Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy
Natural Resources Defense Council
New York State Energy Research and Development Authority

April 8, 2022

Ms. Catherine Rivest
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Building Technologies Office, EE-5B
1000 Independence Avenue SW, Washington, DC 20585

RE: Docket Number EERE-2021-BT-TP-0017: Proposed Rule for Test Procedures for Computer Room Air Conditioners

Dear Ms. Rivest:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), the American Council for an Energy-Efficient Economy (ACEEE), the Natural Resources Defense Council (NRDC), and New York State Energy Research and Development Authority (NYSERDA) on the notice of proposed rulemaking for test procedures for computer room air conditioners (CRACs). 87 FR 6948 (February 7, 2022). We appreciate the opportunity to provide input to the Department.

We support the inclusion of a power adder for heat rejection components to improve the representativeness of the test for water- and glycol-cooled CRACs. The current test procedure captures the energy consumption of heat rejection components for air-cooled CRACs, but does not capture the energy consumption for heat rejection equipment for water- and glycol-cooled CRACs. We believe DOE's proposed approach, consistent with AHRI 1360-202x, to account for the energy consumed by fans and pumps that are installed in the outdoor heat rejection loop (and thus not integral components) will help ensure that efficiency values for this equipment are more comparable to efficiency values of air-cooled CRACs.

We encourage DOE to investigate the representativeness of the proposed return air temperature (RAT) values for CRACs. DOE is proposing to adopt higher RAT values, as specified in the AHRI 1360-202x draft, for certain product classes. DOE explains that the location of the return air inlet on a CRAC relative to the heat source (i.e., server racks), will impact the RAT.[1] However, it does not appear that DOE has performed a thorough analysis of the representativeness of the proposed RAT values but rather is simply proposing to adopt the values in AHRI 1360-202x. In the CRACs standards NOPR, DOE analyzed the magnitude of the impact of increasing RAT from 75 °F to 95 °F for up-flow ducted and down-flow CRACs. From this analysis DOE determined that the net sensible cooling capacity (NSCC) and SCOP increased by

[1] https://www.regulations.gov/document/EERE-2021-BT-TP-0017-0002. p. 41.

approximately 22% and 19%, respectively.[2,3] Given the large potential magnitude change to the metrics, we encourage DOE to scrutinize the appropriateness of updating the RAT values, and, if a revision is found to be justified, the representativeness of the proposed RAT values.

We continue to encourage DOE to capture the part-load operation and air circulation mode operation of CRACs. DOE acknowledges that CRACs typically operate at part-load—estimating that CRACs operate at an average sensible capacity load-factor of 65%.[4] In addition, many CRACs also operate in air-circulation mode, where there would be no energy consumption from refrigerant vapor compression, but fans would be engaged. For these reasons, the test procedure to determine the full-load metric, NSenCOP, is not representative of an average use cycle. We encourage DOE to develop test procedure provisions that capture part-load operation and air circulation mode.

We encourage DOE to continue to investigate an 'annualized metric.'. CRACs are designed to provide year-round cooling at a stable indoor cooling load. An annualized metric that is an integrated measure of CRAC performance at different outdoor temperatures would be more representative of the efficiency of this equipment. DOE indicates a willingness to adopt an 'annualized metric,' but does not propose to adopt such a metric in this rulemaking (as the iNSenCOP metric is under development by AHRI). We urge DOE to continue to investigate a potential 'annualized metric.'

Thank you for considering these comments.

Sincerely,

Rachel Margolis
Technical Advocacy Associate
Appliance Standards Awareness Project

Amber Wood
Director, Buildings Program
American Council for an Energy-Efficient Economy

Chris Corcoran
Team Lead – Codes, Products, & Standards
New York State Energy Research and Development Authority

Joe Vukovich
Energy Efficiency Advocate
Natural Resources Defense Council

[2] https://www.energy.gov/sites/default/files/2022-02/crac-ecs-nopr.pdf. p. 43.
[3] In this test procedures NOPR, DOE proposes an increase from 75 °F to 85 °F for up-flow ducted and down-flow CRACs. Therefore, we expect the impact to be smaller for these equipment.
[4] https://www.regulations.gov/document/EERE-2011-BT-STD-0029-0021. P. 4-15 to 4-16.