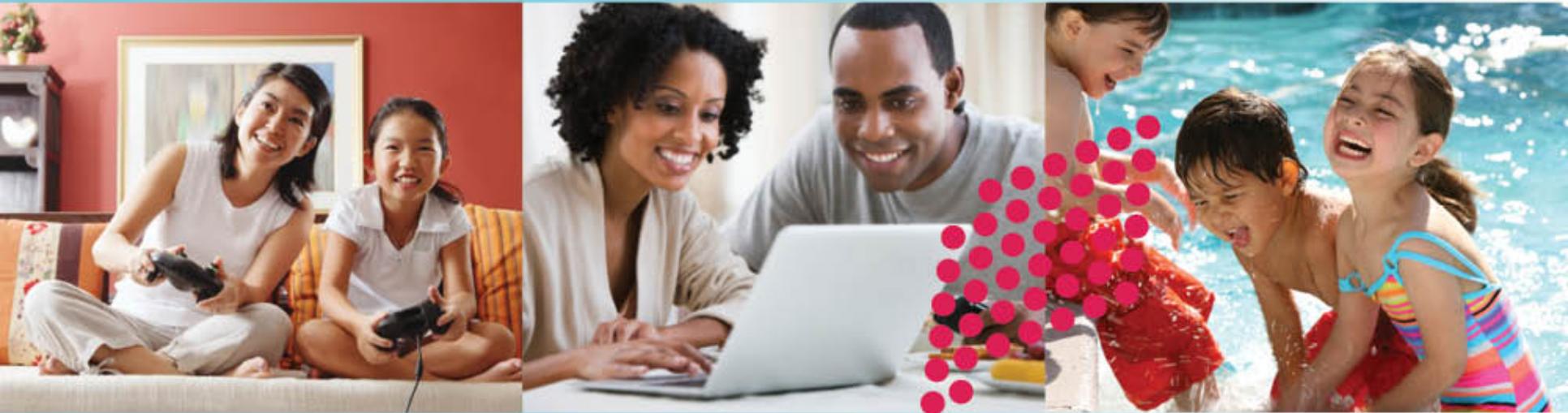


Water Energy Nexus (WEN)

Past, Present, Future



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Speaker: Kelvin Valenzuela

Agenda

- Introductions
- CPUC Decision 15-09-023
- WEN data set vs Ex Ante Data (EAD) tables
- CPUC Staff and EAR Team involvement
- 2019 Updates
- Issues with CPUC (WEN) Calculator
- Questions

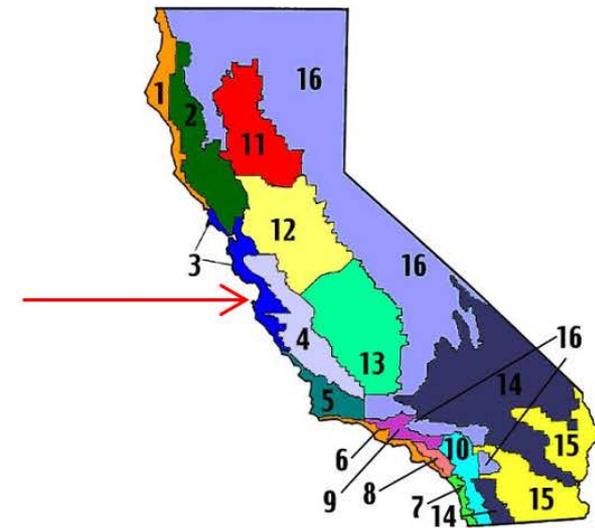
Background – Where did WEN come from?

- Governor Brown
 - On January 17, 2014 declared a Drought State of Emergency
 - In 2016, issued Executive Order B-37-16 directing California to, prioritize and take concrete, measurable actions that “Make Conservation a California Way of Life” and “Manage and Prepare for Dry Periods” in order to improve use of water in our state.
- State Regulatory Departments
 - The California Energy Commission (CEC) and Department of Water Resources have solicited and developed more programs targeting the water–energy nexus, not only to conserve water and energy but also to reduce GHG emissions.
 - California Public Utilities Commission (CPUC) also has same interest and wanted to determine the potential benefits of evaluating embedded energy impacts associated with water conservation measures.
 - D.15-09-023 was released dated September 17, 2015

- “Decision regarding tools for calculating the embedded energy in water and an avoided capacity cost associated with water savings”
- CPUC has had tools but only taken account for site-specific energy savings to the customer (i.e. reduced need for energy to heat water on site).
 - Low-flow showerhead decreases hot-water consumption, which decreases the need for gas or electricity to heat the water
- CPUC contracted Navigant Consulting to develop new tools.
- Water-Energy Nexus Calculator (W-E Calculator)
 - Evaluates energy benefits associated with moving and treating water, along with related indirect off-site energy impacts.
 - Evaluates energy benefits associated with conservation of cold water saving measures as well as off-site hot water savings.
 - Ex. Low-flow showerheads also reduce cold-water use – embedded savings

Hydrologic Regions (Data Set)

95020	4
95023	4
95030	4
95032	4
95033	4
95035	4
95037	4
95039	3
95043	4
95045	4
95046	4
95050	4
95051	4
95053	4
95054	4
95060	3



The California Energy Commission (CEC) Climate Zone places Moss Landing's zip code (95039) in Climate Zone 3 as shown on the very left.

Secondly, the 10 hydrological regions are depicted in the middle, where portions of Moss Landing's zip code map to the San Francisco Bay hydrological zone while the majority of the zip code maps to the Central Coast hydrological zone.

Lastly, the 16 CEC Climate Zones are shown on the right where Moss Landing would be mapped to Climate Zone 3.

W-E Calculator v1.05 – Output (Data Set)



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WEN Workpaper-PGE-CPUCWaterEnergyCalculator-Clothes-g25-L.xlsx

1 Average Embedded Energy and Avoided Cost of Embedded Energy

Note: all metrics are on a per unit basis (Example: per low-flow shower head)

Measure ID#	Measure Name	Average Annual Embedded IOU Electric Energy (kWh)	Average Annual Embedded Non-IOU Electric Energy (kWh)	Average Annual Embedded Gas Energy (therms)	Avoided IOU Electric Energy Cost (2014\$)	Avoided Gas Energy Cost (2014\$)
1	Energy Star most Efficient clot	3.20	0.24	-	\$3.53	\$ -
2	Energy Star most Efficient clot	3.72	0.96	-	\$4.02	\$ -
3	Energy Star most Efficient clot	3.53	1.08	-	\$3.53	\$ -
4	Energy Star most Efficient clot	3.56	6.35	-	\$3.53	\$ -
5	Energy Star most Efficient clot	2.64	0.20	-	\$3.07	\$ -
6	Energy Star most Efficient clot	2.71	0.30	-	\$3.07	\$ -
7	Energy Star most Efficient clot	2.74	0.70	-	\$3.07	\$ -
8	Energy Star most Efficient clot	2.83	0.20	-	\$3.07	\$ -
9	Energy Star most Efficient clot	3.37	2.60	-	\$3.53	\$ -
10	Energy Star most Efficient clot	2.57	0.44	-	\$3.07	\$ -
11		-	-	-	-	-
12		-	-	-	-	-
13		-	-	-	-	-
14		-	-	-	-	-
15		-	-	-	-	-
16		-	-	-	-	-
17		-	-	-	-	-
18		-	-	-	-	-
19		-	-	-	-	-
20		-	-	-	-	-
Total		30.86	13.05	-	\$ 33.45	\$ -

WEN Data Set vs. EAD Tables

- Reporting Proposal for Water-Energy Nexus Measures Workpaper

To capture the relationship between the on-site savings and embedded savings from a water measure, the team created a WaterMeasure table, which, like the CustomMeasure and DeemedMeasure tables, has a 1-to-1 relationship with the Claim table.

Table 1. Proposed Water Measure Table

WaterMeasure	
	ClaimID: nvarchar(255)
	WaterMeasCode: nvarchar(255)
	WaterSavingsProfile: nvarchar(255)
	HydrologicRegion: nvarchar(255)
	WaterSector: nvarchar(255)
	WaterUseCategory: nvarchar(255)
	Gallons: float(53)
	AvgAnnualIOUkWh: float(53)
	AvgAnnualNonIOUkWh: float(53)
	AvgAnnualTherm: float(53)

Each Claim requires either a CustomMeasure or a DeemedMeasure record, and water-saving measures can be either Deemed or Custom measures. Claims that are water-saving measures also need a WaterMeasure 'sister' record, linked by the ClaimID. The WaterMeasure table contains the key inputs and outputs from Navigant's Water-Energy Calculator.

SDG&E's bi-weekly meeting with CPUC Staff (dated - 11/16/2016):

Energy and Water Nexus Tool status update

- Workpaper development (KV – Kelvin Valenzuela (SDG&E); KM – Kevin Madison (EAR Team); PF – Pete Ford(SDG&E); PG – Paula Gruendling(CPUC))
 - KV: SDGE is the lead IOU for the WP. We have complete runs and looking to go over the progress. We are looking to EAR team on our progress with respect to WEN Tool. We have both cost and impacts, for those measures that have been developed. These are riders for measures that are already in place.
 - KM: We are not involved with secondary Nexus savings; done by other CS working group. PG and Amy passed a summary for the secondary benefits and claiming water savings only. We are not going to be involved with the water savings claims. IOUs will need cost for those measures because you have to run cost effectiveness. I don't know if we are going to review any of Nexus tools and impacts. We don't have any plans to add measure to Ex-ante db and it will be a side bar process.
 - PF: For those measure that are already in READI / DEER. We are looking at a flat file that has all the savings. The savings is based on the calculator that includes all hydro zones for all the IOUs. We did to want to blind-side you because it has 1800 records. It's a separate db for CEDARS reporting. I'm assuming you will pass it on the other CS.
 - PG: Are you planning to submit a WP? We are not planning to do any planning on the Nexus tool. I have to discuss internally with other CS, Rory.
 - KV: Yes, plan to file WP by Year end.

2019 WEN Updates

- Rerunning the different combination/permutation for:
 - MWD commercial large rotary nozzle savings were corrected.
 - Applicable MWD outdoor measures were updated from urban to agricultural sector.
- Master spreadsheet was updated to correct typos on naming on worksheets.
- Master List Measures includes 110 WEN measures
 - Including 3,300 permutations

Issues with W-E Calculator

- Issue Statements
- Whether changing the Marginal Supply of Water within the WEN calculator rises to the level of departing from the default values approved by the CPUC in D.15.09.023?
- Whether the WEN Calculator is correctly calculating the Annual Embedded IOU Electric Energy Savings?
- Whether the use of the WEN Calculator should be reconsidered to a more simplified version of the calculator?

WEN Calculator Usage Reconsideration

April 18, 2017

Future Updates

- W-E Calculator Update
 - Jessica Allison’s project plan includes
 - Release of draft calculator scheduled for May 2020
 - Update guidance document
 - Allow for stakeholder feedback
 - Finalize calculator by January 2021

- 2020 WEN Workpaper Update
 - Once all 2020 statewide workpapers that relate to WEN measures are approved, the WEN workpaper will update the embedded water savings.



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Questions?