



October 18, 2023

VIA E-MAIL

Michael Krause, Assistant DEO  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

RE: 1146.2 Working Group Comments

Dear Mr. Krause,

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 tankless products. Navien now has over 30% of the U.S. market in tankless water heaters.

We have followed the meetings of the 1146.2 Working Group and submit these comments for the SCAQMD’s consideration as the rulemaking proceeds.

We acknowledge the serious air quality concerns in the South Coast basin and the agency’s need to meet federal air quality requirements. Navien is committed to helping California achieve its emission reduction goals and reduce its carbon footprint; Navien welcomes the move toward zero emission technology and will actively participate in this change. In fact, we believe our high efficiency, condensing products have already helped move the needle on these goals and encourage the SCAQMD to consider embracing high efficiency, condensing technology as a continuing immediate solution in this effort.

Our high efficiency, condensing tankless water heaters’ NOx emission is 22.1 in<sup>3</sup>/day versus 35.2 in<sup>3</sup>/day from a comparable non-condensing tankless unit, 39.3 in<sup>3</sup>/day from a traditional storage tank unit. Our calculation is inclusive of data related to the “UEF efficiency” rating. (These calculations are drawn from DOE residential daily use test and we are happy to discuss this further either during the Working Group meeting or in a separate Stakeholder conversation.)

We believe high efficiency, condensing tankless water heaters offer South Coast the ability to achieve greater NOx reductions sooner than the path to heat pump technology and can be accelerated into the market using incentives with a target implementation date of 2025.

The U.S. Department of Energy has proposed a shift in many appliance standards, including water heaters, to condensing levels by 2029. This shift will have meaningful impacts on NOx emissions, and we encourage SCAQMD to include this in its overall strategy. We believe having multiple approaches to achieving NOx reductions will be most beneficial to meeting the Basin's air quality targets and would like to explore opportunities with the 1146.2 Working Group and staff.

There are several types of technologies that can be applied to condensing water heaters to reduce NOx emission. Selective Catalytic Reduction (SCR), Exhaust Gas Recirculation (EGR) and Humidification Combustion. We are happy to discuss any of these with SCAQMD staff, but Navien is focusing on the latter. The Humidification Combustion technology is relatively easy to implement and maintain, and further can reduce NOx emissions to less than 9ppm, or less than half of the SCAQMD's NOx reference value (20ppm @ O2 3%).

Also, the Department of Energy supports the research of the low-cost AGR technology that can dramatically reduce NOx emissions by as much as 2ppm. The Humidity Combustion and AGR technologies can be applied to current gas water heaters without the need for expensive infrastructure changes.

For two decades California's building code has given preference to tankless water heaters because of their energy-saving potential. Navien's products have been among those that lived up to this potential and are found in much of the state's new building stock. Many new homes have been designed to eliminate the space requirement for storage-type water heaters because tankless water heaters are compact and wall-hung. Retrofitting these homes to accommodate heat pump water heaters will be difficult, expensive and time consuming, not only raising the cost for residents but also making it impossible to replace their broken water heaters in the 24-hour timeline that is typical in replacements. Between now and the 2029 implementation date (which we believe should be returned to the initial 2031 recommendation), residents who do not have the physical space for storage tanks or the capacity to upgrade their electrical panels, should be incentivized to pivot to high efficiency condensing tankless water heaters. We note that while the Bay Area AQMD chose an earlier implementation date, the South Coast's larger population base, higher density and diverse geography requires a bit longer for successful zero-NOx implementation. We believe that 2033 would be a reasonable date, particularly combined with an increased usage of high efficiency, condensing products in the interim to drive down NOx immediately.

We encourage the Working Group to consider this or other alternatives and incentives around these higher efficiency, condensing products that would help achieve significant NOx reductions sooner than the 2029 (or later) implementation date of this proposed rule.

Also, given the significantly larger size of storage-type water heaters, Navien wonders if the SCAQMD has considered the potential for additional emissions during transportation of these water heaters from the manufacturer to the end user. We also note that because of their larger size,

Page 3 of 3  
SCAQMD  
October 18, 2023

storage water heaters have significantly more end-of-life disposal and recycling challenges than tankless products have.

Navien echoes the concerns expressed by others in previous meetings of the Working Group. First, while California has ambitious goals for renewable energy production, these improvements have yet to be realized. If demand for electricity increases without substantially growing renewable sources, then NOx emissions will increase. Second, rapid implementation of zero-emission water heaters will create a significant economic burden for residents. In addition to purchasing the appliance itself, many residents will have to pay more than \$2,000 for infrastructure to use electric devices like heat pumps (or see their rents rise to accommodate the property owners' expenditures). The price of installing one heat pump water heater could be equal to installing three gas storage water heaters or two gas tankless water heaters. Even with tax credits, the subsidies appear to be minimal, creating troubling equity issues (both compared to Northern California and among the diverse South Coast Basin communities). Also note that while a heat pump water heater consumes only one-sixth the energy of a gas water heater, the electricity bill is four to five times higher than natural gas bills. This means the real cost to people for using the heat pump is high even when factoring in the efficiency of the heat pump.

Additionally, we have some questions about the baseline emission calculations on Page 22 of the presentation that we would like to raise on Thursday.

Finally, Navien is concerned about the interaction of 1146.2 and 1121. Rule 1121 will address the gas storage water heaters below 75,000 BTU/h, the most commonly used in U.S. residential units. However, the implementation for 1121 would be later than 1146.2, so low efficiency gas storage water heaters could remain on the market while high efficiency, condensing tankless products are prohibited. This seems to conflict with the SCAQMD's goals of reducing emissions and we welcome additional conversation around this potential discrepancy.

We look forward to the opportunity to discuss these issues further, both in the Working Group format and in a one-on-one meeting.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read 'K. Pirotin', written over a white background.

KEVIN PIROTIN  
Vice President  
Engineering & Service  
Navien, Inc.