



June 21, 2024

VIA Electronic Submission

California Air Resources Board
1001 I Street
Sacramento, California 95814

RE: Zero-Emission Space and Water Heater Proposed Standards

Navien, Inc. (“Navien”) is the leading supplier of high efficiency, condensing tankless water heaters, combi-boilers and heating boilers in North America. We introduced our products in North America in 2008, beginning with one of the first condensing tankless water heaters. In 2012 Navien revolutionized the industry with the NPE series of condensing tankless water heaters that were installation-friendly, overcoming the barriers associated with replacing low-efficiency gas storage water heaters with high-efficiency tankless products. Navien now has over 30% of the U.S. market in tankless water heaters.

The U.S. federal government has set an ambitious goal to reduce greenhouse gas emissions by 50% from 2005 levels by 2030 and achieve carbon neutrality by 2050, focusing on sectors such as power, transportation, procurement, and buildings. Similarly, the State of California is making significant efforts through California’s Climate Strategy by introducing zero-emission appliances and decarbonizing California’s grid. Navien warmly welcomes and actively supports these policies aimed at reducing greenhouse gas emissions and achieving carbon neutrality, contributing with its own various initiatives to support the federal and state governments’ goals.

As a company dedicated to environmental sustainability, Navien has been striving to reduce greenhouse gas emissions through our condensing gas water heaters which by design, provide more than a 33% reduction in CO₂ emissions¹ compared to gas storage water heaters. In addition, Navien plans to align with U.S. policies by developing hydrogen-based products as well as high-efficiency electric products. However, achieving essential electrification for carbon neutrality entails considerable effort and practical challenges. Therefore, we propose to seek immediate and pragmatic alternatives in line with the current CARB policy direction.

Consideration of Availability of Renewable Energy Sources:

It is crucial to consider the readiness of California’s utility companies to be able to supply the necessary renewable energy to support electrification. Increasing electricity usage without addressing greenhouse gas emissions from fossil fuel-based power generation can lead to an overall increase in emissions. According to California Energy Commission’s latest 2022 Total System Electric Generation report², 47.46% of California’s electricity generation relied on natural gas. By 2030, California has set a target of 60% renewable energy production, still leaving a need for 40% of generation to depend on natural gas and other non-renewables. Without expanding renewable energy infrastructure to meet rising electricity demand, greenhouse gas emissions will continue to increase.

¹ Based on DOE residential water heater test procedure estimated annual therm use figures

² <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation>

Economic Burden on Residents from Policy Implementation:

Accelerated implementation of policies could impose significant economic burdens on residents, considering that many California homes require electrical system upgrades to accommodate high-efficiency electric products. According to the 2022 South Coast Air Quality Management Plan (AQMP) report³, 63% of the six million households in Southern California were built before 1979, and 47% are rental properties. Homeowners could face substantial costs exceeding \$2,000 to upgrade electrical panels to accommodate products such as heat pumps. Including the costs of the product and installation, which add approximately \$4,000, the overall cost is significantly higher than transitioning to higher efficiency gas water heaters. These financial burdens could discourage homeowners from transitioning to electric installations, and the increased costs could lead to higher rental expenses for tenants. Even with available rebates covering some initial installation costs, residents, especially tenants, would still face the burden of electricity bills, which are about five times higher than gas bills.

Importance of Diverse Technologies in Reducing Greenhouse Gas Emissions and Achieving Carbon Neutrality:

Emerging technologies such as humidification combustion and acidic gas reduction (AGR), based on highly efficient condensing tankless water heaters with an expected Uniform Energy Factor (UEF) of 0.95 or higher, are getting closer to the final stages of development. Humidification combustion technology, which is relatively easy to implement and maintain, can reduce NO_x emissions to less than half of current standards. AGR technology, supported by the DOE, can dramatically reduce NO_x emissions to below 2 ppm. Furthermore, clean hydrogen projects supported by the federal government for zero greenhouse gas emissions can facilitate the transition to hydrogen water heaters and heating systems, playing a crucial role in reducing greenhouse gas emissions and achieving carbon neutrality without expensive infrastructure changes.

Additionally, the introduction of dual-fuel products (i.e. heat pumps alongside gas furnaces or gas back-up for electric water heaters) is essential for emergency demands due to power shortages in rural and under-resourced areas, as well as potential blackouts or power supply restrictions due to the surge in electricity demand in densely populated regions. They are also crucial for addressing the urgent needs arising from potential product failures or performance issues in low-temperature environments. These dual-fuel products will serve as a complementary solution to unforeseen difficulties that the state may encounter and must be considered as a transition solution towards full electrification with zero emissions.

³ https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/buildings_final.pdf?sfvrsn=22

Page 3 of 3
CARB
June 21, 2024

Implementation Timeline:

While we express overall support for CARB's policy, we recommend an adjustment to the phased implementation of regulations, proposing a start from 2031 instead of 2027. During the 14-month rule amendment process of SCAQMD's final Rule 1146.2, various concerns from many stakeholders emerged, prompting SCAQMD to plan a technology assessment in 2027 to review these challenges. We recommend CARB to observe the stable implementation of electrification in the two AQMDs, which comprise at least 65% of California's population, and prepare for potential unforeseen issues. Therefore, we suggest CARB consider implementing regulations after carefully reviewing the outcomes of SCAQMD's technology assessment and conducting similar interim assessments to ensure the current regulatory direction is appropriate.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'KPIROTIN'.

KEVIN PIROTIN
Vice President
Engineering & Service
Navien, Inc.