

**DOCKETED**

<b>Docket Number:</b>	22-BSTD-01
<b>Project Title:</b>	2025 Energy Code Pre-Rulemaking
<b>TN #:</b>	252135
<b>Document Title:</b>	Cooling Technology Institue Comments - Title 24
<b>Description:</b>	N/A
<b>Filer:</b>	System
<b>Organization:</b>	Cooling Technology Institue
<b>Submitter Role:</b>	Public
<b>Submission Date:</b>	9/5/2023 4:53:25 PM
<b>Docketed Date:</b>	9/5/2023

*Comment Received From: Cooling Technology Institute  
Submitted On: 9/5/2023  
Docket Number: 22-BSTD-01*

**Title 24**

*Additional submitted attachment is included below.*



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September 5, 2023

To: CEC Docket 22-BSTD-01 (<https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=22-BSTD-01>)

Haile Bucaneg, Senior Mechanical Engineer ([Haile.Bucaneg@energy.ca.gov](mailto:Haile.Bucaneg@energy.ca.gov))

Once again, thank you for the opportunity to provide comments on the Title 24 proposals related to cooling towers, as discussed during the August 29, 2023, Pre-rulemaking Workshop. The Cooling Technology Institute (CTI) understands and supports the California Energy Commission's goals to improve building energy efficiency and reduce overall water use, while also decreasing carbon emissions. As per our Mission statement, the CTI supports all environmentally friendly, sustainable heat rejection technologies, including evaporative heat rejection which continues to be one of the most energy efficient cooling methods available.

The Cooling Technology Institute ([www.CTI.org](http://www.CTI.org)), based in Houston, Texas, is an independent, not-for-profit organization dedicated to advocating and promoting, for the benefit of the public, the use of all environmentally responsible and energy efficient cooling technologies, such as wet cooling towers, air-cooled condensers, dry coolers, adiabatic coolers and condensers, indirect cooling, and hybrid wet/dry systems by encouraging education, research and development, independent performance verification and certification programs, the exchange of technical information and technology, and dialog with government agencies and organizations. The CTI has a broad based, global membership of individuals and organizations interested in environmentally responsible heat transfer systems, including owner/operators, manufacturers, and suppliers to the industry.

We thank the Case Team for responding to Industry feedback on the Draft Case Report on Cooling Towers and recognize the changes that were made to accommodate our input. Based on the final Case Report and the Pre-Rulemaking Workshop, we would like to provide the following additional comments to the two proposals remaining under consideration:

### **Cooling Tower Efficiency**

The CTI strongly suggests that the prescriptive minimum efficiency requirements for axial fan cooling towers used on water cooled chiller systems over 300 tons be held to a maximum of 70 or perhaps 80 gpm/hp, which is a reduction for some Climate Zone (CZ), based on the values proposed in the Workshop. This allows the market to access approximately 50% models that are available, as a protection to market disruptions, such as:

- Unintended market shifts to less energy efficient technologies with increased greenhouse gas emissions. That type of decision would negate much of the expected benefits (reference Tables 4 and 6 in the Final Case Report)
- Increased cooling system cost, especially when the number of cells must increase to comply with the proposed efficiency levels (reference Tables 34 and 35 in the Final Case Report)
- Increased cooling system footprint and weight (reference Tables 7 and 8 in the Final Case Report)

Reducing the required prescriptive minimum efficiency from 70 to 90 gpm/hp to a more reasonable range of 60 to 70 (or 80) gpm/hp will help to minimize these negative consequences, as well as reduce concerns over potential restraint of trade. CTI is not aware of equivalent restrictions on other classes of HVAC equipment. A lower prescriptive maximum will also help to minimize the cases where multiple cells are required to meet the efficiency level for that CZ, while allowing the cooling tower cells to be properly laid out per manufacturer's guidelines.

Please keep in mind that the most important metric to consider is the overall system efficiency. The cooling tower typically accounts for 10% or less of the overall energy use by a water-cooled chiller-based system, with the largest portion being the chiller itself, which is ten times or more the energy consumption of the cooling tower or system pumps. Properly laid out with space allowed for fresh air entry, especially for larger footprint and taller cooling tower cells, energy efficient cooling towers are what enable the overall system to achieve high levels of system efficiency.

### **Blowdown Controls**

The CTI believes in the “wise use of the world’s water resources.” The effort to minimize blowdown is a key goal of our water treatment members, while keeping scale, fouling, corrosion, and microbial growth under control. Increasing cycles of concentration and reducing blowdown must be done carefully to avoid r consequences which can negatively impact the performance and energy efficiency of the entire cooling system.

During the Stakeholder process, many CTI members from our Water Treatment Committee, along with other Industry representatives, met with the Case Team to provide feedback on the blowdown proposal. We believe that the current proposal, as described in the Final Case Report and during the Pre-Rulemaking workshop is reasonable and will yield positive results for the water treatment Industry in California. The transition to conductivity-based blowdown controls recognizes a long-term trend in the water treatment Industry and will save make-up water compared to flow-based controls.

The CTI, specifically our Water Treatment Committee, will continue to work with others in the Industry (such as members of ASHRAE TC 3.6) to simplify the proposed process of achieving the maximum number of cycles of concentration practical for evaporative cooling systems. without causing unintended consequences, such as excessive scale or corrosion, which can negatively impact both system efficiency and service life. On that basis, the CTI reserves the right to provide additional input to the CEC during the Rulemaking process.

### **Next Steps**

The CTI appreciates the opportunity to provide further input to the CEC and will continue to monitor the Rulemaking Process closely. Our members can assist with additional input to CEC Staff, as well as answer any specific questions that may arise relative to these proposals.

Please feel free to contact me at any time.

Sincerely,

A handwritten signature in black ink, appearing to read "Ken P. Mortensen", followed by a long horizontal flourish.

Ken Mortensen, President  
Cooling Technology Institute

cc: CTI Board of Directors  
Vicky Manser, CTI Administrator  
CTI Regulatory Response Committee, Paul Lindahl, Chair