



AMCA ADVOCACY BRIEF

UPDATE STATE ENERGY CODES TO SAVE FAN ENERGY USING NEW METRIC AND SCOPE

OCTOBER 2020

Overview: Fan-efficiency sections in ASHRAE 90.1-2019 and IECC-2021 feature scope increases and a new metric, Fan Energy Index (FEI), that save energy and improve clarity and enforcement. AMCA advises states to apply these updates in their next code cycle, even if adopting earlier editions of ASHRAE 90.1 and IECC.

More Information: amca.org/fei and amca.org/find-fei

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ABOUT FEI

Formalized in ANSI/AMCA Standard 208-18, calculation of the Fan Energy Index, FEI was developed after the U.S. Department of Energy in an as-yet-unfinished rulemaking for commercial and industrial fans and blowers concluded FEG is not an appropriate metric for a federal regulation

Fan-efficiency provisions based on FEI have been approved for:

- ANSI/ASHRAE/IES 90.1-2019, Energy Standard for Buildings Except Low-Rise Residential Buildings.
- ANSI/ASHRAE/ICC/USGBC/IES 189.1-2020, Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings.
- 2021 International Energy Conservation Code (IECC).
- 2021 International Green Construction Code (IgCC).

Meanwhile, FEI is in the new Florida Energy Code and has been proposed for California, Connecticut, and Oregon energy codes. FEI also has been proposed for U.S. Department of Energy and California fan-efficiency regulations.

AMCA International advises state energy offices to update fan-efficiency provisions to the ASHRAE 90.1-2019 and IECC-2021 language during their next code cycles.

BASICS OF FAN ENERGY INDEX

FEI is a measure of the efficiency of an entire fan system—the fan, the motor, and the drive—not just the fan. FEI is calculated using data from performance tests conducted in laboratories and contained in manufacturer sizing software and product catalogs. It establishes a baseline efficiency and resulting baseline power that varies with both airflow and pressure and can be applied to all fan categories. For energy-efficiency regulations, codes, and standards, this establishes a “range of compliant operations,” rather than a single-point pass/fail efficiency threshold. In other words, FEI optimizes fan, motor, and drive selections for the conditions under which they will operate.

BENEFITS

1. Clarity for buyers and specifiers

FEI replaces the Fan Efficiency Grade (FEG) metric. FEG ratings apply to a range of sizes of a particular fan model, which obscures the lower actual efficiencies of smaller fans. The FEG 67 rating, for example, covers a range of efficiencies from approximately 45% to 65%, depending on the impeller diameter. Typically, the larger the fan, the higher the efficiency. To make up for this, a sizing window must be applied by designers to nudge fan selections to larger diameters. FEI solves this problem with values that inherently track the actual efficiency of a fan.

2. Flexible application

When a designer inputs a fan selection or duty point, manufacturers' software offers compliant fans of different types, sizes, motors, drives, and materials. These options make it easy for designers and owners to perform cost-benefit analyses on fans with higher-FEI ratings.



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3. Simpler design and enforcement

FEG requires a sizing window of “15 percentage points from peak total efficiency.” This requires that fans be rated in total efficiency when, in fact, static-pressure ratings are more common. Designers must document window compliance for every covered fan, and code officials must check each fan for compliance. If the window is ignored, smaller fan sizes likely will be selected for lower first cost, but higher energy consumption and life-cycle cost will result. FEI works for static and total efficiency and eliminates the window.

4. Greater energy savings

Because FEI is easier to use and enforce and encourages more-efficient fan types, sizes, and motor/drive combinations, using the FEI metric, it saves energy over the FEG metric.

SAVINGS BEYOND THE METRIC

The fan efficiency sections of the model energy codes and standards were updated to reduce the lower fan-motor limit from 5.0 HP to 1.0 HP, and thus, increase the scope of covered fans. Because FEI works for low-pressure fans, the exemption for powered roof and wall ventilators was removed. This will lead to fan energy savings above and beyond changing from FEG to FEI.

FAN REBATE PROGRAMS

AMCA has been working with regional energy-efficiency offices, representatives of electric utilities, and incentive-program designers to develop FEI-based incentive programs. Midstream (distributor-oriented) programs are expected to launch in 2021. Moving from FEG to FEI will allow your constituents to benefit from these programs and accelerate energy savings and carbon reductions.

CERTIFIED RATINGS

The fan-efficiency provision in the 2021 IECC will require that FEI ratings be certified by an approved third-party laboratory. AMCA International’s Certified Ratings Program covers nearly 300 fan models from 13 manufacturers, with more on the way. For the complete list of certified manufacturers with links to certified FEI ratings, visit amca.org/find-FEI.



CALLS TO ACTION

- If your state references the IECC, consider the approach taken by Florida, which, in adopting the 2018 IECC for Florida Building Code, Energy Conservation, 7th Edition (Section C403.2.12.3), replaced the fan-efficiency section with the language in the 2021 IECC.
- If your state is updating to ANSI/ASHRAE/IES 90.1-2016 (or 2013), consider swapping the fan-efficiency section with the corresponding section in the 2019 edition.
- View recorded webinars and download technical papers about Fan Energy Index at the AMCA FEI microsite at www.amca.org/fei.



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