assessment of the project's nuclear safety culture by a group of nuclear industry subject matter experts, who have experience in INPO evaluations and/or Nuclear Regulatory Commission (NRC) inspections.

• At both a site and corporate level, we are also taking steps to enhance reporting mechanisms for safety-related concerns. At the Hanford site, we have combined the Employee Concerns Programs for ORP and the Richland Operations Office to leverage existing resources to both strengthen this important program and increase its visibility at the site.

• Within EM Headquarters, we have established ombudsmen to act as advocates for employees and their concerns. We have made it easier for employees to use a variety of avenues to raise concerns, including: the line management for each project, site employee concerns programs, union representatives, EM's Office of Safety and Security Programs, HSS, and DOE's Chief of Nuclear Safety. Each office now offers employees access to both a hotline number and general email inbox, so that workers will have the opportunity to ask questions or voice concerns either directly or anonymously.

• We will also require that both EM Headquarters and field sites assess nuclear safety culture and the implementation of a safety conscious work environment in their annual submittals for Integrated Safety Management System (ISMS) declarations. The specific criteria will build on the existing requirements for the ISMS declarations and will be expanded to include safety culture principles not only from DOE, but also from INPO and NRC.

• Regarding your final recommendation, when the Department became aware of Dr. Tamosaitis' petition to the Board, the Assistant Secretary for Environmental Management immediately requested the Department's Inspector General to perform an investigation into the alleged retaliation issues raised by Dr. Tamosaitis. The Office of the Inspector General decided not to examine the merits of the allegations since they were already the focus of an ongoing investigation by DOL, which has jurisdiction and expertise to review whistle blower claims. The Department will fully cooperate with the DOL as requested in its investigation.

Even while DOE fully embraces the objectives of the Board's specific recommendations, it is important to note that DOE does not agree with all of the findings included in the Board's report.

Specifically, the conclusions drawn by the Board about the overall quality of the safety culture at WTP differ significantly from the HSS findings and are not consistent with the safety culture data and field performance experience at WTP. We are concerned that your letter includes the October 2010 HSS review in the list of ''other examples of a failed safety culture.'' The Department disagrees with this categorization and believes the HSS report provided an accurate representation of the nuclear safety culture—and existing gaps—at the WTP.

As discussed above, the HSS review found areas in need of immediate improvement; however, most WTP personnel did not express a loss of confidence in management support, a sense of a chilled environment, or a fear of retaliation.

Additionally, in its report, the Board alleges that DOE and contractor management suppressed technical dissent on the project. The Department rightly takes any such claim very seriously. Based on an investigation by the DOE Office of the General Counsel, however, we do not necessarily agree with some of the specific details the Board provided. For example, our investigation found no evidence that DOE or its contractors were aware of and sought to suppress a technical report.

Moreover, the Board's findings appear to rely on a number of accounts describing the actions and behaviors of both contractor and DOE personnel that we believe may have been misunderstood by the Board. The Department feels compelled to address these for the public record and in fairness to its personnel.

To do so effectively, on June 22, 2011, DOE requested the Board's full investigative record, including transcripts, interview notes, and exhibits. Per your conversation with Deputy Secretary Daniel Poneman today, we look forward to continuing to engage with you to obtain additional details from the Board's investigation. The Board's investigative record or other supporting information will allow us to provide further details on specific discrepancies between our findings and the Board's and will be of great use in defining the structure and scope of follow-on safety culture improvement initiatives and actions.

We look forward to working with the Board and its staff as we continue to strive towards excellence. It is important for the both the Department and the Board to function collaboratively and openly as we work to further improve the safety culture at DOE. To facilitate that objective and in recognition of the significance of these concerns, I recommend we jointly charter a third-party review, such as the National Academy of Science, to evaluate how we can strengthen our relationship and most effectively work together to achieve our shared objective of helping DOE to safely perform its mission.

As additional information becomes available from our actions addressing this Recommendation, we will make it available to you. We hope to continue a meaningful, regular, and open dialogue on this and all safety matters.

I am designating Mr. Daniel Poneman, the Deputy Secretary of Energy, as the Responsible Manager for this recommendation. He will be charged with reporting to me regularly on the specific additional steps we are taking to improve the safety culture at WTP and all of our facilities.

Sincerely,

Steven Chu.

cc:
D. Poneman, S–2
M. Campagnone, HS–1.1

[FR Doc. 2011–18084 Filed 7–18–11; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

[Docket No. EERE–2010–BT–DET–0030]

RIN 1904–AC17

Updating State Residential Building Energy Efficiency Codes

AGENCY: Department of Energy, Office of Energy Efficiency and Renewable Energy.

ACTION: Notice of final determination.

SUMMARY: The U.S. Department of Energy (DOE or Department) has determined that the 2009 edition of the International Code Council (ICC) International Energy Conservation Code (IECC) (2009 IECC or 2009 edition) would achieve greater energy efficiency in low-rise residential buildings than the 2006 IECC, with site energy savings estimated at 14%. Also, DOE has determined that the 2006 edition of the ICC IECC (2006 IECC or 2006 edition) would achieve greater energy efficiency than the 2003 edition of the ICC IECC (2003 IECC or 2003 edition), with site energy savings estimated at 1%. Finally, DOE has determined that the 2003 edition would not achieve greater energy efficiency than the 2000 IECC. Upon publication of this affirmative final determination, States are required to file certification statements to DOE that they have reviewed the provisions of their residential building code regarding energy efficiency and made a determination as to whether to update their code to meet or exceed the 2009 IECC. Additionally, this Notice provides guidance to States on how the codes have changed from previous versions, how to submit certifications, and how to request extensions of the deadline to submit certifications.

DATES: Certification statements by the States must be provided by July 19, 2013.

ADDRESSES: Certification Statements must be addressed to the Buildings Technologies Program-Building Energy Codes Program Manager, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Forrestal Building, Mail Station EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121.

FOR FURTHER INFORMATION CONTACT: Michael Erbesfeld, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Forrestal Building, Mail Station EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121, (202) 287–1874, *e-mail: michael.erbesfeld@ee.doe.gov.* For legal issues contact Chris Calamita, U.S. Department of Energy, Office of the

General Counsel, Forrestal Building, Mail Station GC–72, 1000 Independence Avenue, SW., Washington, DC 20585–0121, (202) 586–9507, *e-mail: Christopher.Calamita@hq.doe.gov.*

SUPPLEMENTARY INFORMATION:

I. Introduction

A. Statutory Requirements

Title III of the Energy Conservation and Production Act, as amended (ECPA), establishes requirements for the Building Energy Standards Program. (42 U.S.C. 6831–6837) Section 304(b) of ECPA, as amended, provides that when the 1992 Model Energy Code (MEC), or any successor to that code, is revised, the Secretary must determine, not later than 12 months after the revision, whether the revised code would improve energy efficiency in residential buildings and must publish notice of the determination in the **Federal Register**. (42 U.S.C. 6833(a)(5)(A)) The Department, following precedent set by the ICC and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) considers high-rise (greater than three stories) multifamily residential buildings and hotel, motel, and other transient residential building types of any height as commercial buildings for energy code purposes. Low-rise residential buildings include one- and two-family detached and attached buildings, duplexes, townhouses, row houses, and low-rise multifamily buildings (not greater than three stories) such as condominiums and garden apartments.

If the Secretary determines that the revision would improve energy efficiency then, not later than 2 years after the date of the publication of the affirmative determination, each State [1] is required to certify that it has compared its residential building code regarding energy efficiency to the revised code and made a determination whether it is appropriate to revise its code to meet or exceed the provisions of the successor code. (42 U.S.C. 6833(a)(5)(B)) State determinations are to be made: (1) After public notice and hearing; (2) in writing; (3) based upon findings included in such determination and upon evidence presented at the hearing; and (4) available to the public. (See, 42 U.S.C. 6833(a)(5)(C)) In addition, if a State determines that it is not appropriate to revise its residential building code, the State is required to submit to the Secretary, in writing, the reasons, which are to be made available to the public. (See, 42 U.S.C. 6833(a)(5)(C))

In the specific case of this final determination, where DOE is publishing the results of three residential determinations at once, each state should certify it has compared its residential building code regarding energy efficiency to the 2009 IECC and made a determination whether it is appropriate to revise its code to meet or exceed the provisions of the successor code.

B. Background

The ICC's IECC establishes national energy efficiency requirements for buildings. In 1997, the Council of American Building Officials (CABO) was incorporated into the ICC and the MEC was renamed to the IECC. A previous **Federal Register** notice, 59 FR 36173, July 15, 1994, announced the Secretary's determination that the 1993 MEC increased energy efficiency relative to the 1992 MEC for residential buildings. Similarly, another **Federal Register** notice, 61 FR 64727, December 6, 1996, announced the Secretary's determination that the 1995 MEC is an improvement over the 1993 MEC. Finally, **Federal Register** notice 66 FR 1964, January 10, 2001, simultaneously announced the Secretary's determination that the 1998 IECC is an improvement over the 1995 MEC and the 2000 IECC is an improvement over the 1998 IECC.

C. Preliminary Determination

DOE published in the **Federal Register** a Notice of Preliminary Determination for the 2003, 2006 and 2009 editions of the IECC that preliminarily concluded that the 2009 version of the IECC would achieve greater energy efficiency in low-rise residential buildings than the 2006 IECC. Also, DOE preliminarily determined that the 2006 version of the IECC would achieve greater energy efficiency than the 2003 IECC. Finally, DOE preliminarily determined that the 2003 version of the IECC would not achieve greater energy efficiency than the 2000 IECC. 75 FR 54131 (Sept. 3, 2010).

D. Public Comments Regarding the Preliminary Determination

DOE accepted public comments on the preliminary determination for the 2003, 2006, and 2009 editions of the IECC until October 4, 2010. DOE received submissions from a total of seven different entities.

The Responsible Energy Codes Alliance (RECA) submitted a written comment (Docket No. EERE–2010–BT–DET–0030–0006.1, pgs. 2–4) stating that it strongly supports the Department's determination that the 2006 and 2009 editions of the IECC would achieve greater energy efficiency in buildings than the relative previous editions. RECA suggests that DOE follow up with the States after publication of the Final Determination, as well as making public, on the Department's Web site, the certification letters that States submit. RECA went on to comment that the Department's decision to publish a Notice of Preliminary Determination rather than a Notice of Determination is unnecessary to comply with the Energy Policy Act and that adding an extra level of administrative procedure is likely to further delay determinations on future editions of the model energy codes.

In response to RECA's comment concerning following up with the States in their certification efforts, DOE notes that under section 304(d) and (e) of ECPA DOE provides technical assistance and funding to States that choose to improve and implement State residential building energy efficiency codes, including increasing and verifying compliance with such codes. As certification letters are received from the States, they will be made public on the Department's Web site at *http://*

[1] The term State includes ''each of the several States, the District of Columbia, the Commonwealth of Puerto Rico, and any territory and possession of the United States.'' 42 U.S.C. 6832(11).

energycodes.gov/states/. The certification letters will also be forwarded to the State Energy Program for their consideration. DOE further notes that a listing of those States that have submitted certification letters from their respective governors under the requirements of the American Recovery and Reinvestment Act is available at *http://www.energy.gov/InYourState.htm.* The letters can be found on each State's Web site under Recovery Act activity.

With regard to issuing a preliminary determination, the Department believes that there is value in providing an opportunity for public comment on its analysis, particularly given that a positive determination could potentially impact States.

The American Chemistry Council (ACC) submitted a written comment (Docket No. EERE–2010–BT–DET–0030–0007.1, pg. 1) stating that it strongly supports the Department's determination that the 2009 edition of the IECC would achieve greater energy efficiency in buildings than the 2006 edition.

The Edison Electric Institute (EEI) submitted a written comment (Docket No. EERE–2010–BT–DET–0030–0002.1, pgs. 1–2) supporting the preliminary determination with one concern about the analysis. Their concern was that the DOE model estimates the annual average baseline residential lighting energy usage at 2,373 kWh per year. EEI suggests that the annual lighting usage should be closer to 900 kWh per year.

The basis of DOE's lighting energy assumptions comes from the 2006 Mortgage Industry National Home Energy Rating Standards developed by the Residential Energy Services Network (RESNET), *http://www.resnet.us/standards/RESNET_Mortgage_Industry_National_HERS_Standards.pdf* , pg. 3–19. These standards assume 2,375 kWh/year of lighting energy use for a newly constructed 2400 ft[2] house. The EEI comment references data from the 2001 Residential Energy Consumption Survey (RECS), *http://www.eia.gov/emeu/recs/recs2001/enduse2001/enduse2001.html,* which reports average energy usage for all existing housing in the year 2001 to be 940 kWh/year. DOE used RESNET as opposed to RECS, because it was the most up-to-date lighting energy usage estimate for a newly constructed 2400 ft[2] house.[2] Therefore, DOE considers the 2,375 kWh for annual lighting energy usage to be a reasonable estimate based on RESNET's standards.

The ICC submitted a written comment (Docket No. EERE–2010–BT–DET–0030–0003.1, pg. 2) stating that DOE's conclusion that the use of the 2009 IECC will improve energy efficiency in residential buildings that are built to meet its requirements is correct.

The Building Codes Assistance Project (BCAP) submitted a written comment (Docket No. EERE–2010–BT–DET–0030–0004.1, pgs. 1–2) supporting the DOE's determination and suggesting that DOE follow up with the States after publication of the Final Determination, as well as making public which States comply with the statutory requirements by updating their code, submitting in writing why they are choosing not to update their code, or by filing for a formal extension within two years of publication. In regards to BCAP's comments see response to RECA's comments above.

The Energy Efficient Codes Coalition (EECC) submitted a written comment (Docket No. EERE–2010–BT–DET–0030–0005.1, pg. 2) stating they strongly support DOE's determination that the 2009 IECC achieves greater energy efficiency than the 2006 IECC.

The Natural Resources Defense Council (NRDC) submitted a written comment (Docket No. EERE–2010–BT–DET–0030–0008.1, pgs. 2–4) stating the following three issues: (1) It urges DOE to use this opportunity to clarify States' commitments with regards to updating and implementing their building energy codes; (2) clarify the limits of preemption of testing and labeling of energy conservation of consumer products under section 327 of the Energy Policy and Conservation Act EPCA (42 U.S.C. 6297); and (3) revise the energy efficiency standards for Federal buildings to reflect the most recent model energy codes.

In regards to NRDC's first comment, see response to RECA's comments above. In addition, Section IV below describes the process for States to file certification statements with DOE. NRDC's second comment is in reference to the preemption requirements applicable to the Federal energy efficiency standards for appliances. Essentially, section 307(f) of ECPA limits the ability of State and local building codes to require minimum energy efficiency levels of appliances. (See, 42 U.S.C. 6297(e)) It is important to note that today's final determination does not require States to adopt a specific building code. Today's final determination requires a State to certify that it has reviewed the provisions of its residential building code regarding energy efficiency and made a determination as to whether it is appropriate for such State to revise such residential building code provisions to meet or exceed the revised code for which the Secretary made such determination. (42 U.S.C. 6833(a)(5)(B)) Section 304 of ECPA does not prescribe how State code provisions must achieve the required energy efficiencies. This final determination does not require States to adopt a specific code or to require energy efficiency levels of covered appliances as part of that code, but rather it allows for States to adopt building codes that meet or exceed the energy efficiency requirements of Standard 90.1–2007. As such, there is no potential conflict between the State code provisions of ECPA and the preemption language in EPCA. In response to NRDC's final comment, DOE intends to update the baseline standards for Federal buildings found in 10 CFR part 433 and 10 CFR part 435 that reference IECC following the issuance of this final determination for 2003, 2006 and 2009 IECC.

E. DOE's Final Determination Statement

Below is a detailed discussion of the Department's final determinations for the 2003, 2006, and 2009 IECCs.

2003 IECC

DOE's review and evaluation found that there are not significant differences in energy efficiency between the 2003 edition and the 2000 edition of the IECC. Although there are a few changes that would modestly improve the energy efficiency of residential buildings, there are a number of changes that reduce energy efficiency in certain situations. Most of the changes to the IECC between the 2000 and 2003 editions would not effect energy efficiency but rather make the code simpler and clearer for designers, builders, and code compliance officials to understand and use. Based on these findings, the Department has concluded that the 2003 edition of the IECC should not receive an affirmative determination under Section 304(b) of ECPA. The Department concludes that there is at best a slight improvement in energy efficiency for some residential buildings, but this potential improvement is not sufficient to merit an affirmative determination. This is discussed in further detail below. It should be noted that DOE is not concluding that the energy efficiency of the 2003 IECC is less stringent than the 2000 IECC.

[2] Census data reports an average square footage of 2438 ft[2] in 2009. See, *http://www.census.gov/const/C25Ann/sftotalmedavgsqft.pdf.*

2006 IECC

The residential portion of the 2006 IECC has been extensively changed from that of the 2003 IECC. However, the most significant changes to the code between 2003 and 2006 simplify the code format rather than fundamentally changing the overall (national average) energy efficiency of the code. Multifamily buildings, which in the past have had separate, less stringent thermal requirements, are an exception. By eliminating the separate requirements, the 2006 IECC increased the energy efficiency of multifamily buildings.

Although the most significant 2006 changes did not directly target efficiency improvements, the new format of the code does result in some energy efficiency differences. The requirements for any given building may have increased or decreased based on the specific location (climate) and building design. The Department has found that overall the 2006 IECC has an improvement in energy efficiency compared to the 2003 IECC. The Department concludes that the 2006 edition of the IECC receives an affirmative determination under Section 304(b) of EPCA. A Technical Support Document (TSD) for the 2006 IECC is available at the following Web site; *http://www.energycodes.gov/status/determinations_res.stm.* DOE has prepared a TSD for the 2006 IECC determination and not for the 2003 IECC and 2009 IECC determination for the following reasons. The 2006 IECC contained a very extensive change in the format of the code compared to the 2003 IECC. In addition, the changes in the format to the 2006 IECC reduce energy efficiency in some cases and increase energy efficiency in others. DOE deemed that its analysis to determine whether energy efficiency was improved in the 2006 IECC would be better addressed in a TSD rather than in this Notice. As discussed above, for the 2003 IECC determination, there were very few changes from the 2000 IECC and therefore no TSD is needed. For the 2009 IECC determination, discussed below, there are a substantial number of changes that effect energy efficiency, but nearly all these changes are clear improvements that will reduce energy use. Therefore, highly detailed calculations are not needed to determine whether energy efficiency is improved overall in the code and these changes are also discussed in this Notice rather than a TSD.

2009 IECC

The 2009 IECC has substantial revisions compared to the 2006 IECC. Many of these revisions appear to directly improve energy efficiency, and the sum results of all changes appear to result in a significant increase in code stringency. Therefore, the Department concludes that the 2009 edition of the IECC receives an affirmative determination under Section 304(b) of EPCA.

II. Discussion of Changes in the 2003, 2006, and 2009 IECC

A. 2003 IECC Compared With the 2000 IECC

As a whole, the 2003 IECC's provisions for energy efficiency in residential buildings are largely unchanged from the 2000 IECC. There are some changes in the code that can have a modest effect on energy efficiency. These are discussed below. In addition, there is a variety of minor changes intended to make the code more concise, more complete, and better organized, but not more or less stringent. For example, more specific requirements have been added for steel roofs/ceilings and floors to correspond to those already in the code for steel walls. Another example is the relocation of the 51 pages of state maps from the middle of the code to the back of the code. Additionally, the performance path in chapter 4 of the 2003 IECC contains a variety of modest improvements compared to the 2000 IECC, which creates more concise requirements.

1. Changes in the 2003 IECC From the 2000 IECC That Improve Energy Efficiency

a. Increased Duct Insulation Requirements

Duct insulation requirements generally increased in the 2003 IECC. The 2003 IECC requirements are shown in Table 1. These are somewhat difficult to compare to the 2000 IECC requirements because the latter are more complex, differing between ducts in unconditioned spaces and ducts completely exterior to the building, and distinguishing requirements by the design temperature difference between the duct air and the space in which the ducts are located.

The 2000 IECC requirements for ducts in unconditioned spaces are shown in Table 2. Assuming typical supply air temperatures of 55°F for cooling and 95°F for heating (for heat pumps), the 2000 IECC insulation requirement for supply ducts in unconditioned spaces is R–5 (minimum) for nearly all cases. Insulation required by the 2000 IECC for return ducts in unconditioned spaces will generally be R–3.3 in warmer climates and R–5 in colder climates.

For the very common case of supply ducts in attics, which is likely to have the greatest impact on energy use, the 2003 IECC always requires at least R–8, which exceeds the 2000 IECC's R–5 requirement. For supply ducts in other unconditioned spaces, the 2003 IECC's requirements exceed the 2000 IECC's requirements in all cases except very warm locations (less than 1500 heating degree-days), where the 2003 IECC requires R–4 compared to the 2000 IECC's requirement of R–5. Because supply ducts transport air in its hottest (or coldest) condition, insulation has its greatest impact on these ducts. The 2003 IECC is almost always more stringent than the 2000 IECC for supply ducts. This includes all supply ducts in attics and, based on the distribution of population,[3] more than 80% of ducts in other unconditioned spaces.

Requirements for return ducts in attics are slightly more stringent in the 2003 IECC than the 2000 IECC (R–4 vs. R–3.3) in the warmest climates, slightly less stringent (R–4 vs. R–5) in mid climates, and slightly more stringent (R–6 vs. R–5) in the coldest climates.

Research[4] showing the impact on heating and cooling energy use due to duct insulation is summarized in Table 3. Based on this research, the Department estimates that improved duct insulation in the 2003 IECC will reduce heating and cooling energy use by about 1%.

[3] Estimated from USGS Population Places data that allows mapping of population to climate (*http://geonames.usgs.gov/domestic/download_data.htm*).

[4] Triedler, B., R. Lucas, M. Modera, J. Miller. 1996. Impact of Residential Duct Insulation on HVAC Energy Use and Life-Cycle Costs to Consumers. American Society of Heating, Refrigerating, and Air-Conditioning Engineers.

TABLE 1—DUCT INSULATION REQUIREMENTS IN THE 2003 IECC

Annual heating degree days base 65 °F	Insulation R-value (h· ft²·°F)/Btu			
	Ducts in unconditioned attics or outside building		Ducts in unconditioned basements, crawl spaces, and other unconditioned spaces	
	Supply	Return	Supply	Return
Below 1,500	8	4	4	0
1,500 to 3,500	8	4	6	2
3,501 to 7,500	8	4	8	2
Above 7,500	11	6	11	2

TABLE 2—INSULATION REQUIREMENTS (R-VALUE, H-FT²-F/BTU) FOR DUCTS IN UNCONDITIONED SPACES IN THE 2000 IECC

Design Temperature Difference (TD) between air temperature in duct and space in which duct is located (degrees F)	Cooling	Heating
TD ≤ 15	None required	None required
40 ≥ TD > 15	3.3	3.3
TD > 40	5.0	5.0

TABLE 3—HEATING AND COOLING ENERGY SAVINGS (PERCENT) FROM INCREASED DUCT INSULATION (ATLANTA, NATURAL GAS HEATING)

	Attic	Basement	Crawl-space
R–4 to R–6	2.3	1.6	1.8
R–6 to R–8	1.4	0.9	1.1

b. Minor Changes to ''Systems Analysis'' Performance Compliance Method

There are two changes that can increase the stringency of the performance path in Chapter 4 of the 2003 IECC in certain cases. First, any house proposed to use electric resistance heating must have equal or lower calculated energy use than a hypothetical ''standard design'' that uses a more efficient electric air source heat pump. This change makes the performance approach much more stringent for designs that have electric resistance heating. However, compliance can be achieved for these designs using the prescriptive compliance methods in chapters 5 and 6, thereby bypassing the increased stringency of the performance path.

Second, a provision has also been added requiring that the least efficient orientation in terms of energy use be assumed for a proposed group of residences with identical designs. Therefore, in a development where the same design is built on multiple lots facing various directions, the compliance analysis must be based on the least advantageous orientation. In most of the United States, this is the orientation that points the most window area toward a westerly direction, maximizing solar heat gains in summer afternoons and therefore increasing air conditioning energy use. Because proposed building designs must have a calculated annual energy use equal to or less than that of a home with window area equally distributed toward the four cardinal directions, the requirement to assume the least efficient orientation effectively makes the code more stringent because the increased energy use from the least efficient orientation must be offset by improved energy efficiency. This requirement in the 2003 IECC will have only modest average impact because it affects only the performance approach and identical house designs used repeatedly in a development.

2. Changes in the 2003 IECC From the 2000 IECC That Decrease Energy Efficiency

a. Sunroom Additions

A special set of requirements has been added to Table 502.2.5 of the 2003 IECC for sunroom additions having a floor area of less than 500 ft² (46.5 m²). Sunroom additions are permitted to have ceiling, wall insulation, and window U-factor requirements that are typically less stringent than the requirements for all other types of residential construction. These special requirements for sunrooms only apply to additions to existing dwellings, not to sunrooms that are built as part of a new dwelling. In the 2000 IECC, there were no special requirements for sunroom additions; they had to meet the same requirements as other residential construction. To qualify for the less stringent requirements in the 2003 IECC, the sunroom addition must be capable of being controlled as a separately heated and cooled zone. Additionally, new walls, doors or windows between the sunroom and the house must meet the envelope requirements of the IECC. Finally, the glazing area must exceed 40% of the gross area of the exterior walls and roof to qualify as a sunroom in the IECC.

Testing with the EnergyGuage (DOE–2) [5] simulation tool indicates that for a 500 ft² sunroom, the less stringent 2003 requirements could add about $200 to the annual energy costs in Chicago if the sunroom is both heated and cooled all year. Impacts are much smaller in Houston, about $10 added energy costs. However, this increase in energy consumption is mitigated (on average) by several factors. First, the requirements apply to a very small fraction of all new residential construction. The Wall Street Journal

[5] EnergyGuage (DOE–2) simulation tool is available at *http://doe2.com/*.

Online (June 3, 2003) reports $3 billion worth of sunroom construction each year, or less than one percent of all residential construction expenditures. But that fraction includes new construction as well as additions, so the fraction representing sunroom additions is less than 1%. Second, it is expected that many sunrooms will not be maintained at comfort conditions all year, further reducing the overall impact. Finally, because the 2003 IECC requires that the sunroom be thermally isolated from the rest of the house and that walls, windows, and doors between the sunroom and house meet the code's envelope requirements, the thermal impact when these spaces are not actively conditioned is negligible. Therefore, the overall impact of this reduction in stringency to national energy use is expected to be extremely small.

b. Climate Zone Maps

The IECC contains prescriptive envelope requirements (insulation R-values and glazing U-factors) in Chapter 6 and Section 502.2.4 of the code. In the 2000 IECC, only the heating degree-days for the city where the housing was to be built could be used to determine the applicable prescriptive envelope requirements. In the 2003 IECC, the heating degree-days can still be used to determine the requirements, but additionally the designer/builder can use the climate zones provided in the state maps in the IECC. For most locations, the Chapter 3 climate zones and heating degree-days lead to the exact same requirements. Using the climate zones in the maps instead of the heating degree-days will allow about 10% of cities nationwide to have a less stringent set of prescriptive requirements. However, about 20% of cities nationwide will have more stringent requirements when the climate zones are used with the prescriptive requirements. If the designer/builders select to use the climate zone maps in the 10% of cities where it lowers requirements but not in the 20% of locations where it raises requirements, the 2003 code effectively is less stringent. However, DOE believes code users will make use of the climate zone maps even in many of the locations where they raise requirements. DOE does not anticipate that most code users will go through the level of effort of determining which method of determining climate based requirements may give less stringent requirements. In fact, DOE believes most users will not even be aware of these differences, but will prefer the climate zone maps because of their simplicity. The REScheck compliance materials developed by the DOE utilize the same heating degree day based requirements for both the 2000 and 2003 IECC.

c. Increased U-Factor for Skylight Replacements

The maximum U-factor for skylight replacements in existing buildings (Section 502.2.5 of the IECC) is raised from a U-factor of 0.50 to a U-factor of 0.60 for locations above 1,999 heating degree-days. A higher U-factor reduces energy efficiency.

3. Net Impact of Changes in the 2003 IECC From the 2000 IECC on Energy Efficiency

Ultimately, the DOE finds that the net impact of the changes in the 2003 IECC on energy efficiency is not sufficient to merit an affirmative determination.

The change in the 2003 IECC that is expected to have the greatest impact on the nation's energy efficiency is the improved duct insulation, because a majority of new residential buildings have ducts that pass through attics, crawl spaces, unheated basements and other spaces where the IECC requires duct insulation. The improved duct insulation in the 2003 IECC is estimated to save about 1% of heating and cooling costs.

DOE believes that the changes to the system analysis method are not sufficient to sway the decision on whether the determination is affirmative or not. This performance compliance method is less commonly used, and, as it is optional, the modest energy savings from the improvements in this compliance method can easily be bypassed by choosing a different method.

Although the changes that effect sunroom additions and skylight replacements reduce energy efficiency, DOE does not believe that they will lead to substantial impacts on national energy use, as they do not apply to new buildings and only apply to specific types or retrofits and additions to existing buildings. The skylight U-factor change is only a modest reduction in energy efficiency and sunroom additions are a small fraction of the residential construction market.

The addition of the climate zone maps in the 2003 IECC as an option to using city-specific heating degree-day data allows for the possibility of preferentially lowering thermal envelope requirements in about 10% of all national locations. However, it will be difficult to exploit this change because the code user must perform relatively complex calculations rather than using the popular and user-friendly REScheck software.

In sum, DOE concludes the changes to duct insulation requirements will slightly improve energy efficiency in most houses, however, the reductions in energy efficiency for skylight replacements and sunroom additions are expected to at least partially offset these savings from a national energy total use perspective. Additionally, the vast majority of all requirements in the IECC are unchanged from 2000 to 2003. For these reasons, DOE finds insufficient improvements in the 2003 IECC to merit an affirmative determination.

B. 2006 IECC Compared With the 2003 IECC

1. Changes in the 2006 IECC From the 2003 IECC That Improve Energy Efficiency

The residential portion of the IECC in general and the building thermal envelope (ceilings, walls, doors, windows, foundations, *etc.*) requirements in particular were completely restructured from 2003 to 2006. This resulted in the code becoming much shorter and simpler, its volume reduced from 38 pages to 9 pages. The climate basis on which envelope requirements depend was completely reworked. The 2003 IECC has envelope requirements that vary continuously with heating degree-days (HDD),[6] or with 17 HDD zones (geographically-defined based on counties, roughly following 500–HDD bins). In contrast, the 2006 IECC has eight geographically-defined climate zones with all borders set on county boundaries.

A major change to envelope requirements was the combining of separate 2003 IECC requirements for two building categories (1) One- and two-family dwellings, and (2) all other low-rise residential buildings[7]. The 2006 IECC requirements are the same for all low-rise residential building types, which has the effect of increasing the energy efficiency of the second category, all other low-rise buildings. Also

[6] Some compliance paths defined requirements based on 17 ''zones'' based on HDD ranges.

[7] The 2006 IECC defines residential buildings as ''R–3 buildings, as well as R–2 and R–4 buildings three stories or less in height above grade''. The R–2/3/4 designation is from the International Building Code and these are defined as follows:

R–2—Apartment houses, boarding houses, convents, dormitories, fraternities and sororities, monasteries.

R–3—one or two family dwellings.

R–4—Residential Care/Assisted living.

R–2 and R–4 buildings that have more stories are covered commercial codes.

eliminated were nine related tables that provided predefined packages of thermal transmittance prescriptive requirements (glazing, ceiling-roof, exterior wall, floor over unconditioned space, basement and crawl space walls, and floor slab on grade) for different window to wall area ratios (WWR). In their place, the 2006 IECC provides a single table of predefined packages of thermal transmittance prescriptive requirements that do not vary with WWR.

Table 4 shows a comparison of major prescriptive envelope requirements for a single-family house at a typical 15% WWR. The requirements for the 2003 IECC will differ from those shown in Table 4 for other WWRs and for multifamily buildings. The 2006 IECC climate zones do not exactly map to the 2003 IECC zones. Table 5 shows a more detailed estimate of how residential construction maps from the 2006 IECC compare to the 2003 IECC climate zones.

TABLE 4—COMPARISON OF THE 2003 IECC AND 2006 IECC ENVELOPE THERMAL COMPONENT PRESCRIPTIVE CRITERIA FOR ONE- AND TWO-FAMILY DWELLINGS AT 15% WINDOW AREA

IECC climate zone		Heating degree days	Maximum		Minimum					
			Glazing U-factor		Ceiling R-value		Wall R-value		Floor R-value	
2003	2006		2003	2006	2003	2006	2003	2006	2003	2006
1	1 2	0–499	Any	1.20	R–13	R–30	R–11	R–13	R–11	R–13
2	2	500–999	0.90	0.75	R–19	R–30	R–11	R–13	R–11	R–13
3		1,000–1,499	0.75	0.75	R–19	R–30	R–11	R–13	R–11	R–13
4		1,500–1,999	0.75	0.75	R–26	R–30	R–13	R–13	R–11	R–13
5	3	2,000–2,499	0.65	0.65	R–30	R–30	R–13	R–13	R–11	R–19
6		2,500–2,999	0.60	0.65	R–30	R–30	R–13	R–13	R–19	R–19
7		3,000–3,499	0.55	0.65	R–30	R–30	R–13	R–13	R–19	R–19
8	4	3,500–3,999	0.50	0.40	R–30	R–38	R–13	R–13	R–19	R–19
9		4,000–4,499	0.45	0.40	R–38	R–38	R–13	R–13	R–19	R–19
10		4,500–4,999	0.45	0.40	R–38	R–38	R–16	R–13	R–19	R–19
11	5	5,000–5,499	0.45	0.35	R–38	R–38	R–18	R–19	R–19	R–19/30
12		5,500–5,999	0.40	0.35	R–38	R–38	R–18	R–19	R–21	R–19/30
13		6,000–6,499	0.35	0.35	R–38	R–38	R–18	R–19	R–21	R–19/30
14		6,500–6,999	0.35	0.35	R–49	R–38	R–21	R–19	R–21	R–19/30
15	5 6	7,000–8,499	0.35	0.35	R–49	R–38/49	R–21	R–19	R–21	R–21
16	6	8,500–8,999	0.35	0.35	R–49	R–49	R–21	R–21	R–21	R–21
17	7	9,000–12,999	0.35	0.35	R–49	R–49	R–21	R–21	R–21	R–21

TABLE 4 CONTINUED—COMPARISON OF THE 2003 IECC AND 2006 IECC ENVELOPE THERMAL COMPONENT PRESCRIPTIVE CRITERIA FOR ONE- AND TWO-FAMILY DWELLINGS AT 15% WINDOW AREA

IECC climate zone		Heating degree days	Minimum					
			Basement wall R-value		Slab perimeter R-value and depth feet		Crawl space wall R-value	
2003	2006		2003	2006	2003	2006	2003	2006
1	1 2	0–499	R–0	R–0	R–0	R–0	R–0	R–0
2	2	500–999	R–0	R–0	R–0	R–0	R–4	R–0
3		1,000–1,499	R–0	R–0	R–0	R–0	R–5	R–0
4		1,500–1,999	R–5	R–0	R–0	R–0	R–5	R–0
5	3	2,000–2,499	R–5	R–10/13	R–0	R–0	R–6	R–5
6		2,500–2,999	R–6	R–10/13	R–4,2	R–0	R–7	R–5
7		3,000–3,499	R–7	R–10/13	R–4,2	R–0	R–8	R–5
8	4	3,500–3,999	R–8	R–10/13	R–5,2	R–10,2	R–10	R–10
9		4,000–4,499	R–8	R–10/13	R–5,2	R–10,2	R–11	R–10
10		4,500–4,999	R–9	R–10/13	R–6,2	R–10,2	R–17	R–10
11	5	5,000–5,499	R–9	R–10/13	R–6,2	R–10,2	R–17	R–10
12		5,500–5,999	R–10	R–10/13	R–9,4	R–10,2	R–19	R–10
13		6,000–6,499	R–10	R–10/13	R–9,4	R–10,2	R–20	R–10
14		6,500–6,999	R–11	R–10/13	R–11,4	R–10,2	R–20	R–10
15	5 6	7,000–8,499	R–11	R–10/13	R–13,4	R–10,2	R–20	R–10
16	6	8,500–8,999	R–18	R–10/13	R–14,4	R–10,4	R–20	R–10
17	7	9,000–12,999	R–19	R–10/13	R–18	R–10,4	R–20	R–10

TABLE 5—PERCENTAGE OF HOMES IN EACH 2006 IECC CLIMATE ZONE THAT WOULD HAVE BEEN IN EACH 2003 IECC CLIMATE ZONE

2003 IECC climate zone	2006 IECC climate zone						
	1	2	3	4 except Marine	5 and Marine 4	6	7 & 8
1	100	5	0	0	0	0	0
2	0	20	0	0	0	0	0
3	0	40	22	0	0	0	0
4	0	31	10	0	0	0	0
5	0	3	18	0	0	0	0

TABLE 5—PERCENTAGE OF HOMES IN EACH 2006 IECC CLIMATE ZONE THAT WOULD HAVE BEEN IN EACH 2003 IECC CLIMATE ZONE—Continued

2003 IECC climate zone	2006 IECC climate zone						
	1	2	3	4 except Marine	5 and Marine 4	6	7 & 8
6	0	0	28	0	0	0	0
7	0	0	16	4	0	0	0
8	0	0	6	9	0	0	0
9	0	0	0	13	1	0	0
10	0	0	0	28	6	0	0
11	0	0	0	41	8	0	0
12	0	0	0	5	28	0	0
13	0	0	0	0	31	0	0
14	0	0	0	0	20	12	0
15	0	0	0	0	6	81	3
16	0	0	0	0	0	5	6
17	0	0	0	0	0	2	85
18	0	0	0	0	0	0	5
19	0	0	0	0	0	0	2

2. Net Impact of Changes From the 2003 to 2006 IECC

The Department has conducted an analysis and has found that the 2006 IECC would modestly increase energy efficiency on an overall national average basis. This analysis is summarized below; a TSD published in conjunction with this Notice contains the full results. The Department stresses that this increased energy efficiency is based on an average across all new residential buildings. The analysis identified combinations of locations and building design where the 2006 IECC would slightly reduce energy efficiency; however, the analysis indicates that the reductions would be more than offset by cases where energy efficiency is improved.

Table 6 provides the overall results of the comparative analysis of the prescriptive envelope requirements of the 2006 IECC and the 2003 IECC. The DOE–2 energy simulation software was used to calculate these values. The 2006 IECC has a 1% average overall national energy savings. The table shows combined results for single-family and multifamily construction accounting for weighted average building characteristics. Table 6 illustrates significant regional differences that are primarily a result of the revised climate zones. In most climates, the two codes are very nearly equivalent. In climate zone 5, the 2006 IECC shows a substantial improvement (about 5%). In climate zone 3, the 2003 IECC is more energy efficient (by about 5%).

TABLE 6—ANNUAL ENERGY SAVINGS (MBTU) OF 2006 IECC COMPARED TO 2003 IECC FOR PRESCRIPTIVE BUILDING ENVELOPE REQUIREMENTS

2006 IECC climate zone	Foundation Type				Average	Percent savings
	Heated basement	Crawl space	Slab-on-grace	Unheated basement		
Zone 1	0.5	0.4	0.3	0.4	0.3	2
Zone 2	−0.1	1.4	0.9	−0.1	0.9	3
Zone 3	−8.6	−1	−3.3	−1.5	−3.4	−5
Zone 4	2	0.8	0.6	0.7	1.1	1
Zone 5	5.5	7.3	4.2	6.3	5.7	5
Zone 6	1.1	3.3	0	2.3	1.4	1
Zone 7	−2	4.5	0.4	3.4	−0.4	0
Average	2.4	2.7	−0.3	3.3	1	1

The analysis underlying the results in Table 6 does not account for all changes in the IECC from 2003 to 2006. For example, the 2006 IECC requires increased duct insulation in certain cases. On the other hand, the 2006 IECC is missing requirements for pool heater controls (on-off switch) and pool covers contained in the 2003 IECC. However, these and a few other miscellaneous changes do not appear to alter a determination that the 2006 IECC has a modest improvement in overall energy efficiency compared to the 2003 IECC. The Department expects all heated pools to have an on-off switch, basic pool covers are dependent on the diligent occupant behavior for removing/covering the pool, and many homes do not have a pool or may not heat their pool. Furthermore, the 2003 IECC allows the pool cover requirement to be bypassed if 20% of the heating energy is provided by solar heat from the sun striking the pool surface.

There was one particular issue that received the most extensive debate during the 2006 IECC development process. This issue was how the 2006 IECC sets requirements based on the window area of a home. There was considerable concern because a residential building with unlimited windows (*e.g.,* an ''all glass'' house) can be built without any penalty under the 2006 IECC. This is not the case in the 2003 IECC, where, as the WWR becomes higher, the code requires improved performance of windows and/or wall insulation. However, this effect is offset in two ways. First, while the 2003 IECC becomes more stringent at high WWRs,

it also becomes less stringent at low WWRs, whereas the 2006 IECC does not. Second, the 2006 IECC increased the baseline efficiency requirements (U-factor) of glazing to almost equal then-current Energy Star levels in most locations. The Department's analysis of the IECC's requirements related to window area indicate that the 2006 code is not less stringent than the 2003 IECC when the distribution of window areas in all residential buildings is accounted for.

A major factor influencing the Department's final determination of improved efficiency in the 2006 IECC is the improvement in energy efficiency for multifamily housing. The building envelope requirements in 2006 IECC are identical for all residential building types. This is not the case in the 2003 IECC where the requirements for multifamily building types are considerably less stringent than those for one and two-family dwellings. This is shown in the wall requirements in Figure 502.2(1) of the 2003 IECC. While multifamily residential construction has a much smaller market share than single-family in terms of number of dwelling units, there is a nearly universal improvement in requirements for multifamily buildings regardless of building design or climate zone. As indicated below in the certification discussion, high-rise (greater than three stories) multifamily residential buildings and hotel, motel, and other transient residential building types of any height are classified as commercial buildings for energy code purposes. However, the building envelope revisions in 2006 IECC would impact residential buildings such as townhouses, row houses, and low-rise multifamily buildings (not greater than three stories) such as condominiums and garden apartments.

C. 2009 IECC Compared With the 2006 IECC

1. Changes in the 2009 IECC From the 2006 IECC That Improve Energy Efficiency

Each of the major changes in the 2009 IECC that impact energy efficiency is examined individually below. All but one of the changes improve energy efficiency.

1. Changes That Improve Energy Efficiency

a. Lighting

The 2009 IECC has a major new requirement that a minimum of 50% of all lamps (bulbs, tubes, etc.) be ''high efficacy,'' which is defined to include compact fluorescent lights (CFLs), T–8 or smaller diameter fluorescent tubes, or other products achieving comparable or better lumen-per-watt ratings. Traditional incandescent bulbs do not meet this requirement. The 2006 IECC had no lighting requirements for residential buildings. The Department has referenced the 2006 Mortgage Industry National Home Energy Rating Standards developed by the Residential Energy Services Network (RESNET) to assume 2,375 kWh/year of lighting energy use for a newly constructed 2400 ft^2 house. The new lighting requirements in the 2009 IECC could reduce this lighting energy use by about 25%.

b. Building Envelope Thermal Measures

The 2009 IECC has a number of changes that improve energy efficiency in the building envelope. There are direct increases in prescriptive building envelope requirements in Tables 402.1.1 and 402.1.3 of the IECC. Table 7 below shows these changes. Additionally, there were a number of minor improvements, including establishing an area limit of 24 ft^2 on the door exemption from U-factor requirements.

TABLE 7—IMPROVEMENTS IN PRESCRIPTIVE ENVELOPE REQUIREMENTS

Component	2006 IECC	2009 IECC
Maximum fenestration U-factor (excluding skylights)	Zone 2: 0.75	Zone 2: 0.65.
	Zone 3: 0.65	Zone 3: 0.50.
	Zone 4: 0.40	Zone 4: 0.35.
Maximum fenestration solar heat gain coefficient (SHGC) in Zones 1 through 3.	0.40	0.30.
Basement wall insulation in Zones 6 through 8	R–13 cavity or R–10 continuous insulation.	R–19 cavity or R–15 continuous insulation.
Basement wall insulation in northern section of Zone 3	No insulation required	R–13 cavity or R–5 continuous insulation.
Wood-Frame wall insulation (all but basements) in Zones 5 and 6	R–19	R–20.
Floor insulation in Zones 7 and 8	R–30	R–38.

c. Building Envelope Air Leakage

Although the fundamental requirement to seal all potential sources of leaks has not changed, the air leakage control specifications in Section 402.4 of the 2009 IECC are considerably more detailed than in the 2006 edition, requiring either a comprehensive inspection against a checklist of component sealing criteria or a whole-building pressurization test. There is a new requirement that fireplaces have gasketed doors to limit air leakage. Additionally, compliance with Standard ASTM E283 is now required to limit air leakage through recessed light fixtures. The 2006 IECC only required recessed light fixtures to be sealed but did not require compliance with the ASTM standard. This testing of fixtures is expected to help eliminate energy consuming leaks through these fixtures, which can be a very common method of lighting in kitchens and other rooms in new houses.

d. Duct Leakage Limits and Testing Requirement

The 2009 IECC contains a new requirement that buildings with ducts that pass outside the conditioned space (for example, if ducts are in unconditioned attics, garages or crawlspaces) have the ducts pressure tested and shown to have a maximum leakage rate below specified limits. While the 2006 IECC also requires ducts to be sealed, the addition of a specific leakage limit verified by a pressure test in each new home or retrofit is expected to substantially reduce leakage in many if not most cases.

Testing of completed homes in Washington State where prescriptive code requirements for duct sealing apply without any testing to confirm compliance, ''showed no significant improvement'' over non-code homes.[8] Another study from Washington State

[8] Washington State University. 2001. *Washington State Energy Code Duct Leakage Study Report.* WSUCEEP01105. Washington State University Cooperative Extension Energy Program, Olympia, Washington.

concluded: ''Comparisons to air leakage rates reported elsewhere for homes built before the implementation of the 1991 WSEC show no significant improvement by the general population'' despite years of training emphasizing duct sealing.[9]

Numerous other studies around the nation show substantial duct leakage in new homes, including those in States with codes requiring duct sealing. For example, a 2001 study of 186 houses built under the MEC in Massachusetts reported ''serious problems were found in the quality of duct sealing in about 80% of these houses''.[10] Pressurization tests in 22 of these houses found an average leakage to the outside of the house of 183 cfm, or 21.6% of the system flow, at a pressure of 25 Pascals.

The energy savings of improved duct sealing are very substantial. A California study estimated a sales-weighted state annual average savings from duct sealing of 38 therms and 239 kWh for a 1761 ft^2 house.[11] This is based on an estimated 12% improvement in duct efficiency based on previous studies indicating a 12–15% improvement potential. The Department concludes that the 2009 IECC's requirement that duct air leakage meet an upper limit and be verified by a pressure test will save significant energy compared to the 2006 and prior editions of the IECC.

e. Improvement in Other Requirements

There are a number of changes to the ''simulated performance alternative'' compliance path in the 2009 IECC. The glazing area in the baseline ''standard reference design'' was reduced from a maximum of 18% of the conditioned floor area to 15%. This results in increased energy efficiency for any proposed design having a glazing area of more than 15%. Because use of this compliance path is completely optional, these savings will only occur when the user chooses this compliance path. Another change does not directly alter code stringency in the performance path but may ultimately result in some energy savings is the removal of the option to trade high-efficiency HVAC equipment for reductions in other requirements in the code, such as reduced envelope insulation. Because building envelopes have substantially longer lives than HVAC and/or water heating equipment, energy savings from envelope improvements may persist for many more years than comparable equipment improvements. Also, because high-efficiency equipment is already the predominant choice in many markets, disallowing envelope/equipment trade-offs is likely to result in improved overall efficiency in many situations.

2. Changes in the 2009 IECC From the 2006 IECC That Reduce Energy Efficiency

There is only one change in the 2009 IECC that directly reduces energy efficiency. Insulation requirements for many ducts outside the building thermal envelope are reduced from R–8 to R–6; exceptions are supply ducts in attics, which must still have R–8 insulation, and ducts in floor trusses, which retain the 2006 code's R–6 requirement.

3. Net Impact of Changes From the 2009 IECC to 2009 IECC on Energy Efficiency

The Department has conducted an energy simulation analysis of 2009 IECC compared to the 2006 using the DOE–2 simulation tool to model[12] a typical single family house:

- 2400 ft2 floor area, two-story.
- Crawl space foundation.
- 8.5-ft high ceilings.
- A ceiling area (bordering the unconditioned attic) of 1,200 ft^2,
- A gross exterior wall area of 2,380 ft^2,
- And a window area of 357 ft^2 (15% of the wall area) equally oriented north, south, east, and west.
- Heating with a natural gas furnace ($1.20/therm).
- Central electric air conditioning ($.12/kWh).

High-efficacy lighting was assumed to increase from 10% to 50% of all lighting within the building, reducing lighting energy use by 26%, or $74 a year. Savings attributable to the lighting requirements in the IECC will decrease as Federal law requires improved light bulbs in 2012 to 2014. Improved duct sealing was assumed to save 10% of the heating and cooling costs.

Figure 1 shows the estimated annual energy cost savings resulting from the Department's energy simulation analysis of the 2009 IECC changes for 14 diverse climates and for the national average. The energy simulation analysis, as described above, takes into account changes involving the space heating, space cooling (air conditioning), and lighting systems. A 10% reduction is applied to solely the heating and cooling energy to account for the improved duct sealing necessary to achieve the low duct leakage rates specified in the 2009 IECC. The 10% reduction is applied post energy simulation analysis to all 14 climate locations and is accounted for in the cost savings presented in Figure 1.

[8] Washington State University. 2001. *Washington State Energy Code Duct Leakage Study Report.* WSUCEEP01105. Washington State University Cooperative Extension Energy Program, Olympia, Washington.

[9] Hales, D., A. Gordon, and M. Lubliner. 2003. *Duct Leakage in New Washington State Residences: Findings and Conclusions.* ASHRAE Transactions. KC–2003–1–3.

[10] Xenergy. 2001. Impact Analysis Of The Massachusetts 1998 Residential Energy Code Revisions. *http://www.mass.gov/Eeops/docs/dps/inf/inf_bbrs_impact_analysis_final.pdf.*

[11] Hammon, R. W., and M. P. Modera. 1999.

[12] The DOE–2 simulation tool is available at *http://doe2.com/.*

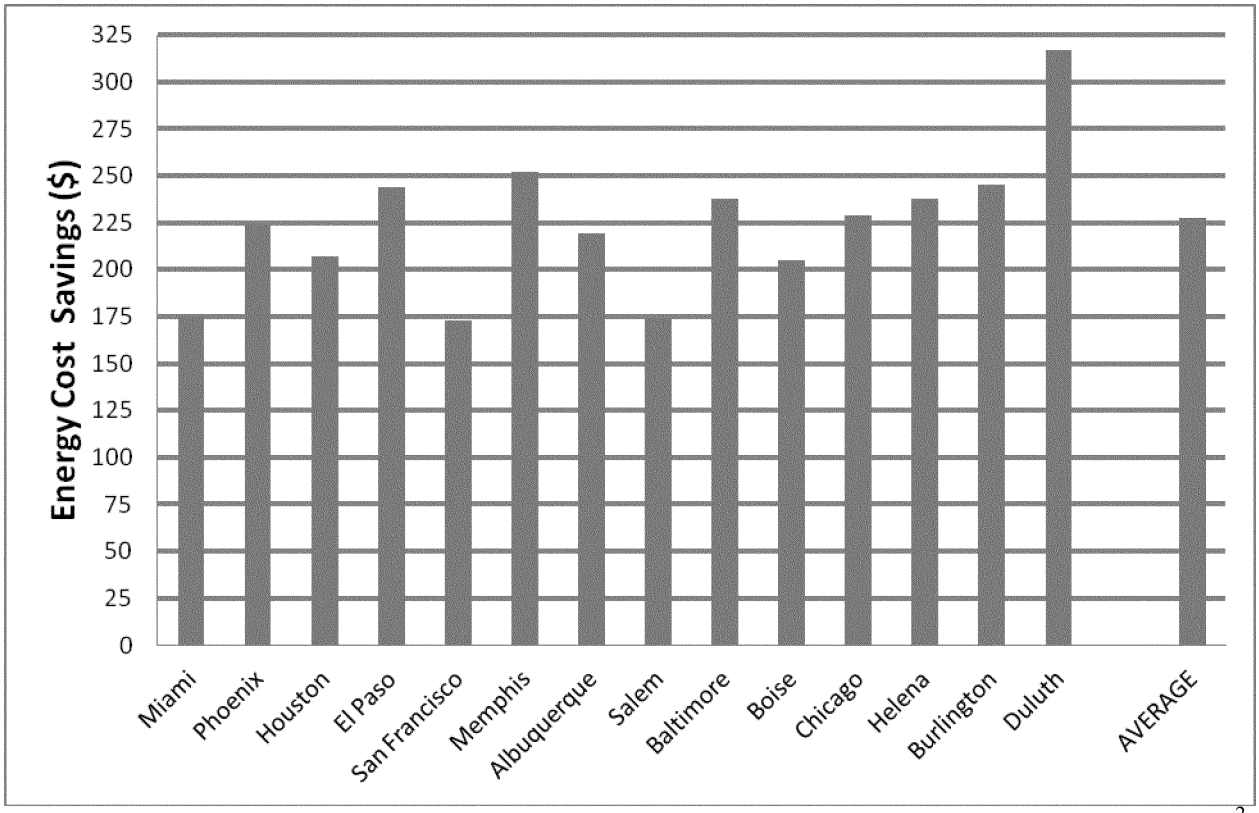

Figure 1. Annual Energy Cost Savings of 2009 IECC Compared to the 2006 IECC for a 2400 ft^2 House

III. Comparison of the 2009 IRC to the 2009 IECC

In the past, some States have adopted the ICC's International Residential Code (IRC) in lieu of the IECC, because the IRC provides a comprehensive building construction code (structural, plumbing, electrical, energy, *etc.*) in a single book for one- and two-family dwellings and townhouses. Consequently, DOE anticipates that some States may wish to adopt the 2009 IRC in lieu of the 2009 IECC. In order to provide technical assistance to States that may wish to adopt the 2009 IRC, DOE has evaluated the 2009 IRC to compare the stringency of its energy provisions with those of the 2009 IECC. Our analysis indicates that the 2009 IRC *would not* equal or exceed the energy efficiency of the 2009 IECC.

A. Changes That Reduce Energy Efficiency or Have the Potential To Increase Energy Consumption

Chapter 11 of the IRC contains energy efficiency provisions. The IRC allows compliance with the IECC as an alternative to complying with Chapter 11. Most of the energy efficiency requirements in the IRC and IECC are identical. However, there are several differences between the two codes that result in the 2009 IRC having reduced energy efficiency compared to the 2009 IECC. All the differences that reduce efficiency are listed below:

1. The 2009 IECC requires a glazed fenestration solar heat gain coefficient (SHGC) of 0.30 or lower whereas the 2009 IRC requires a higher (less stringent) SHGC of 0.35 or lower, in climate zones 1, 2, and 3. Further, the 2009 IRC allows impact resistant fenestration in zones 1 through 3 to meet an even less stringent SHGC requirement of 0.40 and less stringent U-factor requirements in zones 2 and 3.

2. For basement walls, the 2009 IECC requires either R–15 continuous insulation or R–19 cavity insulation in zones 6–8, whereas the 2009 IRC requires lower (less stringent) R-values in these zones: R–10 continuous or R–15 cavity.

3. The 2009 IECC requires R–38 floors in zones 7 and 8; the 2009 IRC requires only R–30.

4. The 2009 IECC limits the allowance for R–30 insulation in ceilings without attics to 500 ft^2 or 20% of the total insulated ceiling area, whichever is less. The 2009 IRC limits the allowance to 500 ft^2 without regard to the total ceiling area. Thus, under the 2009 IRC some smaller homes will have less efficient ceilings.

Additionally, the 2009 IRC differs from the 2009 IECC in some ways that, although they do not reduce the stringency of code requirements, have the potential to result in increased energy consumption in certain situations:

1. Both the IRC and IECC allow for ''trade-offs'' by which the efficiency of one building component can be lowered in trade for higher efficiency in another. The 2009 IECC limits the extent to which glazing properties can be reduced in such trade-offs. The 2009 IECC sets a trade-off ''cap'' on SHGC at a maximum of 0.50 in climate zones 1, 2, and 3 and a cap on U-factor trade-offs of U–0.48 in zones 4 and 5 and U–0.40 in zones 6, 7, and 8. These caps are not present in the 2009 IRC. As these caps do not increase stringency of the code (but rather restrict trade-off options), there is no direct impact on annual energy consumption or cost. There may, however, be some impacts on occupant comfort and/or resistance to moisture condensation, either of which could possibly induce occupants to increase energy consumption, for example by raising thermostat set points.

2. The air barrier and insulation inspection requirements differ slightly between the codes. The 2009 IECC requires checking that ''Air-permeable

insulation is inside of an air barrier'' (right column in the first row). The 2009 IRC is missing this, which could result in insulation on the exterior side of an air barrier being exposed to wind-induced air movement that reduces its effective R-value.

3. The definitions of ''conditioned space'' are different between the two codes, which, depending on local officials' interpretations, could result in different portions of a building being deemed conditioned and hence subject to the code's envelope requirements.

4. The three labels ''*mandatory,*'' ''*prescriptive,*'' and ''*performance*'' are used to label many sections in the 2009 IECC, but are not used at all in the 2009 IRC. The provisions that are *mandatory* are always required while *prescriptive* provisions can be traded off as long as overall home energy efficiency is not decreased. Thus the 2009 IRC may permit trading down the efficiency of some components with the potential to induce increased energy consumption as described above.

5. The 2009 IRC (section N1101.1, ''Scope'') states that chapter 11 (Energy Efficiency) does not apply to portions of the building envelope that do not enclose conditioned space. Section 101.5.2 of the IECC is more specific, exempting only *building thermal envelope provisions* that do not contain conditioned space.

B. Impact of the Differences Between the 2009 IRC and 2009 IECC

DOE has performed a limited analysis of potential impact of the differences between the 2009 IECC and 2009 IRC. The analysis involves thermal simulation of home performance in several representative locations using the EnergyGauge (DOE–2) [13] simulation tool on a typical house:

- 2400 ft^2 floor area, two-story.
- Natural gas furnace heating at $1.20/therm.
- Central air conditioning electricity at 12 cents/kWh.
- Equipment efficiencies at Federal minimum levels.
- 360 ft^2 window area equally distributed to the north, east, south, and west building faces, with no exterior shading.

The results are shown in Tables 8 through 10. The 2009 IRC yields a higher annual energy cost in almost all cases.

TABLE 8—ENERGY SAVINGS OF REDUCING SHGC FROM 0.35 TO 0.30 IN CLIMATE ZONES ONE THROUGH THREE

Climate zone	Representative city	Cooling savings	Heating increase	Energy savings
1	Miami	$29	$0	$29
2	Houston	18	9	9
2	Phoenix	20	1	19
3	Atlanta	16	18	−2
3	Jackson MS	19	15	4
3	Memphis	17	17	0
3	Dallas	20	14	6
3	El Paso	18	17	1
3	Las Vegas	16	15	1

TABLE 9—ENERGY SAVINGS OF INCREASING BASEMENT WALL INSULATION FROM R–13 TO R–19 IN CLIMATE ZONES SIX THROUGH EIGHT

Climate zone	Representative city	Energy savings
6	Burlington	$29
7	Duluth	34
8	Fairbanks	33

TABLE 10—ENERGY SAVINGS OF INCREASING FLOOR INSULATION FROM R–30 TO R–38 IN CLIMATE ZONES SEVEN AND EIGHT (FLOOR OVER UNHEATED BASEMENT)

Climate zone	Representative city	Energy savings
7	Duluth	13
8	Fairbanks	19

IV. Filing Certification Statements With DOE

A. State Determinations

Upon publication of this final determination, each State is required to determine the appropriateness of revising the portion of its residential building code regarding energy efficiency to meet or exceed the provisions of the ICC IECC, 2009 edition. (42 U.S.C. 6833(a)(5)(B)) A State determination for the 2009 IECC would be sufficient to address all of the DOE determinations (e.g. 2006 and 2003) in this notice. The State determination must be: (1) Made after public notice and hearing; (2) in writing; (3) based upon findings and upon the evidence presented at the hearing; and (4) made available to the public. States have considerable discretion with regard to the hearing procedures they use, subject to providing an adequate opportunity for members of the public to be heard and to present relevant information. The Department recommends publication of any notice of public hearing in a newspaper of general circulation and online. The determinations are required to be made not later than two years from the date of publication of this notice of final determination, unless an extension is provided (see section B. below for more details).

Note that the applicability of any State revisions to new or existing buildings would be governed by the State building codes. However, it is our understanding that generally, the revisions would not apply to existing buildings unless they are undergoing a change that requires a building permit.

States should be aware that the Department considers high-rise (greater than three stories) multifamily residential buildings and hotel, motel, and other transient residential building types of any height as commercial buildings for energy code purposes. Residential buildings include one- and two-family detached and attached buildings, duplexes, townhouses, row houses, and low-rise multifamily buildings (not greater than three stories) such as condominiums and garden apartments.

States should also be aware that the determinations do not apply to Chapter 5 of the 2009 IECC, which addresses commercial buildings as defined above. Therefore, States must certify their evaluations of their State building codes for residential buildings with respect to all provisions of the IECC except for that chapter.

Section 304(a)(4) of ECPA, as amended, requires that if a State makes a determination that it is not

[13] EnergyGauge is available at *http://doe2.com/*.

appropriate to revise the energy efficiency provisions of its residential building code, the State must submit to the Secretary, in writing, the reasons for this determination and the statement shall be available to the public. (42 U.S.C. 6833(a)(4))

Some States develop their own codes that are only loosely related to the national model codes and DOE does not typically provide technical support for those codes. However, DOE does provide grants to these States through grant programs administered by the National Energy Technology Laboratory (NETL). DOE does not prescribe how each State adopts and enforces its energy codes.

B. Requests for Extensions To Certify

Section 304(c) of ECPA, as amended, requires that the Secretary permit an extension of the deadline for complying with the certification requirements described above, if a State can demonstrate that it has made a good faith effort to comply with such requirements and that it has made significant progress toward meeting its certification obligations. (42 U.S.C. 6833(c)) Such demonstrations could include one or both of the following: (1) A plan for response to the requirements stated in Section 304; and/or (2) a statement that the State has appropriated or requested funds (within State funding procedures) to implement a plan that would respond to the requirements of Section 304 of ECPA. This list is not exhaustive.

V. Regulatory Analysis

A. Review Under Executive Order 12866

Today's action is a significant regulatory action under section 3(f)(1) of Executive Order 12866, ''Regulatory Planning and Review'' (58 FR 51735 (Oct. 4, 1993)). Accordingly, today's action was reviewed by the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB).

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires the preparation of an initial regulatory flexibility analysis for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. As required by Executive Order 13272, ''Proper Consideration of Small Entities in Agency Rulemaking,'' (67 FR 53461 (Aug. 16, 2002)), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the rulemaking process (68 FR 7990). DOE has made its procedures and policies available on the Office of General Counsel's Web site: *http://www.gc.doe.gov.*

DOE has reviewed today's rule under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. Today's final determination of improved energy efficiency between IECC editions requires States to undertake an analysis of their respective building codes. As such, the only entities directly regulated by this rulemaking would be States. DOE does not believe that there will be any direct impacts on small entities such as small businesses, small organizations, or small governmental jurisdictions.

On the basis of the foregoing, DOE certifies that the rule would not have a significant economic impact on a substantial number of small entities. Accordingly, DOE has not prepared a regulatory flexibility analysis for this rulemaking. DOE's certification and supporting statement of factual basis will be provided to the Chief Counsel for Advocacy of the Small Business Administration pursuant to 5 U.S.C. 605(b).

C. Review Under the National Environmental Policy Act of 1969

DOE has determined that today's action is covered under the Categorical Exclusion found in DOE's National Environmental Policy Act regulations at paragraph A.6. of Appendix A to subpart D, 10 CFR part 1021. That Categorical Exclusion applies to actions that are strictly procedural, such as rulemaking establishing the administration of grants. Today's action impacts whether States must perform an evaluation of State building codes. The action would not have direct environmental impacts. Accordingly, DOE has not prepared an environmental assessment or an environmental impact statement.

D. Review Under Executive Order 13132, ''Federalism''

Executive Order 13132, 64 FR 43255 (Aug. 4, 1999), imposes certain requirements on agencies formulating and implementing policies or regulations that pre-empt State law or that have federalism implications. Agencies are required to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and carefully assess the necessity for such actions. DOE has examined today's final rule and has determined that it will not pre-empt State law and will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Pursuant to Section 304(a) of ECPA, DOE is statutorily required to determine whether the most recent version of the 1992 Model Energy Code (MEC), or any successor to that code, would improve the level of energy efficiency in residential buildings compared to the previous version. If DOE makes a positive determination, the statute requires each State to certify that it has compared its residential building code regarding energy efficiency to the revised code and made a determination whether it is appropriate to revise its code to meet or exceed the provisions of the successor code. (42 U.S.C. 6833(a)(5)(B)) Therefore, today's action only impacts whether States must perform an evaluation of State building codes. No further action is required by Executive Order 13132.

F. Review Under the Unfunded Mandates Reform Act of 1995

The Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) generally requires Federal agencies to examine closely the impacts of regulatory actions on State, local, and tribal governments. Subsection 101(5) of Title I of that law defines a Federal intergovernmental mandate to include any regulation that would impose upon State, local, or tribal governments an enforceable duty, except a condition of Federal assistance or a duty arising from participating in a voluntary Federal program. Title II of that law requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and tribal governments, in the aggregate, or to the private sector, other than to the extent such actions merely incorporate requirements specifically set forth in a statute. Section 202 of that title requires a Federal agency to perform a detailed assessment of the anticipated costs and benefits of any rule that includes a Federal mandate which may result in costs to State, local, or tribal governments, or to the private sector, of $100 million or more. Section 204 of that title requires each agency that proposes a rule containing a significant Federal intergovernmental mandate to develop an effective process for obtaining meaningful and timely input from elected officers of State, local, and tribal governments.

Today's action impacts whether States must perform an evaluation of State building codes. Today's action would not impose a Federal mandate on State, local or tribal governments, and it would not result in the expenditure by State, local, and tribal governments in the aggregate, or by the private sector, of $100 million or more in any one year. Accordingly, no assessment or analysis is required under the Unfunded Mandates Reform Act of 1995.

G. Review Under the Treasury and General Government Appropriations Act of 1999

Section 654 of the Treasury and General Government Appropriations Act of 1999 (Pub. L. 105–277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. Today's action would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

H. Review Under the Treasury and General Government Appropriations Act of 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516, note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). DOE has reviewed today's action under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

I. Review Under Executive Order 13211

Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,'' 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to the OMB a Statement of Energy Effects for any proposed significant energy action. A ''significant energy action'' is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that: (1) Is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy, or (3) is designated by the Administrator of the Office of Information and Regulatory Affairs (OIRA) as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use, should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

Today's action would not have a significant adverse effect on the supply, distribution, or use of energy and is therefore not a significant energy action. Accordingly, DOE has not prepared a Statement of Energy Effects.

J. Review Under Executive Order 13175

Executive Order 13175. ''Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249 (Nov. 9, 2000)), requires DOE to develop an accountable process to ensure ''meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.'' ''Policies that have tribal implications'' refers to regulations that have ''substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.'' Today's regulatory action is not a policy that has ''tribal implications'' under Executive Order 13175. DOE has reviewed today's action under executive Order 13175 and has determined that it is consistent with applicable policies of that Executive Order.

Issued in Washington, DC, on July 13, 2011.

Kathleen Hogan,

Deputy Assistant Secretary for Energy Efficiency, Office of Technology Development, Energy Efficiency and Renewable Energy.

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DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings No. 2

Take notice that the Commission has received the following Natural Gas Pipeline Rate and Refund Report filings:

Docket Numbers: RP11–2137–001.
Applicants: Dominion Cove Point LNG, LP.
Description: Supplemental Information of Dominion Cove Point LNG, LP.
Filed Date: 07/01/2011.
Accession Number: 20110701–5303.
Comment Date: 5 p.m. Eastern Time on Friday, July 15, 2011.

Docket Numbers: RP11–2196–001.
Applicants: Ruby Pipeline, L.L.C.
Description: Ruby Pipeline, L.L.C. submits tariff filing per 154.203: Tariff Implementation & Compliance Amendment to be effective 12/31/9998.
Filed Date: 07/06/2011.
Accession Number: 20110706–5102.
Comment Date: 5 p.m. Eastern Time on Monday, July 18, 2011.

Docket Numbers: RP06–298–014.
Applicants: Public Service Commission of New York v. National Fuel Gas Supply Corporation.
Description: Semi-Annual Report of Operational Sales of Gas for the period ending 06/30/11 of National Fuel Gas Supply Corporation.
Filed Date: 07/11/2011.
Accession Number: 20110711–5066.
Comment Date: 5 p.m. Eastern Time on Monday, July 25, 2011.

Docket Numbers: RP11–1940–001.
Applicants: Chesapeake Energy Marketing Inc, BHP Billiton Petroleum (Fayetteville) LL.
Description: Request for Limited Extension of Temporary Waivers and Request for Expedited Action of BHP Billiton Petroleum (Fayetteville) LLC and Chesapeake Energy Marketing, Inc.
Filed Date: 07/11/2011.
Accession Number: 20110711–5219.
Comment Date: 5 p.m. Eastern Time on Monday, July 25, 2011.

Docket Numbers: CP01–69–009.
Applicants: Petal Gas Storage, L.L.C.
Description: Petal Gas Storage, L.L.C. Compliance filing.
Filed Date: 06/03/2011.
Accession Number: 20110603–5136.
Comment Date: 5 p.m. Eastern Time on Monday, July 18, 2011.

Any person desiring to protest this filing must file in accordance with Rule 211 of the Commission's Rules of Practice and Procedure (18 CFR 385.211). Protests to this filing will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make protestants parties to the proceeding. Such protests must be filed on or before 5 p.m. Eastern time on the specified comment date. Anyone filing a protest must serve a copy of that document on all the parties to the proceeding.

The Commission encourages electronic submission of protests in lieu of paper using the ''eFiling'' link at *http://www.ferc.gov.* Persons unable to file electronically should submit an original and 14 copies of the protest to the Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426.