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Think Fast: Planning Ahead for Rapid Drought Response

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PRESENTATION OUTLINE

- Water Shortage Contingency Planning in California
- Elements of a Strong Drought Response Plan (DRP)
- Quantitative Approach to DRP Development
- Using the Quantitative Approach in DRP Updates
- Lessons from the 2012 – 2016 Drought

WATER SHORTAGE CONTINGENCY PLANNING

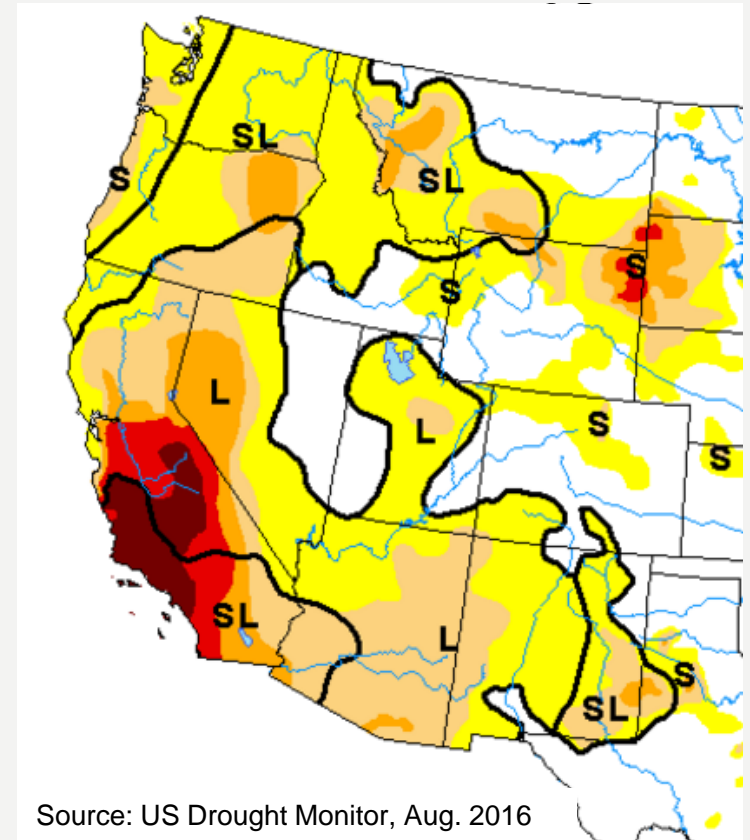
- Component of a California state-required Supply Planning Document

[California Water Code §10632\(a\)](#): Urban water suppliers must develop a water shortage contingency plan which indicates the actions the supplier will take in response to supply shortages of up to 50 percent.

- Most states have similar regulations for drought management
 - Oregon
 - Washington
 - Arizona
 - Colorado
 - Nevada, and so on.

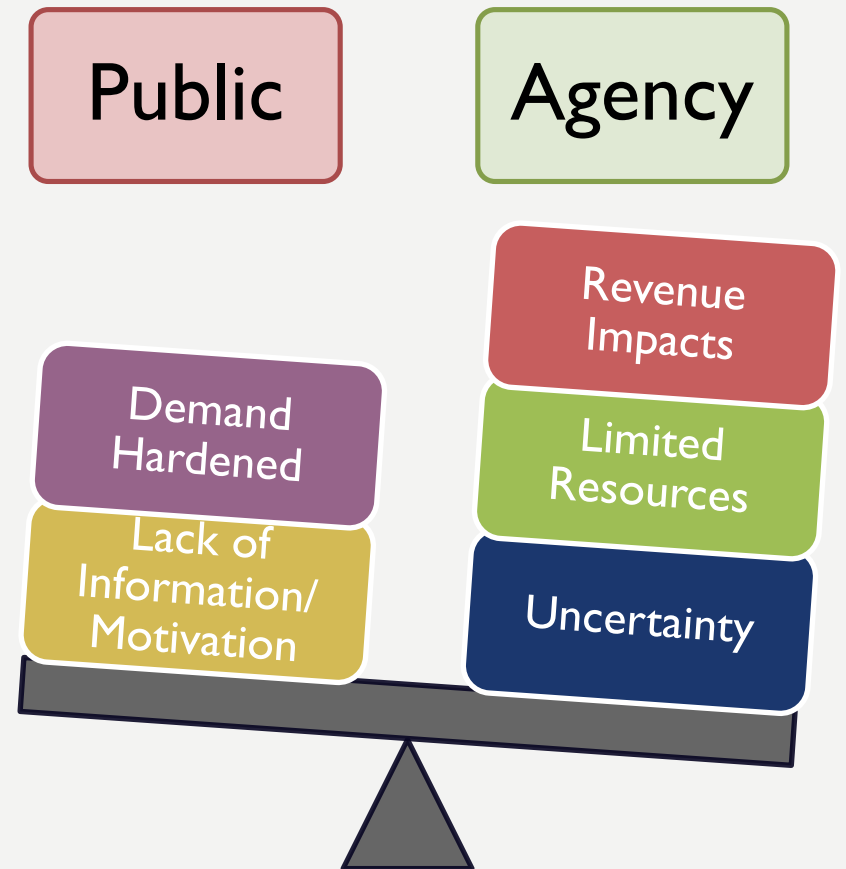
UNPRECEDENTED DROUGHT CHANGED OUR OUTLOOK

- SWRCB actions
 - End user requirements
 - Mandatory conservation savings up to 36%
- Unprecedented cutbacks to surface supplies
 - 5% allocation of SWP water
 - 0% allocation of CVP agricultural water
 - SWRCB curtailing pre-1914 water rights



WHY IS DROUGHT RESPONSE SO DIFFICULT?

- Demand hardening
- Financial solvency
- Meeting regulatory requirements
- Supporting economic development and quality of life in the communities you serve
- Uncertainty



ELEMENTS OF A STRONG DROUGHT RESPONSE PLAN

- Reflects the interests of the Agency, its Governing Body, the Customers
- Process that engages and is transparent to the public
- Determines the triggers for the declaration of a water shortage emergency
- Define the Stages of Action and allocation methods
 - Makes it clear who does what when

STAGES OF ACTION: DESIGNED TO REFLECT SUPPLY OUTLOOK

Stage	Reduction Goal	Rationale
Stage 1	N/A	<ul style="list-style-type: none">• Mandatory prohibitions
Stage 2	10%	<ul style="list-style-type: none">• Wholesaler has called for voluntary rationing of 10%
Stage 3	20%	<ul style="list-style-type: none">• Based on estimated single dry year shortfall in 2040• 2015 State Water Resources Control Board target was 16%
Stage 4	30%	<ul style="list-style-type: none">• Estimated multiple dry year shortfall in 2040
Stage 5	50%	<ul style="list-style-type: none">• Required by the UWMP Act

IDENTIFY DROUGHT RESPONSE OPTIONS AND ACTIONS

- Identify and think about:

How Much Water Can Be Saved?

- By Sector
- By End Use

How to Achieve Savings

- Regional Actions
- Agency Actions
- Customer Actions

DROUGHT RESPONSE TOOL

- High-level planning tool
- Quantitative, Excel-based model to guide development of drought response plans
- Help visualize and target savings opportunities so you can balance your objectives

AGENCY INPUT

Agency Information

- Production data
- Water use by sector
- Accounts by sector
- Population
- Savings goal

AGENCY INPUT

Select Drought Response Actions

- Agency actions
- Customer actions
- Compliance rate

OUTPUT

Estimated Water Savings Potential

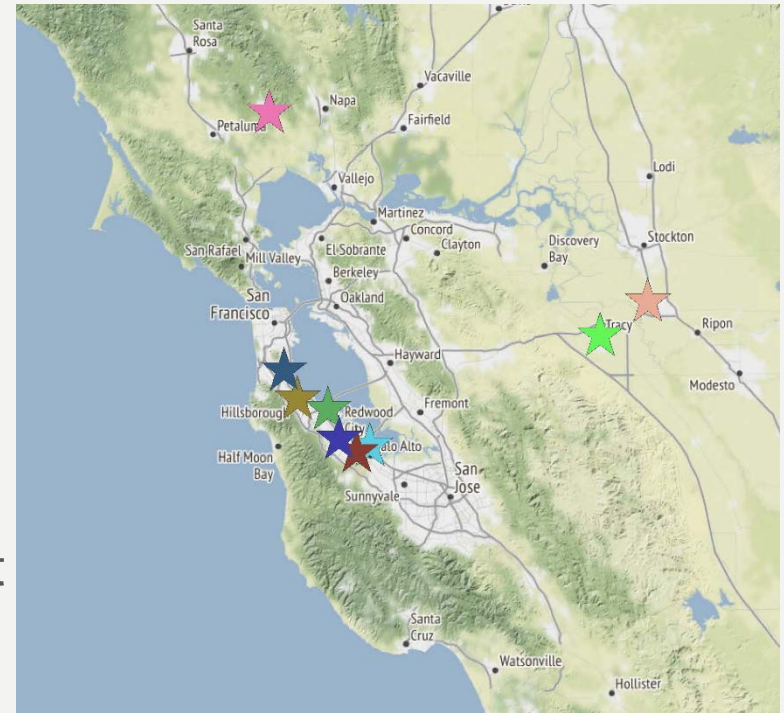
- Water savings by end-use
- Water savings by sector
- Total water savings

QUANTITATIVE APPROACH TO DROUGHT RESPONSE PLANNING

- Developed a quantitative analytical tool to develop water allocation method & stages of action:
 - Based on system-specific data
 - Allows testing of different water savings strategies
 - Compare/contrast different consumption reduction methods
 - Have confidence in water savings potential
 - Ability to analyze economic impacts
 - Supports communication with management, elected officials and the public

APPLICATION TO URBAN WATER MANAGEMENT PLANNING

- DRT used to develop the Drought Response Plan (or WSCP) component for:
 - City of Menlo Park
 - Redwood City
 - Foster City
 - City of Burlingame
 - Westborough Water District
 - City of Lathrop
 - Valley of the Moon Water District
 - City of Tracy
 - City of East Palo Alto



3 - Baseline Year (2010 - 2014) Water Use Profile

Agency 1

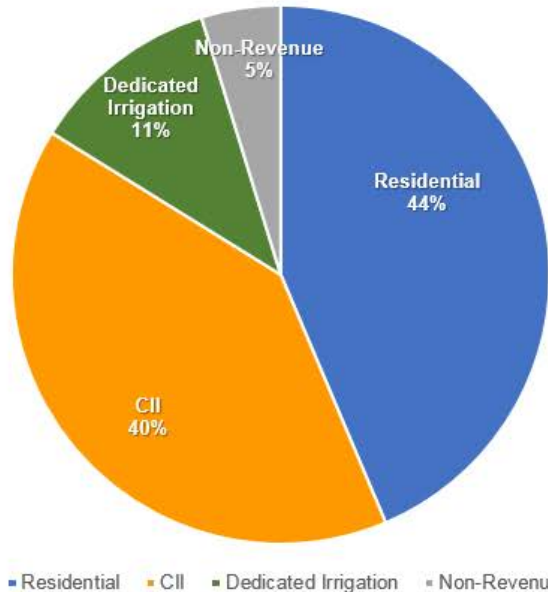
Baseline Year (2010 - 2014) Annual Water Use Summary

Units:

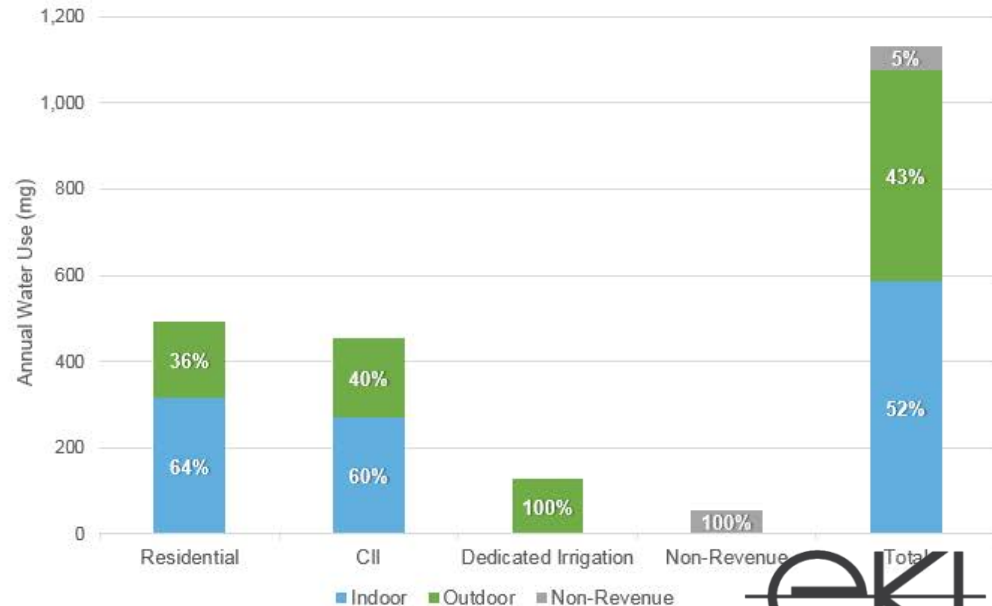
A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

Water Use	Total Production (mg)	Water Use (mg)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	1,130	493	454	129	54	
Total Indoor	585	314	272	--	--	
Total Outdoor	491	179	183	129	--	
Total Non-Revenue	54	--	--	--	54	
Total Indoor %	52%	64%	60%	0%	--	
Total Outdoor %	43%	36%	40%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	

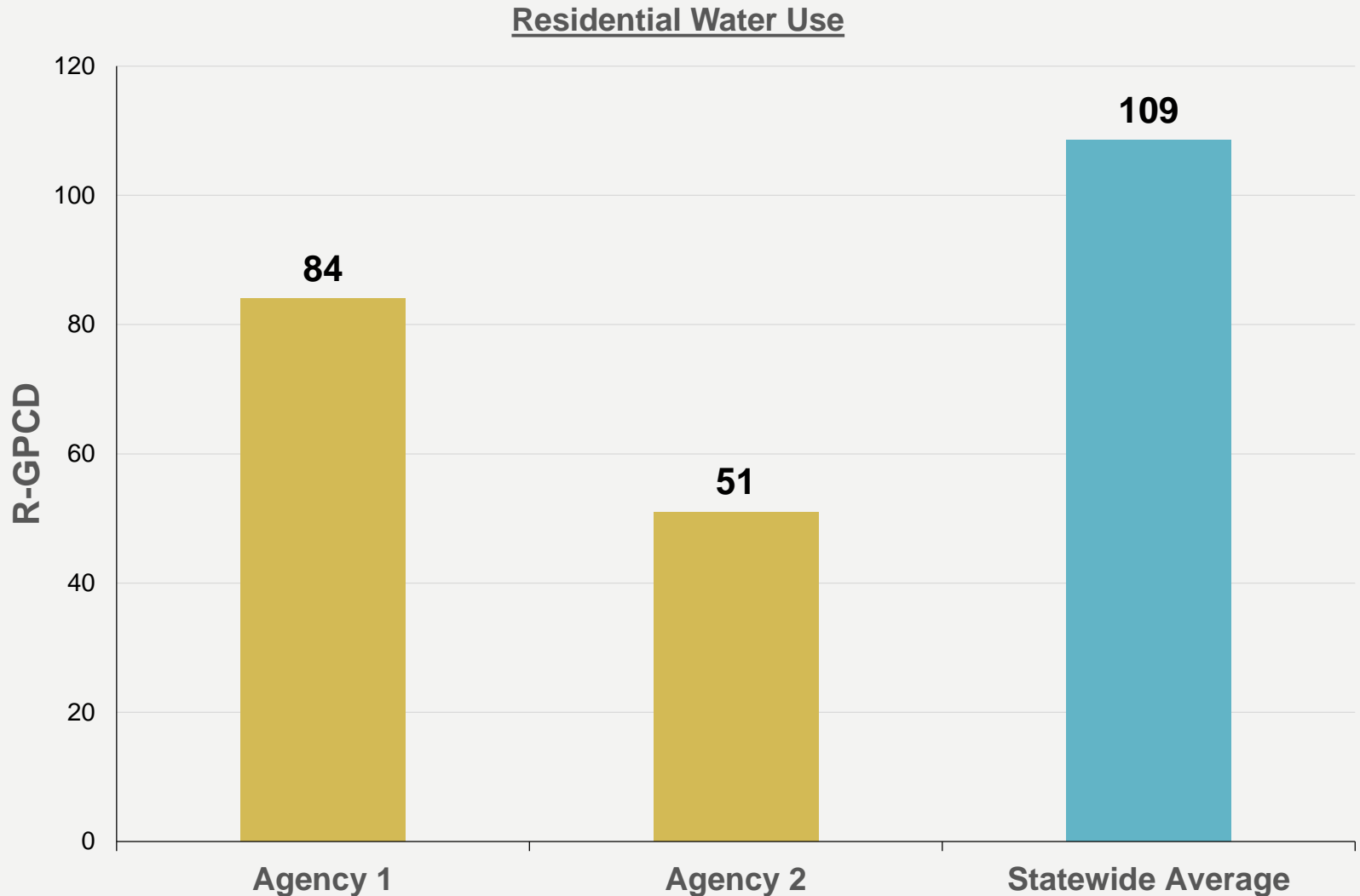
Baseline Year (2010 - 2014) Percent Annual Water Use by Sector



Baseline Year (2010 - 2014) Annual Water Use by Sector and End Use

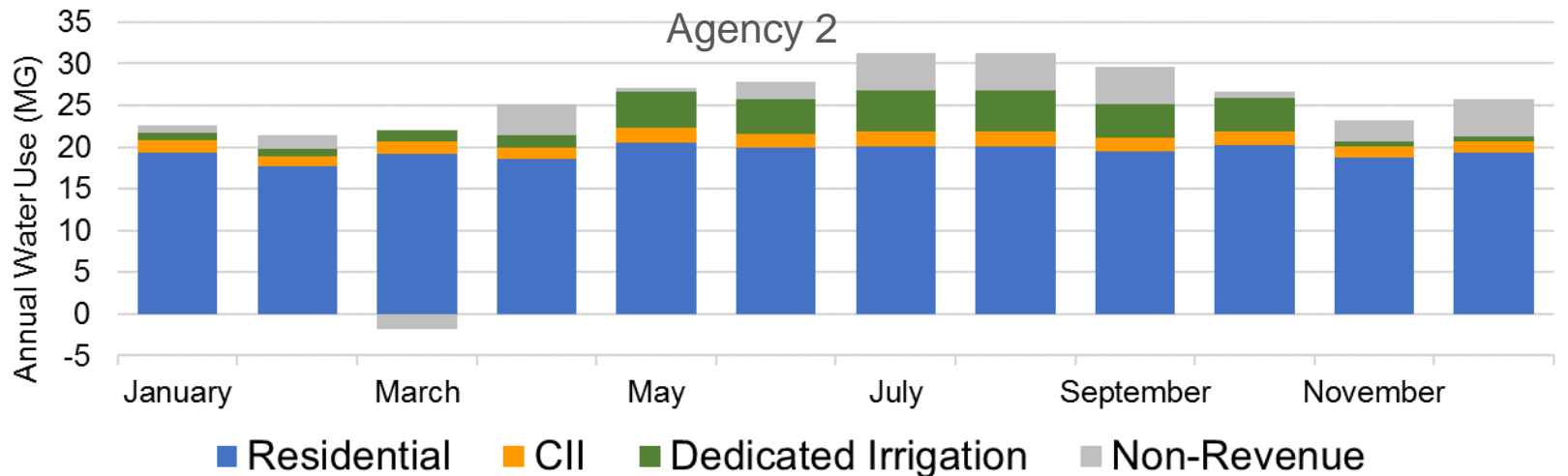
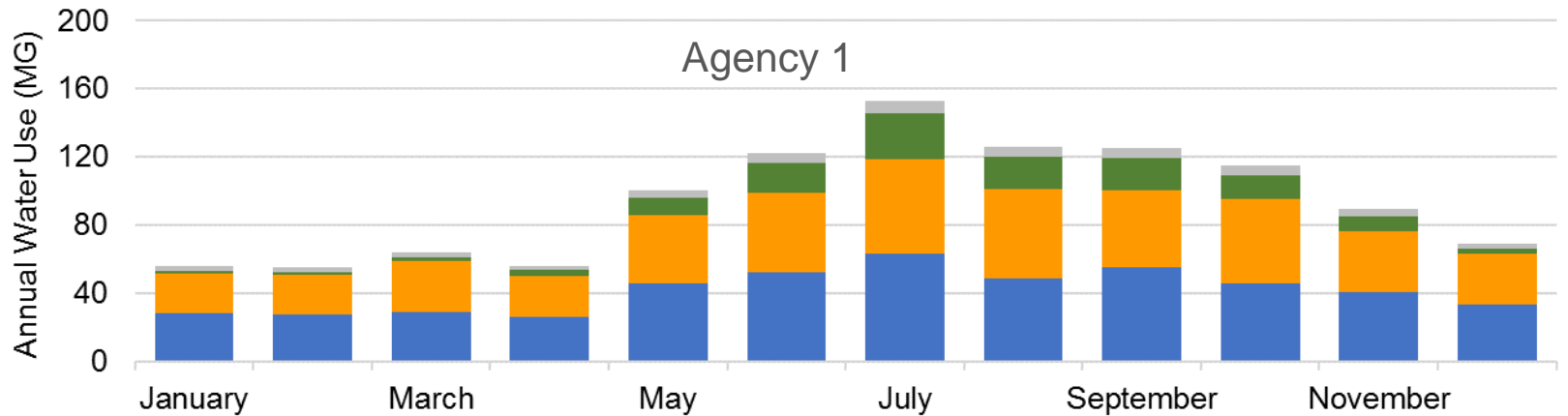


AGENCIES ARE STARTING FROM DIFFERENT BASELINES



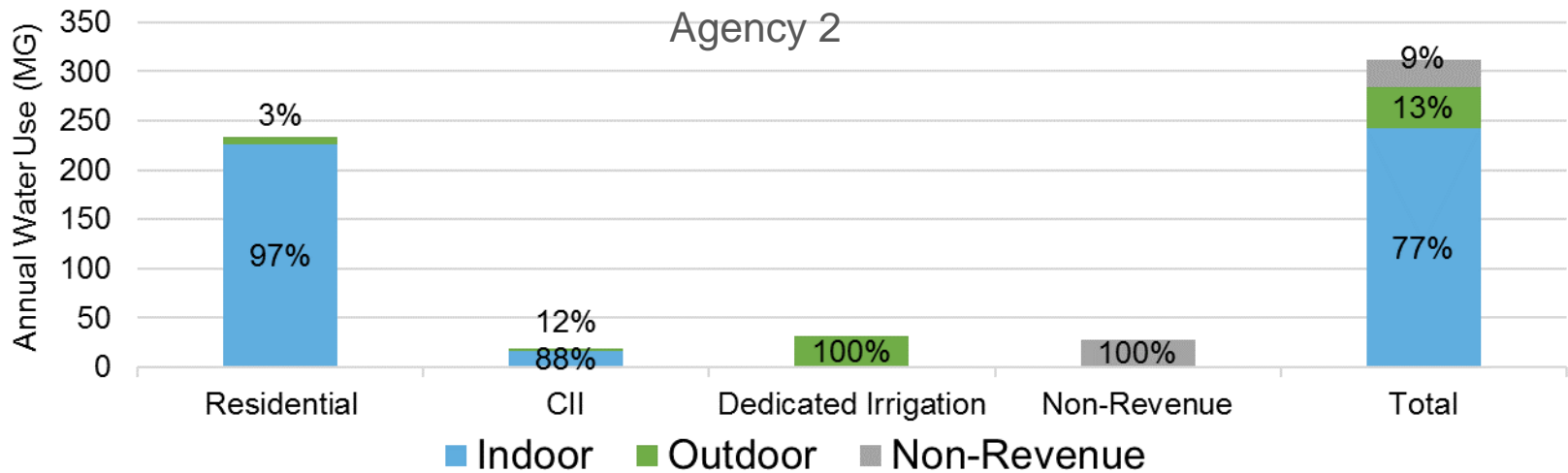
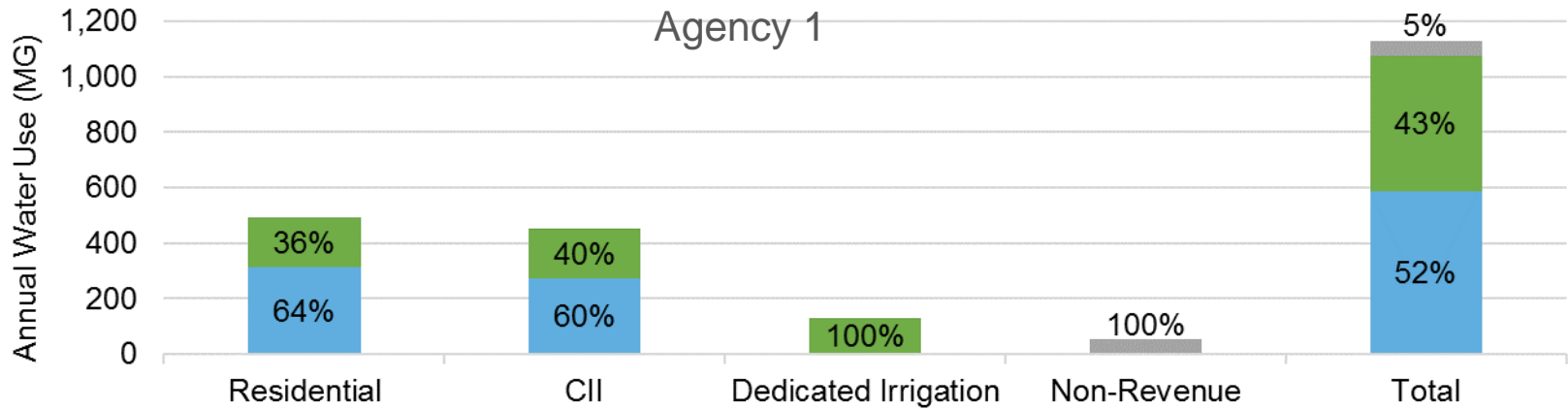
USED BASELINE ANALYSIS TO IDENTIFY SECTORS

Baseline Year (Non-Drought) Monthly Total Water Use by Sector



...AND MORE DISCRETIONARY WATER USE / SAVINGS POTENTIAL

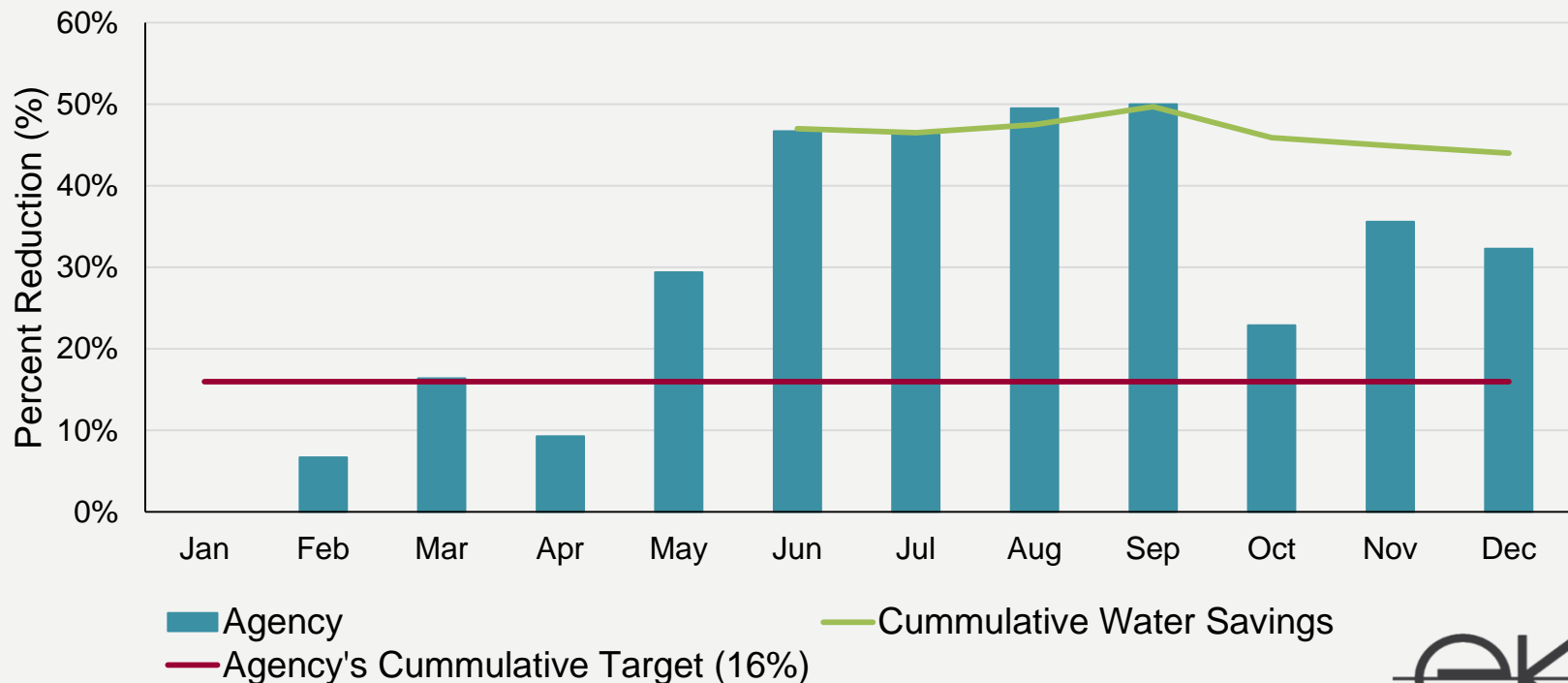
Baseline Year (Non-Drought) Indoor Vs. Outdoor Water Use by Customer Type



MANY AGENCIES OVERSHOOT SAVINGS GOALS

- An agency achieved more than 40% reduction in summer and fall of 2015 by enacting Stage 2 (20% reduction) their previous WSCP.
- The agency's State required reduction target was 16%

Monthly Water Use Reduction for 2015 Compared to 2013 Baseline



IDENTIFY DROUGHT RESPONSE OPTIONS AND ACTIONS

- Identify and think about:

How Much Water Can Be Saved?

- By Sector
- By End Use

How to Achieve Savings

- Regional Actions
- Agency Actions
- Customer Actions

THE DRT MODELS WATER SAVINGS FROM A VARIETY OF MEASURES

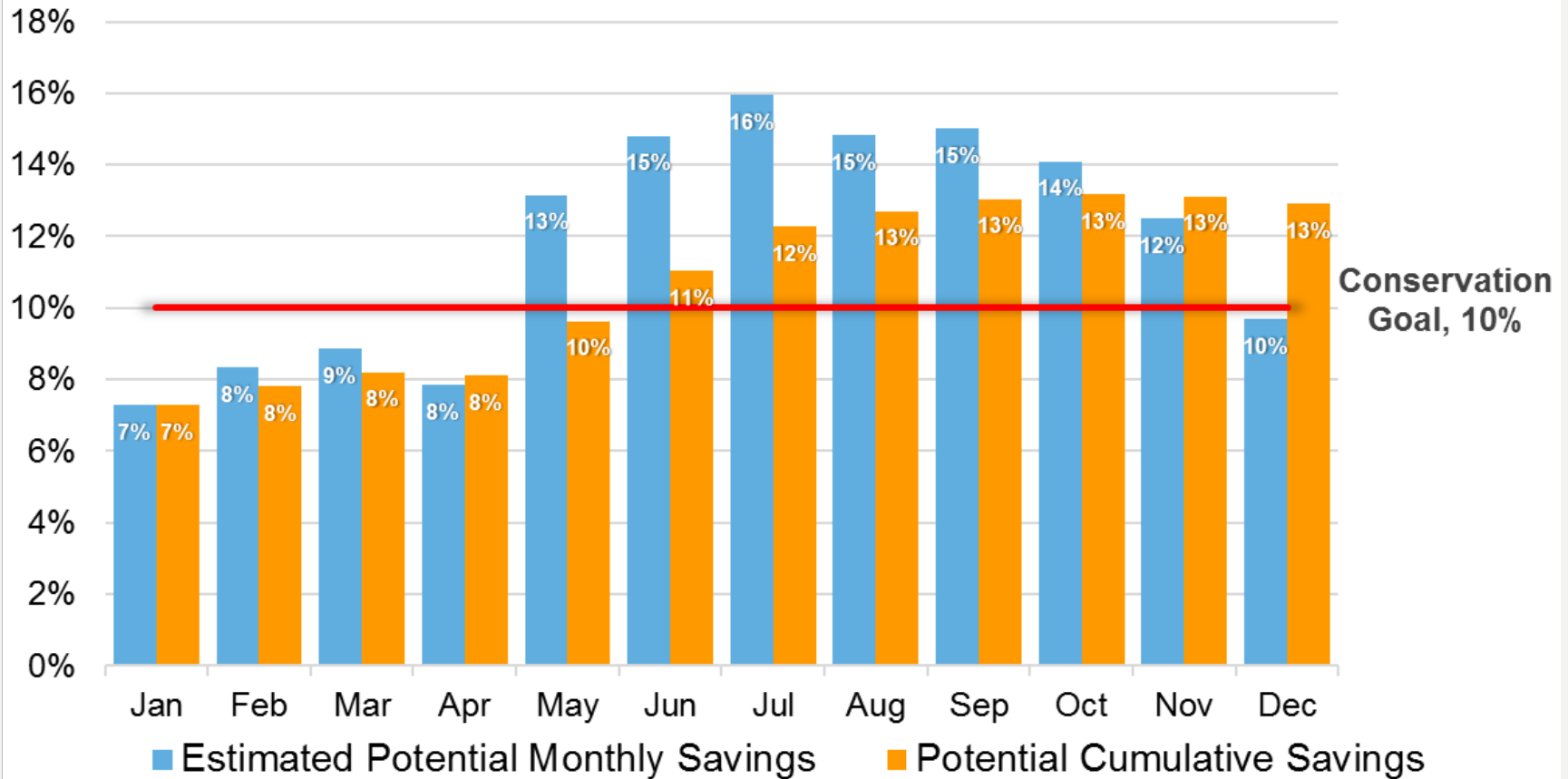
- Types of drought response measures
 - State mandatory prohibitions
 - Accelerated implementation of rebate programs
 - Agency actions
 - Customer / end use prohibitions
- Grouped by sector and by end use
 - Residential, CII, irrigation
 - Indoor, outdoor, non-revenue
- Each measure has default water savings and implementation rate base on in-depth research
 - Also customizable

SELECT AND COMPARE DROUGHT RESPONSE ACTIONS

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation
▶ Agency Drought Actions / Restrictions						
▶ Agency Actions						
Media Campaign, Newspaper Articles, Website	All	<input checked="" type="checkbox"/>	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	<input checked="" type="checkbox"/>		50%	--	--
Water Efficiency Workshops, Public Events	All	<input checked="" type="checkbox"/>	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	<input checked="" type="checkbox"/>	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	<input type="checkbox"/>	100%		--	--
Home or Mobile Water Use Reports	All	<input type="checkbox"/>	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	<input type="checkbox"/>	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	<input type="checkbox"/>	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	<input checked="" type="checkbox"/>	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	<input type="checkbox"/>	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	<input type="checkbox"/>			--	--
Moratorium on New Connections	All	<input type="checkbox"/>			--	--
Move to Monthly Metering / Billing	All	<input type="checkbox"/>	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	<input checked="" type="checkbox"/>			--	--
Establish Drought Hotline	All	<input checked="" type="checkbox"/>			--	--
Reduce Distribution System Pressures	Non Revenue Water	<input type="checkbox"/>	4.5%	100%	CUWCC, 2010; DWR, 2015	--
▶ Dedicated Irrigation						
Conduct Irrigation Account Surveys	Irrigation	<input checked="" type="checkbox"/>			30%	10%
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	<input checked="" type="checkbox"/>	38%	50%		
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	<input type="checkbox"/>	79%	50%	UC IPM, 2014	--
Prohibit use of Potable Water for Irrigation	Irrigation	<input type="checkbox"/>	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	<input checked="" type="checkbox"/>	100%	5%	--	--
- OR -						
Establish Water Budget - 25% Reduction	Irrigation	<input type="checkbox"/>	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	<input type="checkbox"/>	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	<input type="checkbox"/>	75%	50%	--	--

MODEL FOR EFFECTIVE, MORE PREDICTABLE SAVINGS

Estimated Potential Monthly Water Savings



EXAMPLE WSCP STAGE – 10% SUPPLY SHORTAGE

Agency Implementation	End User Actions
<ul style="list-style-type: none">• Conduct public outreach.• Expand outreach for existing water conservation programs.• Conduct coordination with regional agencies and wholesale supplier.• Conduct staff training.• Implement drought surcharge on water rates.	<ul style="list-style-type: none">• Continue with mandatory prohibitions from Stage 1.• Restaurants and other food service operations shall serve water to customers only upon request.• Landscape irrigation with potable water is prohibited on more than 3 days per week and certain times during the day.• Other measures as may be approved by Resolution of the City Council.

LESSONS FROM THE 2012-2016 DROUGHT

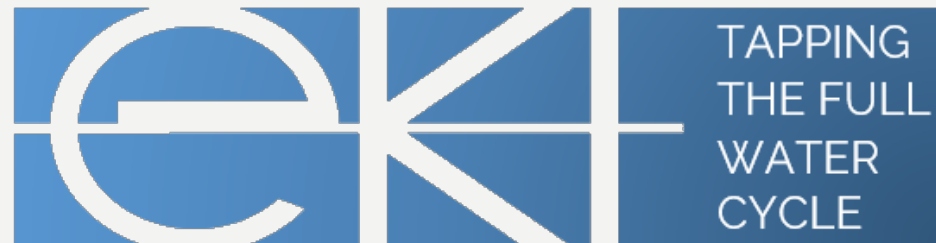
- Need effective drought management tools in place
- The more detail regarding specific actions and by who, the easier to implement
- Focus on behavior-based response measures
- Even agencies with low per capita water use can achieve large savings
 - Result of extensive media and public outreach
- Real data from the recent drought will be valuable in calibrating future analyses
- Quantitative modeling provides more predictable results and transparency in measures



QUESTIONS?

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