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Project Title:	2028 Energy Code Pre-Rulemaking.
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Document Title:	Opposition to Proposed Pool Heating Regulation CEC Docket Number 25-BSTD-03 Project Title 2028 Energy Code Pre-Rulemaking
Description:	Solar and Heat pump requirements can not meet the temperature requirements for swim lesson pools, and the costs are prohibitive for public and private swim providers, when there would be no decarbonization savings.
Filer:	Gerry Root
Organization:	Drowning Prevention Foundation under nonprofit umbrella of California Coalition for Children's Safety and Health
Submitter Role:	Other Interested Person
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June 22, 2025

David Hochschild, Chair
California Energy Commission
715 P Street
Sacramento, CA 95814

Cc: Vice Chair Siva Gunda, Commissioner Andrew McAllister, Commissioner Noemí Gallardo, and Commissioner Nancy Skinner

Re: Opposition to Proposed Pool Heating Regulation

CEC Docket Number: 25-BSTD-03

Project Title: 2028 Energy Code Pre-Rulemaking

Subject: Public Comment on "Solar Heating for an Existing Pool and Spa" CASE Proposal

Introduction

The organizations signing this letter strongly support California's climate and carbon reduction goals. However, we must respectfully oppose the proposed pool heating regulation requiring solar and heat pump systems for public and private pools. As a point of fact, and to understand the drowning prevention community's position on the solar heating regulation proposal key fact needs to be laid on the deck of this entire discussion. First, drowning is a major public health issue not only because it is the leading cause of death for California's children ages one through age four, second leading cause of death for California's children ages five through age 14 and third leading cause of death for California's teenagers and youth ages 15 through 24. But also, because of the specific populations of children that are the most vulnerable regarding drowning. California's Black and Native American children living in the most underserved communities of the state have drowning rates two to three times higher than their peers living in well served financially wealthy communities. California's large population of children with autism have the highest risk of drowning over all other children. Second, drowning prevention swim lessons and rehab pools must maintain a water temperature of 88-92 degrees Fahrenheit. Solar heating of pools – even as cited in the CASE study - can only achieve 80 degrees Fahrenheit and cannot maintain even this level of temperature when the water is agitated with swimmers in the water. Third, studies of pool heating profile regarding pools' share of contributing to California's green-house gas climate situation is a miniscule cause on California's climate landscape. Moving forward to require solar heating of pools used for drowning prevention swim lessons, medical rehabilitation programs, and for community recreation would not achieve enough greenhouse gas impact in California, but would put many of California's most vulnerable children at greater risk of drowning by removing an essential component of California's drowning prevention strategies, and do so in the most vulnerable and already underserved communities in our state.

- **The Regulatory Gap:** The current CASE framework relies on unglazed solar thermal collectors, which are highly cost-effective for some standard *recreational* pools (typically kept at 78°F to 82°F). However, the baseline calculations fail to account for the unique operating constraints of specialized instructional and therapeutic facilities which must maintain the pool's water at 88 to 90 degrees Fahrenheit. And the CASE analysis in building the proposed solar pool heating regulation acknowledges that to keep pools used for drowning prevention swim lessons at the required temperatures, gas heating backup would be required. Most drowning prevention swim lesson pools which are also used for important community recreation do not own their own

buildings or land, and even when they do own their own building and land do not have enough roof or land space to accommodate enough solar panels to make a difference in heating of the pool.

- **The financial realities:** The majority of California's pools – public park and recreation, YMCA, private swim lesson programs – do not have the financial capability to accommodate the estimated \$50,000 to \$100,000 retrofitting of their buildings, roof structures, or land without the state designating large amounts of public funding that would be necessary up front and then every five to ten years for such a retrofitting even when the building, roof space, and land area would be available to accommodate such a retrofit. Which it is not. The other financial problem is the CASE and other contributing points of view on this issue do not have realistic life span calculations for the required solar panels, piping, and electrical equipment within their proposals. To maintain the higher temperatures, the increased caustic nature of the water and air around such equipment – due to the public health requirements for chemicals to keep the water safe – those pools that have tried and do incorporate solar find the pipes, electrical panel upgrades, and the solar panels report systems only have a five to eight year life span. Not the 15-to-30-year life spans in the CASE modeling and other contributing solar company reports. The solar companies putting solar on these drowning prevention swim lesson pools only provide limited life span warranties of five to eight years. Legislation would be necessary to require warranties to cover the solar equipment required up to the proposed 30 years, to help offset the constant financial burden on these drowning prevention swim schools and community recreation pools. The bottom line is moving forward requiring these pools to add solar heating does not adequately lay out for the California Energy Commissioners the reality of the financial position most pools that provide drowning prevention swim lessons nor the finances of the communities which use these pools for both swim lessons and community recreation programs.
- **The Thermal Reality:** To prevent rapid hypothermia, muscle cramping, and distress in infants, toddlers, young children, and vulnerable therapeutic populations, these pools must maintain stable ambient water temperatures between 88°F and 94°F. Solar heating systems cannot achieve this level of temperature, especially for drowning prevention swim lesson and rehab pool programs taking place outside of summer months.
- **California needs more swim lesson water not less:** Drowning prevention swim lessons have just been placed into California's statutes as an essential component of California's drowning prevention strategies (AB 1005 Chapter 387 of 2025 Health and Safety Code 116036.)
- **Equity Impacts:** The proposed regulation would disproportionately harm Black children, Native American children, children diagnosed with autism, low-income families, and underserved communities with the highest drowning rates. These communities rely heavily on public and private swim lesson programs to bring water safety and swimming proficiency up to a level that is needed to turn California's long standing drowning inequities around. Research shows these populations and communities have only 54% level of swim skills. Again, having swim skills prevents drowning by up to 88%. Closing pools would deepen existing racial and socioeconomic inequities to a higher level of drowning risk.
- **The Core Inefficiency:** Solar thermal efficiency drops exponentially as the desired pool temperature rises above ambient air temperature. In microclimates across California, solar systems cannot reach or sustain even the 80°F+ temperatures reliably.

- **The Wasted Capital Risk:** If forced to build out solar thermal infrastructure under a blanket "replacement trigger" mandate, California's majority of pool operators will experience an immediate and dangerous cost impact most of these pools cannot handle, requiring the closure of the many pools impacting both the state's drowning prevention swim lesson strategies but also impacts at-risk and underserved communities the availability of the pool for recreational use when swim lessons are not happening. Because the solar array cannot maintain the threshold temperature, the auxiliary gas system will be required to fire constantly to bridge the temperature drops when the pool is in use and in the evening and at night when solar cannot help with heating the water. The cost of planning, structural roof engineering, installation, and dual-system maintenance yields zero net natural gas savings, directly undermining the purpose of the proposed Title 24 regulation.
- **The Aquatherm Industries quandary:** In its submission to the CEC Aquatherm Industries raises a compelling and important discussion of how solar can co-exist with efficient gas heating systems to reduce energy consumption. But what it does not explore is the great percentage of drowning prevention swim lesson pools that do not own their own building or land so there are insufficient opportunities in most cases to accommodate the hybrid solar and gas heating option. And if they do have sufficient roof or land space to accommodate the solar and gas hybrid system the finances of the initial retrofit coupled with the short life span of the equipment would keep the financial burden as a detracting reality for these pool settings. Aquatherm submission does not provide information how cash strapped and financially struggling pools could afford solar and gas coexisting systems especially with the short life span of the high-cost solar system. Wealthy communities and well funded pools should and can partner with experienced industries like Aquatherm but that is not the reality for most pools that provide the water needed to sustain and grow California's drowning prevention swim lesson pool needs.

Some drowning prevention swim lesson pool complexes have tried adding solar heating as a business model but found when comparing their energy use between their solar and efficient gas heating pools at their pools with only high efficiency gas heaters found that the energy use and savings of adding solar was too small to make it worth the financial investment, maintenance requirements, and structural design efforts.¹

More details why drowning is one of California's most urgent and inequitable public health crises:²

- Leading cause of death for children ages 1–4
- Second leading cause of death for children ages 5–14
- Third leading cause of death for youth ages 15–24
- Fatal drowning rates are two times higher for Black children and even higher for Native American children³
- Leading cause of death for children diagnosed with Autism⁴
- For every fatal drowning: There are seven to ten nonfatal drowning incidents with many non-fatal drowning incidents resulting in permanent brain injury due to hypoxia^{5 6}
- One of the leading causes of Cerebral Palsy is brain injury due to drowning.^{7 8}
- The societal costs in California due to drowning are estimated to be \$3 billion a year from first responder, emergency department, initial hospitalizations, follow up hospitalizations, follow up healthcare, rehab, institutionalization,⁹ legal, and can other on-going costs associated with both fatal and non-fatal drownings.

The California Governor and Legislature have elevated its attention to the drowning public health issue (Governor's annual drowning prevention Proclamation and ACR 77 Chapter 142 of 2025). Due to the high public health stakes in California the state Legislature and Governor have recently placed swim lessons in statute as an essential component of California's drowning prevention strategies (CA Health and Safety Code 116036). These programs require access to pools, including pools capable of staying open year-round to address the reality that half of California's children do not have water safety swimming competency. California's access to heated pools is critical and pools capable of maintaining water temperatures of 88–92°F is critical.

In summary: The submissions to CASE and to the California Energy Commission lay out the realities:

California's pools used for drowning prevention swim lessons, water rehabilitation programs, and community recreation – commonly the same pools – do not contribute enough to California's greenhouse gas climate situation to warrant the proposed solar heating regulation that would be so devastating to the state's drowning prevention swim lesson strategies.

Solar pool heating on its own cannot achieve the temperatures needed for drowning prevention swim lessons and rehabilitation programs. When solar heating is tried and coupled with back-up efficient gas heating the comparison of energy use between these hybrid pools and efficient gas heated pools the energy use difference was negligible.

The well-reasoned Aquatherm Industry discussion about how solar and high efficiency gas heating could address some of the problems of this solar pool heating regulation discussion but fails to address the financial realities of the communities and swim lesson programs that make up the majority of pools needed for drowning prevention swim lessons. Nor does this addition to the conversation account for the reality that most of the community and swim lesson private pools do not own their own buildings or land or have sufficient roof space or land, if they do own their building and land, to accommodate the solar system's sun exposure requirements.

The solar equipment – solar panels, pipes, electrical, and control systems – have a short life span in the real world of these pools of five to eight years, and not the long life spans showcased in the CASE modeling, making the financial burden not only of the initial retrofit costs but the constant upgrade and replacement costs too expensive for most of California's pools used for drowning prevention swim lessons. To exasperate this situation the solar companies' warranties time spans are far too short to help with the financial replacement burden.

The solar pool heating regulation proposed would exacerbate California's drowning and access to recreation inequities. California's most underserved communities and most at-risk childhood populations of minority communities would be put at the most risk both for increased drownings due to the loss of swim lesson pools, but also these communities would lose these pools for important community recreation programs.

For these reasons we respectfully oppose moving forward with the proposed solar pool heating regulation at this time. We would like to be involved in additional exploration of this pool heating and environmental impact discussion. As technologies advance there are likely to be other opportunities to address this issue in a way that does not put so much of California's underserved communities and at-risk populations at further risk of drowning and not having pools as an important part of the community's recreational programs.

Consigners:

Steve Barrow, State Policy Director, for California Coalition for Children's Safety and Health and Vice Chair Drowning Prevention Foundation (CCCSH and DPF) (scbarrow88@gmail.com)

Marcia Kerr, Chair, for Drowning Prevention Foundation, retired U.S. Consumer Product Safety Commission incident site investigator, and affected parent having lost her two-year-old son Cody to drowning.

Rose Chollewinski, President, for U.S. Swim School Association (USSSA), Owner SwimAmerica Davis CA and Lisa Zarda, Executive Director U.S. Swim School Association (USSSA)

Bobby Hazen, Executive Director, for Stop Drowning Now

Jessica Heldman, Executive Director, for Children’s Advocacy Institute (CAI) University of San Diego School of Law, and **Professor Robert Fellmeth**, Founder, Children’s Advocacy Institute University of San Diego School of Law

Jon Alpert, Owner WaterWorks Swim Schools, member of USSSA

CCs: Heather Riatt, Policy Development, CEC

Office of Governmental and International Affairs, CEC

Office of the Public Advisor, Energy Equity, and Tribal Affairs, CEC

Attachments – See Endnote viii: Example PG&E and SDGE actual bills with and without solar at Attachments A, B, C, D, and E.

Attachment A – WaterWorks Aquatics Carlsbad SDGE Dec 2023 Bill_WW CB

Attachment B – WaterWorks Aquatics Pasadena SoCalGas Dec 2023 Bill_WW Pas

Attachment C – WaterWorks Aquatics Pasadena SoCalGas Jun 2024 Bill_WW Pas

Attachment D – WaterWorks Carlsbad SDGE Jun 2024 Bill_WW CB

Attachment E – WaterWorks energy bill comparison with and without solar

¹ To explain the pool heating real life situation for swim lessons one of the drowning prevention community pool owners is sharing a real heating bill comparison of similar sized swim lesson pools with one having solar and the other not having solar. Below is a real-life heating costs associated taken from swim lesson pools that have tried solar as compared with swim lesson pools without solar. Demonstrating the minimum to none cost and energy use saving when solar is attempted in a swim lesson pool setting. Again, most public, and private pools that are not residential associated pools are used for drowning prevention swim lessons and/or water rehab programs.

When pool owners tried solar to heat their pools the high efficiency gas heater systems always became – even when their gas heating system was meant to be the back-up system – the primary source of heating the water. Below is an example of the pool heating real life costs and comparisons regarding similar sized swim lesson pool in Pasadena vs. Carlsbad, with one having solar addition to the pools heating equipment and the other without solar.

Exhibit: Attached is a comparison of gas usage and costs for the “WaterWorks” swim lesson pool in Pasadena and one of its other pools located at its Carlsbad facilities for the December 2023 and June 2024 billing periods. The corresponding gas invoices are also included at Attachments A, B, C, and D to this letter for your reference.

The Pasadena facility has rooftop pool solar equipment, which was installed as part of the original building construction. Despite this, Pasadena’s gas usage remains higher than that of the Carlsbad facility, which does not have pool solar. The rooftop solar system is providing minimal to no savings due to the required pool operating temperatures, as reflected in the utility bills from both summer and winter seasonal periods.

Below are the current pool specifications for each facility:

Carlsbad

- Pool 1: 43,270 gallons
- Pool 2: 79,000 gallons
- **Total:** 122,270 gallons

Pasadena

- Pool 1: 41,869 gallons
- Pool 2: 96,650 gallons
- **Total:** 138,519 gallons

Pasadena Solar has 1950 Sq Ft of panels on the roof. “Suntrek Solar” quoted the following if we installed this system today:

1950 Sq Ft System: \$37,250
Plumbing: \$3000 (estimate)
Controller: \$1200
Pump: \$3800
Plans permit/engineering: \$2500 (estimate)

Total: \$47,750

² California Department of Public Health EPICenter, CDC WISQARS, and American Academy of Pediatrics.

³ Centers for Disease Control and Prevention, American Academy of Pediatrics, Safe Kids Worldwide.

⁴ National Autism Association citing children with autism are 160 times as likely to die from drowning as the general pediatric population, American Red Cross, and National Drowning Prevention Alliance.

⁵ Idid.

⁶ Biological impact of water submersion and hypoxia leading to brain damage (Underpinning why swim skills, which through scientific research is shown to prevent drowning by up to 88% is so important.):

- During a drowning incident, the brain tissue most impacted by hypoxia (lack of oxygen) includes the hippocampus, cerebellum, and basal ganglia,
- With cortical layers also highly vulnerable, leading to cell death in these energy-demanding areas within minutes, resulting in severe neurological deficits like memory, movement, and coordination problems.
- Vulnerable Brain Regions Hippocampus:
 - Especially CA1 (Carbonic Anhydrase 1) pyramidal neurons, critical for memory.
 - Cerebellum: Particularly its deep folia (folds and valleys of the brain) and Purkinje cells, affecting balance and motor control.
 - Basal Ganglia: Including the striatum and thalamic reticular nucleus, influencing movement, and aiding in the choice of behaviors to execute Cerebral Cortex: Layers 3, 5, and 6 of the neocortex are extremely sensitive.

Why These Areas of the brain?

High Metabolic Demand:

- These regions require a continuous, high supply of oxygen and glucose to function, making them extremely sensitive to deprivation.
- Selective Vulnerability: Different neurons have varying levels of susceptibility, with these specific areas being the first to suffer irreversible damage.
- Impact Irreversible damage and neuronal death can occur within 4-10 minutes of severe hypoxia, causing profound deficits in cognition, motor function, and coordination.
- Brain Resuscitation in the Drowning Victim - PMC the greatest permanent harm in drowning accidents is to the brain, which has negligible metabolic substrate reserves to subsist on.

Timeline of Damage:

- Seconds: Functional failure begins.
- Minutes (4-10): Irreversible injury develops in these vulnerable regions, potentially causing memory/coordination issues if resuscitated.
- 10+ minutes: Tissue death.

⁷ National Institutes of Health, Children's Hospital of Orange County (Now Rady Children's Hospital of Orange County) "Oxygen Deprivation from Near-Drowning Can Lead to Brain Damage."

⁸ Cerebral Palsy Guidance – "Acquired Brain Injuries and Cerebral Palsy" and National Library of Medicine Functional integrity in children with anoxic brain injury from drowning.

⁹ Just one state agency that provides institutionalized care for non-fatal drowning victims with severe brain damage, the Department of Developmental Services (DDS) reports it has more than 770 non-fatal drowning victims in its care at \$30,000 a month or around \$277 million for this one agency.