



**BOARD OF DIRECTORS
EAST BAY MUNICIPAL UTILITY DISTRICT**

375 - 11th Street, Oakland, CA 94607

Office of the Secretary: (510) 287-0440

Notice of Special Meeting

**Water Budget Rate Structures Workshop
Tuesday, October 11, 2016
9:30 a.m.
Training Resource Center
375 Eleventh Street
Oakland, California**

At the call of President Frank Mellon, the Board of Directors has scheduled a workshop on Water Budget Rate Structures at 9:30 a.m. on Tuesday, October 11, 2016, at 375 Eleventh Street, Training Resource Center, Oakland, California.

The Board will receive an overview of water budget rate structure concepts, rate structures, impacts, approaches to implementation and other upcoming activities related to water budgets.

Dated: October 6, 2016

A handwritten signature in cursive script that reads 'Lynelle M. Lewis'.

Lynelle M. Lewis
Secretary of the District



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AGENDA
Special Meeting

Water Budget Rate Structures Workshop
Tuesday, October 11, 2016
9:30 a.m.
Training Resource Center
375 Eleventh Street
Oakland, California

ROLL CALL:

PUBLIC COMMENT: The Board of Directors is limited by State law to providing a brief response, asking questions for clarification, or referring a matter to staff when responding to items that are not listed on the agenda.

DISCUSSION:

1. Staff presentation on water budget rate structures.

ADJOURNMENT:

Disability Notice

If you require a disability-related modification or accommodation to participate in an EBMUD public meeting please call the Office of the Secretary (510) 287-0404. We will make reasonable arrangements to ensure accessibility. Some special equipment arrangements may require 48 hours advance notice.

Document Availability

Materials related to an item on this Agenda that have been submitted to the EBMUD Board of Directors within 72 hours prior to this meeting are available for public inspection in EBMUD's Office of the Secretary at 375 11th Street, Oakland, California, during normal business hours.

EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: October 6, 2016

MEMO TO: Board of Directors

FROM: Alexander R. Coate, General Manager *ARC*

SUBJECT: Board Workshop on Water Budget Rate Structures

SUMMARY

Staff has been working with Raftelis Financial Consultants to analyze how water budget rate structures could be implemented for the District's single-family residential (SFR) customer class and what the impact to customers would be. At the Board workshop on October 11, staff will review water budget rate structure concepts, the spectrum of water budget rate structures, and provide an analysis of potential impacts. Staff will also review what it would take to transition to a water budget rate structure with regards to rate approach, billing structure, and timing. Staff's presentation will cover steps being taken by the State of California on water budgets and other District activities that best guide the timing if a potential change in rate structure is desired.

DISCUSSION

The District's current inclining tiered rate structure for SFR customers has been in place for more than 20 years. The intent of an inclining tiered rate structure is to encourage low water use because the price (\$/Ccf) increases with use in the higher tiers. The range of use allowed within each tier is fixed and the same for all SFR customers. The intent of a water budget rate structure is to encourage efficient water use and discourage wasteful water use. This is achieved by inclining tiered rates, but the range of use allowed within each tier is customized to the water needs of each customer, called the water budget. The water budget is broken into two components: the indoor water budget that is based on a per capita amount for efficient indoor use, and the outdoor budget which is based on the water necessary to efficiently irrigate the customer's landscape area.

The presentation will show how the customer's landscape area can be estimated with a simplified approach or can be evaluated through an individualized approach. An outdoor water budget is calculated from the landscape area and the local weather conditions at the customer's location through a calculation based on evapotranspiration. The impacts of a water budget rate structure will be presented using the actual billed water use for SFR customers from 2013 (assumed to be pre-drought use) and 2015 (drought use). The results show that since our current tier blocks are based on winter water use for Tier 1 and average outdoor use for Tier 2, that the overall shifts based on a water budget approach were not significant. However, implementing a water budget rate structure could identify some inefficient water use by some SFR customers and at the same time lower the amount of water charged at the highest price to SFR customers who are using water efficiently to meet their large water budget needs for large lots in warm areas.

ARC:SDS:RL

Attachment

Water Budget Rate Structures Workshop

Board of Directors

October 11, 2016

- Introduction to Water Budget Based Rate
 - Potential Impacts of Change
- Preliminary Results of Water Budget Analysis
- Next Steps

GOAL OF THE WORKSHOP



- To understand water budget rate structures and provide context through the lense of the District's existing rate structure

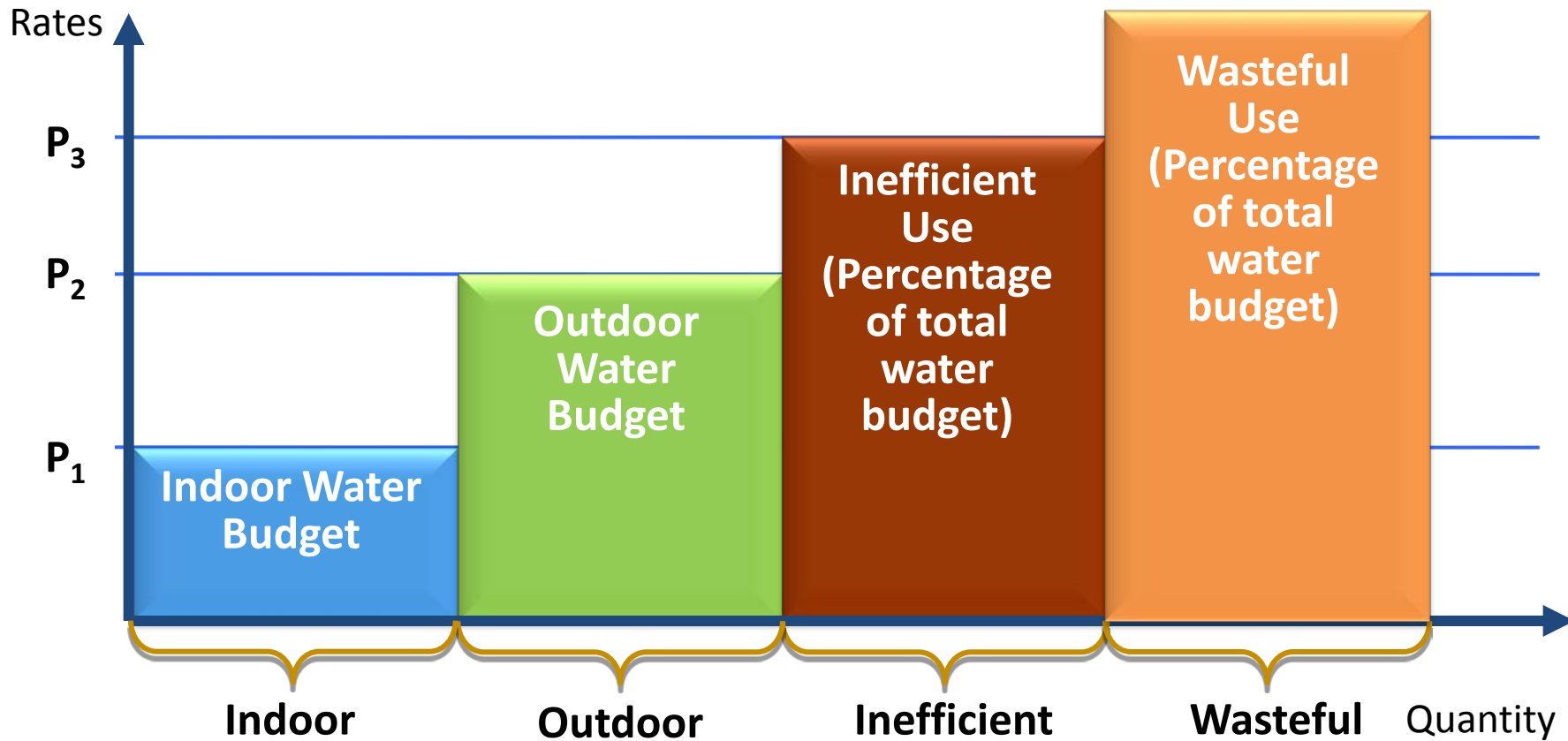
WHAT IS A WATER BUDGET RATE?



“Water budget rate is an increasing block rate structure in which the block definition is different for each customer based on an efficient level of water use by that customer.”

Source: American Water Works Association Journal, May 2008, Volume 100, Number 5

SFR WATER BUDGET INCLINING TIERED RATE STRUCTURE



CONSERVATION & EFFICIENCY



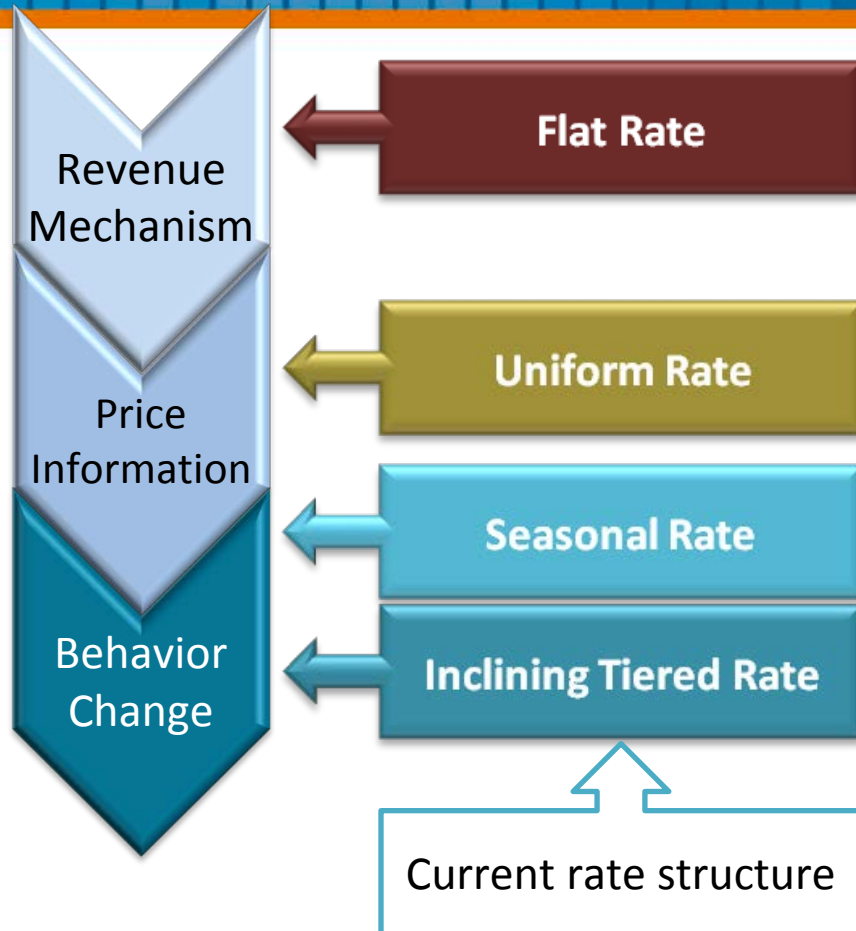
WATER CONSERVATION

- Landscape adjustments
- Reducing water usage
- Restricting water use

WATER EFFICIENCY

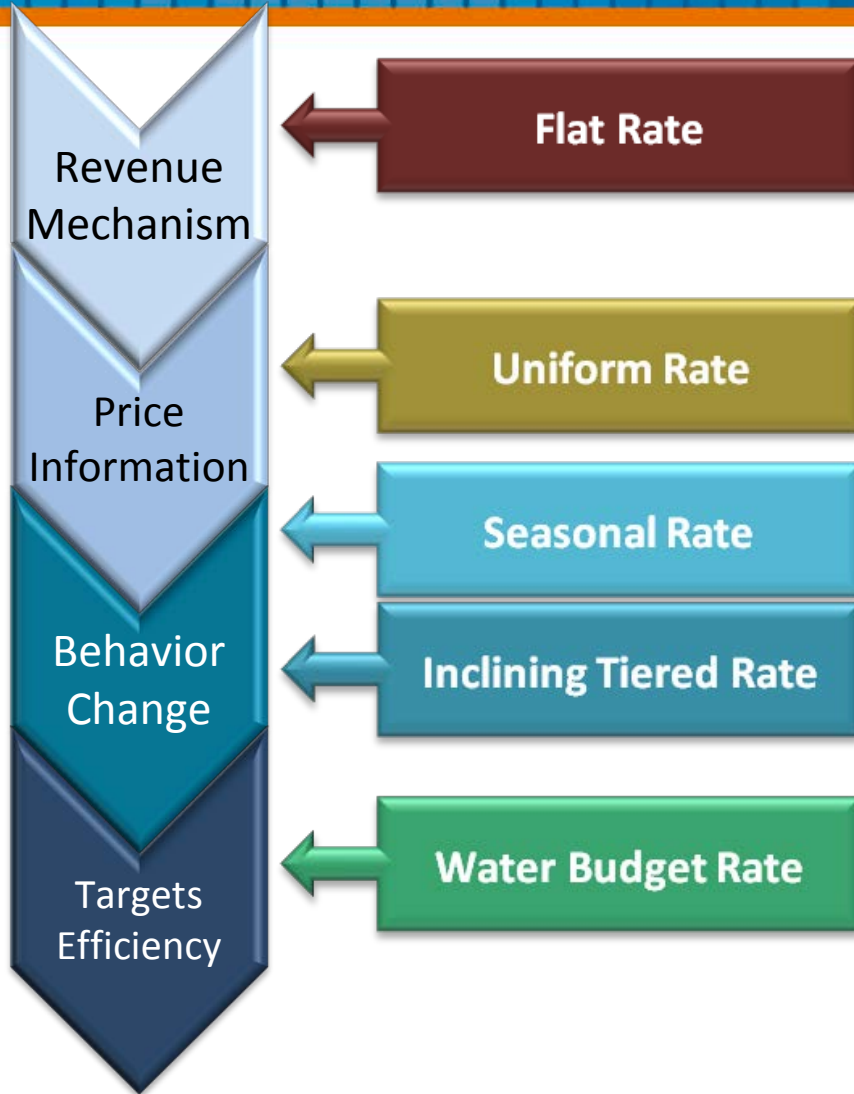
- No change in landscape
- Reducing water waste
- Appropriate water use

BASIC INCLINING TIERED RATES



- Promotes conservation
- Affordable for essential use
- Easy to administer
- Less complex
- Relies on revenue generated from higher tiers

WATER BUDGET INCLINING TIERED RATES



- Promotes water efficiency for all customers
- Affordable for essential use
- Drought messaging tool
- Revenue stability
- Higher administrative cost
- More complex
- Increased data needs
- Requires proactive public outreach
- Goal is to minimize use in inefficient tiers
- Lower tiers generate higher portion of revenue

CURRENT EBMUD BASIC INCLINING TIERED RATES



- SFR Customers
 - Tier 1: 0 to 7 ccf per month
 - Provides 172 gpd of indoor water for a household of 3 people at 57 gallons per person per day
 - Tier 2: 8 to 16 ccf per month
 - Provides irrigation for 3,300 sqft at average weather for service area
 - Tier 3: 16 + ccf
 - Considered high outdoor water use

SIMILARITY BETWEEN THE RATE STRUCTURES



Both typically have three groupings of usage tiers with increasing tier rates:

- **Typical Indoor water use:** Generally ranges from 7 to 12 ccf per month
- **Typical Outdoor water use:** Generally ranges from 10 to 25 ccf per month
- **Atypical water use**

DIFFERENCES BETWEEN THE RATE STRUCTURES



- Water budget Inclining Tiered Rates can take into account the following:
 - Per capita use
 - Weather/Microclimates
 - Irrigation area
- Basic Inclining Tiered Rates do not address these factors:
 - Customers move in out of tiers during the season
 - Customers in hotter climates tend to have more water use in the higher tiers
 - Customers that have larger lots tend to have more water use in the higher tiers

SUMMARY OF INCLINING TIERED RATE STRUCTURES



BASIC (CURRENT)

General

- Easy to administer
- Sends clear conservation signal
- Addresses affordability for basic needs

Conservation

- Targets larger water users
- High water use = wasteful water use

Efficiency

- Does not address household size, landscape area, or ET

Drought

- Blanket approach to drought rates

WATER BUDGET

General

- Requires customized bills and rates
- Targets inefficient use above individually calculated budget
- Addresses affordability for basic needs

Conservation

- Provides more water for larger landscapes at Tier 2 rates

Efficiency

- Addresses household size, landscape area and ET
- Efficiency required of all customers, including low water users

Drought

- Allows for targeted drought messaging and rates

WATER BUDGETS RATES ARE BASED ON INDOOR AND OUTDOOR BUDGETS



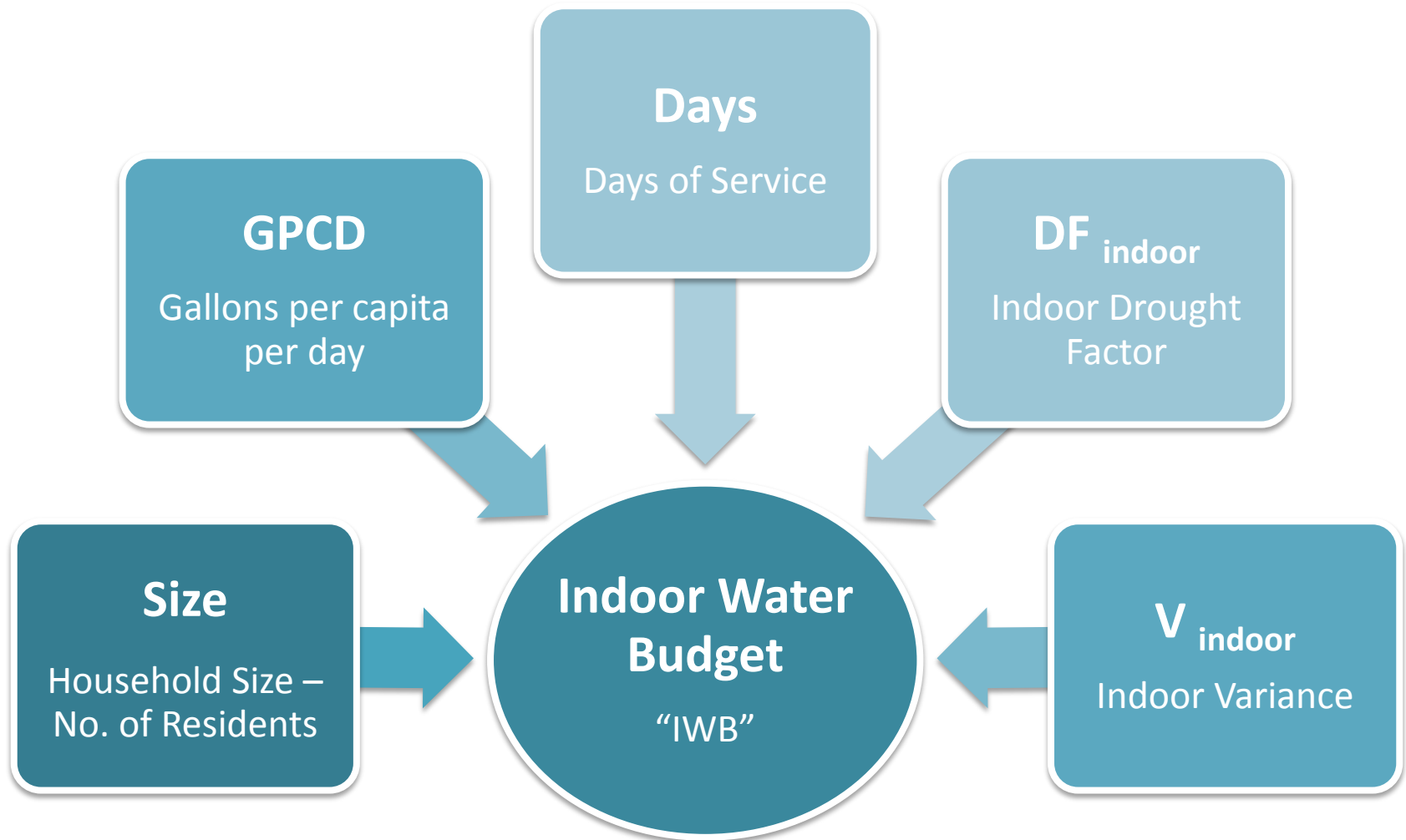
- Indoor budgets are based on efficient water use on a per capita basis
- Outdoor budgets are on based efficient irrigation of landscape area and weather data
- Setting the indoor and outdoor water budget (efficient use) for each customer is the challenge
 - Many options and choices
- Customer use above the indoor and outdoor water budget is considered inefficient

THREE WATER BUDGET OPTIONS



- INDOOR BUDGET ONLY
 - Only calculate water budget for indoor use
 - Keep fixed Basic Inclining Tiers for outdoor use
- SIMPLIFIED OUTDOOR BUDGET (+ indoor budget)
 - Uses algorithm to assign landscape area to a parcel based on readily available parcel data
- INDIVIDUALIZED OUTDOOR BUDGET (+ indoor budget)
 - Uses analysis of aerial imagery to determine the landscape area for each parcel

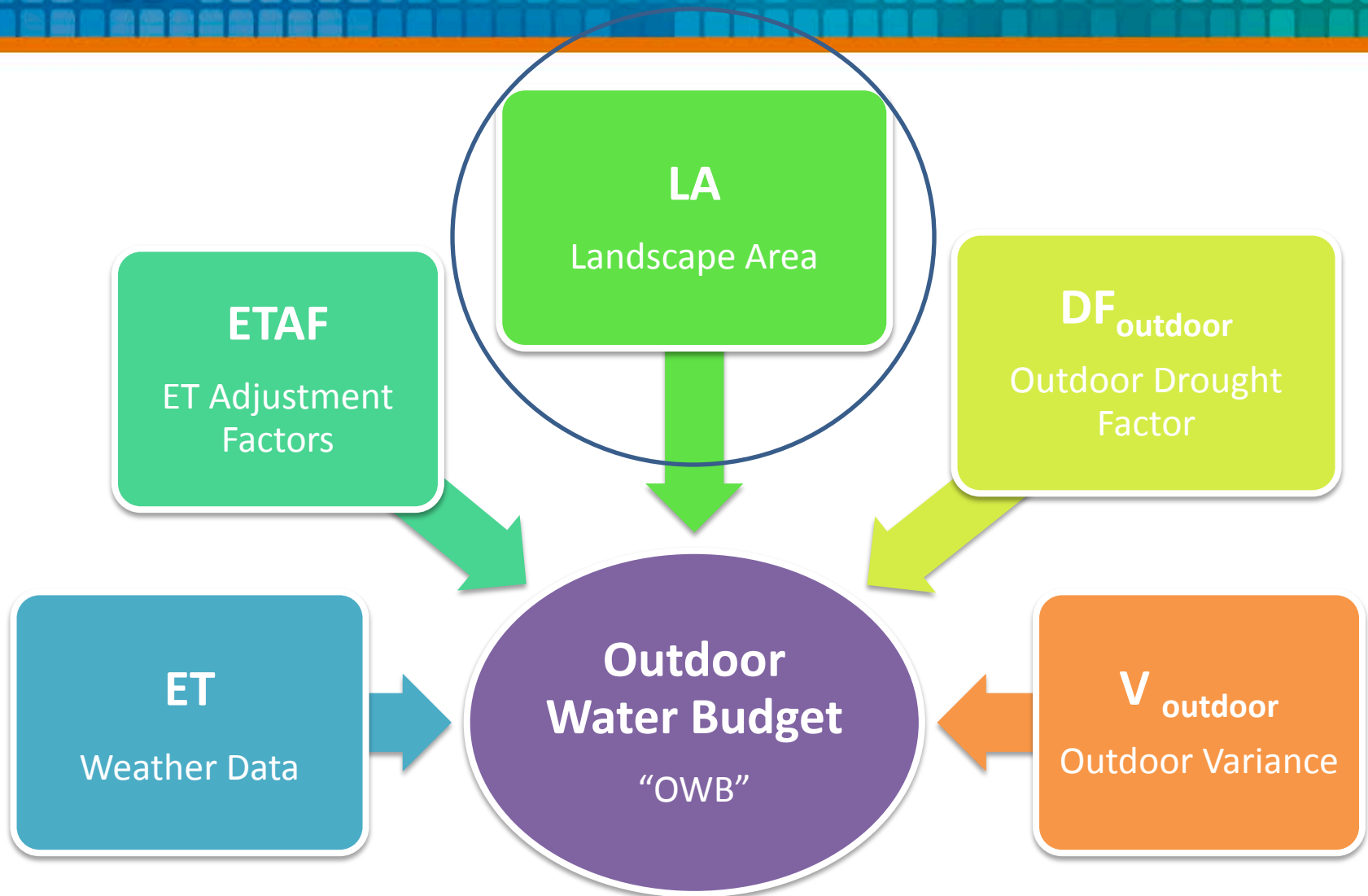
INDOOR WATER BUDGET



DEFINING EFFICIENCY: OUTDOOR WATER BUDGET



OUTDOOR WATER BUDGET



KEY ASPECT OF OUTDOOR BUDGET IS DETERMINING LANDSCAPE AREA



- Simplified versus Individualized approach to determining landscape area
 - Ease of implementation
 - Accuracy
 - Customer acceptance

SIMPLIFIED APPROACH TO DETERMINE LANDSCAPE AREA



- Uses formula or average values to assign landscape area per parcel
- Options
 - Flat % of parcel size
 - **Create groupings (bin) of parcel size with average landscape area values for each bin**
- Easy to implement and generally results in fewer customer appeals

INDIVIDUALIZED APPROACH TO DETERMINE LANDSCAPE AREA



- This approach has not been analyzed at present
 - Tools to assess landscape area from aerial imagery are still being refined
- Individual review of every parcel
 - Based on the actual current needs of the individual parcel
 - Computer or manual analysis of every parcel
- Can be challenging to implement

WATER BUDGET ANALYSIS FOR SINGLE FAMILY CUSTOMERS



**ANALYZED IMPACT OF TWO OF THREE
WATER BUDGET OPTIONS:**

- 1) INDOOR BUDGET ONLY**
- 2) SIMPLIFIED OUTDOOR BUDGET**
- 3) INDIVIDUALIZED OUTDOOR BUDGET**

METHODOLOGY



- Used actual SFR water use; redistributed the use from our current Tier 1, 2, 3 to water budget indoor, outdoor, and inefficient tiers
- Did not project changes to customer behaviors in response to water budget rates structure

INDOOR BUDGET ONLY ASSUMPTIONS



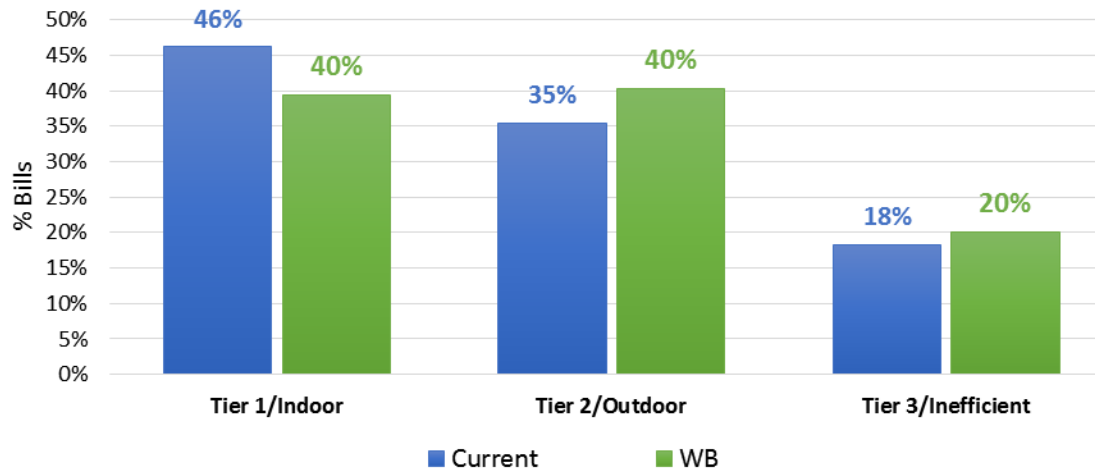
- Indoor Efficient/Tier 1 (0-6 ccf/month)
 - 3 people per household
 - 50 gallons per person per day
- Current Tier 2 – 9 ccf per month additional
 - 7-15 ccf/month total use
- Current Tier 3 – above Tier 2 usage
 - 15+ ccf/month total use
- Addresses basic water needs
- Allows for variance for indoor water

INDOOR BUDGET ONLY RESULTS – 2013

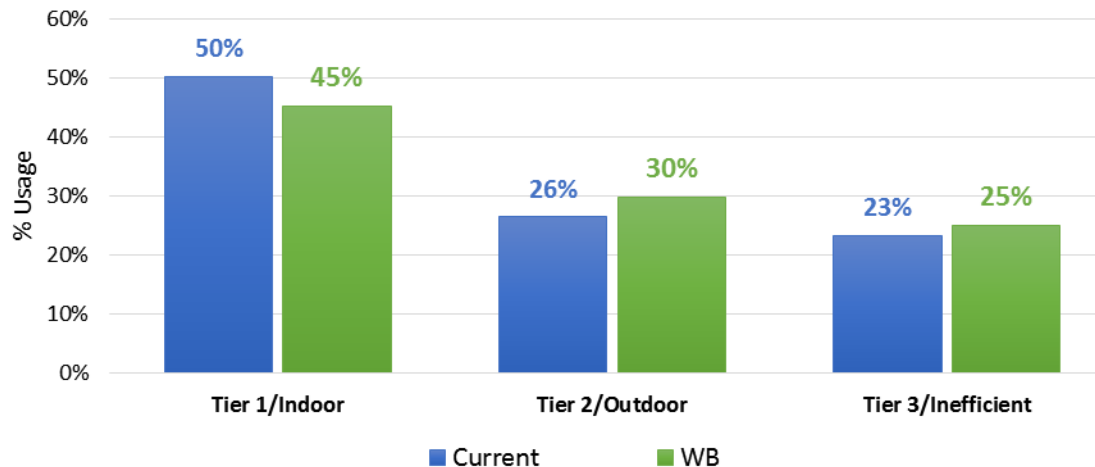


Analysis without Considering Variances

% SFR Bills Ending in Each Tier



% SFR Usage by Tier

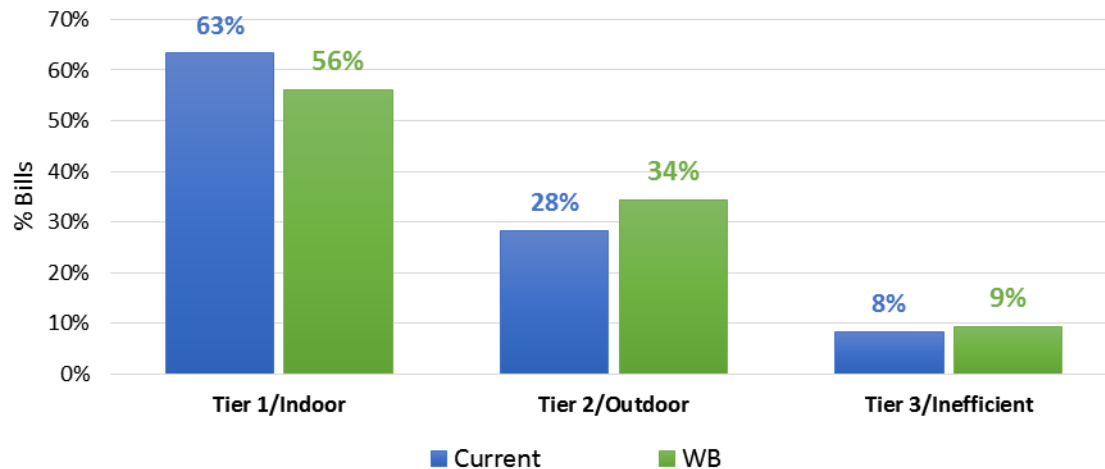


INDOOR BUDGET ONLY RESULTS – 2015

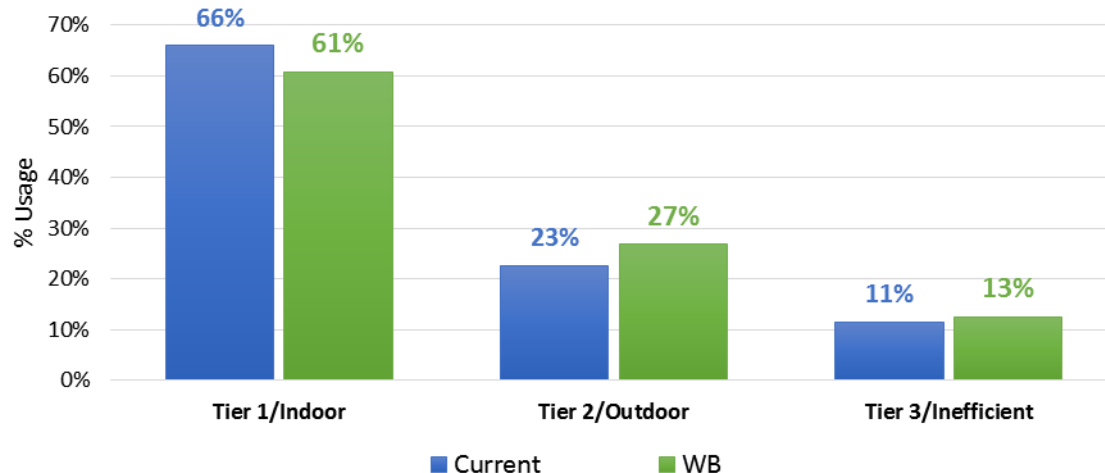
Analysis without Considering Variances



% SFR Bills Ending in Each Tier



% SFR Usage by Tier



COMPARISON BETWEEN CURRENT AND INDOOR BUDGET ONLY



- Results are similar
- Exception:
 - In water budget, Indoor/Tier 1 is smaller by 1 ccf
- Indoor Variance Requests:
 - Variance is dependent on default household size
 - Level of review can vary dependent on policy
 - Number of variance requests can vary between 10 to 25% of customers
 - As more customers request variances to increase their indoor water budget, use in Indoor Efficient Tier will drift back to current Tier 1 level

SIMPLIFIED OUTDOOR BUDGET OPTION



- **Landscape Area = Assign Landscape Area by Lot Size Bins**
 - Group the parcel sizes into bins and then determine the appropriate landscape area for each bin
 - Assigns landscaped area for each bin based on the average of observed landscape area for parcels within each bin
 - Calculates outdoor water budget using ET zone and assigned landscape area

SIMPLIFIED OUTDOOR BUDGET STRUCTURE

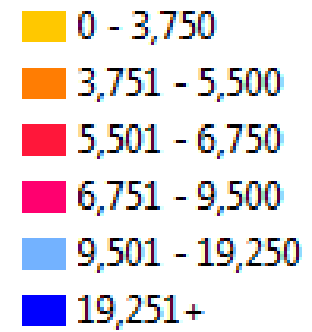


- Indoor Efficient/Tier 1 (6 ccf/month)
 - 3 people per household
 - 50 gallons per person per day
- Outdoor Efficient/Tier 2
 - Five lot size bins
 - Four weather stations
- Inefficient/Tier 3
 - Use above Indoor and Outdoor Efficient Budgets

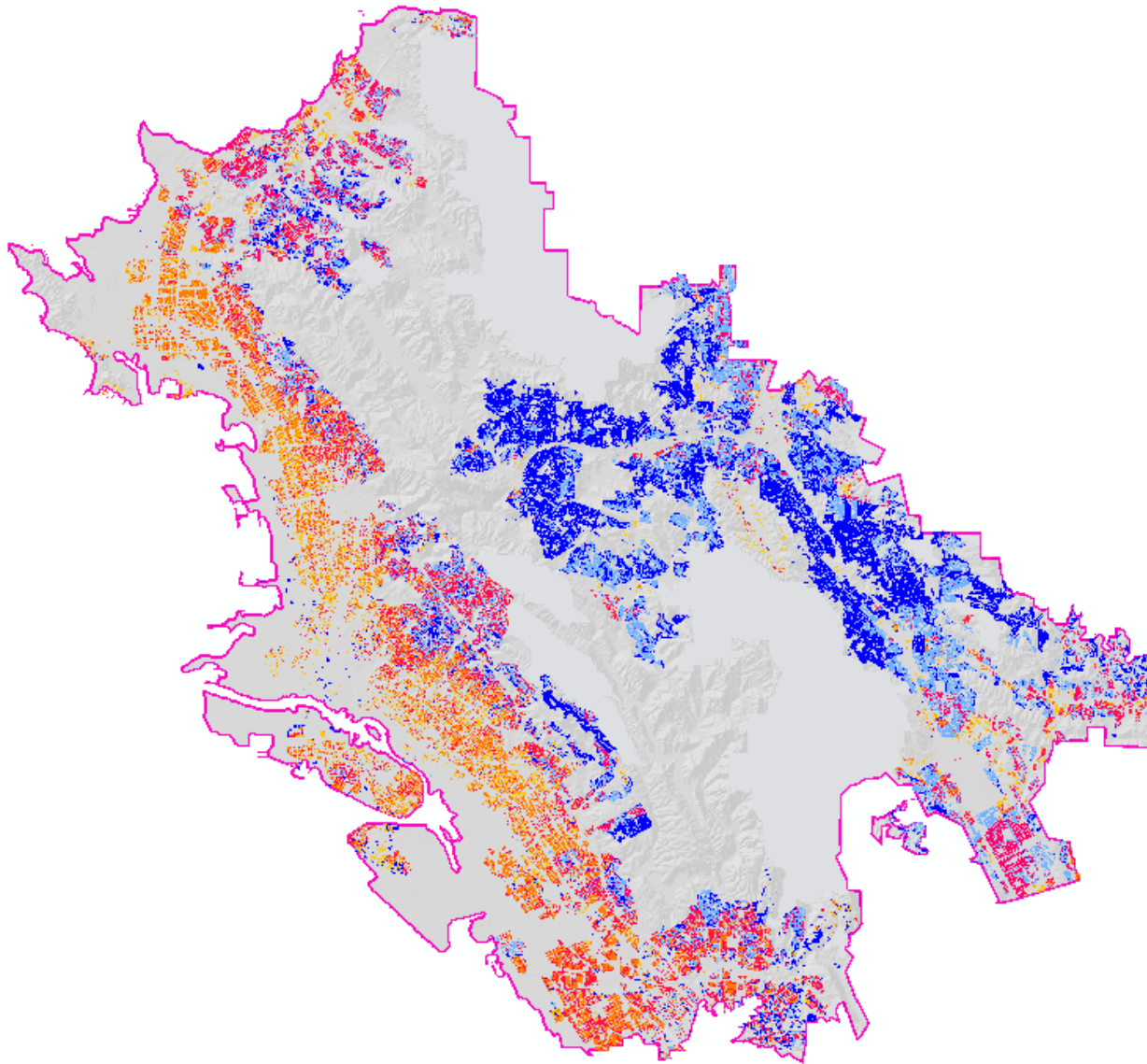
SINGLE FAMILY RESIDENTIAL PARCEL SIZE DISTRIBUTION ACROSS DISTRICT



Lot size (sq. ft.)



324,955 Single-family parcels



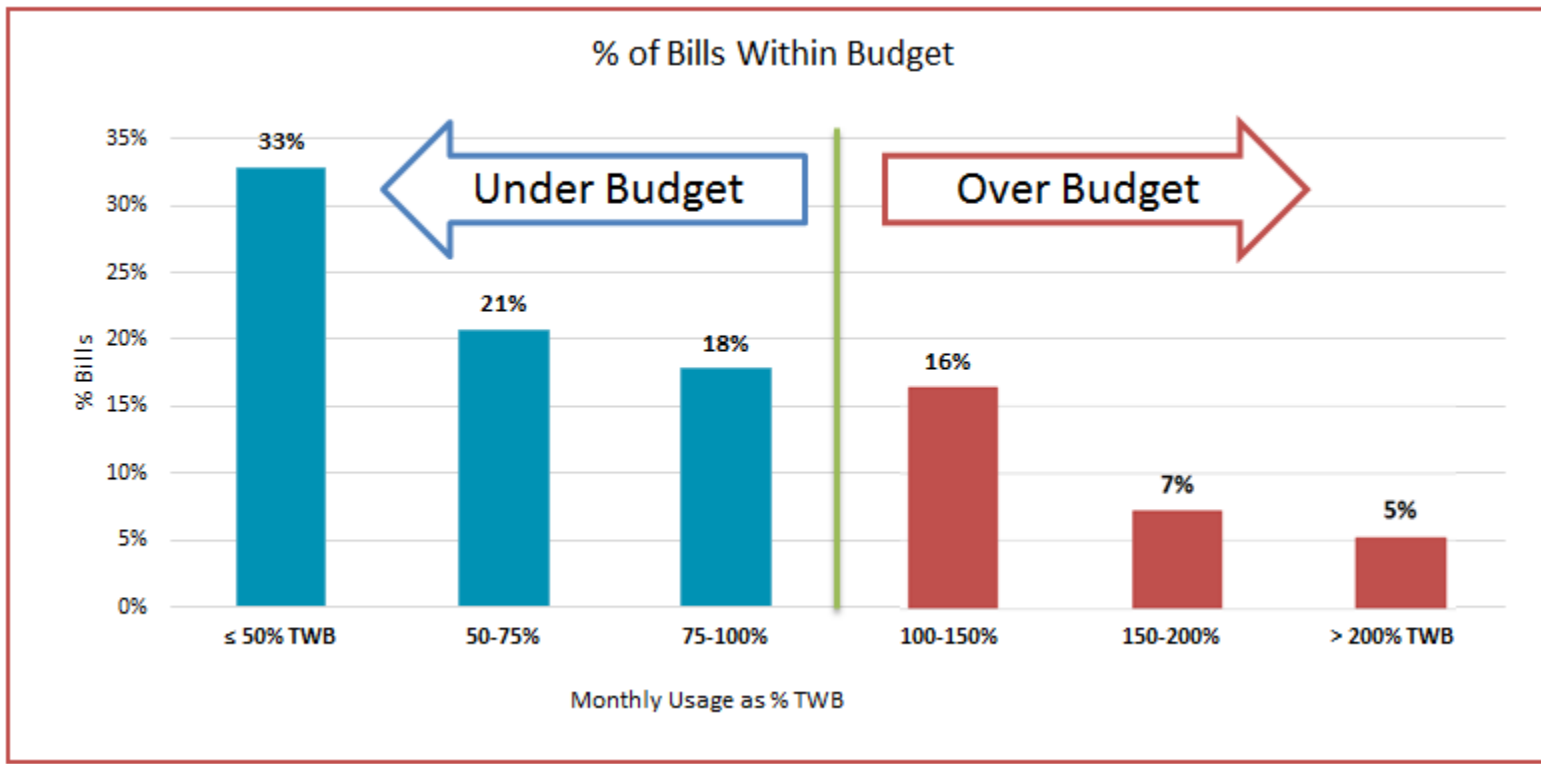
SIMPLIFIED OUTDOOR BUDGET – PROPOSED BIN SIZE AND LANDSCAPE AREA



Parcel size (sqft)		Bin	Average Landscape Area (sqft)	% of Parcels
0 to	3,750	1	700	14%
3,751 to	5,500	2	1,400	32%
5,501 to	6,750	3	2,000	15%
6,751 to	9,500	4	2,500	15%
	9,501+	5	5,000*	24%

*Irrigated area capped at 5,000 sqft for this analysis

SIMPLIFIED OUTDOOR BUDGET RESULTS* - 2013



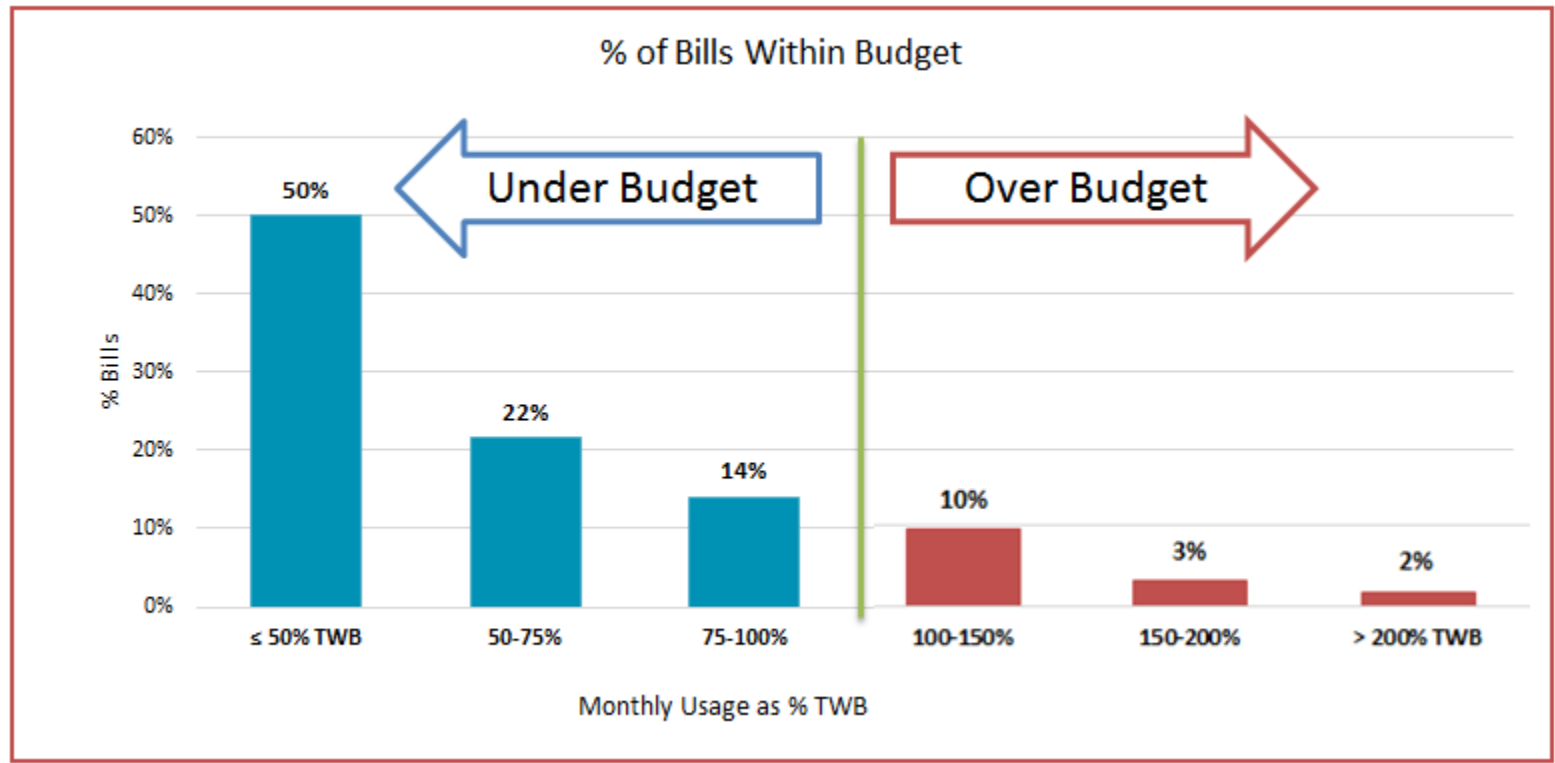
33% of customers use only 50% of their total water budget (TWB)

72% of customers are within Total Water Budget

28% (16+7+5) of customers exceed their total water budget (TWB)

*Analysis without considering customer response to water budget rates

SIMPLIFIED OUTDOOR BUDGET RESULTS* - 2015



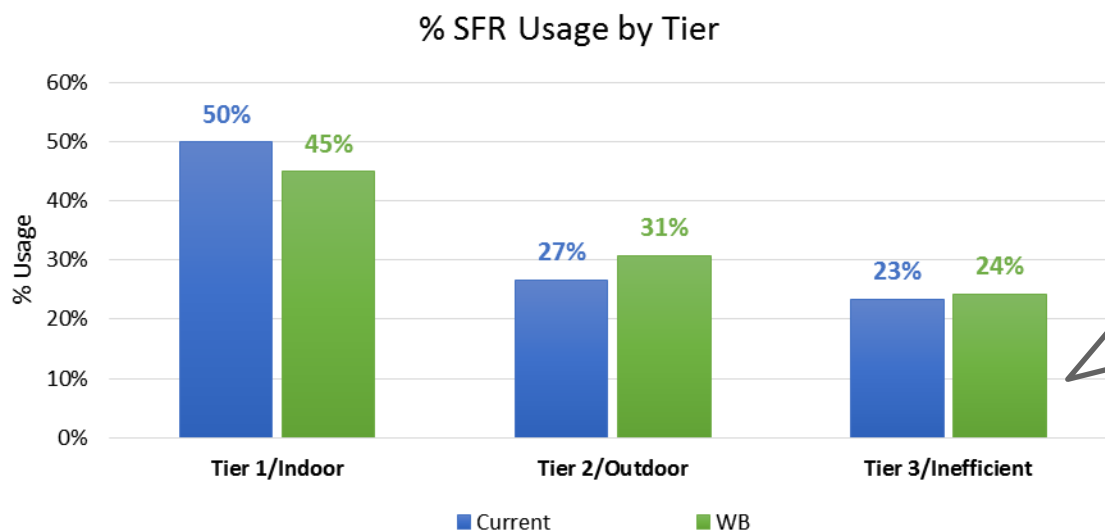
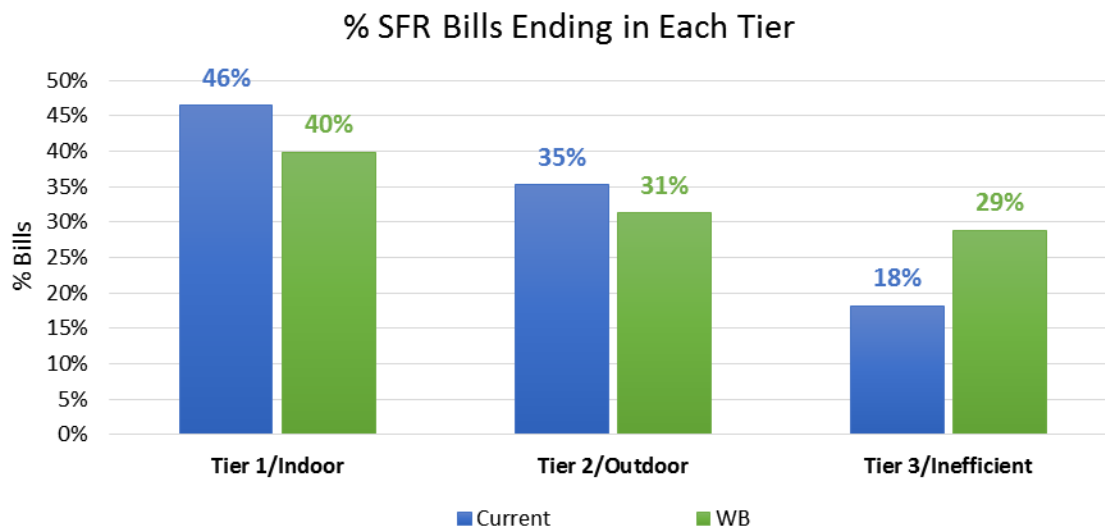
50% of customers use only 50% of their total water budget (TWB)

86% of customers are within Total Water Budget

15% (10+3+2) of customers exceed their total water budget (TWB)

*Analysis without considering customer response to water budget rates

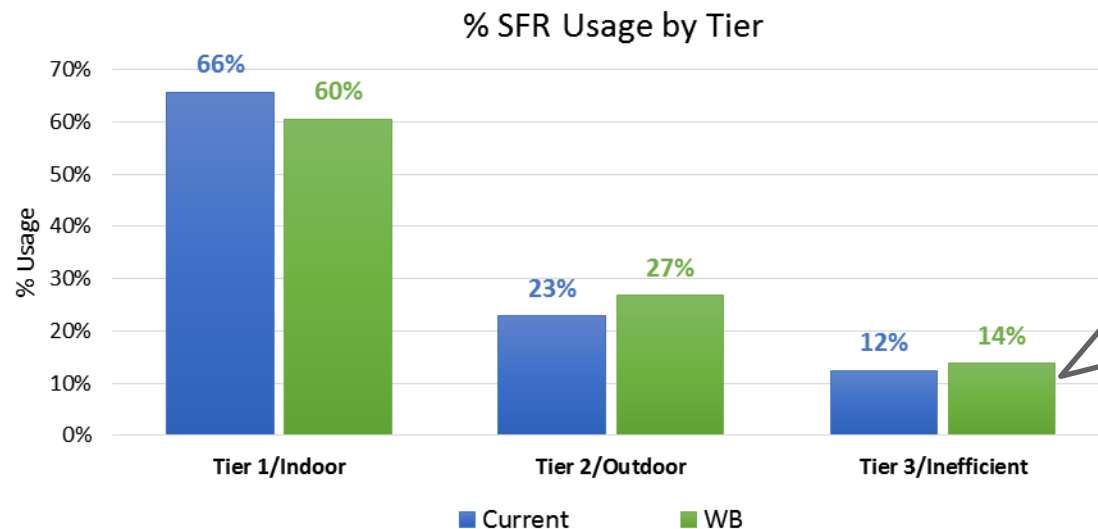
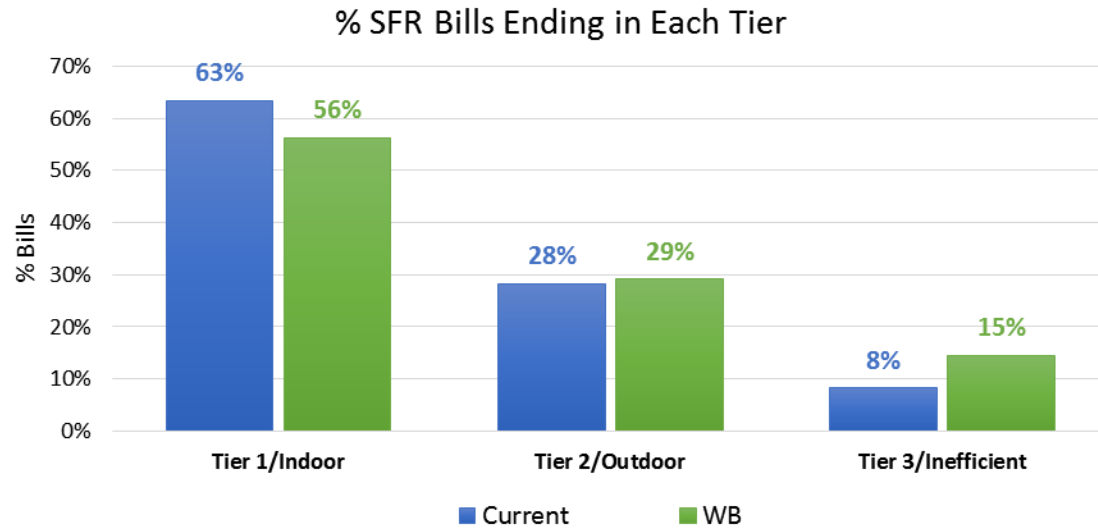
SIMPLIFIED OUTDOOR BUDGET RESULTS - 2013



Overall inefficient water use is about the same as current Tier 3 use

*Analysis without considering customer response to water budget rates

SIMPLIFIED OUTDOOR BUDGET RESULTS - 2015



Overall inefficient water use is about the same as current Tier 3 use

*Analysis without considering customer response to water budget rates

COMPARISON BETWEEN CURRENT AND SIMPLIFIED OUTDOOR BUDGET

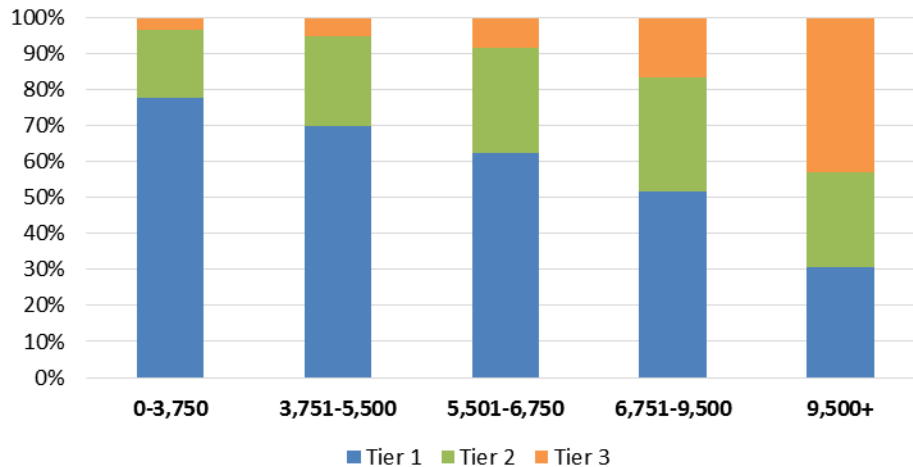


- Total water use by tiers are similar for current and water budget
- Bill distribution by tiers are different
 - ~35% of current Tier 2 customers are considered inefficient
 - ~20% of current Tier 3 customers are efficient
 - Impact on customers varies primarily on bin (parcel) size
- Analysis did not include customer response to rate structure

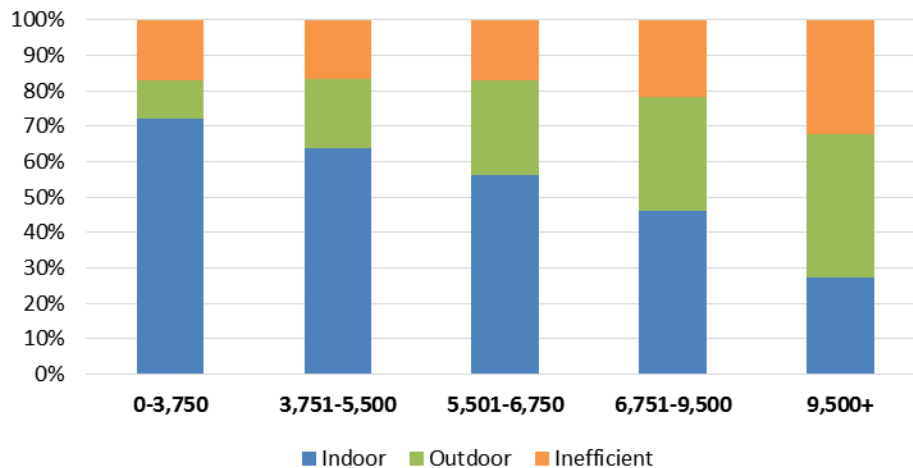
PARCEL SIZE COMPARISON – CURRENT AND SIMPLIFIED BUDGET



Total Service Area - 2013 Current



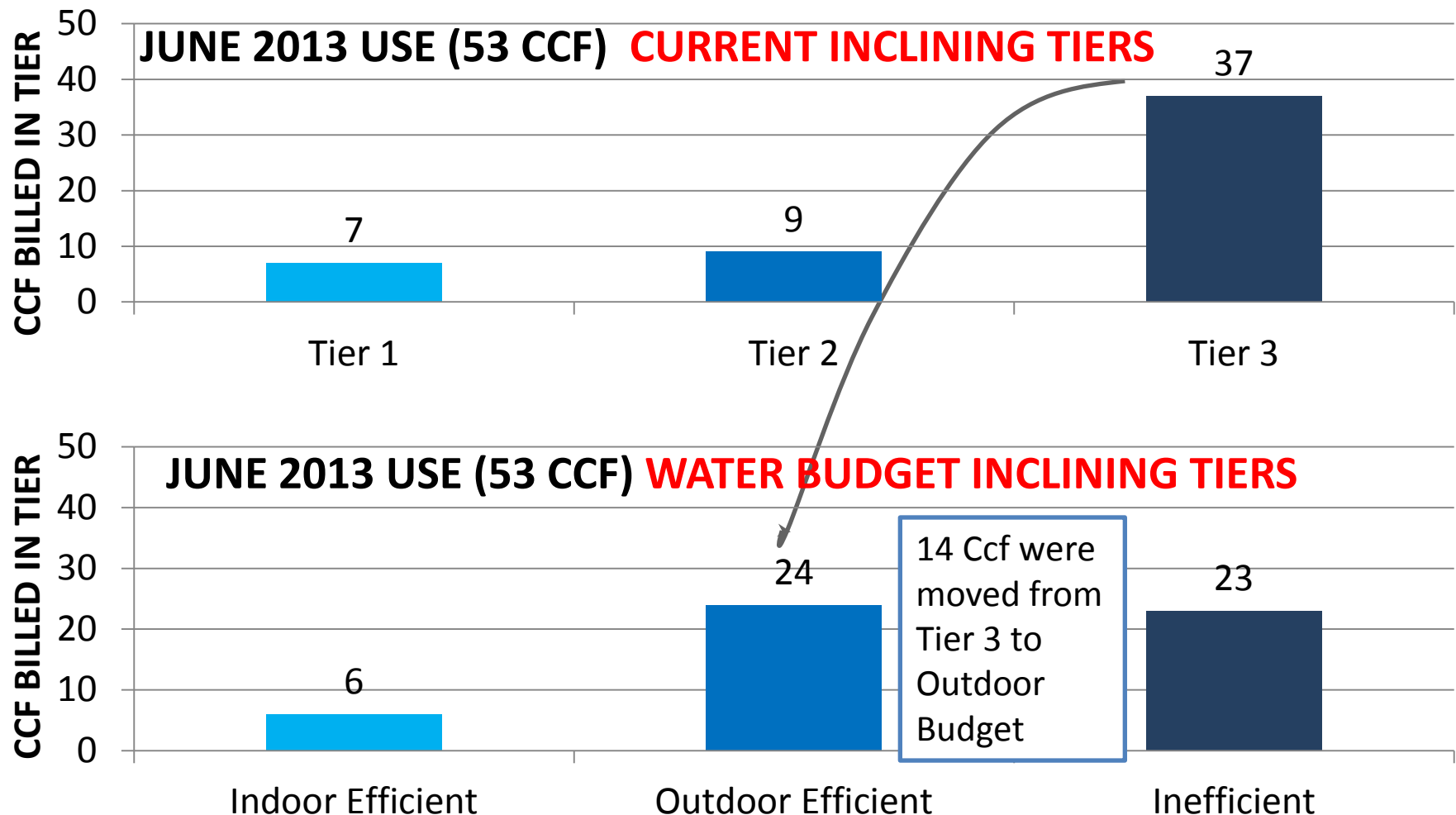
Total Service Area - 2013 Simplified WB



- Current rate structure
 - ~3% of the use for small lots (<3,750 sqft) and ~43% of the use for large lots (9,500+ sqft) are in Tier 3
- Simplified water budget structure
 - ~17% of the use for small lots and ~32% of the use for large lots usage are considered inefficient

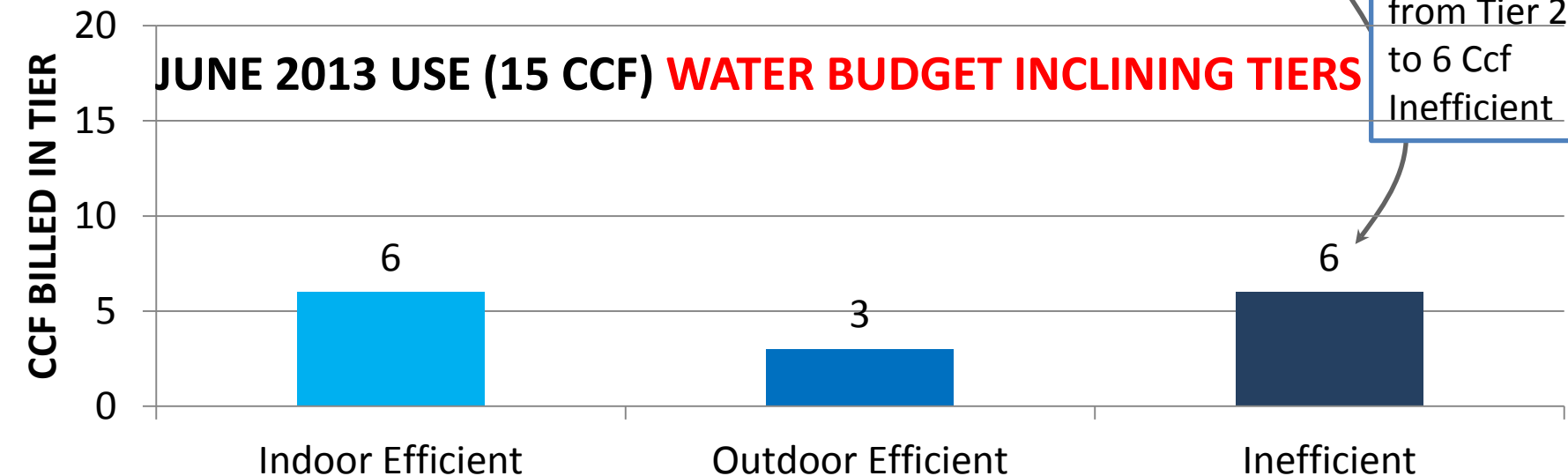
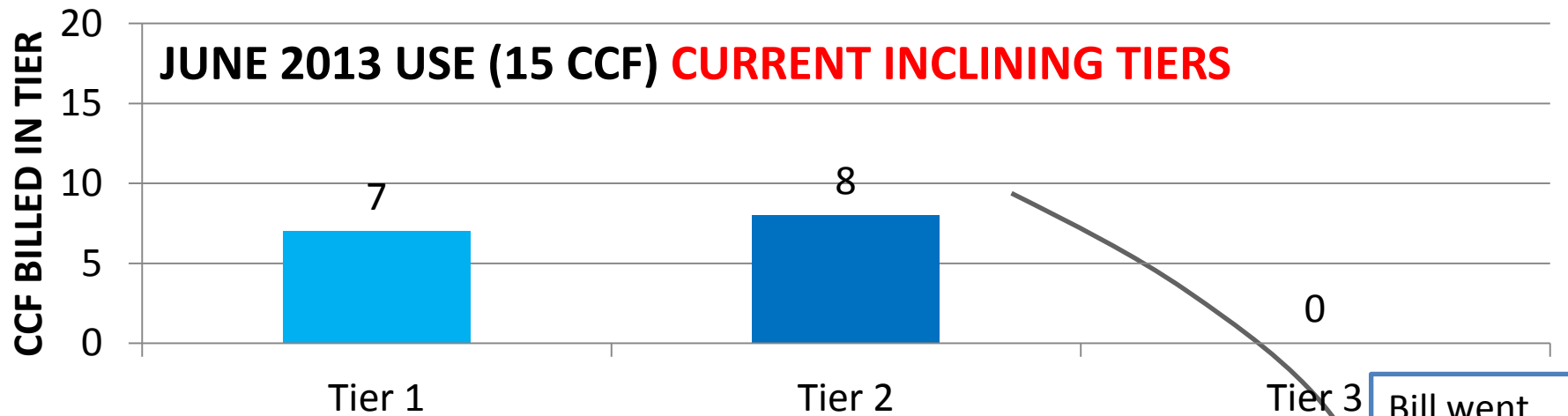
ANALYSIS EXAMPLE: CUSTOMER A

JUNE 2013 USE 53 CCF, 5000 SQFT LANDSCAPE



ANALYSIS EXAMPLE: CUSTOMER B

JUNE 2013 USE 15 CCF, 700 SQFT LANDSCAPE



Bill went from Tier 2 to 6 Ccf Inefficient

SUMMARY OF WATER BUDGET INCLINING TIERED RATES



		CURRENT BASIC	INDOOR WATER BUDGET ONLY	SIMPLIFIED OUTDOOR WATER BUDGET
2013	Total Usage (AF) (no change*)	79,680	79,680	79,680
13	Tier 3/Inefficient Usage (AF)	18,710	20,028	19,339
2015	Total Usage (AF) (no change*)	54,242	54,242	54,242
15	Tier 3/Inefficient Usage (AF)	6,252	6,844	6,892

*Analysis did not include any changes in customer consumption or variance requests as a result of water budget rate structure

COST & TIMING CONSIDERATIONS FOR WATER BUDGETS



- Decision process:
 - Defining goals and objectives
 - Determining budget approach
 - Public outreach
- One time costs:
 - Billing system
 - Cost \$4M \pm \$2M
 - 2 years to implement
 - Customer service – 12 FTE (~\$1.8M)
- Some ongoing FTE costs

CONCLUSIONS



- Water budget rates will impact customers differently
- Based on experiences of other California agencies, potential additional savings up to 3,500 AF (7% in 2015) or higher as customers respond to inefficient use designation

CONCLUSIONS



- Water budgets beneficial for drought messaging
- Costs not unreasonable for anticipated water savings
- Reduced use in Inefficient/Tier 3 will have revenue impacts
 - Currently more than 1/3 of revenue is from Tier 3, reducing Tier 3 use will require rebalancing of SFR rates.
- Must meet Prop 218 requirements

RECOMMENDED NEXT STEPS



- Continue with current water budget related activities
 - Track State efforts on water budget/landscape area
 - Complete Automated Meter Infrastructure (AMI) pilot and plan
 - Expand EBMUD Home Water Report programs
 - WaterSmart
 - IRIS
- Water budgets would benefit from integration with these programs over the next 5+ years
- **Recommend continued review and planning as these programs are implemented in the coming years**

Q & A