

DEPARTMENT OF ENERGY**Public Meeting on Analysis of ASHRAE Standard 90.1–2007**

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy (DOE).

ACTION: Notice of public meeting.

SUMMARY: The Department of Energy is in the process of making a determination as to whether ANSI/ASHRAE/IESNA Standard 90.1–2007 would save energy in commercial buildings. In doing so, we are performing a comparative analysis of the 2007 edition of that standard to the 2004 edition and seeking input on our considered approach to carrying out that analysis.

DATES: The Department will hold a public meeting on Wednesday, February 18, 2009, in Washington, DC. Please send requests to speak at the meeting so that we receive them by 4 p.m., Wednesday, February 11, 2009. DOE must receive a signed original and an electronic copy of statements to be given at the public meeting no later than 4 p.m., Friday, February 13, 2009.

ADDRESSES: Requests to make statements at the public meeting and copies of those statements should be sent to Brenda Edwards-Jones at the following address: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121.

You should identify documents as either, “Request to Speak,” or “Statement,” followed by, “Public Meeting on Analysis of Standard 90.1–2007”.

The public meeting will begin at 9 a.m., on Wednesday, February 18, 2009, in Room 1E–245 at the U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC. You can read copies of the transcript of the public meeting in the Freedom of Information Reading Room (Room No. 1E–090) at the U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC, between the hours of 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

You may obtain copies of the reference standard ANSI/ASHRAE/IESNA Standard 90.1–2007 by request from the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1791 Tullie Circle, NE., Atlanta, GA 30329, (404) 636–8400, <http://www.ASHRAE.org>. A copy of the “Draft Methodology for a Comparative Analysis of ANSI/ASHRAE/IESNA

Standard 90.1–2007 and Standard 90.1–2004” may be downloaded from Building Energy Codes Program Web site at http://www.energycodes.gov/implement/determinations_com.stm. The latest information regarding the public workshop is available on the Building Energy Codes Program Web site at http://www.energycodes.gov/implement/determinations_com.stm.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:**I. Introduction****A. Authority**

Section 304(b)(2) of title III of the Energy Conservation and Production Act (ECPA), as amended, requires the Secretary of Energy to determine whether the revisions of the American National Standards Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)/Illuminating Engineering Society of North America (IESNA) Standard 90.1 will improve energy efficiency in commercial buildings. (42 U.S.C. 6833(b)(2)(A)) A notice of the determination is required to be published in the **Federal Register**. (42 U.S.C. 6833(b)(2)(A)) If the Secretary makes an affirmative determination, each State is required to certify to DOE within two years of the determination that it has reviewed and updated the provisions of its commercial building code regarding energy efficiency and that its State commercial building code meets or exceeds the revised standard. (42 U.S.C. 6833(2)(B)(i)).

B. Background

Standard 90.1 was revised by ASHRAE in 2007. In preparation for making a determination as to whether the recent revision would improve energy efficiency in commercial buildings, DOE is doing a comparative analysis between the 2004 edition and 2007 edition of Standard 90.1. DOE's determination for ANSI/ASHRAE/IESNA Standard 90.1–2004 was conducted using the same methodology as the previous determination for ANSI/ASHRAE/IESNA Standard 90.1–1999. The analysis used in the determinations for both the 1999 and 2004 versions was discussed in detail at 67 FR 46464 (July 15, 2002). DOE is considering modifying the methodology used in the determination associated with Standard

90.1–2007. DOE is holding a meeting to obtain comment on the new approach prior to analyzing ANSI/ASHRAE/IESNA 90.1–2007 and to identify any issues. This meeting is the subject of today's notice.

C. Summary of Draft Methodology for Comparative Analysis of ANSI/ASHRAE/IESNA Standard 90.1–2007 and Standard 90.1–2004

DOE is considering both a qualitative and quantitative comparison of the Standard 90.1–2004 and Standard 90.1–2007. The considered analysis would provide qualitative comparisons of the stringencies between the two editions of Standard 90.1 in the scope of the standard; the building envelope requirements; the building lighting requirements; the building mechanical equipment requirements; and the paths to compliance. The quantitative comparison of energy codes would be done on whole building energy simulations of specific building prototypes compliant with each standard. For the determination, DOE is considering to simulate several representative building types in 16 representative U.S. climates. The detailed methodology for the quantitative comparison is presented in “Draft Methodology for a Comparative Analysis of ASHRAE/IESNA Standard 90.1–2007 and Standard 90.1–2004.” DOE is considering a new methodology for two reasons. First, DOE is considering use of the EnergyPlus building energy simulation software in place of the BLAST building energy simulation software used in previous determinations. EnergyPlus is the newest simulation software developed by DOE and most DOE buildings-related analysis is now being conducted with EnergyPlus. Second, DOE is considering the use of a DOE benchmark building for the building models. The Benchmark buildings are a set of prototypical buildings developed by DOE for evaluation of commercial building energy programs, including codes and standards.

II. Discussion**A. Draft Methodology for a Comparative Analysis of ANSI/ASHRAE/IESNA Standard 90.1–2004 and Standard 90.1–2007**

DOE is considering both a qualitative and quantitative comparison of the Standard 90.1–2004 and Standard 90.1–2007.

Qualitative Comparisons

The draft analysis would provide qualitative comparisons of the

stringencies between the two editions of Standard 90.1 based on examination of the differences between the editions in each of the following areas:

- Scope of the standard,
- Building envelope requirements,
- Building lighting requirements,
- Building mechanical equipment requirements, and
- Paths to compliance.

The emphasis of the qualitative comparison would differ between the envelope, lighting, and mechanical sections. In the building envelope section, the comparison would focus on the impact of the different building envelope requirements on the building heating and cooling loads for different building types and climates. The envelope comparison would examine requirements for all envelope components, including roofs, walls, floors, and fenestration, as well as explore variations in construction types and in the window-to-wall ratio.

In the lighting requirements comparison, the focus would be primarily on the impact the different lighting requirements have on lighting energy use, as well as on building loads. The comparison would look separately at the whole building and space-by-space lighting requirements in both standards in a variety of commercial building types, as well as examine the effect of any "additional lighting power allowances."

The mechanical requirements comparison would be divided into comparisons of equipment efficiency requirements and system design requirements. The system design requirements affect both the system efficiency, system load, and may have direct energy impacts due, for instance, to fan design. Tables of relative stringency and estimated positive or negative national energy impact would be prepared based on practical application of the system design requirements in each standard.

Each standard has multiple ways to demonstrate compliance. DOE would enumerate the multiple paths to compliance, but is not considering a detailed comparison of the relative stringency of alternate paths within a single standard or between standards. The large quantity of variables among the alternative compliance paths would make such analysis prohibitive to undertake. Further, we know of no data on which to base the selection of representative requirements for such an analysis. Assignment of requirements would be arbitrary. Rather we would focus on what we believe is the most common approach to using the standard in question for particular building types.

The qualitative comparison methodology proposed for the Standard 90.1–2007 determination is identical to that used for the Standard 90.1–2004 determination.

Quantitative Comparison

We are considering basing the quantitative comparison of energy codes on whole building energy simulations of buildings built to each standard. The simulated buildings would utilize EnergyPlus prototype buildings developed within DOE as reference buildings for tracking and predicting the energy impacts of DOE programs. (These prototypes are known as DOE's Benchmark Buildings.) The use of EnergyPlus prototypes represents a significant change from past determinations where the BLAST simulation tool was utilized and where a scaling process was used to represent buildings of varying size within a specific building type.

DOE is developing 17 building prototypes under its Benchmark buildings effort. Each benchmark prototype is being developed through support of DOE national lab staff at Lawrence Berkeley National Laboratory (LBNL), the National Renewable Energy Laboratory (NREL), and Pacific Northwest National Laboratory (PNNL), as well as being reviewed by members of ASHRAE Standing Standard Project Committee (SSPC) 90.1, with the purpose of being as representative of current building designs as possible. However, not all of these prototypes are expected to be completed in sufficient time for DOE to meet its statutory deadline for the 90.1–2007 determination on December 31, 2008. DOE expects to have between five and ten prototypes completed in time for use in the quantitative aspect of the determination. DOE intends to simulate the available prototypes over a range of climate locations (16 versus 11 in previous determinations).

For the 90.1–2007 determination, DOE plans to develop weighting factors by climate zone for each building prototype simulated based on historical construction data. These weighting factors would be based on historical construction square footages by building types assigned to each climate zone. DOE intends to weight simulated building energy use intensities (EUI) across the climate zones by building type to determine the relative change in efficiency by building type and will report these results as was done in previous determinations. In previous determinations, a national estimate of relative energy improvement was provided by weighing the resulting

improvements across building types. If the available building prototypes can represent a sufficiently large percentage of the commercial building market, DOE intends to publish in the determination an estimate of relative national improvement in energy efficiency based on weighting EUIs across building types. If not, DOE may choose not to publish a national estimate of relative improvement, but will make relative weighting factors available.

As more benchmark prototypes become available, DOE plans to complement its 90.1–2007 determination analysis with simulation results from other prototypes and intends to make this additional data available on the Energy Codes Program Web site at the address provided above. The 17 benchmark building types being developed by DOE are: Large Office, Medium Office, Small Office, Stand-Alone Retail, Strip Mall, Primary School, Secondary School, Outpatient Health Care, Hospital, Small Hotel/Motel, Large Hotel, Public Assembly, Fast Food Restaurant, Sit-Down Restaurant, Mid-Rise Apartment, High-Rise Apartment, and Non-Refrigerated Warehouse. These buildings (minus the two apartment buildings) together account for approximately 82 percent of commercial building energy use, according to the Commercial Buildings Energy Consumption Survey (CBECS). Mid Rise and High-Rise residential buildings are also within the scope of ASHRAE 90.1, but are not represented in CBECS. DOE envisions that at a minimum that Medium Office, Large Office, Mid-Rise Apartment, Warehouse and Hospital building prototypes will be available for the Determination.

The 16 climates considered for the analysis represent the 15 distinct climate zones identified in the United States and utilized in Standards 90.1–2004 and 90.1–2007. One location per climate zone would be included in the determination with the exception of Zone 3B, for which two climates are being considered. The climate locations selected are: Miami, Florida (Zone 1A); Houston, Texas (Zone 2A); Phoenix, Arizona (Zone 2B); Atlanta, Georgia (Zone 3A); Los Angeles, California (Zone 3B-California), Las Vegas, Nevada (Zone 3B-other than California); San Francisco, California (Zone 3C); Baltimore, Maryland (Zone 4A); Albuquerque, New Mexico (Zone 4B); Seattle, Washington (Zone 4C); Chicago, Illinois (Zone 5A); Denver, Colorado (Zone 5B); Minneapolis, Minnesota (Zone 6A); Helena, Montana (Zone 6B); Duluth, Minnesota (Zone 7); and Fairbanks, Alaska (Zone 8).

Note that only changes to new buildings would be considered in this quantitative analysis. The scopes of both Standard 90.1–2004 and 90.1–2007 also address additions and renovations to

existing buildings. While this may have a significant energy impact, we do not believe the data is available to quantify this impact.

The differences between the quantitative analysis proposed for the Standard 90.1–2007 determination and the Standard 90.1–2004 determination are summarized below in tabular form.

TABLE 1—COMPARISON OF PRIOR TO CURRENT QUANTITATIVE DETERMINATION METHODOLOGY

Building simulation tool	Standard 90.1–1999 and 90.1–2004 Determinations	2007 Determination
	BLAST	EnergyPlus
Source and Description of Building Models	Pacific Northwest National Laboratory (PNNL; GUMBY). Single generic three-story 48,000 sf slab on grade building model with changeable envelope characteristics (e.g. Window-Wall-Ratio, Wall-Type) and Changeable Internal Plug Loads and Lighting Loads and Schedules.	Building-specific Building Models from DOE Benchmark Building Task.
Building Types Included in Comparison	Office Retail Warehouse Education Lodging Public Assembly. Food Service. (Multi-family Residential buildings not included).	Medium Office. Large Office. Warehouse. Hospital. Mid-Rise Apartment.
Method of characterizing building “type”	Changing of internal loads and schedules in building models.	Building-specific designs based on typical building characteristics, including building design, size and shape, and schedules developed from various data sets and engineering judgment during DOE Benchmarks development.
Method of characterizing building-type population characteristics.	National Characteristics Data Set (CBECS99) used in development of weights for key characteristics known to vary within building “types” (i.e. window-to-wall ratio, mass versus frame wall construction, electric resistance versus gas heat fuel source; simulations done for each of the above characteristics and weighted to final EUI.	National Characteristics Data Set (CBECS03) used in development of Benchmarks Building Models characteristics.
HVAC System Type	Generic Single Zone DX equipment with Gas Furnaces used for all buildings by Lodging. Lodging category represented with PTAC equipment with electric resistance. More detailed system models not considered.	Varies depending on building types. Cooling Systems include Single Zone DX Systems, Central Chiller VAV, and Water-loop Heat Pumps. Heating Systems include hydronic boilers and furnaces and zone reheat systems in VAV models.
HVAC Efficiencies	HVAC efficiencies improvements modeled. Determination “Credit” given for changes to HVAC efficiencies in Standard if not already in Federal Law.	Same; however, efficiencies with effective dates that are more than 3 years out from date of standard are not included.
Ventilation Rates	Ventilation based on Standard 62–1989	Ventilation based on Standard 62–2004.
Extracted Data	Zonal Energy used for Direct Electric Loads, DX Cooling Energy including Fan Energy, Zone Heating energy and SHW energy in central plant. Zonal Data used to develop representative EUI for building population with the simulated characteristics using core and perimeter zone area weights developed from CBECS Size and Form Factor Data for represented building “types”.	Whole-Building Energy Use Data for Electric and Gas Energy Use extracted for each building model.
Fuel Types—Cooling	Electric	Electric.
Fuel Types—Heating	Gas Furnace or Electric Resistance Furnace, with Electric Furnace weights developed through CBECS estimates.	Gas and Electric depending on Benchmark building HVAC system characteristics.
Fuel Types—Hot Water	Gas and Electric (Electric assumed for all buildings with electric heat).	Electric resistance for mid-rise apartment and warehouse, gas for other building types.
Climate Zones Simulated	11 Climate Locations used in 1999 development.	15 climate locations, each representative of one of the 15 U.S. climate zones used in defining the requirements in Standard 90.1–2004 and Standard 90.1–2007.

TABLE 1—COMPARISON OF PRIOR TO CURRENT QUANTITATIVE DETERMINATION METHODOLOGY—Continued

Building simulation tool	Standard 90.1–1999 and 90.1–2004 Determinations	2007 Determination
	BLAST	EnergyPlus
Mapping between simulated locations to geographic regions.	Specific Climate Simulations mapped to geographic census divisions using PNNL-developed weighting factors (vintage 1996).	A representative climate is selected for each of the geographic climate zones.
Building Construction weights	Construction Weights developed based on EIA-NEMS estimates 10 years of future new construction in census division by building type category.	Construction weights developed based on 5 years recent county construction data for building types represented by Benchmark Buildings (DODGE Data, including multi-family >3 stories).
Energy Characteristics Reported	EUI by Building Type and Census Division National EUI estimates through weighting across modeled building types categories.	EUI by Building Type across U.S. National EUI weights not proposed until more Benchmark building type simulations can be included.

B. Public Meeting

1. Procedures for Submitting Requests To Speak

DOE invites any person who would like to attend the public meeting to notify Brenda Edwards-Jones at (202) 586–2945. You may hand deliver requests to speak to the address indicated at the beginning of this notice between the hours of 8 a.m. and 4 p.m., Monday through Friday, except Federal holidays, or send them by mail.

2. Conduct of Public Meeting

The public meeting will be to receive comments representing the individual opinions of participating entities. It is not the object of the hearing to obtain any group position or consensus. Rather DOE is seeking as many comments as possible from all interested parties. The Department may use a professional facilitator to facilitate discussion, and a court reporter will be present to record the transcript of the meeting. We will present summaries of comments received before the public meeting, allow time for presentations by public meeting participants, and encourage all interested parties to share their views on issues affecting the draft analysis. Following the public meeting, we will provide an additional two week comment period, during which interested parties will have an opportunity to present further comment on the draft analysis. The Department will arrange for a transcript of the public meeting and will make the entire record of the public meeting, including the transcript, available for inspection in the Department's Freedom of Information Reading Room. Any person may purchase a copy of the transcript from the transcribing reporter.

C. Issues Requested for Comment

The Department of Energy is interested in receiving comments and/or data concerning issues relating to the comparative analysis of Standard 90.1–2004 and Standard 90.1–2007. These issues are discussed in greater detail in the Draft Methodology for a Comparative Analysis of ASHRAE/IESNA Standard 90.1–2004 and Standard 90.1–2007 that is posted on the web at http://www.energycodes.gov/implement/determinations_com.stm. We are especially interested in any comments or data regarding:

(1) Specific reductions in stringency in Standard 90.1–2007 that the Department should be made aware of and that have been identified by stakeholders.

(2) Specific changes in scope between Standard 90.1–2004 and Standard 90.1–2007 and how DOE should interpret expansions of scope in its determination.

(3) DOE's considered approach to changes in referenced ventilation standards between Standard 90.1–2004 and Standard 90.1–2007.

(4) DOE's considered approach for addressing future effective dates for mechanical equipment requirements.

(5) The frequency of use of alternative paths to compliance in building standards (e.g. space-by-space versus whole building lighting power allowances).

(6) New non-residential building construction data (including mid rise and high rise residential) by State or census division and building type.

(7) Data to quantify the impact of Standard 90.1 on additions and renovations to existing buildings.

(8) The relative prevalence of the semi-heated building envelope subcategory in the building types draft for analysis (e.g., warehouses).

(9) The relative importance of the Mid- and High-rise residential sector in DOE's determination and data for developing weighting factors for this sector.

(10) Data describing the relative frequency of use of alternative paths to compliance.

(11) The impact of using a limited number of building prototypes (medium office, large office, warehouse, hospital, and mid-rise apartment) in the quantitative portion of the determination.

These data will help us to make a determination whether ASHRAE/IESNA Standard 90.1–2007 will improve energy efficiency in commercial buildings as well as provide background that will help DOE in future determinations on Standard 90.1.

Issued in Washington, DC, on January 13, 2009.

John F. Mizroch,

Acting Assistant Secretary, Energy Efficiency and Renewable Energy.

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DEPARTMENT OF ENERGY

Office of Science; Basic Energy Sciences Advisory Committee

AGENCY: Department of Energy.

ACTION: Notice of open meeting.

SUMMARY: This notice announces a meeting of the Basic Energy Sciences Advisory Committee (BESAC). Federal Advisory Committee Act (Pub. L. 92–463, 86 Stat. 770) requires that public notice of these meetings be announced in the **Federal Register**.

DATES: Thursday, February 26, 2009, 8:30 a.m.–5 p.m., and Friday, February 27, 2009, 8:30 a.m. to 12 noon.