

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460



OFFICE OF
AIR AND RADIATION

December 9, 2016

Dear Distribution Transformer Brand Owner or Other Interested Party:

The U.S. Environmental Protection Agency (EPA) thanks all stakeholders for their participation in the development of the ENERGY STAR specification for medium-voltage, liquid-immersed distribution transformers. In consideration of compelling stakeholder feedback, EPA has decided not to finalize the specification at this time, and instead will pilot it as part of buying guidance and web resources designed to connect utilities with manufacturers offering more efficient transformers. Pilot tools will leverage the extensive work EPA and stakeholders have completed in developing criteria that:

- Define energy efficiency at a level above the minimum DOE standard, creating an option for utilities that are interested in and able to claim distribution system efficiency improvements toward stated energy efficiency goals.
- Define efficiency levels for a range of load factors to assist purchasers in identifying efficient products that are right-sized for their intended uses.
- Incorporate a total cost of ownership approach in criteria development to offer product availability that delivers both energy savings and cost-effectiveness for purchasers with higher generation costs.

This approach will enable EPA, interested manufacturers, and other stakeholders to advance energy efficient distribution transformers in utility service territories where it makes sense to do so. Through the pilot, EPA will work to better understand the extent that the criteria can be effectively leveraged to advance energy efficient transformers in tandem with the total cost of ownership approach to purchasing. The pilot will not include Third-party Certification. Lessons learned from EPA's pilot will help inform next steps in incentivizing the uptake of efficient transformers.

EPA is posting the latest version of the ENERGY STAR specification on the [ENERGY STAR Distribution Transformers Product Development page](#) as a resource that will be used for purposes of the forthcoming buying guidance. In light of comments on the Draft 2 specification, EPA made changes to this document as reflected in Attachment A to this letter. All documents related to this specification development, including EPA responses to stakeholder comments on Draft 2, are also available on the [ENERGY STAR Distribution Transformers Product Development page](#).

For questions about the ENERGY STAR program, please contact Verena Radulovic, EPA, at Radulovic.Verena@epa.gov and (202) 343-9845 or Matt Malinowski, ICF, at Matt.Malinowski@icf.com and (202) 862-2693.

For utilities and manufacturers interested in the buying guidance pilot effort, please contact Maureen McNamara, EPA, at McNamara.Maureen@epa.gov and (202) 343-9047. More information about the pilot will be coming in 2017.

Thank you for your support of ENERGY STAR.

Sincerely,

A handwritten signature in cursive script that reads "Verena Radulovic".

Verena Radulovic, Product Manager

Enclosures:

Attachment A: Summary of changes to the ENERGY STAR Distribution Transformers criteria

Attachment A

Summary of Changes

Definitions: EPA has modified the definition of Transformer to mention "insulated conductor" instead of "insulated wire" to reflect different technologies available for conductor choice. EPA also added a definition for Basic Impulse Level (BIL) due to a new scope exclusion of products with a BIL greater than 150 kV (see below).

Scope: EPA has excluded the following product sizes due a lack of data on products that would be able to meet criteria more efficient than the DOE standard. Since these types of transformers represent a very low market share, EPA estimated their exclusion will not significantly impact energy savings potential of the specification.

- Single phase transformers larger than 500 kVA
- Three-phase vault transformers
- All transformers with a BIL greater than 150 kV

Efficiency Criteria Revisions: EPA has maintained the requirements for the load factor ranges that were presented in Draft 2. However, EPA has made the following modifications in response to stakeholder feedback:

- EPA has divided the high load factor bin into two: > 40–55% and > 55%; doing so will also generate more energy savings.
- EPA has provided recommended energy savings requirements for Design Lines (DLs) 3 and 5 at the lower load factor bins. These were marked as TBD in the Draft 2 specification due to concerns with additional core weight required to meet the same requirements as the other design lines, especially for DL 3. EPA requested data from stakeholders but did not receive any. Instead, EPA performed its own analysis and found that meeting the requirements would increase weight by 11% if using M3 steel and not increase it at all if using DR80. Due to these modest increases, EPA included the same recommended efficiency levels as for the other Design Lines.
- In response to manufacturer input that optimizing transformers at each utility-provided load factor within a bin would be burdensome for manufacturers, EPA has provided specific load factors in the midpoint of each bin at which the recommended requirement shall be met. Based on analysis, EPA does not expect this to decrease savings significantly. The midpoint was chosen by reviewing the RMS load distribution for DL 1 previously developed by DOE. Designating one load factor within a bin should simplify the process of providing designs that adhere to the pilot buying guidance in response to a customer request. A manufacturer will be able to provide just a single design that is acceptable across the entire load factor bin, rather than ensuring that its designs meet the requirements each time a utility purchaser provides a load factor.
- EPA has clarified that transformers with multiple ratings and duplex transformers shall have each portion of the unit meet the criteria applicable to the portion's kVA rating.

- EPA updated Equation 2 with the assumption that the minimum DOE designs will have a core loss equal to load loss at 50% load factor. This approach will reduce burden for manufacturers by keeping the performance of the DOE model a constant for a given capacity for all manufacturers, rather than a variable that would need to be modeled for each TOC-optimized design.