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California Investor Owned Utilities Comments on Irrigation Controllers

Additional submitted attachment is included below.



February 7, 2024

California Energy Commission
Docket Unit, MS-4
Docket No. 17-AAER-10
715 P Street
Sacramento, California 95814

Topic: Landscape Irrigation Controllers
TN Number: 253050

Dear Commission Staff,

This letter comprises the comments of the Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric (SDG&E), and Southern California Edison (SCE), collectively referred to herein as the California Investor-Owned Utilities (CA IOUs), in response to the California Energy Commission (CEC) regarding the Staff Analysis of Proposed Efficiency Standards for Landscape Irrigation Controllers (Staff Report).

The CA IOUs comprise some of the largest utility companies in the nation, serving over 32 million customers in the Western U.S. We are committed to helping customers reduce energy costs and consumption while striving to meet their evolving needs and expectations. Therefore, we advocate for standards that accurately reflect the climate and conditions of our respective service areas.

We respectfully submit the following comments:

1. The CA IOUs recommend the CEC incorporate additional analysis into the Staff Report.

The CA IOUs commend the CEC staff for their work on this proposal, which is an important step toward realizing significant water savings from landscape irrigation controllers. This regulation will complement other state water efficiency efforts, described in more detail in Appendix A, and consideration of this proposal with other related efforts should be factored when assessing regulatory impact. Furthermore, to strengthen this proposal, we recommend that the CEC refine the Staff Report to include additional analyses on water savings, energy impacts, and non-residential sector savings.

The Staff Report does not quantify potential costs and water savings attributable to soil moisture sensor-based controllers. Instead, the report only considers the costs and benefits of weather-based irrigation controllers as they are assumed to represent most of the compliant products on the market. The proposed regulation scope includes simple products like hose-bib and battery-operated controllers that are currently not widely available with weather-based control features; however, these products may be able to interface with a soil moisture sensor. Therefore, the proposed regulation may increase the market share of soil moisture sensor-based controllers. We recommend the CEC quantify the anticipated market share, costs, and benefits of soil moisture sensor-based controllers compared to

weather-based irrigation controllers. We further recommend the CEC include estimates of incremental costs, water savings, product lifetime, and other assumptions to show the cost effectiveness of soil moisture-based landscape irrigation controllers. We suggest adding the changes to Tables 7-1 and 7-2 to contrast with savings from weather-based irrigation controllers.

In addition to including data for soil moisture sensor-based controllers, we recommend the CEC bolster the water savings analysis in the Staff Report to include newer data from studies of landscape irrigation controllers. Additional studies for the CEC to consider are listed in Appendix B.

The CA IOUs recommend the CEC analyze the energy impacts of compliant landscape irrigation controllers. Although the report finds significant embedded energy savings, it notes that compliant products “typically result in higher standby power consumption.”¹ Irrigation controllers that use onsite soil moisture sensors to inform their irrigation schedules typically draw more standby power than non-compliant basic irrigation timers. However, products that rely on an internet connection to access weather data may use a similar amount of energy as basic controllers. We recommend that the CEC quantify the proposed standard’s energy impacts and that the CEC addresses irrigation controller energy use promptly via the CEC low-power mode roadmap program.

Finally, we note the baseline annual average water use value cited in the report is for single-family homes.² The proposed regulation scope includes central irrigation control systems typically used in large, non-residential landscapes like commercial office parks, golf courses, or schools. Moreover, the cited percentage of water savings estimated for weather-based irrigation controllers is based on an aggregation of studies that includes commercial landscapes. We recommend the CEC update the water savings analysis to account for water used and saved at non-single-family home landscapes, including commercial and institutional landscapes. This update would better align the savings analysis with the regulation scope and underlying savings assumptions.

2. The CA IOUs recommend the CEC update the Staff Report and proposed regulatory language to align with the provisions in the U.S. EPA WaterSense® specifications for weather-based and soil moisture sensor-based controllers.

The proposed regulation generally follows the United States Environmental Protection Agency WaterSense® (EPA WaterSense) specifications for weather-based and soil moisture sensor-based controllers. However, we suggest that the CEC rectify the key differences between the CEC proposal and the EPA WaterSense specifications to ensure market clarity. The CA IOUs support alignment with these specifications, which were developed via a process that solicited wide input from relevant stakeholders.

The EPA WaterSense Specification for Weather-Based Irrigation Controllers includes definitions for:

- Add-on devices – weather-based controls compatible with multiple brands that are designed to be added on to a base controller without this functionality,
- Plug-in devices – weather-based controls compatible with a single brand that are designed to be added on to a base controller without this functionality, and

¹ Soheila Pasha and David U. Johnson, “Staff Analysis of Proposed Efficiency Standards for Landscape Irrigation Controllers,” *California Energy Commission*, November 2023, p. 36, <https://efiling.energy.ca.gov/GetDocument.aspx?tn=253050&DocumentContentId=88249>.

² Ibid, Table A-1.

- Stand-alone controllers – irrigation controllers for which weather-based control is an integrated capability.

The CEC’s Staff Report and proposed regulatory language would benefit from further clarification on how these controller configurations align with the regulation scope. We recommend adding definitions for “base,” “add-on,” “plug-in,” and “stand-alone irrigation controllers” and more clearly stating the allowable configurations under the proposed regulation, the testing procedures for each controller type (if applicable), and the irrigation control system components subject to testing and certification. The staff proposal should align with the EPA WaterSense specification for ease of manufacturer and consumer understanding.

Similarly, the EPA WaterSense Specification for Soil Moisture-Based Irrigation Controllers also differentiates between add-on, plug-in, and stand-alone devices. Furthermore, the WaterSense specification uses a more precise definition for soil moisture-based irrigation controllers that differs from the CEC proposal’s definition. This specification defines soil moisture-based irrigation controllers as including a sensor mechanism (the portion of the device that contacts the soil and measures soil properties) and an interface device (the portion of the device that enables/disables irrigation events or transmits soil water information to a control system for irrigation decision-making). These distinctions are important for soil moisture sensor-based controllers, as they are not commonly stand-alone products with the irrigation interruption feature integrated into the base controller. Instead, the separate sensor and interface device provide this irrigation interruption capability, as evidenced by the lack of certified “stand-alone” soil moisture sensor-based controllers in the WaterSense product database; only add-on or plug-in sensor/interface devices that add this capability to base controllers are certified. As written, one could interpret the CEC’s proposed definition for “soil moisture-based landscape irrigation controller” to mean that the timing device must be able to turn irrigation on or off with integrated features and without using a separate interface device. This interpretation would not permit the sale of packaged products with a base controller, sensor mechanism, and separate interface device to comply with the standard. We recommend revising the soil moisture-based landscape irrigation controller definition to align better with WaterSense and reflect the operation of currently available products.

The WaterSense soil moisture sensor-based controller specification and the CEC’s proposed test procedure for these controllers do not apply to on-demand soil moisture sensor products that initiate irrigation at a lower preset soil moisture level and terminate irrigation at an upper preset soil moisture level. Because the specified test procedure does not address these products, we recommend excluding them from the regulation scope.

3. The CA IOUs recommend the CEC refine the proposal scope.

We recommend the CEC collaborate closely with stakeholders to refine the proposal scope and provide more clarity. For example, as noted above, the CEC proposal aligns with WaterSense performance levels and test procedures, but the proposal scope does not explicitly align with the scope of the WaterSense specifications.

The scope includes battery-operated and hose-bib controllers, but few could comply with this standard by the proposed effective date. Without available weather-based controls, these controllers require a compatible soil moisture sensor to be compliant. However, not all manufacturers of battery-operated or hose-bib controllers manufacture a compatible soil moisture sensor. If these products are included in

the scope, the CA IOUs recommend a later effective date for these products to ensure that battery-operated and hose-bib products remain available to California consumers.

The proposal reports savings for single-family home landscapes, but the proposed scope includes central irrigation control systems used for large landscapes. The CA IOUs ask that the analysis consider the feasibility of including these systems. If they are included in the scope, they should be accounted for in the regulation's cost-benefit analysis.

Although the proposal excludes irrigation controllers used for agricultural crops, it does not describe features that differentiate an agricultural irrigation controller from a landscape irrigation controller. Products for small agricultural sites and those used for larger non-residential landscapes may overlap, which is particularly relevant for central irrigation control systems. The proposed standard could be improved by identifying design features to separate out-of-scope agricultural products from in-scope products. Collaboration with stakeholders to refine the scope would alleviate the burden on agricultural irrigation controller manufacturers that could result from their unnecessary compliance with the proposed landscape irrigation controller standards.

4. The CA IOUs recommend the CEC form a workgroup with manufacturers, advocates, and landscape industry stakeholders to review the proposal further.

The CEC last publicly engaged with stakeholders on this topic in December 2019. Since then, updated test procedures for soil moisture sensor-based and weather-based controllers were finalized and incorporated into new and updated WaterSense specifications. New irrigation controller products have become available, and the market share of controllers with “smart” features has increased in California. Considering the current market situation and feedback from stakeholders who attended the December 11, 2023, CEC workshop, we recommend the CEC form a workgroup that includes manufacturers, advocates, landscape industry professionals such as growers, nurseries, contractors, landscape architects, and other interested stakeholders to review the proposal in more detail and resolve the outstanding issues raised by stakeholders during this process. For example, opportunities exist to clarify the proposal scope and definitions and align with related efforts, such as updates to California's Model Water Efficient Landscape Ordinance. By closely engaging with stakeholders, the CEC can make iterative changes to the proposal and quickly address outstanding issues.

5. The CA IOUs recommend specific editorial changes to the proposal.

In addition to the general recommendations above, we offer feedback on specific sections of the proposal for CEC consideration in Appendix C of this letter.

The CA IOUs appreciate the opportunity to provide these comments regarding the Staff Analysis of Proposed Efficiency Standards for Landscape Irrigation Controllers. We thank the California Energy Commission for its consideration. We look forward to the next steps in the process.

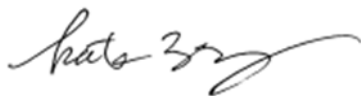
Sincerely,

A handwritten signature in black ink that reads "Michael Burger". The signature is written in a cursive style with a long horizontal stroke at the end.

Michael Burger
Senior Manager, Energy Efficiency
Pacific Gas and Electric Company

A handwritten signature in black ink that reads "Christopher Malotte". The signature is written in a cursive style with a long horizontal stroke at the end.

Christopher Malotte
Sr. Manager, Codes and Standards
Southern California Edison

A handwritten signature in black ink that reads "Kate Zeng". The signature is written in a cursive style with a long horizontal stroke at the end.

Kate Zeng
ETP/C&S/ZNE Manager
Customer Programs
San Diego Gas & Electric Company

Appendix A: Complementary Water Efficiency Regulations for CEC Consideration

Assembly Bill 1573³ was finalized in October 2023, prohibiting the use of potable water for irrigating non-functional turf located on commercial, industrial, and institutional properties or in common interest developments or similar entities in California. This legislation requires property owners to certify their compliance with this law, risking penalties for noncompliance. This legislation may eventually reduce the number of irrigated landscapes in non-residential settings, and it could reduce irrigation of landscapes like median strips that may rely on a battery-operated irrigation controller.

Additional water efficiency developments include efforts stemming from Senate Bill 606 and Assembly Bill 1668 (2018), which called for retail water suppliers to further increase urban water efficiency in indoor and outdoor uses and reduce the volume of treated drinking water lost to distribution system leaks. The State Water Resources Control Board (State Board) released draft regulations⁴ specifying the extent of these customized reductions in August 2023, but these regulations are not yet finalized. The CA IOUs recommend that these efforts be tracked to evaluate how the landscape water budgeting required under the State Board regulations may affect the CEC proposal.

These draft regulations would require retail water suppliers to maintain actual water use at or below an Urban Water Use Objective mandated by the state, including several compliance calculations. A primary focus for compliance will be significant reductions in outdoor landscape irrigation water use for residential and commercial properties.

For residential outdoor water use, the proposed standard includes an aggregate water budget consisting of a water supplier's landscape area multiplied by a climate factor to account for various climates across California and then multiplied by an efficiency standard. Per the proposal, the calculation for a supplier's annual outdoor water budget is as follows:

$$\text{Outdoor Residential Water Budget (gal/yr)} = \text{LAM} \times \text{LEF} \times (\text{ET}_o - \text{P}_{\text{eff}}) \times 0.62$$

Where: LAM = Landscape Area Measurement (square feet)
 LEF = Landscape Efficiency Factor (percentage)
 ET_o = Reference Evapotranspiration (inches per year)
 P_{eff} = Effective Precipitation (inches per year)
 0.62 = Conversion factor to gallons per year

With the implementation of the regulation, the landscape efficiency factor (LEF) will reduce sharply over time:

- Beginning July 1, 2023, the LEF will be 0.80.
- Beginning July 1, 2030, the LEF will be 0.63.
- Beginning July 1, 2035, the LEF will be 0.55.

Communities with existing turf landscapes will find it difficult to reach the lowest LEF values. If enacted as proposed, the regulations may spur communities to change their irrigation practices. The CA IOUs recommend that these potential regulations be considered when assessing the future impact of the proposed CEC regulation.

³ Assembly Bill 1572, October 2023, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240AB1572

⁴ Proposed Regulation Text, State Water Resources Control Board, August 2023, <https://www.waterboards.ca.gov/conservation/regs/docs/2023/proposed-reg-text-081723.pdf>

Appendix B: Additional Landscape Irrigation Controller Studies for CEC Consideration

Title/Link	Author/Year	Summary
Smart Irrigation Controllers in Residential Applications and the Potential of Integrated Water Distribution Systems	Nathan T. Lunstad and Robert B. Sowby, 2023	• Reviews the body of research on residential smart irrigation controllers and their effectiveness • Finds that smart controllers reduce water demand by 15% in general and by 40% for high water users • Includes information on various types of irrigation controllers, including weather-based and soil moisture sensor-based irrigation controllers • Appendix includes 80 reviewed studies on residential applications of smart irrigation controllers
Two Decades of Smart Irrigation Controllers in U.S. Landscape Irrigation	Michael D. Dukes, 2020	• Literature review that summarizes smart irrigation controller research studies and pilot implementations • Finds that when studies report positive water savings, average savings are 51% for plot studies and 30% for residential studies • Negative reported savings are often due to smart controllers installed on sites with little excess irrigation or controller programming not optimized for savings
Large Landscape Urban Irrigation: A Data-Driven Approach to Evaluate Conservation Behavior	Kimberly J. Quesnel and Newsha K. Ajami, 2018	• Provides insights on water use and conservation at sites with large landscapes
A Comparative Study of the Water Budgets of Lawns Under Three Management Scenarios	Neeta S. Bijoor, Diane E. Pataki, Darren Haver, James S. Famiglietti, 2014	• Field test that provides insights on the effect of different types of smart irrigation systems on water savings across three different landscape types
Implementing Landscape Water Conservation in Public School Institutional Settings: A Case for Situational Problem Solving	Douglas C. Kilgren, Joanna Endter-Wada, Roger K. Kjelgren, and Paul G. Johnson, 2010	• Focuses on institutional landscape settings • Evaluates water conservation interventions at schools, controlling for type of irrigation system (manual versus automated)

Appendix C: Recommended Editorial Changes to the Proposed Regulatory Language

Section	Text	Comment
1602(x)(3)	Combined Landscape Irrigation Controller	“Combined landscape irrigation controller” definition complicates the proposal, and this device is not commonly sold. Recommend deleting the definition and instead certifying products by product type per 1606(a)(1)(D).
1602(x)(3)	Reference weather station	To improve clarity, change “licensed certifying body” to “manufacturer or testing laboratory.” The licensed certifying body is an EPA WaterSense term for the entity that performs certifications for the WaterSense program. The CEC proposal does not require participation in the WaterSense certification program.
1602(x)(3)	Soil moisture-based landscape irrigation controller	Align with EPA WaterSense definition for soil moisture-based irrigation controllers, including sensor mechanism and interface device definitions.
1602(x)(3)	Soil-moisture mode	Clarify sensor mechanism type by adding “soil moisture,” i.e., “Soil-moisture mode” means the operating mode in which the landscape irrigation controller uses readings from the <u>soil moisture</u> sensor mechanism to modify the irrigation schedule.
1602(x)(3)	Soil moisture sensor mechanism	Clarify the word “device” to specify what device the soil moisture sensor mechanism is a portion of.
1602(x)(3)	Weather-based landscape irrigation controller	Clarify if subsections 1-4 create prescriptive standards for a controller to be a “Weather-Based Landscape Irrigation Controller” per the proposed section 1605.3(x)(2)(A).
1602(x)(3)	None	Add new definitions for “base controller,” “add-on device,” “stand-alone device,” and “plug-in device” consistent with the EPA WaterSense Specification for Weather-Based Irrigation Controllers, Version 1.1. Describe what devices are within the scope of proposal. If add-on and plug-in devices are included, testing and certification requirements should be updated.
1602(x)(3)	None	Add a new definition for “basic model” of a landscape irrigation controller that aligns with the description in Section 3.2.2.5 of the Supplemental Guidance for WaterSense Certification and Labeling of Weather-Based and Soil Moisture-Based Irrigation Controllers. ⁵ The regulation could then allow manufacturers to test one “basic model” of a controller product line for certification (instead of every potential product configuration) where controller product finish and non-substantive product differences do not impact baseline product water or energy consumption.

⁵ U.S. Environmental Protection Agency, “Supplemental Guidance for WaterSense® Certification and Labeling of Weather-Based and Soil Moisture-Based Irrigation Controllers,” *EPA WaterSense*, February 2021, p. 5, <https://www.epa.gov/sites/default/files/2017-01/documents/ws-products-guidance-cert-labeling-irrigation-controllers.pdf>.

Section	Text	Comment
1602(x)(3)	None	For clarity, add a new definition for “irrigation zone” to support use of “zone” for certification and testing requirements. Definition per ASABE S627: <u>Irrigation zone means a section of an irrigation system served by a single control valve for distribution of water to a defined target area.</u>
1604(x)(2)(C)	Test method for combined landscape irrigation controller	Recommend removing this section. It is unnecessary since a landscape irrigation controller that can perform the function of a weather-based irrigation controller and a soil moisture-based irrigation controller can be certified as each under section 1606(a)(1)(D).
1605.3(x)(2)	Landscape Irrigation Controller Standards	Suggestion to organize standards to state the following and remove provisions for “combined landscape irrigation controller”: (2) Landscape Irrigation Controllers. Landscape irrigation controllers manufactured on or after January 1, 2025, shall comply with all of the following requirements: (A) Shall be either a weather-based landscape irrigation controller or a soil moisture-based landscape irrigation controller. (B) Weather-based landscape irrigation controllers manufactured on or after 1/1/25 shall meet all of the following requirements: [list] (C) Soil moisture-based landscape irrigation controllers manufactured on or after 1/1/25 shall meet all of the following requirements: [list]
1605.3(x)(2)(E)4.	Watering Restrictions	Add “user-accessible” to clarify who can shut off the controller. “Complete <u>user-accessible</u> shutoff to accommodate outdoor irrigation prohibition restrictions.”
1605.3(x)(2)(H)	Troubleshooting	Clarify the maximum time between when the user begins the troubleshooting mode and when the device must return to weather- or soil moisture-based mode of operation.
1605.3(x)(2)(J)4.	Depletion-level readings	Clarify whether the depletion levels should be expressed as a percentage of full scale or on another basis.