DOCKETED	
Docket Number:	26-AAER-01
Project Title:	Commercial Dishwashers
TN #:	270010
Document Title:	California Investor Owned Utilities Comments - Commercial Dishwashers Staff Report Comment Letter
Description:	N/A
Filer:	System
Organization:	California Investor Owned Utilities
Submitter Role:	Public
Submission Date:	5/15/2026 2:28:18 PM
Docketed Date:	5/15/2026

Comment Received From: California Investor Owned Utilities
Submitted On: 5/15/2026
Docket Number: 26-AAER-01

Commercial Dishwashers Staff Report Comment Letter

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 staff report regarding commercial dishwashers.

Additional submitted attachment is included below.

May 15, 2026

Mr. Alejandro Galdámez
California Energy Commission (CEC)
715 P Street
Sacramento, California 95814

Docket Number: 26-AAER-01
TN Number: 268978

Dear Mr. Galdámez:

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 staff report regarding commercial dishwashers.

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 to the California Energy Commission:

1. **The CA IOUs support adopting ENERGY STAR® Version 3.0 standard levels.**

The Statewide CASE Report for Commercial Dishwashers (CASE Report) docketed in February 2024[1] recommended adoption of ENERGY STAR Version 2.0. However, since that time, the commercial dishwasher market has continued to advance, and baseline model efficiencies have improved as many manufacturers update their model lines every 10 or 15 years.

Based on models available from the two largest online retailers,[2] most undercounter and door-type models already meet ENERGY STAR V3.0, as shown in the table below. This data represents the number of available models and does not represent sales volume. Among the largest online retailers, approximately 60–80% of undercounter and door-type commercial dishwasher models meet ENERGY

[1] California Investor-Owned Utilities, *Title 20 Dishwasher CASE Report RFI Response – Commercial Food Service*, TN 254440, Docket No. 23-AAER-01, docketed February 13, 2024. Available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=254440&DocumentContentId=89825.
[2] Combined listings from Katom and Webstaurant

STAR V3.0. Fewer conveyor models meet V3.0 levels; however, inefficient units are concentrated in only two model lines. Commercial conveyor dishwashers primarily serve larger restaurants and institutional kitchens, which are generally better positioned to absorb incremental equipment costs than small, independently operated foodservice businesses. Low-temperature conveyor machines remain relatively uncommon. For high-temperature conveyor units, the observed price premium of ENERGY STAR V3.0 models often reflects the inclusion of an integrated booster heater, which would otherwise require an external booster heater costing approximately $4,000-$6,000. Lastly, most flight-type product lines from major manufacturers are already ENERGY STAR V3.0.

Commercial Dishwasher Type	Temp	Total model count	ESTAR V3.0 models	ESTAR V3.0 prevalence	ESTAR price	Baseline price	Cost Difference
Undercounter	Low	26	16	61%	$6,475	$5,896	$579
	High	86	55	63%	$8,344	$6,284	$2,060
Door type	Low	30	24	80%	$7,464	$8,092	($629)
	High	59	50	84%	$17,576	$13,242	$4,333
Conveyor	Low	8	2	17%	$33,393	$25,712	$7,681
	High	29	14	49%	$45,728	$32,234	$13,495
Flight	High	4	4	100%		NA	NA

ENERGY STAR introduced a kWh/rack wash-energy metric in V3.0, which requires more complex wash testing (V2.0 was based on idle and water consumption only); however, V3.0 has been in effect for nearly five years,[3] and almost all manufacturers have at least one model certified to V3.0 in one or more categories. We support the CEC adopting standards that align with V3.0 and agree with the CEC's cost-benefit analysis and savings calculations.

2. We support commercial electric dishwasher standards and encourage the CEC to prioritize a rulemaking that aligns with the ENERGY STAR scope.

As demonstrated in the staff report, significant electric energy and water savings can be achieved by setting standards for commercial dishwashers. The majority of these savings would be realized by simply aligning with ENERGY STAR V3.0. We encourage the CEC to move forward with these standards quickly so California residents can realize these savings and the benefits of raising the bar for these products. Electrically heated commercial dishwashers are the majority of the market and offer an opportunity to save both electricity and gas by reducing the load on the building's water heater. We encourage the CEC to limit the scope to electrically heated commercial dishwashers that align with the ENERGY STAR scope. The CEC has included standards for gas- or steam-tank heated commercial dishwashers and gas- or steam-heated internal booster heaters, which are not part of the ENERGY STAR scope. To expedite the

[3] ENERGY STAR Commercial Dishwasher Specification Version 3.0 became effective July 27, 2021 (EPA ENERGY STAR Program) https://www.energystar.gov/sites/default/files/asset/document/Commercial%20Dishwashers%20Final%20Version%203.0%20Cover%20Memo_0.pdf.

process and issue a timely final rule, we encourage the CEC to adopt a more streamlined scope that aligns with ENERGY STAR.

Gas or Steam Heated Tanks

Gas- or steam-tank-heated commercial dishwashers (applicable only to commercial conveyor dishwashers) are rare and represent a small share of the market.[4] Because no published energy-performance data are available for this product, it is not possible to determine appropriate efficiency levels. Market analysis of gas wash-tank-heated machines indicates that the electric version of the same model meets ENERGY STAR V3.0;[5] which would have the same water consumption defined by the wash and rinse nozzles, and idle energy defined by the tank insulation and size. All units on the market with a gas or steam heated wash tank have electrically heated ENERGY STAR versions of the same machine. The only electrically heated machine that is not on the ENERGY STAR list and has a steam heated tank version has been discontinued.[6]

Due to insufficient data, the appropriate energy-consumption thresholds for gas- or steam-tank-heated units are unclear. Historically, thresholds for gas equipment are based on performance data from gas units rather than a conversion from kWh to Btu, because gas heating efficiencies are lower than those of electric resistance heaters. For example, commercial fryers have different idle and cooking-energy thresholds for gas versus electric models. No performance data exists for gas- or steam-heated tanks.

Gas Booster Heaters

Across all high-temperature commercial dishwasher sizes, manufacturers offer models with or without internal booster heaters. If a high-temperature commercial dishwasher does not come with an internal booster heater, it is tested with an external electric booster heater.[7] For high-temperature commercial dishwashers that do not come with an internal booster heater, the recommended booster-heater sizing is typically in kW. For conveyor machines only, the recommended booster-heater sizing can be in kW or Btu/hr. Dual-temperature commercial dishwashers do not come with internal booster heaters; therefore, if a dual-temperature commercial dishwasher is installed for high-temperature use, it is installed with an external booster heater. Our understanding is that the CEC intends to include gas-powered internal booster heaters within the scope of the proposed standards, even though they are not included in the ENERGY STAR scope.

Including gas booster heaters within the scope of the proposed standards is complicated for the following reasons:

- **Limited or no efficiency data are available for gas booster heaters**.
- **Efficiency level differences among gas booster heaters are expected to be minimal** because **a**ll units use the same underlying technology—multi-pass heat exchangers with a non-condensing flue.
- **Commercial dishwashers with internal gas booster heaters are relatively uncommon** because they are more expensive and require ventilation beyond what is required for steam removal.
- **If integrated gas booster heaters were regulated, consumers might choose an external booster heater instead**.

[4] Based on number of models available.
[5] For example, Hobart CL and Champion PRO series are available gas- or steam-tank-heated.
[6] The Jackson AJ44 with gas tank heat has been discontinued.
[7] ASTM F1696 Section 9.2; ASTM F1920 Section 9.2

Glasswashers

The overview of commercial glass-washing machines in both the CASE Report and the CEC staff report (Chapter 2) defines several glasswasher types. The standard scope in Chapter 5 of the staff report includes "glass-washing commercial dishwashers that use a 20-inch by 20-inch stationary rack." However, Section 1602 Definitions defines glass washers as:

> "'Undercounter commercial glasswasher' means an undercounter commercial dishwasher specifically designed to clean and sanitize glass only."

This definition does not differentiate between rack-type glasswashers covered by the proposed scope and carousel or batch rotary glasswashers, which have similar form factors but are excluded from the ENERGY STAR scope and lack a defined test procedure.

Our CASE Report (Section 4.2.3) recommended a test-and-list for carousel or batch rotary glasswashers using a modified test procedure with a per-glass metric. The ASTM committee is now working to establish this test procedure. At this time, we recommend that the CEC clarify the definitions for glasswashers to better reflect the scope stated in Chapter 5 of the staff report. CEC should also consider a test-and-list requirement for carousel or batch rotary glasswashers once the ASTM test procedure has been finalized, given the limited data and the absence of a validated test method.

3. We recommend improvements and clarifications to the test procedure.

We appreciate CEC including a test method to review (in section 1604(o)(2)) and have the following comments:

1. Section (A) states that "for commercial dishwashers with multiple-voltage versatility and those that are available in different voltage configurations, the basic commercial dishwasher model shall be tested at the most energy consumptive (worst case scenario) rating." It is unclear how the least-efficient rating would be determined without testing each voltage and phase option. We recommend that dishwasher models available in multiple voltage configurations be tested at 208 V 3-phase, which is the most common service in foodservice. Alternatively, the CEC could specify machines that come in 208/240/480 V configurations be tested at either 208 V or 240 V. If a 3-phase configuration is not available for the dishwasher model, we recommend testing at 208 V single-phase.

2. Section (D) states, "Conveyor commercial dishwashers that offer multiple conveyor speeds adjustable by the user must be set to the maximum conveyor speed setting for testing. Water consumption values using the maximum conveyor speed setting shall be used for certification purposes of section 1606 of this Article." We note that the water consumption per rack will be the lowest at maximum conveyor speed. We also recommend that CEC consider including energy use, and not just water use.

3. Section (F) includes a list of energy-consuming features and states, "Idle results should be measured with the door closed and represent the total idle energy consumed by the commercial dishwasher, including tank(s), heater(s), and controls." We recommend specifically stating "tank and booster heaters" rather than "tanks and heaters" to improve clarity.

4. We recommend that the CEC explain the constants in the heat-recovery primary hot-water energy-offset calculation formula in Section (G), assuming the heat-recovery dishwasher offsets an electric primary water heater per ASTM test method, as follows:
    a. 77% water heater delivery efficiency (95% efficiency and 19% recirculation losses)
    b. 583.1 = as a product of the following variables:
        i. 8.33 lb/gal water density
        ii. 1 Btu/lb °F specific heat
        iii. 70°F delta T (70°F inlet and 140°F outlet)
    c. 0.00293 = kWh/Btu conversion

We welcome the opportunity to discuss these suggestions and appreciate working with the CEC to refine the test procedure.

4. We have the following recommendations for reporting fields to more closely align with existing databases.

We appreciate the CEC proposing reporting requirements that generally align with the State Appliance Standards Database (SASD). As noted in Section 4.2.4 of the CASE Report, we encourage the CEC to use the same fields in the same order as required by SASD and ENERGY STAR. Table 6 in the CASE Report lists the fields in the current order,[8] explains each field, and includes the units for reference. That table is copied below, including an added column with the CEC-proposed fields.

IOU Recommended Field	Source and Explanation	Example Values and Units	CEC Proposed Field
Brand Name	This is the company name	Kleen Dishmachines	
Basic Model Number	This is usually name of the model series which may encompass multiple electrical configurations	CH44 series	
Individual Model Number	This is usually an alphanumeric distinct model designation	CH44B3HR	
Machine Type	Machine types are based on ENERGY STAR categories	undercounter door, rotary glasswasher, conveyor glasswasher, upright door-type, double rack door-type, pot, pan, utensil, rack conveyor, dual-tank rack conveyor, single-tank flight-type, multiple tank flight-type, carousel	Commercial Dishwasher Type. (Undercounter, door type, Conveyor Multiple-tank, etc.)
Sanitization Method	Chemical sanitizing machines are low temperature with rinse temperatures around	Low Temp, High Temp, Dual Sanitizing	Rinse Type (Low-Temperature, High-

[8] The reporting order in SASD and ENERGY STAR remains unchanged from the order in place when the CASE Report was published in February 2024.

IOU Recommended Field	Source and Explanation	Example Values and Units	CEC Proposed Field
	140F, hot water sanitizing machines are high temperature with rinse temperatures above 180F. Dual temperature machines can be configured either way.		Temperature, or Dual-Sanitizing)
Idle Energy Rate Low Temp	For door type machines use ASTM F1696 Section 10.8 For conveyor machines use ASTM F1920 Section 10.9	kW	Low-temperature Idle Energy (kW)
Idle Energy Rate High Temp	For high temp machines: For door type machines use ASTM F1696 Section 10.8 For conveyor machines use ASTM F1920 Section 10.9	kW	High-temperature Idle Energy (kW)
Inseparable Booster Heater	High temperature machines with integrated booster heaters may not be able to separate booster heater energy, this means that the booster heater energy is **already included** in the "Idle Energy Rate High Temp"	Yes or no	
Booster heater Idle Energy Rate	High temperature machines with integrated booster heaters may not be able to separate booster heater energy, this means that the booster heater energy is **not included** in the "Idle Energy Rate High Temp" and is shown separately in this field For door type machines use ASTM F1696 Section 10.8.2 For conveyor machines use ASTM F1920 Section 10.10	kW	
Water Consumption GPR	For dishwashers using racks. Water consumption is measured per cycle. For door type machines use ASTM F1696 Section 10.5 For conveyor machines use ASTM F1920 Section 10.8	Gallons per Rack	High-Temperature Water Consumption AND Low-Temperature Water Consumption

IOU Recommended Field	Source and Explanation	Example Values and Units	CEC Proposed Field
Water Consumption GPH	For dishwashers that do not use racks. Water consumption is measured per hour with continuous rinse. Use ASTM F1920 Section 10.7	Gallons per Hour	High-Temperature Water Consumption
Water Consumption GPSF	For pot and pan utensil washers only. Water consumption is measured per cycle. The wash area is not standardized, so the width and depth of the washing cavity is measured. Use ASTM F1696 Section 10.5	Gallons per Square Foot	High-Temperature Water Consumption
Washing Energy Consumption Low Temp	For low temperature machines: ENERGY STAR V3 reporting requirement, energy consumed by the machine which includes tank heat, pump and control energy. For door type machines use ASTM F1696 Section 10.7 For conveyor machines use ASTM F1920 Section 10.8	kWh/rack	Low-temperature Washing Energy (kWh/rack)
Washing Energy Consumption High Temp	For high temperature machines: ENERGY STAR V3 reporting requirement, energy consumed by the machine which includes tank heat, booster heat, pump and control energy. For door type machines use ASTM F1696 Section 10.7 For conveyor machines use ASTM F1920 Section 10.8	kWh/rack	High-temperature Washing Energy (kWh/rack)
Has Heat Recovery	Whether a machine has heat recovery features, vapor condensation without water preheat is not heat recovery	True or false	Heat Recovery
Heat Recovery Features	Type of heat recovery	Only if Has Heat Recovery is true: Exhaust Heat Exchanger or Supplemental Heat pump or Drainwater Heat Exchanger	

IOU Recommended Field	Source and Explanation	Example Values and Units	CEC Proposed Field
(Optional) Claimed hot Water Energy Offset	If a machine has heat recovery, it should claim the hot water energy offset	True or false	Primary Hot Water Energy Offset
(Optional) Hot Water Energy Offset	This is the energy that a heat recovery machine (fed with cold water) would be saving over a non-heat recovery machine that is fed with 140F water.	kWh/rack	Primary hot water energy offset
Racks Per Hour	For machines that use racks, this is the production capacity. Per ASTM F1920 flight-type conveyor machines are tested with racks also.	Racks per Hour	
Pot Pan Utensil Wash Area	For pot pan and utensil wash machines, this is the area of the washing compartment (width multiplied by depth)	Square Feet	
Has Energy Saver Mode	If a machine has an automatic idle setback mode which lowers component energy use after a period of inactivity	True or False	
Energy Saver Mode Idle Rate	For door type machines use ASTM F1696 Section 10.9 For conveyor machines use ASTM F1920 Section 10.9.1.5	kW	

The CEC has also included the following fields that do not appear to align with the SASD database. It would be helpful to better understand the intent of these fields.

- Dual sanitation (true or false) – This field may be redundant of the CEC field titled "Rinse Type (Low-Temperature, High-Temperature, or Dual-Temperature)."
- Percentage (Cold/Hot) Water Supply (If Heat Recovery = True) – We have not identified a similar field in the SASD database. This appears to request that hot and cold water consumption be reported separately. It would be helpful if CEC could clarify the expected responses to this field.

We recommend the following fields are added based on the proposed scope in the staff report. These fields also align with the SASD database. The fields are listed below in the order that they appear in the table above:

- Inseparable Booster Heater
- Booster Heater Idle Energy Rate

- Heat Recovery Fields
- Hot Water Energy Offset
- Racks per hour
- Pot Pan Utensil Wash Area
- Has Energy Saver Mode
- Energy Saver Mode Idle Rate

If the CEC decides to include gas/steam tank heater units and rackless glasswashers, we recommend including the following fields for those products:

- For gas/steam tank heated units (if included)
    - Idle energy in Btu/h
    - Wash energy in Btu/rack and Wh/rack
- Glasswasher type: rack, batch rotary, carousel, conveyor for glasswashers only (if included)
    - Water consumption in gal/glass
    - Washing energy consumption in kWh/glass
    - Glasses per hour

As stated in the CASE Report, we strongly recommend CEC use the same fields as SASD and ENERGY STAR, in the same order, to simplify reporting requirements for manufacturers. We are available to discuss and clarify any questions the CEC may have on the existing reporting fields.

The CA IOUs appreciate the opportunity to provide these comments regarding the staff report for commercial dishwashers. We thank the California Energy Commission for its consideration and look forward to the next steps in the process.

Sincerely,

Rob Bohn
Manager, Codes & Standards
Pacific Gas and Electric Company

Scott Higa
Acting Sr. Manager, Codes and Standards
Southern California Edison

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