MEMORANDUM

Pacific Northwest NATIONAL LABORATORY

Date:	**February 1, 2024**	Memo No.:	[##########]
To:	**Mr. Duane Jonlin**	Project No.:	[##########]
From:	**Tillou, Michael M**	Internal Distribution:	**File/LB**
Subject:	**AHRI concerns with proposed IECC 2024 Section C406.1.1.1 and Energy Credit W02**		

Summary: PNNL reviewed the proposed energy credits in the pending 2024 IECC Commercial provisions, as requested by the ICC, and found that restaurants and hotels can comply with the requirements of both Section C406.1.1.1 and energy credit W02, without using equipment that exceeds federal minimum efficiency requirements.

Background: The ICC Board of Directors received a letter from the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) expressing concern that specific sections of the IECC and IRC Commercial provisions may potentially be preempted under the Energy Policy and Conservation Act (EPCA). Specifically, AHRI asserted that restaurants and hotels would be unable to comply with the requirements of both C406.1.1.1 and W02 energy credits. The ICC Board of Directors, in turn, asked the IECC Commercial Consensus Committee to address AHRI's assertion regarding C406.1.1.1 and Energy Credit W02. ICC staff, on behalf of the ICC Commercial Consensus Committee chair, requested that PNNL review the proposed requirements of the (pending) 2024 IECC Commercial provisions, and assist in determining whether restaurants and hotels are prevented from complying with C406.1.1.1 and earning W02 credit without using *high efficiency equipment* (i.e., equipment which exceeds federally regulated minimum efficiency requirements for covered products). AHRI references 42 USC 6297 (f)(3) as the basis for their concerns with regard to federal preemption.

Discussion of Technical Issues:

Can restaurants and hotel building types comply with the requirements of both C406.1.1.1 and energy credit W02?

A service water heating (SWH) system can be designed to comply with energy credit W02 regardless of the building type and requirements in C406.1.1.1. Energy credit W02 is intended to incentivize heat pump water heaters being designed to operate in a pre-heat configuration at a high efficiency in combination with additional water heaters designed to provide the remaining SWH loads.

AHRI's assertion that restaurants and hotels cannot comply with both requirements appears to be based on a SWH system design that only uses a single heat pump water heater. The requirements of energy credit W02 were not written for an application where a single heat pump water heater is designed to provide 100% of the SWH load. PNNL agrees that a single heat pump water heater in this application may have difficulty achieving the W02 energy credit.

Instead, projects can comply with both W02 and C406.1.1.1 by designing a service water heating system that uses multiple heat pump water heaters. Such a system can be designed using a heat pump water heater in a pre-heat configuration that meets the minimum efficiency and minimum 30% load requirements as specified in the W02 energy credit. The remaining load can be met using additional heat pump water heaters that are not required to meet the W02 energy credit performance requirements. A system in this configuration would be capable of complying with the requirements in C406.1.1.1 and the W02 energy credit, and as a result, a user would not need to use equipment that exceeded federal minimum efficiencies to achieve the required number of energy credits.

Are sufficient credits available for all buildings, including restaurants and hotels, to comply with the requirements of C406.1.1.1 without using equipment that exceeds federal minimum requirements?

PNNL's review and analysis finds that sufficient energy credits are available to the range of typical building types and climate zones without requiring the use of equipment that exceeds federal minimums. As noted in the answer above, the requirements in C406.1.1.1 do not preclude restaurants and hotels from also earning energy credit W02, and they would not be required to use energy credits for equipment efficiencies that exceed federal minimums.

Energy credit pathways that do not require using energy credits for equipment that exceeds federal minimums have been demonstrated for all building types. To address energy credit concerns with the requirements of C406.1.1.1, a table of carryover credits was approved that allow projects to use renewable energy and load management credits as a substitute for energy efficiency credits to achieve compliance. The concerns being raised by AHRI do not dispute this but rather question whether restaurants and hotels complying with C406.1.1.1 can also earn energy credit W02, which as previously explained, they can.

The purpose of the energy credits is to provide building owners and designers with the flexibility to achieve the specified level of energy performance through a range of optional measures, as well as to make it easier for designers to incorporate new and advanced technologies and construction practices without having to undertake more complicated calculations or energy modeling. It is anticipated that many designers will elect to incorporate high efficiency equipment into their building designs, as these

options tend to be highly practical and cost effective. However, as previously explained, designers who elect not to utilize high efficiency equipment can still meet the required number of energy credits.

Are sufficient credits available for all buildings, including restaurants and hotels, to comply with the requirements of C502.3.7.1 for Additions without using equipment that exceeds federal minimum requirements?

PNNL's review indicates that sufficient credits are available under this scenario, as well. AHRI expressed this concern during the 2024 IECC development process, including during the second public comment period, with the view that it would be difficult to achieve enough credits in Section C502.3.7.1. In response, the committee approved AHRI's proposal to resolve the issue by increasing the number of renewable and load management credits that could be used to comply with the energy credit requirements of C406.1.1.1 and C502.3.7.1. PNNL concludes that additions are able to comply with the requirements of C502.3.7.1 and energy credit W02 in the same manner as discussed above for C406.1.1.1.