Appliance Standards Awareness Project
American Council for an Energy-Efficient Economy
New York State Energy Research and Development Authority
Northwest Energy Efficiency Alliance

April 15, 2024

Mr. Troy Watson
U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Building Technologies Office, EE-2B
1000 Independence Avenue SW
Washington, DC 20585

RE: Docket Number EERE-2017-BT-STD-0009: Energy Conservation Standards for Walk-In Coolers and Freezers

Dear Mr. Watson:

This letter constitutes the comments of the Appliance Standards Awareness Project (ASAP), American Council for an Energy-Efficient Economy (ACEEE), New York State Energy Research and Development Authority (NYSERDA), and the Northwest Energy Efficiency Alliance (NEEA) on the notification of data availability (NODA) for walk-in coolers and freezers. 89 Fed. Reg. 18555 (March 14, 2024). We appreciate the opportunity to provide input to the Department.

We generally support DOE's updates to the analysis for walk-in non-display doors and refrigeration systems presented in the NODA and are pleased the Department has incorporated improved single-speed compressor efficiency as a design option. Based on the Trial Standard Levels (TSLs) evaluated in the NODA, the Department should adopt TSL 2 for all walk-in components, which would save about 1.7 quads of energy and yield net present value savings for purchasers of up to $3.3 billion.[1] However, we believe that greater cost-effective energy savings may be possible. In particular, we urge the Department to consider higher standards for non-display doors associated with the use of thicker insulation.

Additionally, we re-iterate our comments in response to the September 2023 notice of proposed rulemaking (NOPR) that were not addressed in the NODA.[2] We urge DOE to consider adopting a standard level for outdoor dedicated condensing units (DCUs) that assumes use of a variable-speed condensing fan and to further consider electronic expansion valves (EEVs) as a design option for outdoor DCUs and single-packaged units. We also remain concerned that DOE may be overestimating the cost of variable-speed compressors and encourage the Department to include learning rates for variable-speed controls. Additionally, we encourage DOE to further investigate the assumptions regarding refrigeration maintenance costs. Finally, we encourage DOE to further examine walk-in door and panel lifetimes and appropriate installation costs for panel insulation thicknesses greater than 4 in.

[1]Tables II.20 to II.23. 89 Fed. Reg. 18575, 18576.
[2]EERE-2017-BT-STD-0009-0037, www.regulations.gov/comment/EERE-2017-BT-STD-0009-0037

DOE should adopt TSL 2 for walk-in refrigeration systems. In the NODA, DOE updated the analysis for DCUs, unit coolers, and single-packaged units. TSL 2 in the NODA aligns with the proposed TSL 2 in the NOPR for many evaluated representative units (RUs), but TSL 2 in the NODA reflects higher cost-effective ELs for medium-temperature outdoor DCUs (DC.M.O) and low-temperature outdoor single-packaged units (SP.L.O).[3] A major source of additional cost-effective energy savings for TSL 2 in the NODA relative to the NOPR is the assumed use of more efficient single-speed compressors for some medium-temperature DCUs.[4] NODA TSL 2 for single-packaged units also better reflects the highest cost-effective ELs from both the NOPR and NODA analyses. Based on the updated analysis, DOE should adopt TSL 2 for walk-in refrigeration systems, which would deliver an additional 0.25 quads of energy savings and similar consumer benefits relative to TSL 1.[5]

We support DOE's approach regarding non-display doors with additional electrical components but encourage the Department to gather additional component energy use data. In the September 2023 NOPR, DOE assumed that baseline non-display doors had insulation, wood framing materials, a viewing window, and anti-sweat heaters; the Department did not consider lighting or other electrical components in the analysis at the baseline or higher ELs.[6] However, Kolpak commented that additional electronic components may be implemented on non-display doors including lighting, a heated viewing window, a heated ventilator, thermometers, and temperature alarms, and that the proposed standards could not be met with inclusion of these additional components. In response, DOE has proposed a separate equipment class with additional daily energy consumption allowances for non-display doors offered with one or more of these additional electrical components.[7]

While we are generally supportive of DOE's approach, we encourage the Department to gather additional information to ensure that the energy use allowances for non-display doors with additional electrical components reflect the use of efficient components. For example, DOE assumes that lighting controls would not be implemented on non-display door lighting,[8] but controls could be implemented to reduce lighting energy usage. We also encourage DOE to further investigate the discrepancy between Kolpak's suggested ventilator heat power (4 W) and the power allowance included in the NODA (23 W) for low-temperature non-display doors.[9]

We urge DOE to evaluate an intermediate TSL for non-display doors that assumes the use of thicker insulation. In the NOPR, DOE stated that TSL 2 represented the highest efficiency levels that resulted in a positive consumer net present value (NPV) at a 7% discount rate.[10] TSL 2 for non-display doors, equivalent to EL 3 in both the NOPR and NODA analyses, assumes reductions in anti-sweat heat power and use of insulative framing materials, but no change to insulation thickness.[11] However, based on both the NODA and NOPR analyses for low-temperature non-display doors, TSL 3 (which assumes use of thicker insulation) has a positive consumer NPV at 7%. While DOE may not have proposed TSL 3

[3]TSL 2 ELs are also higher for the 75 kBtu/hr DC.L.O, 54 kBtu/hr DC.M.I, 2 kBtu/hr SP.H.OD, and SP.H.I RUs.
[4]The 54 kBtu/hr DC.M.O, 124 kBtu/hr DC.M.O, and 54 kBtu/hr DC.M.I RUs are assumed to implement improved single speed compressors at TSL 2. 89 Fed. Reg. 18560, 18561.
[5]Tables II.20, II.22. 89 Fed. Reg. 18575.
[6]NOPR 88 Fed. Reg. 60746, 60769, 60770 (September 5, 2023).
[7]The actual energy usage of these components would still be determined using the walk-ins test procedure.
[8]89 Fed. Reg. 18557.
[9]89 Fed. Reg. 18558.
[10]88 Fed. Reg. 60746, 60786 (September 5, 2023).
[11]EL 3 assumes 3.5 in and 4 in. of insulation for medium- and low-temperature non-display doors, respectively.

(associated with 6 in. of insulation) due to manufacturer impacts,[12] we believe an intermediate level would likely be cost-effective for both low- and medium-temperature non-display doors. DOE notes in the NOPR that most manufacturers today can produce non-display doors up to 5 in. thick,[13] so EL 4 (associated with 4 in. and 5 in. of insulation for medium- and low-temperature non-display doors, respectively) would appear to be unlikely to result in significant adverse impacts on manufacturers.

Table 1 shows the average LCC savings calculated at EL 4 relative to the baseline (EL 0) based on DOE's LCC spreadsheet[14] for the NOPR and the simple payback period reported in the spreadsheet for both the motorized (NO) and manual (NM) low-temperature and medium-temperature non-display door equipment classes. TSL 2 (EL 3) values are shown in Table 1 for comparison. As shown in Table 1, average LCC savings at EL 4 relative to the baseline and simple PBPs are comparable between EL 3 and EL 4 for all non-display door equipment classes. We note that while DOE has not provided the full LCC sample as part of the NODA, the average LCC savings for TSL 2 and TSL 3 for low-temperature non-display doors increased between 15% and 30% relative to the NOPR, while DOE's analysis for medium-temperature non-display doors is unchanged. (We note that there is a small discrepancy in LCC values between our Table 1 estimates, the "Summary" sheet of the LCC spreadsheet, and the NOPR LCC tables.)

Table 1. Estimated average LCC savings relative to the baseline level (EL0) and simple PBPs for walk-in non-display doors.

Equipment Class	TSL 2 (EL 3) Avg. LCC Savings	EL 4 Avg. LCC Savings	EL 3 PBP	EL 4 PBP
NO.L	$1200	$1120	1.0	1.5
NM.L	$860	$740	1.3	2.0
NO.M	$320	$260	2.4	3.0
NM.M	$190	$130	3.2	4.0

Overall, these results suggest that EL 4 is cost-effective for purchasers and we thus encourage DOE to fully evaluate and consider adopting an intermediate level between TSL 2 and TSL 3 that reflects use of thicker insulation (i.e., EL 4) for both low- and medium-temperature non-display doors.

Thank you for considering these comments.

Sincerely,

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[12] 88 Fed. Reg. 60746, 60845 (September 5, 2023).
[13] 88 Fed. Reg. 60746, 60828 (September 5, 2023).
[14] EERE-2017-BT-STD-0009-0051, www.regulations.gov/document/EERE-2017-BT-STD-0009-0051

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