppliers are required to submit copies of their adopted UWMPs to DWR, the California State Library, as well as cities or counties that receive water supplies from the water suppliers.

UWMPs are written primarily as local planning documents, but the data in the plans is also critical for regional and state water planning. The plans contain data on current and future water supply and demands, recycled water and other alternative water supply projects and water conservation and drought contingency measures. This local data is aggregated and used to develop regional and state estimates on water management implementation and water supply reliability.

DWR develops guidance and guidebooks to assist urban water suppliers in the preparation of UWMPs to comply with requirements of the UWMP Act, as well as other related legislation including: SB X7-7 (2009) Water Conservation Bill , SB 610 (2001) Water Supply Assessments, SB 221(2001) Written Verifications of Water Supply, and AB 1420 (2007) Implementation of Water Demand Management Measures. The UWMP guidebooks include numerous (38 in the 2010 guidebook) data tables to facilitate the compilation, reporting, and review of the required information. Although DWR encourages water suppliers to use these tables and submit them electronically, standardized reporting is not required in statute. As a result, water suppliers present and submit data in different formats making data review and aggregation more difficult.

Section 10608.52 of the Water Code directs DWR to develop a standardized water use form for water suppliers to report on progress towards meeting water conservation targets specified by SB X7-7. DWR is currently developing the standardized water use reporting form in coordination with its Urban Stakeholder Committee. Currently this will be the only form water suppliers are required to complete for the 2015 UWMPs.

Recommended Action

The ITP recommends that the Legislature revise the UWMP Act to authorize DWR to require electronic submission of UWMPs including standardized forms, tables, or displays, in order to enable easier review and data aggregation of the plans by DWR, and to provide easier access to the UWMP data by the public. Clarification of DWR's authority to specify forms and tables for reporting key parameters would enable a more efficient method of tabulation and analysis of the plans with a higher degree of consistency and accuracy. DWR should develop and provide the standardized forms for water supplier use at least nine months before the UWMP submittal date.

Recommended Statutory Language:

Add the following language shown in underlined and italicized text to Section 10644(a) of the Water Code:

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan, no later than 30 days after adoption. *An electronic copy of the plan shall be submitted to the department, including any standardized forms, tables, or displays specified by the department.* Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption. *An electronic copy of amendments or changes to the plan, including any data forms, tables, or displays, shall be submitted to the department.*

Recommendation #4: Voluntary Reporting on Projected Water Savings from Codes, Standards, Ordinances and Transportation and Land Use Plans Affecting an Urban Water Supplier's Service Area

Plumbing codes, appliance standards, landscape ordinances, as well as sustainable transportation and land use plans, reduce water use and the future demand for water. The 20x2020 Water Conservation Plan estimated that the water savings from efficient codes and standards alone would account for a 4-percent reduction in per capita water use by 2020. Currently, a few water suppliers account for these savings and demand reductions in their UWMP future water use projections. This recommendation would direct DWR to begin an effort to develop guidance for the estimation of water savings from codes, standards, ordinances and sustainability plans in the guidebook. This guidance would encourage more suppliers to account for these demand reductions in future water use projections.

Background:

Statewide average per-capita water use has decreased or remained constant since the early 1990s due to many factors including the statewide adoption of efficient water code, standards and regulations. Codes and standards increase efficiency by ensuring the installation of more efficient fixtures and appliances in new construction, as well as in retrofits, and replacements within existing buildings and structures. For example, since 1992, only ultra-low-flush toilets and low-flow showerheads have been available for sale in California. AB 715(2007) revised the 1992 code and requires only high-efficiency toilets and urinals to be sold or installed after January 1, 2014. SB 407 (Padilla, 2009) mandates replacement of all noncompliant plumbing fixtures by water-conserving plumbing fixtures when alterations or improvements are made to residential and commercial buildings after January 1, 2014. SB 407 also mandates replacement of all noncompliant plumbing fixtures with water-conserving fixtures in residential properties by 2017 and in multi-family residential and commercial properties by 2019. The California Green Building Standards Code that became effective in 2011 prescribes high efficiency indoor plumbing fixtures and fittings.

The California Water Code requires that all urban water supply connections be metered by 2025. The State's Model Efficient Landscape Ordinance, revised in 2010, requires all new construction with significant landscape area have efficient irrigation systems and include the use of low water use plants.

In 2012, the U.S. Department of Energy revised federal efficiency standards for residential dishwashers and clothes washers with new water efficiency requirements taking effect in 2013 and 2015 respectively.

In addition to codes, standards and regulations, regional transportation plans and sustainable communities strategies might also influence urban water demand and water use through the implementation of coordinated land use plans that promote sustainable communities. The Sustainable Communities and Climate Protection Act of 2008 (SB 375, Steinberg) requires each of California's metropolitan planning organizations to prepare a Sustainable Communities Strategy (SCS) as an integral

part of its regional transportation plan. These SCSs contain land use, housing, and transportation strategies to enable compliance with regional greenhouse gas emissions reduction targets. SB 375 requires consideration of open space and natural resource protection and supports accommodating new housing and commercial development within existing areas designated for urban growth. By promoting more compact development within existing urbanized areas and more multi-unit housing, urban per capita water demand is expected to decrease corresponding to a decrease in outdoor landscape irrigation needs.

Estimation of savings from codes, standards, regulations, and land use plans:

The 20x2020 Water Conservation Plan includes estimates of potential water savings driven by efficiency codes and regulations, and from the installation of meters on previously unmetered accounts.[19] Statewide average water savings in gallons-per-capita-day (GPCD) from codes and regulations is estimated at eight GPCD or four percent of the baseline GPCD by 2020. Although the best available information in 2008 was used in developing these estimates, the methodology for estimating these types of water savings inherently contain uncertainties such as device turnover rates and regulation implementation rates.

Urban Water Management Plan Future Water Use Projections

The UWMP Act requires water suppliers to estimate future water use projections in five year increments to 20 years in the future. The UWMP Act gives local suppliers the flexibility to calculate the water use projection as best fits their local circumstances. Some water suppliers account for future demand reductions from efficient codes, standards, and ordinances. This recommendation would help water suppliers with the ability to capture such information to report it, thus paving the way for more accurate projections in future UWMPs.

Recommended Action

DWR should begin an effort to include guidance for the estimation of future urban water savings attributable to codes, standards, ordinances, and sustainability plans beginning with the 2015 UWMP Guidebook, as schedules and availability of information permit. Such guidance may include acceptable statewide default values and/or standardized calculators for entering locally-specific data.

[19] See Table 5, 2020 Efficiency code Water Savings – GPCD, 20x2020 Water Conservation Plan, February 2010.

Recommended Statutory Language:

Modify Section 10631(e) of the Water Code with the addition of a new subsection (5), as shown in underlined and italicized text below:

(5) When available and applicable to an urban water supplier, water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier as applicable to the service area. To the extent that the urban water supplier chooses to report the above, it shall: (a) provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections; and (b) indicate the extent that the projections of the water use consider savings from codes, standards, ordinances, or land use planning. Projections of water use that do not account for such savings shall be noted as such.

Recommendation #5: Voluntary Inclusion of Energy Intensity in Urban Water Management Plans

The intent of this recommendation is to encourage the voluntary reporting of information about the energy intensity of water delivered to customers in a uniform format and at regular intervals, e.g., every five years. The value of reporting energy intensity by water agencies is significant and recognized as a need at the national, state, and local planning levels by the U.S. Environmental Protection Agency and California state agencies. This recommendation will remove a major impediment that currently inhibits the cost sharing collaboration between the water and energy sectors, and will allow the water industry and policymakers a better understanding of the potential opportunities for future cost-effective joint water/energy efficiency programs[20].

Background

California's water supply is highly energy intensive with the average electric intensity level of supply two to five times greater than national averages[21]. In many cases, water utilities are among the largest energy users in their community, on par with local industrial users. Energy use is typically 30-40% of a water utility's operating and maintenance costs, with energy costs usually second only to labor costs, even with optimized load management[22].

Water and energy providers have had a long history of partnering to implement joint water and energy efficiency programs. Examples of partnership programs include pre-rinse spray valve installations and high-efficiency clothes washer incentive programs. In 2009, the California Public Utilities Commission (CPUC) directed the implementation of several water-energy pilot programs for water conservation and recycled water that included incentives for high-efficiency toilets, landscape water conservation, recycled water retrofits, leak detection, and commercial customer audits. The CPUC pilot project report included an impact evaluation that calculated, where possible, water and embedded energy[23] savings for each of the pilot programs. In conjunction with the pilot programs, several studies on embedded energy in water were completed between 2007 and 2011.

In order for future water-energy efficiency partnerships to be successful, the CPUC must continue to provide its support to the energy utilities that participate in the partnerships. To that end, and in response to direction in CPUC decision D.12-05-015, CPUC staff formed a Project Coordination Group

[20] 2013 Saving Water and Energy Together: Helping Utilities Build Better Program (Young, Rachel, ACEEE and Alliance for Water Efficiency) http://www.aceee.org/sites/default/files/publications/researchreports/e13h.pdf

[21] 2009 American Council for an Energy-Efficient Economy (ACEEE) Summer Study on Energy Efficiency in Industry.pg. 6-31 http://www.aceee.org/files/proceedings/2009/data/papers/6_83.pdf

[22] 2009 American Council for an Energy-Efficient Economy (ACEEE) Summer Study on Energy Efficiency in Industry. Pg.6-32. http://www.aceee.org/files/proceedings/2009/data/papers/6_83.pdf

[23] Embedded energy refers to the to the amount of energy that is used to collect, convey, treat and distribute a unit of water to end users, and the amount of water that is used to collect and transport used water for treatment prior to safe discharge of the effluent in accordance with regulatory rules. (California Public Utilities Commission Energy Division. 2010 Embedded Energy in Water Studies Study 1: Statewide and Regional Water-Energy Relationship. GEI Consultants/Navigant Consulting. pg. 12)

(PCG) in June 2013 to evaluate the cost-effectiveness of water-energy efficiency partnership programs. The PCG is tasked with providing input on staff's development of a comprehensive cost-effectiveness framework to analyze the value of demand side programs that save energy and water, through the valuation of avoided cost of energy and water. This framework will incorporate a methodology to calculate the embedded energy in water based on energy intensity. Once complete, the PCG's recommendations will provide the CPUC with a better understanding of the potential opportunities for cost-effective water-energy efficiency programs. If the CPUC developed framework shows that water-energy partnership programs can be cost-effective, funding from energy utilities may be available to improve the cost-effectiveness of the programs from the perspective of water suppliers. On December 17, 2013 the CPUC voted to open a new rulemaking (R.13-12-011) to promote water-energy nexus programs.

California's major energy utilities currently invest between two and three percent of gross sales on energy efficiency measures, resulting in a pool of funds of more than $1 billion spent on efficiency projects and programs each year. The CPUC has directed state-regulated energy companies to investigate the potential for water-saving measures to achieve cost-effective energy savings. However, the development of these joint programs has been hindered by a lack of current and uniform information from water suppliers. Therefore, this proposal would serve the purpose of creating a credible dataset for water suppliers' energy use that would be updated every five years and made accessible to electric and gas utilities interested in developing joint programs that yield both water and energy savings. Such programs would be very beneficial to water suppliers by providing a potential source of funding and expertise to achieve water savings at reduced cost by conserving energy and water simultaneously.

The energy intensity of urban water deliveries can be defined as the cumulative amount of energy (either in kilowatt-hours (KWh)or therms) required to convey, treat, and distribute a specified volume of water to a customer. This value is often expressed in kWh/million-gallons or kWh/acre-feet with therms converted to KWh equivalents. For a retail water supplier, the "customer" is an end user; for a wholesale water supplier, the customer is another water supplier receiving water from the wholesaler.

Recognizing that the initial calculation of the energy intensity of water may take at least some staff time and resources not currently committed to the UWMP process, the ITP recommends that DWR facilitate voluntary reporting in a standardized format by interested water agencies. Such an approach will impose no general burden on water suppliers, but should produce a substantial amount of searchable data not otherwise available that will be useful to both water and energy managers. Credible energy intensity values are likely to become a pre-requisite for participating in joint efficiency projects with energy utilities, so the calculation of these values is in the best interest of most water agencies. Although the initial organization and presentation of such information will require new efforts, the processes established for initial reporting should allow subsequent calculations to become routine.

Recommended Action

To ensure that the voluntary information reported serves its intended purpose, the ITP recommends that DWR, in consultation with the CPUC and other stakeholders, include guidance and methodologies for estimating and reporting energy intensity in the 2015 UWMP Guidebook. Retail water suppliers would have the option to voluntarily report the average energy intensity of the water systems that they operate. In other words, retail agencies may only report the incremental energy used for local supplies and to treat and distribute water to their customers, as measured between the point of delivery from the wholesale water supplier (if any) to the point of delivery to the customers. This is the energy they can account for and not any "upstream" or "embedded" energy in the water they receive from a wholesaler.

The DWR Guidebook should include a methodology and/or information sources where retailers and wholesalers can find energy intensity calculation tools and best practices for compiling their energy data so as to calculate these values. Because of inter-annual variability related to weather and supply changes, the energy intensity value should be a multi-year average using a consistent method specified by DWR in its guidance document. The voluntary reporting format should include the average annual energy intensity of the water system, represented by the overall energy use of the water supplier, divided by the total volume of water delivered to customers. For each component of a water system (e.g., local supply and transmission, distribution, potable water treatment, administrative facilities), an estimate of the amount of energy used as a percent of the water supplier's total energy use would be made, using guidance from DWR to ensure a consistent approach across water suppliers.

Based on guidance developed by DWR, wholesale water suppliers may voluntarily report on the average energy intensity of the water they deliver to each agency they serve, as measured at the point of delivery. If a unique energy intensity of water delivered to multiple agencies is difficult to determine, an aggregated average energy intensity value of those supplies could be reported.

The Guidebook should also be amended to request simple information be provided voluntarily regarding energy and gas utility service within the urban water system area. Wholesale and retail agencies that choose to report their energy intensity would identify their own supplier(s) of electricity and, or natural gas, and any self-generated energy. Additionally, such retail agencies would identify the electric and gas utilities whose service area overlaps their own, i.e., who provide service to the same customers as the water agency.

Recommended Statutory Language:

Add the following language shown in underlined and italicized text to the end of Section 10631 of the Water Code:

( ) The department shall include in guidance for the preparation of urban water management plans for 2015 and beyond, a methodology for the voluntary reporting of energy intensity of urban water systems.

Minority Report on Recommendation #5: Voluntary Inclusion of Energy Intensity in Urban Water Management Plans (February 2014)

Recommendation #5 is intended to remove an impediment to cost sharing collaboration between the water and energy sectors, and allow the water industry and policymakers a better understanding of the potential opportunities for future cost-effective joint water-energy efficiency programs.

There have been long-term partnerships between water and energy providers for many types of programs, including incentive and rebate programs. Many of these successful programs have been based on hot water savings. These types of partnerships can be enhanced by including embedded energy savings as a basis for funding water conservation programs. The biggest challenge has been to establish a methodology acceptable to the California Public Utilities Commission (CPUC) for the calculation of embedded energy. Several options have been under consideration:

1. Calculate the embedded energy based on the average energy use currently associated with the existing water supply. The challenge to this has been that much of the current energy used by water suppliers is for imported water supplies used outside of the area where the water provider and their local energy provider are located. The CPUC rules do not allow energy providers to fund programs for energy savings outside of their service area.
2. Calculate the embedded energy based on the average energy currently used within the service area of the local energy provider. This approach would meet the current CPUC rules, but for many water agencies this embedded energy is insignificant and would not be adequate to provide a basis for funding current programs.
3. Calculate the embedded energy based on the marginal water supply. The marginal water supply would be determined based on the next increment of water to be developed and would generally be a locally developed water supply. The determination of marginal water supplies could be at the local water agency level or by hydrologic region or sub-region. Additional energy for conveyance, treatment and distribution could also be included. Additional work needs to be done by the CPUC to determine anticipated marginal supplies and develop standardized embedded energy numbers acceptable to the CPUC that could be used by water and energy partners participating in jointly funded programs. Use of a marginal water supply approach could be conducive to supporting water-energy partnerships.

In CPUC decision D.12-05-015, CPUC staff formed a Project Coordination Group (PCG) in June 2013 to develop a methodology for determining embedded energy and evaluating the cost-effectiveness of water-energy efficiency partnership programs. The PCG has been tasked with providing input on staff's development of a comprehensive cost-effectiveness framework to analyze the value of demand side programs that save energy and water, through the valuation of avoided cost of energy and water. This

framework will incorporate a methodology to calculate the embedded energy in water based on energy intensity.

On December 19, 2013, the CPUC issued an order instituting rulemaking for R.13-12-011 based on a petition of the ratepayer advocates, to develop policies to promote a partnership framework between energy investor owned utilities and the water sector. The order included a preliminary scoping memo which anticipates the following areas of concern will be addressed:

1. The appropriate methodology for determining the energy embedded in water;
2. The appropriate methodology for determining water system benefits to water sector partners and other entities that may benefit;
3. The appropriate methodology for allocating program costs;
4. Strategies to overcome barriers to joint funding;
5. Appropriate ratemaking treatment;
6. Availability of other state and federal funding for programs; and
7. Coordination between the proposed rulemaking and future energy efficiency rulemaking.

The rulemaking process for R.13-12-011 was assigned to an administrative law judge, who held a hearing on the process on February 11, 2014. The rulemaking process is anticipated to be coordinated with the PCG efforts over the next year. It appears that embedded energy calculations could likely be based on the energy associated with marginal water supplies, as opposed to the average intensity of existing water supplies described in the Independent Technical Panel (ITP) recommendation. However, a final methodology and calculation approach will not be finalized by the CPUC for approximately two years. A significant amount of time could be spent by Department of Water Resources (DWR) staff to develop criteria for reporting the average energy intensity in water supplies as part of the urban water management plans, and for water agency staff to compile and submit data that could have little use in encouraging water-energy partnerships. This effort by DWR would be duplicative of the rulemaking process currently being implemented by the CPUC and could provide inconsistent results or information that is not applicable. Based on this, Recommendation #5, Voluntary Inclusion of Energy Intensity in Urban Water Management Plans, as described in the ITP report, is not appropriate at this time. In the interest of maximizing the efficiencies of state and local agencies, the efforts related to embedded energy and water-energy partnerships should focus on the current rulemaking process at the CPUC. No legislation is needed at this time.