Multi-Year Program Plan -

Building Regulatory Programs -

U.S. Department of Energy -

Energy Efficiency and Renewable Energy -

Building Technologies Program -

October 2010

[This plan will be updated based on actual appropriations, future budget requests and other program developments; the next significant revision is expected to be completed by spring 2011]

Contents

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1. Executive Summary

This document presents DOE's multi-year plan for the three components of the Buildings Regulatory Program: Appliance and Equipment Efficiency Standards, ENERGY STAR, and the Building Energy Codes Program. This document summarizes the history of these programs, the mission and goals of the programs, pertinent statutory requirements, and DOE's 5-year plan for moving forward.

Building Regulatory Programs (BRP) combines three existing DOE programs focused on developing or overseeing the implementing regulations and voluntary commitments to increase the energy efficiency of new buildings and equipment. Appliance and Equipment Efficiency Standards and ENERGY STAR are closely aligned by their focus on improving the efficiency of new appliances and equipment, the establishment of test procedures for determining product efficiency, and the verification of compliance with these test procedures and specified efficiency levels. The Building Energy Codes Program uses a holistic view of new buildings, including installed equipment, to develop model codes and improve overall energy efficiency. By combining these programs under a single organization, they can take a strategic focus on high opportunity technologies, including accelerating the speed and increasing the breadth and savings opportunities of codes and standards improvements. BRP also provides a complement role to the research and demonstration activities of the Building Technologies Program. While research, demonstration and deployment support for new efficient building, appliance and equipment technologies, the BRP helps bring these new, efficient technologies into widespread use and adoption when the technologies become economically feasible.

The Building Regulatory Programs play an integral role in reducing energy consumption at the National scale. In 2006, the Nation's 113 million households and over 4.7 million commercial buildings consumed approximately 38.8 quadrillion Btu (quads) of energy annually, about 39 percent of the U.S. total, making the building sector the largest energy consumer. In addition, the Appliance and Equipment Efficiency Standards program regulates certain industrial equipment. Residential buildings use the most energy in the buildings sector with 21 percent of the U.S. total, commercial buildings use 18 percent. Energy use by industrial equipment and processes comprises 26 percent of the national total. Energy use in buildings costs $392.2 Billion ($2006)[1]. Since the passage of the Energy Policy and Conservation Act (EPCA), subsequent energy bills have amended the statute to add many products to the Appliance and Equipment Efficiency Standards Program. These products are responsible for 82% of residential building energy consumption, 67% of

[1] Source: 2006 Building Energy Data Book, U.S. Department of Energy, Office of Planning, Budget and Analysis, Energy Efficiency and Renewable Energy. Prepared by D&R International, Ltd., September 2006. Note: Energy Use does not total 100% due to the adjustment for SEDS, the EIA energy adjustment for data discrepancies.

commercial building energy consumption,[2] and approximately half of industrial energy consumption.

Appliance and Equipment Efficiency Standards

The Federal Government's efforts to test, label and set minimum efficiency standards for consumer products began in the 1970's. The first appliance standards were enacted by law in 1987, and since that time a series of laws and DOE regulations have established, and periodically updated, energy efficiency or water use standards for over 50 categories of appliances and equipment used in the residential, commercial and industrial sectors. During the 1990s, DOE was unable to meet a number of its statutory deadlines for updating efficiency standards, and a significant backlog of delayed rulemakings developed.

In its 2006 Report to Congress, DOE presented a 5-year plan to eliminate the backlog of appliance standards while meeting the obligations of then-new EPACT 2005. Later that year, the separate court proceedings *(State of New York, et al. v. Bodman* and *NRDC, Inc. et al. v. Bodman* resulted in a consolidated consent decree between the plaintiffs and DOE (filed November 6, 2006). The consent decree largely adopted the schedule that DOE published in the January 31, 2006 report to Congress for backlogged products.

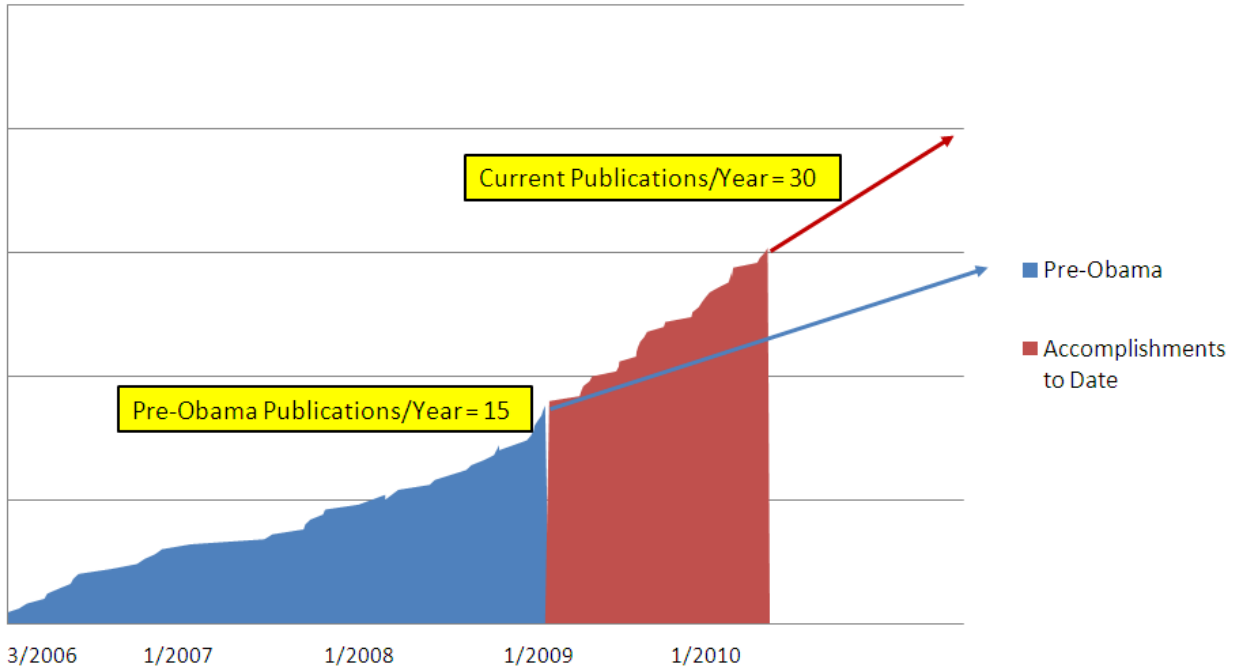
Since the initial report, DOE has issued efficiency standard final rules for 13 of the 21 backlogged products. In addition, EISA 2007 prescribed standards for another three backlogged products; DOE codified these standards in its regulations at Parts 430 and 431. Thus, standards have been completed for 16 of the original 21 backlogged products. The remaining five products are the subject of ongoing DOE rulemakings. DOE notes that to date it has met all the deadlines contained in the initial January 2006 rulemaking schedule and all the deadlines set forth in the consent decree.

Under the Obama Administration, the Department of Energy has accelerated the pace for finalizing new appliance standards and has placed new resources and emphasis behind the enforcement of these important standards. Since President Obama came to office, DOE has issued or codified new efficiency standards for more than twenty different products, which will save consumers between $250 and $300 billion on their energy bills through 2030.

Figure 1-1 shows that the annual number of Federal Register publications has increased significantly since 2008, indicating that more rulemakings are being completed at a faster pace than the historical rate.

[2] Building Energy Data Book

Figure 1-1 Cumulative Federal Register Publications



In addition to accelerating the pace of new final standards, the Obama Administration has significantly increased the enforcement of existing conservation standards. To ensure that the appliance standards are as effective as possible, DOE will continue to work aggressively and consistently to enforce energy efficiency standards across the country.

Because DOE has succeeded in meeting all of the deadlines identified in the 2006 report and is confident of its ability to continue to fulfill its statutory and other legal commitments, DOE is now in the position to create a rulemaking schedule that does more than meet its minimum statutory deadlines. In the multi-year plan presented here, DOE anticipates that it will not only meet the statutory requirements in EPACT 2005 and EISA, it will also have the resources and flexibility to pursue additional opportunities that will benefit the nation.

DOE views the currently scheduled rulemakings as the base upon which it will build an even more effective/impactful program over the next five years. Within approximately one year, the Appliance and Equipment Efficiency Standards Program has been able to double its publication rate and start an entirely new compliance and enforcement program. While substantial productivity gains have already been made, DOE plans to take further actions to:

- Reduce the costs of rulemakings
- Reduce the time required for individual rulemakings
- Increase the energy, emission and economic benefits of rulemakings, by
    - Expanding the number and scope of the products covered by efficiency standards

- Giving priority to those new or updated standards likely to yield the greatest energy, emission and economic benefits
- Increasing stringency of standards, to the extent permitted by existing law

DOE will establish a process to set priorities for new activities based on the potential for energy savings and consumer cost savings. Possible new activities include:

- Accelerating rulemakings so that they are completed before the statutory deadline.
- Adding new covered products to the Appliance and Equipment Efficiency Standards - Program. -
- Increasing verification and enforcement activities.
- Other actions that would save significant amounts of energy.

The estimated cumulative net present value of consumer benefit from standards amounted to $64 billion at the end of 2005; standards are projected to save $241 billion by 2030, growing to $269 billion by 2045, while the cumulative cost of DOE's program to establish and implement these standards over the past 20 years is in the range of $200-250 million. Annual carbon savings reach 38 million tons by 2020 and the cumulative savings by 2045 is estimated at 1,200 million tons.[3]

Support to the ENERGY STAR Program

The Energy Star program was initiated by the Environmental Protection Agency in 1992 as a voluntary labeling program designed to help consumers identify energy-efficient products to reduce greenhouse gas emissions. The DOE began supporting the program in the late 1990's. The program has now established ENERGY STAR labeling criteria for over 50 product categories used in the residential and commercial sectors.

On September 30, 2009, the EPA and DOE signed a new agreement called the 2009 EPA-DOE Memorandum of Understanding (MOU). Among other things, the MOU stated that EPA-DOE will have enhanced efforts on test procedure updates. As part of the agreement, DOE will support EPA by increasing its efforts in the development of Federal test procedures and metrics.

In 2010, DOE assumed responsibility from EPA for developing and maintaining test procedures used for testing ENERGY STAR products. DOE will evolve EPA's historical process for developing and maintaining ENERGY STAR test procedures based on best practices developed for test procedures for Covered Products.

ENERGY STAR expends considerable effort maintaining the integrity of its brand. While the program has been broadly successful, it is important not only to continue but to strengthen those

[3] http://efficiency.lbl.gov/drupal.files/ees/Realized%20and%20Projected%20Impacts%202008%20938510.pdf

efforts. To that end, DOE is committed to increased monitoring to safeguard the integrity of the ENERGY STAR brand.

The ENERGY STAR products program has grown to encompass products in more than 50 categories and is used by millions of Americans in selecting products that help them save money and protect the environment. ENERGY STAR has committed to reinforce its brand integrity by increasing its compliance and enforcement actions, giving consumers confidence that the products they select will perform as expected.

Americans, with the help of ENERGY STAR, prevented 45 million metric tons of greenhouse gas emissions in 2009 alone–– equivalent to the annual emissions from 30 million vehicles - and saved nearly $17 billion on their utility bills. Cumulative savings from 2000 - 2009 total 1,347 billion kWh.

Productivity improvements over the next five years will increase the energy, emission and economic benefits resulting from the program, by:

- Updating and enhancing ENERGY STAR test procedures - 38 new test procedures will be developed for those ENERGY STAR product classes that are not currently covered by any DOE test procedure. Of the remaining 23 ENERGY STAR product classes, 14 have separate ENERGY STAR and DOE test procedures that must be harmonized.
- Increasing compliance and verification efforts - The EPA and DOE are developing an expanded system that will require all products seeking the ENERGY STAR label to be tested in approved labs and require manufacturers to participate in an ongoing verification testing program that will ensure continued compliance.

Building Energy Codes

Building codes are promulgated and enforced by the states and local governments, except for manufactured housing[4] standards, which have been the responsibility of the Department of Housing and Urban Development (HUD). State codes are generally based on the model energy codes, except for a few states such as California. Enforcement is generally a local responsibility, except in a few states where codes for some commercial building types such as schools are enforced by the state. Since the 1970's, DOE has been supporting the development and implementation of more stringent building energy codes.

For commercial buildings, Standard 90.1-2007, which was published in late 2007, is the most recent model energy standard. It requires buildings to be 5 to 8 percent more efficient that those built to the 2004 edition. Standard 90.1-2010 will be published in late 2010, and requires buildings to be 20 to 25 percent more efficient that those built to the 2004 edition.

[4] Factory-built housing units, called manufactured homes, formerly known as mobile homes.

For residential buildings, the most recent model energy code is the 2009 edition of the International Energy Conservation Code (IECC), which was published in February 5, 2009 and requires residential low rise buildings to be 5 to 8 percent more efficient that those built to the 2006 edition. The 2012 edition will be published in October 2011, and is expected to require residential buildings to be about 30 percent more efficient that those built to the 2006 edition.

As of May 25, 2010, twelve states have adopted codes equivalent to Standard 90.1-2007. As of April 28, 2010, ten states have adopted codes equivalent to the 2009 IECC. However, there are ten states that have no statewide commercial building energy code, and nine states that have codes that are significantly less stringent than the 2009 IECC. Similarly, there are eleven states that have no statewide residential building energy code and eleven states that have codes that are significantly less stringent than the 2009 IECC.

The level of compliance with these codes is not well known, and until recently, the definition of compliance has ranged from non-compliance due to minor infractions to relatively sophisticated ratings based on weighting of infractions based on their energy impact.

The energy portion of the manufactured housing standards were last updated by the Department of Housing and Urban Development in October 1994. It is approximately equivalent to the IECC 1990. The Department of Energy is in a rulemaking process to promulgate a standard equivalent to the current edition of the IECC. DOE issued an advance notice of proposed rulemaking for manufactured housing energy standards on February 22, 2010.

The Building Energy Codes Program will continue its activities in five areas: supporting the upgrade of the model building energy codes; determining --whether those codes will improve energy efficiency in buildings; providing financial and technical assistance to States to update their building energy codes to meet the national model energy codes, and implement, enforce , and assess compliance with their codes; promulgation of manufactured housing standards, and enforcement of , those manufactured housing standards.

BECP supports energy code development, adoption, implementation, and compliance initiatives at the national, state and local level and is estimated to generate energy cost savings of more than $2.5 billion per year. Since the inception of the Program 20 years ago accumulated energy savings has been more than 1.5 quads and cost savings to consumers has been more than $14 billion. These savings have resulted primarily from the Program's activities that accelerate the adoption of building energy codes by and within the states and that improve code compliance by means of various software tools and other types of training and technical support..[5]

[5] http://www.energycodes.gov/why_codes/

Multi-Year Schedule and Resource Plan

The cornerstone objective of the multi-year plan described in this report is to continue to meet all statutory requirements. Deadlines for appliance standards and test procedures were used as a starting point. Forecasts of activity related to building code development, verification and enforcement of appliance standards, and support to Energy Star test procedures were used to build out the schedule. Once the continued achievement of all statutory requirements has been assured, resources will be allocated to the initiation of other high priority rulemakings and supporting activities likely to significantly increase the energy savings and economic benefits of these programs. In the event that additional funding becomes available, the Appliance and Equipment Efficiency Standards Program is developing a preliminary list of products that may warrant, based on their potential for economically justified efficiency improvements, priority consideration for the establishment of new or updated efficiency standards. Over the next five years, Building Regulatory Programs intends to use its resources efficiently and effectively to maximize reductions in energy consumption and emissions that are economically justified.

2. Introduction

The Building Regulatory Programs (BRP) reside within the Building Technologies Program (BTP) of the Office of Energy Efficiency and Renewable Energy of the U.S. Department of Energy. In partnership with the private sector, state and local governments, national laboratories, and universities, BTP works to improve the efficiency of buildings and the equipment, components, and systems within them. The program supports research and development (R&D) activities and provides tools, guidelines, training, and access to technical and financial resources.

BRP is the result of the combination of three existing programs focused on developing regulations that increase building energy efficiency – the Appliance and Equipment Efficiency Standards Program, ENERGY STAR, and the Building Energy Codes Program (BECP). Appliance and Equipment Efficiency Standards and ENERGY STAR are closely aligned through their development of equipment standards and test procedures. BECP uses a holistic view of new buildings, including installed equipment, to develop model codes and improve overall energy efficiency. By combining these programs under a single organization, they can take a strategic focus on high opportunity technologies, including accelerating the speed and increasing the breadth and savings opportunities of codes and standards improvements.

The Appliance and Equipment Efficiency Standards Program addresses DOE's continuing legislative requirements to improve the minimum efficiency for buildings by implementing energy efficiency standards for appliances and building equipment. National standards provide manufacturers with a single set of requirements rather than an array of potentially conflicting State and local regulations. By eliminating the most inefficient technologies, Appliance and Equipment Efficiency Standards Program activities complement the other BTP strategies which develop and promote advanced, highly efficient technologies and practices.

ENERGY STAR is a joint DOE/EPA activity designed to identify and promote energy efficient products and buildings. Through its partnership with more than 7,000 private and public sector organizations, ENERGY STAR delivers the technical information and tools that organizations and consumers need to voluntarily choose energy efficient solutions and best management practices. Under the terms of a new Memorandum of Understanding, EPA will act as the ENERGY STAR brand manager with technical support from DOE in product testing and verification, leveraging the substantial ongoing DOE work with the minimum efficiency standards program and test procedure development.

The Building Energy Codes Program supports the incremental upgrading of the model building energy codes, and the state adoption, implementation and enforcement of those codes as they are incrementally upgraded. The BECP also promulgates and enforces energy standards (codes) for manufactured housing. Building energy codes set minimum requirements for energy-efficient

design and construction for new and renovated buildings that impact energy use and emissions for the life of the building. They are part of the overall building codes, which govern the design and construction of buildings for the health and life safety of occupants. Building energy codes set a baseline for energy efficiency in construction by establishing minimum energy efficiency requirements. Improving the energy code generates energy savings in a consistent and long lasting manner. Buildings last for 50 years or more. Many energy efficiency and renewable measures, such as orientation, window location insulation and massing will continue to produce savings for the life of the building. Other measures, such as lighting, will produce savings for their life and then be upgraded under improved codes during renovation.

2.1.Mission, Goals, and Strategies

The Building Technologies Program has established its mission and goals in support of the President and Secretary's priorities for DOE. Appliance and Equipment Efficiency Standards, ENERGY STAR, and Building Energy Codes will all implement strategies to help BTP achieve its mission and goals.

2.1.1. Mission

The mission of the Building Technologies Program is to change the landscape of energy demand in homes and buildings through energy productivity and increased use of clean, secure energy, which will lower greenhouse gas (GHG) emissions, foster economic prosperity and increase National energy security. BTP brings together science, discovery, and innovation to develop the technologies, techniques, and tools for making residential and commercial buildings more energy efficient, productive, and affordable.

The mission of the Building Regulatory Programs is to combine the output of BTP's research programs with detailed knowledge of building sector markets, products and regulatory authorities and impacts in order achieve the maximum energy efficiency of new buildings, appliances and equipment that is technically feasible and economically justified.

2.1.2. Goals

Buildings in the U.S. consume 39% of all energy use, 74% of electricity, and are responsible for 38% of carbon emissions. The Building Technologies Program reduces energy consumption in buildings, while contributing to the President's goal of 80% reduction in carbon emissions by 2050. The Program seeks to have a high impact on new and existing residential and commercial buildings by strategically focusing on high opportunity technologies, including accelerating the speed and increasing the breadth and savings opportunities of codes and standards improvements.

The goals of the Building Regulatory Programs are to fulfill all of its statutory and other legal mandates, while using DOE's existing statutory authorities to produce the maximum possible reductions in future building sector energy use and related emissions.

2.1.3. Appliance and Equipment Efficiency Standards Strategies to Achieve BTP's Mission and Goals

The Appliance and Equipment Efficiency Standards Program works to improve the efficiency of appliances and equipment by conducting analyses and developing energy conservation standards that are technologically feasible and economically justified as defined by the Energy Policy and Conservation Act (EPCA), as amended. Program activities include:

1. - Development of Appliance and Equipment Efficiency Standards
2. - Development of energy efficiency test procedures,
3. - Product certification, enforcement, and verification.

2.1.4. ENERGY STAR Strategies to Achieve BTP's Vision and Goals

DOE will implement ENERGY STAR program enhancements as stated in the Memorandum of Understanding between DOE and EPA signed September 30, 2009. A two-pronged strategy will be deployed in FY 2011 to support the portfolio of existing technologies:

1. - Developing and updating ENERGY STAR test procedures for products to keep the label relevant and meaningful in the market
2. - Working with EPA on certification and product verification.

The National Buildings Rating Program (NBRP) will provide guidance for energy retrofits of existing buildings based on state-of-the-art cost and performance data. It will also establish a comprehensive energy efficiency rating system for both residential and commercial buildings on a national scale. DOE will develop, validate, and update software tools for both asset and benchmark ratings in consultation with EPA. These tools provide information to owners on whole-building comparative energy use, while also providing decision assistance about retrofits. DOE will maintain all relevant databases used by the software tools and create data sharing mechanisms with EPA. EPA will establish ENERGY STAR criteria for buildings based on technical input from the DOE and the NBRP.

2.1.5. Building Energy Codes Strategies to Achieve BTP's Mission and Goals

The mission of BECP is to support and verify the development of more efficient model building energy codes, promulgate and enforce manufactured housing energy efficiency standards, and provide assistance to states to upgrade, implement, enforce and increase compliance. Building Codes has developed several strategies in support of BTP's mission and goals including:

1. - Support and participate in the upgrading of ASHRAE Standard 90.1 and the IECC model energy code seeking adoption of all technologically feasible and economically justifiable energy efficiency measures

2. - Determine within one year of the publication of an updated model code whether the code will improve energy efficiency over the previous version of the code
3. - Provide financial and technical assistance to states to upgrade, implement, and increase compliance with their building energy codes
4. - Promulgate, enforce, and upgrade the manufactured housing energy efficiency standards by Dec 2011.

Strategies 1, 2, and 3 are mandated by EPCA, as amended. Strategy 4 is required in the Energy Independence and Security Act of 2007. The mandate to increase compliance with energy codes is contained in Section 410 of the American Recovery and Reinvestment Act of 2009.

In support of the President's goal of reduced carbon emissions, the Building Energy Codes Program has a goal of upgrading the model building energy codes to require an increase in energy efficiency in new building of 30 percent by 2010 for commercial buildings and by 2012 for residential buildings. It has a further goal of upgrading the model building energy codes to require an increase in energy efficiency in new buildings of 50 percent by 2016 for commercial buildings and by 2015 for residential buildings.[6]

[6] The baseline for these goals is Standard 90.1-2004, for commercial buildings, and the 2006 IECC for residential low-rise buildings.

3. History of Building Regulatory Programs

3.1.Appliance and Equipment Efficiency Standards Program

The Department of Energy's Appliance and Equipment Efficiency Standards Program is conducted pursuant to Title III, Part B, of the Energy Policy and Conservation Act (EPCA or the Act). EPCA established test procedures, conservation targets (followed by standards if targets are not set), and labeling requirements for certain major household appliances. EPCA also provided for DOE to establish test procedures for evaluating compliance by manufacturers with applicable efficiency standards.

The movement for federal appliance efficiency standards started in the 1970s. At that time, several states, including California, were adopting state appliance efficiency standards. In 1978, DOE was authorized to set mandatory energy efficiency standards for 13 household appliances and products under the National Energy Conservation and Policy Act (NECPA).

In 1987, EPCA was amended and updated by the National Appliance Energy Conservation Act (NAECA), which superseded existing State requirements. The products covered by these standards included refrigerators and freezers, room air conditioners, central air conditioners and heat pumps, water heaters, furnaces, dishwashers, clothes washers and dryers, direct heating equipment, ranges and ovens, and pool heaters. NAECA also contains requirements and deadlines for updating the initial standards through rulemakings conducted by DOE using criteria included in the law. Fluorescent lamp ballasts were added by an amendment in 1988. In conducting the rulemakings to update the standards, the Secretary is to set standards at levels that achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. NAECA 1988 added ballasts to the statutory list of covered products.

The Energy Policy Act of 1992 (EPACT 1992) further amended EPCA to expand the coverage of the standards program to include certain industrial equipment, including commercial heating and air conditioning equipment, water heaters, certain incandescent and fluorescent lamps, distribution transformers, and electric motors. EPACT 1992 established maximum water flow rate requirements for certain plumbing products and provided for voluntary testing and consumer information programs for office equipment and luminaires. EPACT 1992 also established a labeling program for commercial products. It also allowed for the future development of standards for many other products.

In September 1995, the Department announced a formal effort to consider further improvements to the process used to develop appliance efficiency standards, calling on energy efficiency groups, manufacturers, trade associations, State agencies, utilities and other interested parties to provide input to guide the Department. On July 15, 1996, the Department published Procedures for

Consideration of New or Revised Energy Conservation Standards for Consumer Products (hereinafter referred to as the Process Rule).

The Energy Policy Act of 2005 (EPACT 2005) significantly expanded and changed the Department's regulatory requirements in appliance standards. EPACT 2005 establishes numerous prescriptive standards for many types of products and expands the Department's authority to regulate other product areas. New standards are legislated for ceiling fan light kits, dehumidifiers, unit heaters, torchiere lamps, medium base compact fluorescent lamps, fluorescent lamp ballasts, mercury vapor lamp ballasts, illuminated exit signs, traffic signals and pedestrian signals, commercial pre-rinse spray valves, low voltage dry-type distribution transformers, commercial package air conditioning and heating equipment; commercial refrigerators, freezers, and refrigerator-freezers; automatic commercial ice makers; and commercial clothes washers.

New York State along with several other states and the NRDC sued DOE and the Secretary of Energy, Samuel W. Bodman in his official capacity for failing to comply with deadlines and other requirements contained in EPCA. This court ruling on December 6, 2005 established a strict schedule for DOE to publish final rules for product standards. This court proceeding resulted in a consent decree between the plaintiffs and DOE. The consent decree set one final rule deadline per product, with the exception of small motors in which two final rule deadlines were set.

In January 2006, DOE delivered a report to Congress in response to section 141 of EPACT 2005 which pertained to DOE's failure to meet deadlines for new or amended energy conservation standards. The report identified all products for which DOE has missed the established deadlines, explained reasons for such delays and stated DOE's plan for expeditiously prescribing new or amended standards. DOE subsequently submitted semi-annual implementation updates to Congress, summarizing the program's accomplishments and any changes in its statutory obligations.

The Energy Independence and Security Act of 2007 (EISA 2007) again expanded and changed the Department's regulatory requirements for the Appliance and Equipment Efficiency Standards Program. EISA 2007 established prescriptive standards for many products, expanded the Department's authority to regulate additional products, and added additional regulatory provisions.

EISA 2007 requires all energy conservation standards promulgated after July 1, 2010 to include standards for standby- and off-mode energy consumption. In addition, EISA 2007 directed DOE to review energy conservation standards for certain products and to establish standby- and off-mode test procedures for certain products by statutorily defined deadlines. Finally, pursuant to EISA 2007, all energy conservation standards and test procedures established by DOE are subject to regular periodic review. Not later than six years after issuance of a final rule establishing or amending a standard, DOE must either publish a notice of proposed rulemaking to amend the

standard or a notice of determination that an amended standard is not warranted. DOE must review all test procedures at least once every seven years.

Table 3-1 lists all products that are currently covered by DOE efficiency standards. Appendix A summarizes DOE's obligations to conduct rulemakings as indicated in legislative amendments to EPCA. Section 8 contains detailed information on DOE's multi-year rulemaking schedule for developing standards in accordance with legislative requirements. Appendix 2 provides a full listing of all products covered by a minimum energy efficiency standard or by ENERGY STAR for comparison purposes.

Table 3-1 Products Covered by DOE Standards -

Covered Product Categories		
Lighting Products: • 3-Way Incandescent Lamp • Candelabra base incandescent lamp • Ceiling Fan Light Kits • Ceiling Fans • Fluorescent lamp ballasts • General Service Fluorescent Lamps • General Service Incandescent Lamps • Incandescent Reflector Lamps • Intermediate Base Incandescent Lamps • Light Emitting Diodes (LEDs) • Medium Base Compact Fluorescent Lamps • Organic Light Emitting Diodes (OLEDs) • Rough Service Lamp • Shatter-Resistant Lamp • Torchieres • Vibration Service Lamp • Mercury Vapor Lamp Ballasts • Metal Halide Lamp Ballast • Metal Halide Lamp Fixtures • High-intensity discharge lamps • Traffic Signal Modules and Pedestrian Modules • Illuminated Exit Signs	**Heating Products:** Residential: • Direct heating equipment • Furnace Fans • Furnaces • Mobile Home Furnace • Pool heaters (Gas Fired) • Residential Boilers • Residential Water heaters • Small Furnaces Commercial: • Commercial warm air furnaces • Packaged boilers • Storage water heaters, instantaneous water heaters, and unfired hot water storage tanks • Unit Heaters	**Space Cooling Products:** Residential: • Central Air Conditioners and Central Air Conditioning Heat Pumps • Room Air Conditioners Commercial: • Packaged terminal air conditioners and packaged terminal heat pumps • Single package vertical air conditioners and single package vertical heat pumps • Small commercial package air conditioning and heating equipment • Large commercial package air conditioning and heating equipment • Very large commercial package air conditioning and heating equipment

Covered Product Categories		
Commercial Refrigeration Products: • Automatic commercial ice makers • Commercial refrigerators, freezers, and refrigerator-freezers • Refrigerated Beverage Vending Machines • Walk-in coolers and walk-in freezers	**Appliances:** Residential: • Clothes dryers • Dehumidifiers • Dishwashers • Kitchen ranges and ovens • Microwave ovens • Refrigerators, Freezers and Refrigerator-Freezers • Residential Clothes washers Commercial: • Commercial clothes washers	**Computers and Electronics:** • Battery Chargers • External Power Supplies, Class A and non-Class A • Television sets
Transformers and Motors: • Electric Motors (medium to large) • Small Electric Motors • Distribution Transformers, MV Dry and Liquid-Immersed	**Plumbing Products:** Residential: • Faucets • Showerheads (except safety shower showerheads) • Urinals • Water closets Commercial: • Commercial Pre-rinse Spray Valves	**Building Products** • None

3.2.ENERGY STAR

ENERGY STAR is a joint program of the Environmental Protection Agency and the Department of Energy, helping consumers save money and protect the environment through energy efficient products and practices.

In 1992, the US Environmental Protection Agency introduced ENERGY STAR as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. Computers and monitors were the first labeled products. Through 1995, EPA expanded the label to additional office equipment products and residential heating and cooling equipment. EPA also extended the label to cover new homes and commercial and industrial buildings.

In 1996, EPA joined with DOE to expand the labeling program to additional product categories. On September 30, 2009, the EPA and DOE signed a new agreement designed to enhance and strengthen the trusted ENERGY STAR program.

The ENERGY STAR products program has grown to encompass products in more than 50 categories and is used by millions of Americans in selecting products that help them save money and protect the environment. Table 3-2 lists ENERGY STAR products. Appendix 2 provides a full listing of all products covered by a minimum energy efficiency standard or by ENERGY STAR for comparison purposes.

Table 3-2 Current ENERGY STAR Products

ENERGY STAR Product Categories		
Lighting Products: Residential: • Decorative Light Strings • Ceiling Fans • Medium Base Compact Fluorescent Lamps • Light Fixtures • Light Emitting Diodes Commercial: • Light Emitting Diodes	**Heating Products:** Residential: • Furnaces • Residential Boilers • Residential Water Heaters • Small Furnaces Commercial: • Storage water heaters, instantaneous water heaters, and unfired hot water storage tanks	**Commercial Refrigeration Products:** • Automatic commercial ice makers • Commercial refrigerators, freezers, and refrigerator-freezers • Refrigerated Beverage Vending Machines • Walk-in coolers and walk-in freezers • Water Coolers
Transformers and Motors: • None	**Plumbing Products:** • None	**Building Products** Residential: • Home Sealing and Insulation • Roof Products • Windows, Doors and Skylights

ENERGY STAR Product Categories		
Space Cooling Products: Residential: • Central Air Conditioners and Central Air Conditioning Heat Pumps • Room Air Conditioners Commercial: • Small commercial package air conditioning and heating equipment • Large commercial package air conditioning and heating equipment • Very large commercial package air conditioning and heating equipment • Small commercial split-system air conditioning and heating equipment • Large commercial split-system air conditioning and heating equipment • Very large commercial split-system air conditioning and heating equipment	**Appliances:** Residential: • Dehumidifiers • Dishwashers • Refrigerators, Freezers and Refrigerator-Freezers • Residential Clothes washers • Room Air Cleaners and Purifiers Commercial: • Commercial clothes washers • Commercial Kitchen Packages • Commercial Dishwashers • Commercial Fryers • Commercial Griddles • Commercial Hot Food Holding Cabinets • Commercial Ovens • Commercial Steam Cookers	**Computers and Electronics:** • Audio/Video Equipment • Battery Chargers • External Power Supplies, Class A • External Power Supplies, non-Class A • Television sets • Computers • Cordless Phones • Digital to Analog Converter Boxes • Displays (computer monitors, digital picture frames, professional signage) • Imaging Equipment (copiers, fax machines, printers, mailing machines, and scanners) • Set-Top Boxes and Cable Boxes • Enterprise Servers

3.3.Building Energy Codes Program

DOE's work on building energy codes was established by the Energy Conservation and Production Act of 1976. ECPA established requirements for the development and implementation of performance standards for all new residential and commercial buildings. The standards were to be "designed to achieve the maximum practicable improvements in energy efficiency and increases in the use of nondepletable sources of energy". The Department of Energy Organization Act transferred from HUD to DOE the responsibility for developing and promulgating the standards.

DOE published proposed building energy performance standards (BEPS) in late 1979 that specified maximum levels expressed in Btu/ft^2/yr., of total building energy consumption to which new buildings would be designed. The most significant aspect of the BEPS was that it was a whole building performance standard that required computer simulations to demonstrate that the designed energy consumption of a new building did not exceed the energy level specified for that building type in its applicable climate area. The BEPS defined 21 different building types and

contained energy budgets for all types, as well as a procedure to select an appropriate climate zone from 78 different Standard Metropolitan Statistical Areas.

The BEPS represented a radical departure from the standard practices of the building community in that it required a "whole building" approach rather than a building component by component compliance process. Additionally, it required a computer simulation analysis in place of hand written compliance procedures. DOE received over 1.800 written responses during the official comment period.

DOE continued work on commercial building energy codes in the 1980s with technical support for American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)/DOE Special Project 41 which led to the development of American National Standards Institute (ANSI)/ASHRAE/Illuminating Engineering Society of North America (IESNA) Standard 90.1-1989. Another DOE research activity in the commercial codes arena conducted in the 1980s was the Targets program. This program represented another attempt by DOE to develop whole building energy use targets for commercial buildings. In this case, a methodology and software were developed to generate those targets.

For residential buildings, DOE's Voluntary Residential Energy Standard (VOLRES) project developed a methodology and tools to assist states and local governments in designing custom energy codes based on life-cycle cost effectiveness. DOE subcontracted ASHRAE to assemble a technical evaluation committee for Special Project 53. The result, completed in the late 1980s and published via rulemaking in the early 1990s, was a software system called ARES (Automated Residential Energy Standard) that allowed states to develop residential energy requirements based on an LCC optimization analysis customized to local cost and price structures. Although the voluntary residential standards were repealed by EPACT 1992, the ARES software was used extensively by DOE in its code development activities throughout the 1990s.

The Building Energy Codes Program (BECP) was funded in 1993 in response to EPACT 1992, which mandated that DOE participate in the model national codes development process and that DOE help states adopt and implement progressive energy codes. DOE staff had been active in the development of energy codes going all the way back to the development of ASHRAE Standard 90-75 under the auspices of the Energy Research and Development Administration (DOE's predecessor) but BECP represented the first time energy codes had been given their own program with its own mandates.

EPACT 1992 originally mandated that DOE use ANSI/ASHRAE/IESNA Standard 90.1-1989 (commercial) and the 1992 Council of American Building Officials (CABO) Model Energy Code (residential) as the basis for state codes. Over the next 18 years, a number of significant changes occurred in the codes world.

CABO merged with the Building Officials Council of America (BOCA), the Southern Building Codes Council International (SBCCI) and the International Council of Building Officials (ICBO) in 1998 to form the International Code Council. BECP provided the new commercial requirements chapter for the International Energy Conservation Code (IECC), the successor to the CABO Model Energy Code.

After a ten year gap between Standard 90.1-1989 and Standard 90.1-1999, ASHRAE put their commercial codes onto a 3-year development cycle with the publication of ANSI/ASHRAE/IESNA Standard 90.1-12001 (with significant assistance from BECP ranging from leadership of the development committee to response to comments).

ICC and ASHRAE began publishing new codes on a 3 year basis - with ASHRAE releasing new codes in 2001, 2004, 2007, and 2010 (to be released in Fall 2010); and ICC releasing in 2000, 2003, 2006, 2009, and 2012 (to be released in 2011).

In 2007, as part of its Advanced Codes Initiative, DOE signed an MOUwith ASHRAE to develop advanced commercial codes, with the first being that Standard 90.1-2010 would be 30% better than Standard 90.1-2004. This MOU set off the current efforts by BECP and ASHRAE which should culminate in 2010 with the development of Standard 90.1-2010. The Advanced Codes Initiative also called for the development of advanced residential codes, with the first being the 2012 IECC, which would be 30% better than the 2006 IECC.

EPACT 1992 also called on DOE to support the adoption and enforcement of energy codes in the states. To this end, BECP develops and maintains free software and tools to support those codes and standards (including the award-winning RES*check* software for low-rise residential building energy code compliance, and the COM*check* software for commercial building energy code compliance). The first desktop version of RES*check* (originally called MEC*check*) was released in 1993. A web-based version followed in 2003. The first desktop version of COM*check* was released in 1997. A web-based version followed in 2005.

BECP also conducts outreach and deployment activities related to energy codes and high-performance sustainably designed buildings to national organizations such as AIA, ASHRAE, BOMA, ICC, IESNA, and NAHB, as well as many industry stakeholders. Outreach activities include:

- the only building energy codes focused annual training event for states and other energy code stakeholders -
- on-demand training and technical assistance, -
- a quarterly newsletter, and
- a comprehensive website on all aspects of US building energy codes.

BECP also works with the Building Codes Assistance Project (BCAP) to support code-related advocacy activities.

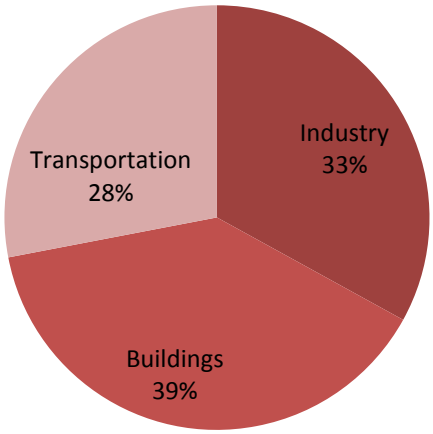
One of DOE's ultimate goals for energy codes is for net-zero energy buildings (NZEB) to be cost-effective alternatives to traditional construction by 2025 which means that NZEB should be required in codes by about the same time. The American Recovery and Reinvestment Act of 2009 provided a new goal for DOE's building codes efforts - 90% compliance with energy code requirements for each state. BECP has developed processes and materials to support measurement of energy code compliance and is currently conducting pilot studies of those materials with states and the regional energy efficiency partnerships – MEEA, NEEA, NEEP, SEEA, and SWEEP.

4. Building, Appliance and Equipment Energy Loads, Consumption, Markets, and Impact

4.1.Building Sector, and Appliance and Equipment Overview

The Building Regulatory Programs play an integral role in reducing the Nation's energy consumption. In 2006, the Nation's 113 million households and over 4.7 million commercial buildings consumed approximately 38.8 quadrillion Btu (quads) of energy annually, about 39 percent of the U.S. total, making the building sector the largest energy consumer. Figure 4-1 depicts the percentage of US primary energy consumption by sector. Residential buildings use the most energy in the buildings sector with 21 percent of the U.S. total, while commercial buildings use 18 percent. Energy use in buildings costs 392.2 Billion ($2006)[7].

Figure 4-1 US Primary Energy Consumption by Sector

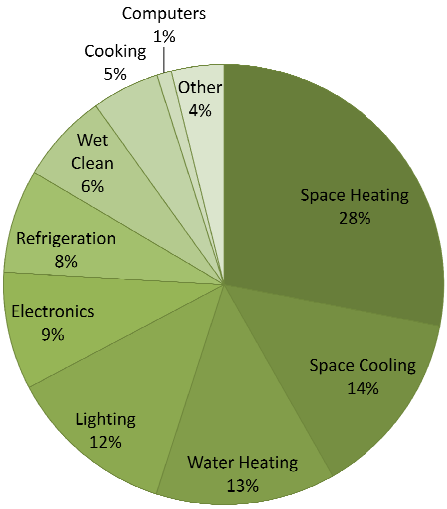


Building energy loads differ significantly due to building size, function, and climatic location. In response, patterns of energy use in buildings differ significantly. Figure 4-2 illustrates the differences between residential and commercial buildings nationwide, without respect to the effect of climate location. However, there is significant variation in actual end-use demand in real buildings, due to variation across climate zones, type of building (single-family detached versus 20-

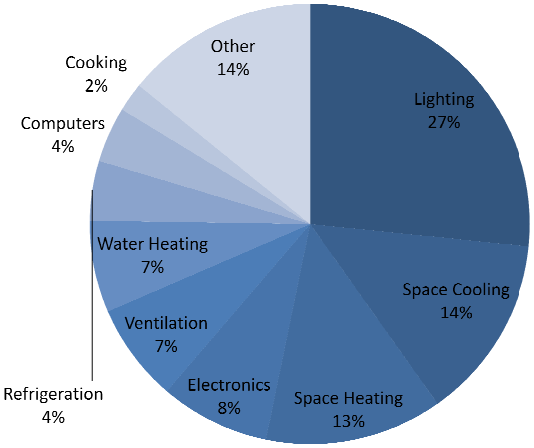
[7] Source: 2006 Building Energy Data Book, U.S. Department of Energy, Office of Planning, Budget and Analysis, Energy Efficiency and Renewable Energy. Prepared by D&R International, Ltd., September 2006. Hereafter, BED. Note: Energy Use does not total 100% due to the adjustment for SEDS, the EIA energy adjustment for data discrepancies.

story apartment buildings), and demographics of the household (number of occupants, patterns of occupancy, and lifestyle).

Figure 4-2 Primary Energy End-Use Split by Sector



Covered Products are Responsible for 82% of Residential Energy Consumption

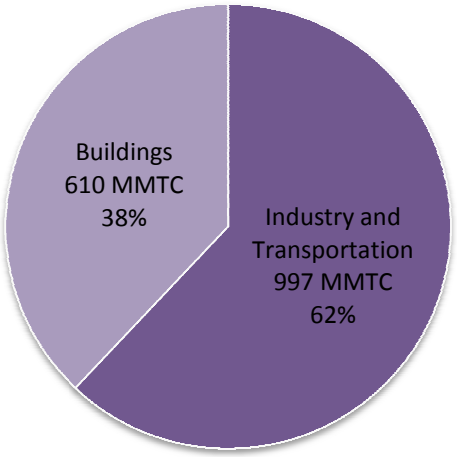


Covered Products are Responsible for 67% of Commercial Energy Consumption

Buildings contribute to 72% of US electricity consumption (in 2006), require nearly 9 quads of delivered energy, and are predicted to contribute to 78% of US electricity consumption by 2030. Of this amount, 37% is consumed by the Residential sector and 36% is consumed in the Commercial sector. Buildings emit 2,236 million metric tons of carbon dioxide a year, which is 38% of US emissions and 7.9% of world carbon dioxide emissions.[8] Figure 4-3 depicts the percentage of US Carbon Emissions in 2006 by sector.

[8] Building Energy Data Book

Figure 4-3: US Carbon Emissions, 2006



4.2.New Appliances and Equipment

Since the passage of EPCA, subsequent energy bills have amended the statute to add many products to the Appliance and Equipment Efficiency Standards Program. Table 3-1 lists the products and equipment currently covered by the program. These products are responsible for 82% of residential building energy consumption and 67% of commercial building energy consumption.[9]

4.2.1. Program Impacts

The Appliance and Equipment Efficiency Standards Program is clearly one of the Federal Government's most effective energy saving programs. Based on a Lawrence Berkeley National Laboratory Analysis published in March 2008, federal residential energy efficiency standards that went into effect from 1988 to 2006 will have an estimated cumulative energy savings of 39 quads by 2020, and 63 quads by 2030. Roughly 75 percent of these savings are attributable to efficiency standards for just four product classes (refrigerators, clothes washers, water heaters, and central air conditioners), with the other regulated residential product classes accounting for the remaining 25 percent.

Figure 4-4 illustrates the trends in average annual energy consumption for refrigerators[10]. It shows the historic actual efficiency data and the estimated base case. The base case scenarios reflect the

[9] Building Energy Data Book

[10] http://efficiency.lbl.gov/drupal.files/ees/Realized%20and%20Projected%20Impacts%202008%20938510.pdf

historical trend, where available, along with judgment as to changes that might have occurred as a result of market forces. In the case of refrigerators, standards have reduced energy consumption by nearly 50%. Other products show similar trends.

Figure 4-4 Average Annual Electricity Use of Refrigerators by Year of Shipment

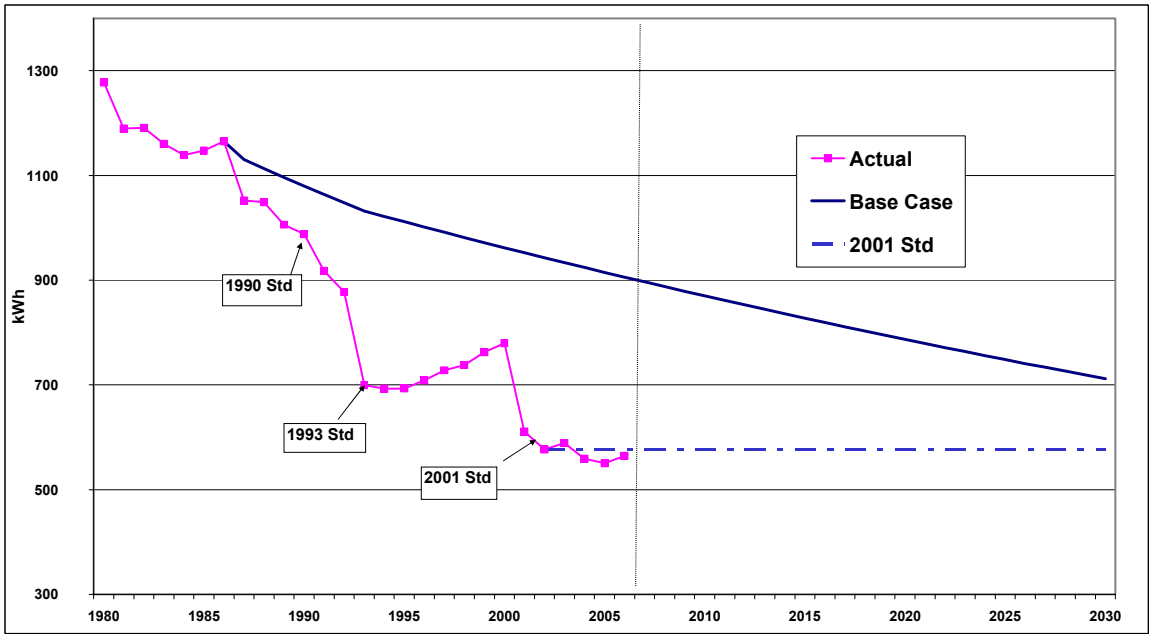


Figure 4-5 shows, for three sample products, the percentage of cumulative replacements over time based on a constant replacement rate estimated from each product's life expectancy. For illustrative purposes, we assumed that the final rule for all three products went into effect in 2010. The sample products were chosen to demonstrate short, medium, and long life expectancies (an incandescent light bulb, a refrigerator, and a transformer, respectively). For a product with a short life expectancy, such as the incandescent light bulb, nearly all products sold today will be replaced within just a few years as their life cycles expire. Conversely, products with longer life expectancies, such as transformers, will be replaced in the market over a longer period. However, nearly all of these longer life products will still be replaced before 2050.

Figure 4-5 Product Replacement Over Time

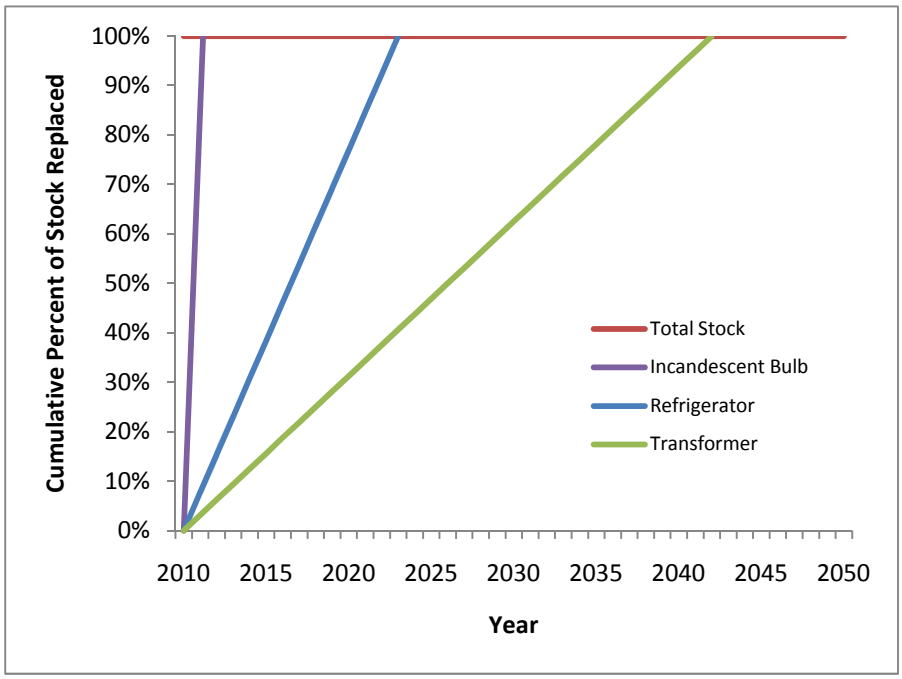


Table 4-1 shows a variety of covered products that fall within the range of life expectancy between the light bulb and a transformer, and will therefore be replaced within the corresponding time frames

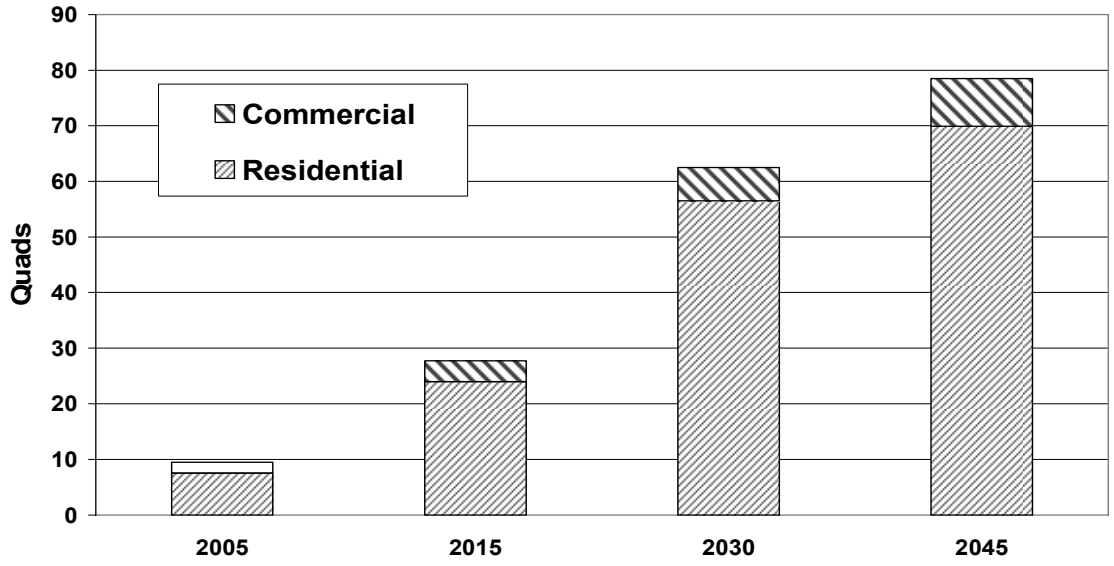
Table 4-1 Life Expectancy of Select Covered Products

Product	Life Expectancy
Incandescent Lighting	**1.18 years**
TV, LCD	6 years
TV, Color	8 years
TV, Projection	9 years
Dishwashers	9 years
Microwave Ovens	9 years
Dryers	11 years
Dehumidifiers	11 years
Washers	11 years
Freezers	11 years
Air Conditioner, Room	11 years
Refrigerators	**13 years**
Ranges	14 years

Product	Life Expectancy
Furnace, Electric	14 years
Furnace, Warm Air, Gas	16 years
Furnace, Warm Air, Oil	18 years
Transformer	**32 years**

The estimated cumulative net present value of consumer benefit amounted to $64 billion at the end of 2005; standards are projected to save $241 billion by 2030, growing to $269 billion by 2045, while the cumulative cost of DOE's program to establish and implement these standards over the past 20 years is in the range of $200-250 million. Annual carbon savings reach 38 million tons by 2020 and the cumulative savings by 2045 is estimated at 1,200 million tons.[11] Figure 4-6 shows estimated energy savings through 2045.

Figure 4-6 Cumulative Primary Energy Savings for Residential and Commercial Products



Since President Obama took office in January 2009, DOE has finalized seven energy conservation standards which may save up to 10 quads of primary energy by 2030. In addition, DOE codified the energy conservation standards prescribed by EISA 2007 which may save up to 15.29 quads by 2030. The seven standards developed by DOE may save consumers up to $103 billion on their utility bills by 2030, while the standards prescribed by EISA 2007 may save consumers up to $159 billion by 2030.

[11] http://efficiency.lbl.gov/drupal.files/ees/Realized%20and%20Projected%20Impacts%202008%20938510.pdf

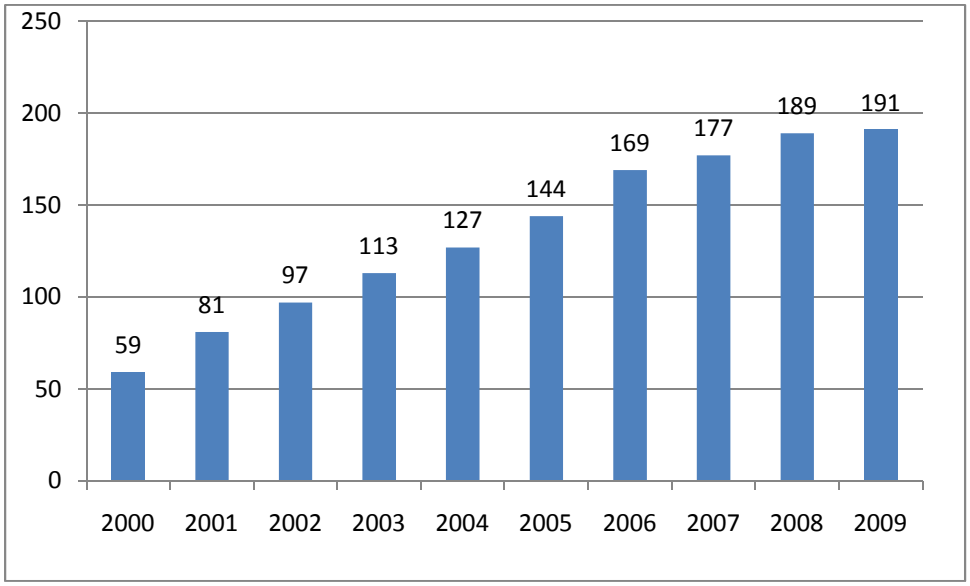
4.3.ENERGY STAR Appliances and Equipment

The ENERGY STAR program seeks to reduce energy consumption through a similar channel to the Appliance and Equipment Efficiency Standards Program by increasing the average efficiency of new purchased products. However, instead of prohibiting manufacture of products below a certain efficiency threshold, the ENERGY STAR program encourages voluntary adoption of highly efficient products. Products that meet the ENERGY STAR efficiency level can be labeled as ENERGY STAR compliant. Consumers can then consider the efficiency of the product (and the resulting operating cost savings) in their purchasing decision.

4.3.1. Program Impacts

Americans, with the help of ENERGY STAR, prevented 45 million metric tons of greenhouse gas emissions in 2009 alone–– equivalent to the annual emissions from 30 million vehicles - and saved nearly $17 billion on their utility bills. These savings are expected to grow substantially in the years ahead as consumers and businesses continue to realize the benefits of their purchases and look to ENERGY STAR for guidance on investing in additional energy-efficient products, practices, and policies[12]. Figure 4-7 shows the increasing benefits of the ENERGY STAR program from 2000 through 2009. Cumulative savings over that period total 1,347 billion kWh.

Figure 4-7 Energy Savings due to ENERGY STAR (billion kWh)



[1212] http://www.energystar.gov/ia/partners/annualreports/2009_achievements.pdf

ENERGY STAR program impacts are often enhanced by supporting local utility, state, and other programs. For example, ENERGY STAR is currently helping states enact Cash for Appliances programs. These programs provide rebates to consumers who purchase ENERGY STAR products in a number of categories, including heat pumps, furnaces, central and window air conditioners, refrigerators, freezers, dishwashers, washing machines and water heaters.

ENERGY STAR expends considerable effort maintaining the integrity of its brand. While the program has been broadly successful, it is important not only to continue but to strengthen those efforts. To that end, DOE is committed to increased monitoring to safeguard the integrity of the ENERGY STAR brand through increased compliance activities.

4.4.Building Energy Codes

Building codes govern the design and construction of new construction and of retrofits of existing buildings. Building energy codes build on the regulatory infrastructure build by the cities and states to protect public health and life safety. This infrastructure focuses on review of plans and specification and field construction inspection of new construction and renovations, and at completion, with issuance of an occupancy certificate. The infrastructure is therefore a good vehicle for enforcing energy efficient and renewable energy building design and construction but not for controlling the efficiency of lighting and equipment brought into the building after construction by occupants and businesses.

Legislation has removed specific appliance and equipment efficiencies from what can be governed by codes. State equipment criteria may not be more stringent than national Federal appliance and equipment manufacturing standards. However, uncovered equipment, criteria for equipment controls and the distribution portion of equipment systems may still be included in codes.

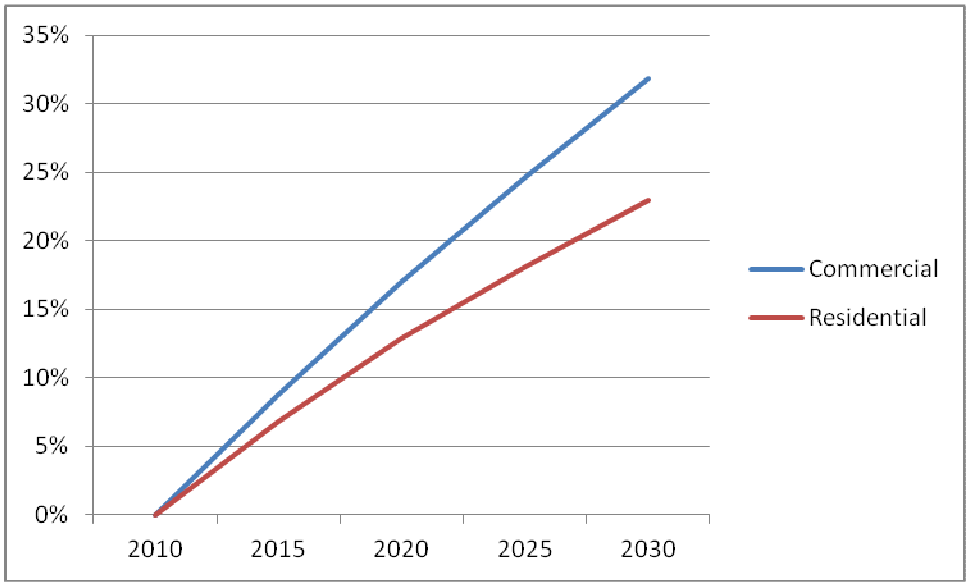
New buildings represent about 2% of the total building stock in a given year. As such, they represent a unique chance to effect energy efficiency. Since buildings can last for decades if not centuries, they present an important opportunity to save energy that cannot be neglected. Figure 4-8 shows that replacement of building stock is a slow process. By 2030, less than 35% of commercial building, and less than 25% of residential buildings, will have been constructed based on building energy codes effective in 2010[13].

Once a new building is constructed, it is very expensive and often impossible to achieve the energy efficiency that can be economically built in at the time of initial construction or during renovation. Had the Nation built more efficient structures in the past, retrofitting of existing buildings would not be as critical today. It is vital to make energy efficiency a fundamental part of the building

[13] Building Energy Data Book

design and construction process and energy codes are an effective way to achieve this goal and ensure energy efficiency is a component of all buildings. States have the lead to make this happen.[14]

Figure 4-8 Percentage of Building Stock Constructed Using Building Energy Codes Effective in 2010



4.4.1. Program Impacts

The Building Energy Codes Program supports energy code development, adoption, implementation, and compliance initiatives at the national, state and local level and is estimated to generate energy cost savings of more than $2.5 billion per year. Since the restructuring of the Program 20 years ago, accumulated energy savings have been more than 1.5 quads and cost savings to consumers have been more than $14 billion. These savings have resulted primarily from the Program's activities which incrementally upgrade the model energy codes and accelerate their adoption by and within the states and which improve code compliance by means of code compliance software tools, training, information dissemination, and technical support.

BECP supports energy code development, adoption, implementation, and compliance initiatives as the national, state and local level and is estimated to generate energy cost savings of more than $2.5 billion per year. Since the inception of the Program 20 years ago accumulated energy savings has been more than 1.5 quads and cost savings to consumers has been more than $14 billion. These savings have resulted primarily from the Program's activities that accelerate the adoption of building energy codes by and within the states and that improve code compliance by means of various software tools and other types of training and technical support..[15]

[14] http://www.energycodes.gov/why_codes/
[15] http://www.energycodes.gov/why_codes/

5. Appliance and Equipment Efficiency Standards Program Rulemaking Process

DOE's Appliance and Equipment Efficiency Standards Program carries out activities in four areas: mandatory energy conservation standards, test procedures, certification and enforcement, and labeling.

DOE establishes Federal standards to keep consistent, national energy efficiency requirements for selected appliances and equipment. By law, DOE must upgrade standards to the maximum level of energy efficiency that is technically feasible and economically justified.

DOE outlines the test procedures that manufacturers must use to certify that their appliances meet the standards. The test procedures measure the energy efficiency and energy use and provide an estimate of the annual operating cost of each appliance. Frequently test procedures are maintained by industry associations and incorporated by reference into the rules set by DOE.

In its efforts to ensure compliance with energy conservation standards, the Department of Energy actively pursues enforcement actions. Under existing DOE regulations, DOE can take an enforcement action and assess civil penalties if a manufacturer fails to properly certify a covered product and retain records.

In addition to developing test procedures and setting energy conservation standards, EPCA requires the development of appliance labels for 13 covered products. DOE and the Federal Trade Commission (FTC) share responsibility for labeling appliances. FTC is required to prescribe labeling rules for residential appliances and the FTC and DOE share responsibility for labeling commercial products.

5.1.Appliance and Equipment Efficiency Standards Setting

5.1.1. Overview of Statutory Requirements and Authorities

Any new or amended energy conservation standard must be designed to achieve the maximum improvement in energy efficiency that is technologically feasible and economically justified. To determine whether economic justification exists, EPCA directs that the Department determine that the benefits of the proposed standard exceed its burdens to the greatest extent practicable, weighing the following seven criteria:

1. - The economic impact of the standard on the manufacturers and on the consumers of the products subject to such standard;
2. - The savings in operating costs throughout the estimated average life of the covered product in the type (or class) compared to any increase in the price of, or in the initial charges for, or

maintenance expenses of, the covered products which are likely to result from the imposition of the standard;

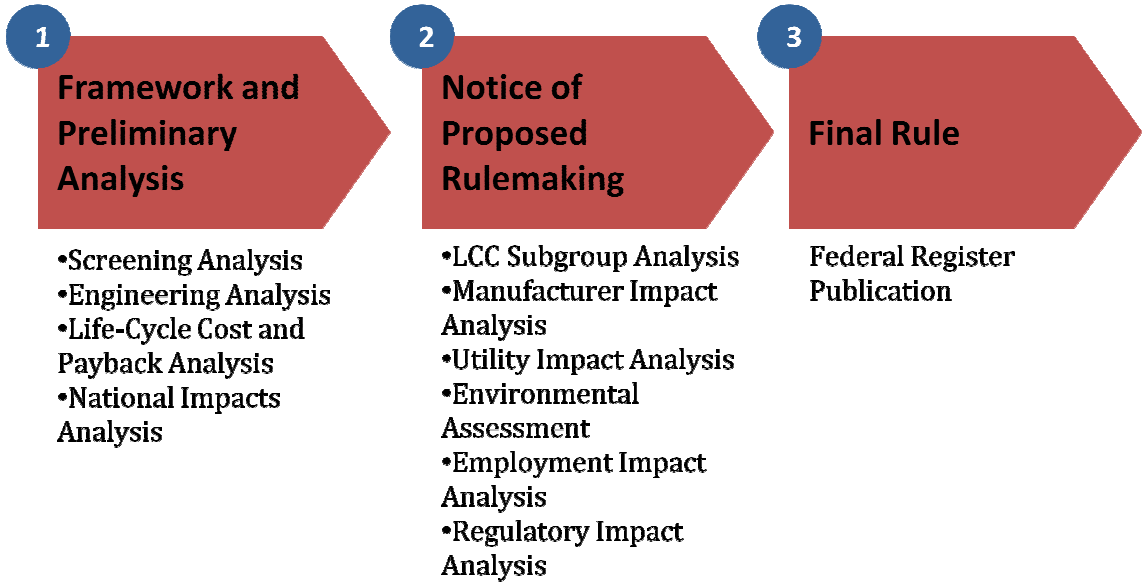
3. - The total projected amount of energy savings likely to result directly from the imposition of the standard;
4. - Any lessening of the utility or the performance of the covered products likely to result from the imposition of the standard;
5. - The impact of any lessening of competition, as determined in writing by the Attorney General, that is likely to result from the imposition of the standard;
6. - The need for national energy conservation; and
7. - Other factors the Secretary considers relevant.

To fully consider those seven criteria, DOE performs numerous analyses throughout the rulemaking process. In addition to ensuring that its analyses address the seven EPCA criteria, the Department must follow numerous procedural requirements—mandated by various statutes and Executive Orders—and perform all associated supporting analysis. These requirements are integrated into the rulemaking process, analysis, and documents.

5.1.2. Rulemaking Stages and Supporting Activities

Energy conservation standards are established by a three-phase rulemaking process: a framework and preliminary analysis phase, notice of proposed rulemaking (NOPR), and final rule. The Department actively encourages the participation and interaction of all stakeholders at all stages of the process. Early and frequent interactions among stakeholders have been useful for providing a balanced discussion of critical information required to conduct the analysis to support any standards. Figure 5-1 provides an overview of the rulemaking process and the analyses that are performed at each stage.

Figure 5-1 Energy Conservation Standard Rulemaking Process



5.1.3. Framework Document and Preliminary Analysis

At the beginning of a new rulemaking, DOE typically convenes a public workshop to discuss and receive comments on issues considering the adoption of energy conservation standards for a product. Approximately one month before the workshop, DOE makes available a framework document to explain and discuss the process, analyses, and issues concerning the development of such standards.

For the preliminary analysis, DOE publishes a brief notice in the Federal Register announcing the availability of a preliminary technical support document and public meeting. This preliminary technical support document specifies the candidate standard levels chosen for further analysis, but does not propose a particular standard. DOE bases the selection of candidate standard levels on costs and benefits of design options or efficiency levels.

The major analytical activities conducted for the preliminary analysis are:

A screening analysis. As part of its initial analytical activities, DOE identifies the product design options or efficiency levels that will be analyzed in detail and those which can be eliminated from further consideration. This process includes a market and technology assessment, which relies on consultations with stakeholders and independent technical experts.

An engineering analysis. After the screening analysis, the technologically feasible design options or efficiency levels not eliminated are considered. The engineering analysis determines the maximum technologically feasible energy efficiency level among the technology options and

develops cost-efficiency relationships, showing the manufacturers' cost of achieving increased - efficiency levels.

A life-cycle cost (LCC) and payback analysis. A LCC and payback analysis is performed to calculate the savings in operating costs throughout the estimated average life of the covered product compared to any increase in the price, initial charges, or maintenance expenses for the product likely to result directly from the imposition of the standard.

A preliminary national impact analysis. The national impact analysis calculates expected national energy and water savings and net present value of related consumer expenses (including increased equipment prices and decreased energy bills).

The preliminary analysis presents the results of the engineering analysis and the preliminary values of consumer life-cycle costs, national net present value, and national energy savings. In addition to analyses, the TSD provides a market and technical assessment of the product covered in the rulemaking.

There may be a sixty-day public comment period after publication of the preliminary analysis. Based on comments received, DOE may revise the analysis or the candidate standard levels.

5.1.4. Notice of Proposed Rule (NOPR)

After the preliminary analysis, DOE conducts further economic impact analyses of the candidate standard levels. It refines the analyses it performed for the preliminary analysis, and performs new analyses, including:

(i) **A consumer sub-group analysis.** This analysis evaluates variation in household characteristics or location (e.g., energy prices, appliance use behavior, installation costs, and heating or cooling degree days) that might cause a standard to impact particular consumer sub-groups, such as low-income households, differently from the overall population.

(ii) **A manufacturer impact analysis.** This analysis estimates the financial impact of standards on manufacturers and calculates impacts on employment and manufacturing capacity.

A utility impact analysis. This analysis estimates the effects of proposed standards on electric and gas utilities.

An environmental assessment. This analysis provides estimates of changes in emissions of carbon dioxide and the pollutants sulfur and nitrogen oxides.

The results of all the analyses are made available on DOE's website for review, and DOE considers comments received. This process culminates with the selection of proposed standard levels, which are presented in the NOPR. DOE considers many factors in selecting proposed standards. These factors include the selection policies established by statute and the many benefits, costs, and impacts of the standards shown by the analyses.

5.1.5. Final Rule

The last step in the rulemaking process is the publication of a final rule in the Federal Register. The final rule promulgates standard levels based on all of the analyses and explains the basis for the selection of those standards. It is accompanied by the final TSD.

5.1.6. Regulatory Procedural Requirements

Numerous regulatory requirements must be met by DOE rulemakings including laws, regulations, and executive orders. In addition to public comment requirements, the Department must now respond to the following 13 requirements:

- Review Under Executive Order (hereafter "E.O.") 12866, "Regulatory Planning and Review"
- Review Under the Regulatory Flexibility Act
- Review Under the Paperwork Reduction Act of 1995
- Review Under the National Environmental Policy Act of 1969
- Review Under E.O. 13132, "Federalism"
- Review Under E.O. 12988, "Civil Justice Reform"
- Review Under the Unfunded Mandates Reform Act of 1995
- Review Under the Treasury and General Government Appropriations Act of 1999
- Review Under E.O. 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights"
- Review Under the Treasury and General Government Appropriations Act, 2001
- Review Under E. O. 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use"
- Review Under section 32 of the Federal Energy Administration Act of 1974
- Congressional Notification

5.2.Appliance and Equipment Test Procedures

Before an energy standard is set, a test procedure for the product must be in place. Test procedures describe the laboratory actions for measuring the energy efficiency and energy use of each covered product. Test procedure development is a key element of DOE's Appliance and Equipment Efficiency Standards Program.

5.2.1. Requirements and Authorities

DOE test procedures are used to: (1) provide the methodologies for testing or analysis used to develop proposed standards for covered products or equipment; (2) determine compliance with those standards; (3) establish that manufacturer equipment complies with energy conservation standards and to make representations about equipment efficiency, and (4) determine whether a covered product complies with EPCA standards under an enforcement action. Test procedures for

covered products should measure energy use, energy efficiency, or estimated operating cost during a period that is representative of typical use. Furthermore, the test procedure should not be unduly burdensome to the manufacturers of covered appliances and equipment.

5.2.2. Test Procedure Rulemaking Process

Test procedures provide a uniform method for testing a product's compliance with energy conservation standards. A good test procedure should: (1) be repeatable, (2) be representative, (3) be reproducible, (4) not be overly burdensome to conduct, (5) anticipate technology changes, and (6) discourage circumvention of the test-procedure's intent. A test procedure is repeatable if multiple tests performed on the same unit yield comparable results. One that is reproducible will yield similar results when various persons or laboratories perform the test. A test procedure is representative when it produces results that reflect how the product uses energy and water in the field. A test procedure should not impose unnecessary or excessive burden on manufacturers (*i.e.,* it should not be excessively costly, time-consuming, or difficult to execute). Developers of a test procedure should also attempt to anticipate future technology changes, and write the test procedure to accommodate anticipated future technology changes, especially for products having short life cycles (such as consumer electronics). Finally, a test procedure should be difficult to circumvent, which means that it's clearly and precisely worded so that it's difficult to misinterpret (accidentally or otherwise), and difficult to design around (i.e., implement product design changes that defeat the intent of the test procedure).

When conducting a review of a test procedure, DOE investigates numerous issues:

- Does the test procedure reference the most recent versions of relevant industry or other test procedures? If not, are there good reasons for DOE to reference older versions of test procedures?
- Does the test procedure accurately measure energy and/or water consumption for both the products currently on the market and those anticipated to released in the future?
- Do available survey and field data suggest that the test procedure is representative of actual use by the consumer?
- Are there any outstanding test-procedure waivers that have not yet been incorporated into the test procedure?
- Have there been numerous petitions for waivers, applications for interim waivers, or questions asked about the test procedure that might suggest the need for amendments?

5.2.3. Development of Proposed and Final Rules

The current test procedure rulemaking process incorporates many of the elements of the standards rulemaking process. The standards process includes (1) a framework document & preliminary analysis, (2) a NOPR and (3) a final rule. However, unlike the standards process, there is no framework document or preliminary analysis in a test procedure rulemaking, only a NOPR and final

rule. The test procedure process is shorter and typically lasts 2 years. A test procedure rulemaking either modifies an existing test procedure, or develops a new test procedure.

5.2.3.1. Test Procedure Rulemaking Triggers

Various events can "trigger" a rulemaking to begin.

Supporting a Standards Rulemaking: The most common trigger is a standards rulemaking that requires supporting amendments to the associated test procedure. In most cases, DOE synchronizes the standards rulemaking and the test procedure rulemaking for a given product. This helps DOE to identify any required modifications to existing test procedures. Often, the test procedure final rule is published during the same timeframe as the standards NOPR.

Periodic Reviews: Legislation introduced in recent years (such as EISA 2007) requires DOE to pursue, at an increasing rate, test procedure rulemakings independently of standards rulemakings. As a result, DOE is required to review test procedure for all covered products every seven years. Test procedures are updated if it is determined that new procedures would more accurately measure product energy consumption.

Mandates Linked to Industry Test Procedures: Legislation can prescribe amendments to a specific test procedure, require establishing a new test procedure, or require DOE to make a determination whether a test procedure amendment or new test procedure is needed. EPACT 2005 and EISA 2007 are examples.

Petitions: DOE can initiate a test procedure revision in response to a petition by any interested person.

DOE Recognition of Need: DOE can initiate a test procedure revision on his own behalf.

Deferrals: Occasionally, an earlier final rule defers action on some aspect of a TP to allow more information gathering and analysis

Stakeholder Comments: DOE may initiate a TP amendment in response to stakeholder comments

Petition for Waiver/Petition for Interim Waiver: DOE is required to publish a NOPR to amend a test procedure within one year of granting a waiver

5.2.4. Notice of Proposed Rulemaking and Prior Activities

Once the rulemaking is triggered, development of the NOPR begins. When developing a new test procedure for a product, DOE looks to test procedures maintained by industry, trade associations, and other governmental bodies. DOE often incorporates by reference or adopts modified versions

of these test procedures if they are widely accepted by stakeholders, and if they meet the six criteria mentioned above: repeatable, reproducible, representative, not overly burdensome, anticipates technology changes, and discourages circumvention. The purpose of the NOPR is to present the proposed test procedure and receive comment from interested parties on its appropriateness.

The NOPR typically includes the following discussions:

- Authority and background for the test procedure rulemaking. This includes DOE's authority to regulate the product as well as past rulemakings and legislation related to the product.
- Proposals for the scope of coverage, definitions, test set-up, ambient conditions, and output metrics of the test procedure.
- The proposed method of testing, which is usually in whole or in large part an industry test procedure. DOE asks for comment from interested parties on any significant changes being proposed.
- Regulatory review requirements.

Once published, DOE may hold a public meeting to collect verbal comments from interested parties. If the test procedure NOPR aligns with a corresponding standards preliminary analysis, the public meetings may be combined or held on consecutive days. The period for written comments usually extends for 75 days after the publication of the NOPR.

5.2.5. Publication of Final Rule

The final stage of the test procedure rulemaking process results in the publication of a final rule in the Federal Register. The final rule promulgates a final test procedure, addresses comments received during the NOPR stage and explains the basis for the test procedure.

5.2.6. Test Procedure Waivers

5.2.6.1. Requirements and Authorities

DOE's regulations contain provisions allowing a person to seek a waiver from the test procedure requirements for covered consumer products if at least one of the following conditions is met:

1) - The petitioner's product contains one or more design characteristics that prevent testing according to the prescribed test procedure, or
2) - When the prescribed test procedures may evaluate the product in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data.

Petitioners must include in their petition any alternate test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption characteristics. The

Assistant Secretary for Energy Efficiency and Renewable Energy may grant a waiver subject to certain conditions, such as requiring adherence to alternate test procedures.

The waiver process also allows any interested person who has submitted a petition for waiver to file an application for an interim waiver of the applicable test procedure requirements. The Assistant Secretary will grant an interim waiver request if it is determined that the applicant will experience economic hardship if the interim waiver is denied, if it appears likely that the petition for waiver will be granted, and/or if the Assistant Secretary determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the petition for waiver.

Within one year of granting a waiver, DOE is required to publish a NOPR for the relevant test procedure so as to eliminate any need for the continuation of such waiver. The waiver will terminate on the effective date of the final rule.

5.2.6.2. Waiver Reviews and Actions

If a manufacturer feels that the DOE test procedure does not accurately measure the energy or water consumption of a product, it can submit a petition for a waiver. A manufacturer seeking a test procedure waiver submits a petition for waiver to DOE, often accompanied by an application for interim waiver. DOE notifies the applicant within 15 business days if the interim waiver is granted. The interim waiver terminates 180 days after issuance or upon the determination on the petition for waiver, whichever occurs first.

Upon submittal, the petition for waiver is published in the Federal Register, along with a request for comments. DOE then issues a decision and order, either granting or denying the waiver, which is published in the Federal Register. If the waiver is granted, DOE publishes in the Federal Register a notice of proposed rulemaking to amend the test procedure and eliminate the need for the waiver.

5.3. Certification and Enforcement

By law, manufacturers and private labelers may not distribute in commerce any product that does not meet applicable energy conservation, water conservation, or design standards.

DOE monitors compliance with DOE regulations, including the above, through two channels: certification and enforcement. DOE requires manufacturers to certify that covered products meet applicable standards. If DOE receives information that a product does not meet applicable standards, it is obligated to investigate the product and the claims.

5.3.1. Requirements and Authorities

EPCA authorizes DOE to enforce compliance with the energy conservation, water conservation, and design standards established for certain consumer products and commercial equipment. To ensure

that all covered products distributed in the United States comply with the applicable conservation standards, the Department has promulgated enforcement regulations that include product-specific certification and compliance requirements.

Under existing DOE regulations, DOE can take enforcement action and assess civil penalties if a manufacturer fails to properly certify a covered product and retain records.

5.3.2. Certification

DOE requires that manufacturers of certain products certify, by means of a compliance statement and certification report, that the product meets applicable energy conservation, water conservation, and design standards. Each certification report contains the product type, product class, manufacturer's name, private labeler's name(s) (if applicable), the manufacturer's model number(s), and the energy efficiency/consumption or water consumption data. Because certification reporting requirements are developed by DOE and incorporated into the CFR on a product by product basis, not all products with energy conservation standards currently have certification reporting requirements. DOE will continually update its certification regulations to expand to other types of covered products and commercial equipment.

5.3.3. Enforcement

DOE has the authority to initiate enforcement actions to ensure compliance with its standards. At this time, the current regulations provide for enforcement testing upon DOE's receipt of written information that a covered product may be violating a standard. DOE undertakes enforcement actions against a manufacturer that it suspects is distributing in commerce a product that does not meet applicable energy conservation, water conservation, or design standards. Three distinct pathways can initiate an enforcement action. The first is a stakeholder submission to DOE that contains written information concerning the energy or water performance of a particular covered product, which indicates that the covered product may not be in compliance with the applicable energy or water conservation standard. Secondly, DOE may initiate enforcement action after finding deficiencies in certification reports. Finally, DOE uses the results of secondary government sponsored test programs, such as DOE and EPA ENERGY STAR test programs. For example, if the results of ENERGY STAR verification testing indicate that a product does not meet applicable minimum energy conservation standards, DOE will be notified and begin enforcement proceedings.

5.3.4. Lab Accreditation

Historically, DOE has not generally required test laboratories to have specific accreditations or certifications. Accreditations are required for certain lamps. Additionally, commercial products are subject to unique provisions, which have requirements for non-voluntary program participants to use third-party, accredited testing facilities. As discussed in Section 8.1.1.2, DOE anticipates establishing accreditation requirements for test labs in the future.

5.4.State Standards and Preemption of State Standards

Generally, where an energy conservation standard is effective for a covered product under EPCA, a State regulation is preempted and is not effective. However, EPCA provides states with the ability to petition DOE for an exemption from federal preemption. EPCA allows DOE to grant a petition only if it finds a significant State or local interest to justify such State regulation and the State regulation is more stringent then the Federal standard. In 1987, Congress passed NAECA which amended EPCA's provisions on petitions for waiver from Federal preemption under section 327(d). Under the new amendment, States are allowed to apply for petition to be waived from Federal preemption, but the waiver is difficult to achieve.

Any State with a State regulation may petition DOE for a waiver from Federal preemption and seek to apply its own State regulation. When determining whether a waiver of preemption will be granted, DOE looks at all relevant factors. For example, DOE considers the impact on manufacturers, small manufacturers, and sales volume of covered product types.

EPCA established criteria for DOE to evaluate in order to determine whether a waiver will be granted or denied. For DOE to grant an exemption from preemption, DOE must find that:

- The State has unusual and compelling interests,
- The State regulation does not create a significant burden on manufacturers, and that
- The State regulation would not likely result in the unavailability of products.

EPCA defines unusual and compelling interests as substantially different in nature or magnitude than those prevailing in the United States generally; and the cost, benefits, burdens, and reliability of energy or water savings resulting from the State regulation make such regulation preferable or necessary. In addition, DOE must find the State standard has no significant burden on manufacturing, marketing, distribution, sales, or servicing on a national basis. Lastly, DOE must find that the State standard does not affect the availability of covered product types (or classes), including performance characteristics, features, sizes, and capacities.

After making its determination on the petition, DOE must in the case of denial, publish a notice of reasons for denial, or in the case of granting, publish a notice of proposed rulemaking, hold a public meeting and issue a final rule.

EPCA also specifies that State law providing for the disclosure of information with respect to any measure of energy consumption is superseded if the law requires testing or the use of any energy descriptor in any manner other than provided by federal regulations. Therefore, in the absence of a Federal test procedure or accompanying conservation standard, States may prescribe their own test procedures and standards pursuant to applicable State law.

5.5.Regional Standards

EISA enables DOE to consider regional standards for certain products if such standards can save significantly more energy and are economically justified. Specifically, in addition to a base national standard, DOE may establish up to two additional regional standards for central air conditioners and heat pumps (CACHP) and one additional standard for furnaces. The unprecedented prospect of regional standards presents new compliance and enforcement issues for which DOE must prepare. Congress ostensibly anticipated this situation, explicitly requiring DOE to begin an enforcement rulemaking for regional standards no later than 90 days of the issuance of a final rule establishing regional standards. DOE is required to finish this enforcement rulemaking no later than 15 months of the final rule's issuance.

However, prescribing an enforcement plan only after publishing a final rule is problematic, given that DOE is required by the same statute to assess the impacts of regional standards on manufacturers and other market participants, including "distributors, dealers, contractors and installers." Based on stakeholders' comments following the CACHP framework meeting, the impacts of regional standards on certain of these market players depend directly on the specific compliance and enforcement plan adopted. For this reason, as well as to solicit more effective feedback, DOE should immediately initiate a rulemaking establishing an enforcement plan.

5.6.Energy Guide Labeling

EPCA requires the FTC to prescribe labeling rules for the disclosure of estimated annual energy costs or alternative energy consumption information for a variety of products covered by the statute, including home appliances (e.g., refrigerators, clothes washers, and dishwashers), lighting, and plumbing products. For most covered products, labels must disclose energy information derived from Department of Energy (DOE) test procedures.

The FTC implements EPCA's directive through the Appliance Labeling Rule. Under the Rule, appliance manufacturers must disclose specific energy use information at the point of sale in the form of a yellow ''EnergyGuide'' label affixed to each unit. This information also must appear in catalogs and on Internet sites from which covered products can be ordered. Labels for most appliances must provide the product's estimated annual operating cost as the primary disclosure.

To calculate these operating cost estimates, manufacturers must use national average cost figures for energy (e.g., electricity, natural gas, etc.) determined by DOE. The Rule also allows manufacturers to place the ENERGY STAR logo on labels for products that qualify for that program. Required labels for appliances must include a ''range of comparability'' that shows, for most products, the highest and lowest operating cost of all similar appliance models. These ranges help consumers compare similar models. The Rule also requires manufacturers of most covered products to file data reports with the FTC. These reports must contain the estimated annual energy

consumption or energy efficiency ratings for the appliances derived from tests performed pursuant to the DOE test procedures.

6. Support to the ENERGY STAR Program

6.1.EPA and DOE Partnership via Memorandum of Understanding

ENERGY STAR is a voluntary, joint program between DOE and the Environmental Protection Agency. The goal of ENERGY STAR is to identify and promote energy-efficient products and buildings to reduce energy consumption, improve energy security and reduce pollution.

On September 30, 2009, the EPA and DOE signed a new agreement called the 2009 EPA-DOE Memorandum of Understanding (MOU). Among other things, the MOU stated that EPA-DOE will have enhanced efforts on test procedure updates. As part of the agreement, DOE will support EPA by increasing its efforts in the development of Federal test procedures and metrics.

When possible ENERGY STAR examines and uses existing test procedures. ENERGY STAR often uses the DOE test procedures established for covered products, when available. When an ENERGY-STAR product is not a DOE covered product, ENERGY STAR also looks into industry or other governmental body's test procedure.

6.2. Test Procedures for ENERGY STAR Products

In 2010, DOE assumed responsibility from EPA for developing and maintaining test procedures used for testing ENERGY-STAR products. DOE will evolve EPA's historical process for developing and maintaining ENERGY-STAR test procedures based on best practices developed for test procedures for Covered Products. Because ENERGY STAR is a voluntary program, the process for developing and maintaining ENERGY-STAR will not involve a regulatory process as outlined in Section 5.2.3 above. It will, however, address the same elements used to define a "good" test procedure for Covered Products. A good test procedure should: (1) be repeatable, (2) be representative, (3) be reproducible, (4) not be overly burdensome to conduct, (5) anticipate technology changes, and (6) discourage circumvention of the test-procedure's intent. DOE will also establish a periodical review process to ensure ENERGY-STAR test procedures do not become outdated or obsolete.

6.3.Third Party Certification

The Department of Energy and the Environmental Protection Agency conduct "off the shelf" and third party testing of a wide range of products bearing the ENERGY STAR label. For example:

All ENERGY STAR qualified windows, doors, and skylights must be independently tested by the National Fenestration Rating Council, an independent nonprofit organization with rigorous testing procedures monitored and supported by the Department of Energy.

The Environmental Protection Agency regularly conducts "off the shelf" testing to verify ENERGY STAR compliance. For example, in 2009 the EPA tested 20 TV models and 16 imaging products and found 100% compliance with the ENERGY STAR label.

Residential Light Fixtures, Compact Fluorescent Lights and Solid State Lighting systems (also known as LEDs) all undergo “off the shelf” testing by accredited, third-party laboratories.

Recently EPA changed its procedures such that EPA representatives will review all submissions to the ENERGY STAR program and notify partners through email that products have been approved. Partners may NOT label products until receiving notification of qualification.

6.4.Performance Verification Testing

ENERGY STAR expends considerable effort maintaining the integrity of its brand. While the program has been broadly successful, it is important not only to continue but to strengthen those efforts. To that end, DOE is committed to increased monitoring to safeguard the integrity of the ENERGY STAR brand. In 2010, DOE initiated a pilot testing program to ensure that products bearing the ENERGY STAR logo deliver the efficiency consumers expect. The pilot program supports the State Energy Efficient Appliance Rebate Program (SEEARP), which is expected to run from January 2010 to June 2011. Under the pilot program, DOE is testing samples of the most popular products in the SEEARP program to 1) ensure that ENERGY STAR products meet the ENERGY STAR program requirements and 2) ensure that ENERGY STAR products meet the manufacturer’s stated ratings. Product types being tested under the pilot program include refrigerators, freezers, dishwashers, gas tankless water heaters, gas storage water heaters, and room air conditioners.

DOE is implementing this verification process in two steps. As a first step, DOE launched in 2010 a pilot verification program in support of the SEEARP anticipated to run from January 2010 to June 2011. The purpose of the SEEARP is to save energy and stimulate the economy by encouraging consumers to replace old appliances with new ENERGY-STAR-qualified models. The pilot program is funded by the American Recovery and Reinvestment Act of 2009 (ARRA). If products do not meet ENERGY STAR requirements, manufacturers need to remove all ENERGY STAR labeling on the product. Furthermore, if the results of verification testing indicate that the product may not meet Federal minimum efficiency standards, DOE follows the protocol as laid out in the Code of Federal Regulations to initiate an enforcement action.

As a second step, the findings and results from the pilot program will inform the development of a long-term verification program. The long-term program will expand coverage to additional products not directly related to the SEEARP support efforts.

7. Building Energy Codes

DOE's Building Energy Codes Program is responsible for both increases to the energy efficiency of codes as well as implementation and deployment of those codes to the states. As such, BECP conducts activities in five areas:

- Support the upgrade of the model building energy codes (including performance codes, above codes and outcome based approaches)
- Determine if these codes will improve energy efficiency in buildings
- Provide technical and financial assistance to States to update their building energy codes to meet the national model energy codes
- Implement, enforce, and assess state compliance with their codes
- Promulgate, update and enforce manufactured housing energy efficiency standards

The Building Energy Codes Program originates energy efficiency standards, analyses and measured procedures, and enforcement procedures that influence the entire Nation. Many states may also develop energy efficiency regulations that only affect their particular state. Generally, federal regulations preempt state regulations. The BECP goals appear in Figure 7-1.

Figure 7-1 BECP Goals

Goals by FY	Baseline	2010	2011	2012	2013	2014	2015	2016	2017
IECC Code Improvement	IECC 2006	IECC 2009 (17%)		IECC 2012 (30%)			IECC 2015 (50%)		
ASHRAE 90.1 Code Improvement	90.1-2004		90.1-2010 (30%)			90.1-2013 (50%)			
Adoption Rate for IECC 2009 (or equivalent)									80%
Compliance Rate with IECC 2009	Unknown								90%

7.1.Upgrade Model Building Energy Codes

The program reviews the technical and economic basis of the model energy codes. For commercial and multi-family high-rise buildings, the basis for the code is the American Society for Heating Refrigeration and Air conditioning Engineers (ASHRAE) Standard 90.1 (known formally as ANSI/ASHRAE/IESNA Standard 90.1). For residential, the relevant code is the International Energy Conservation Code (IECC) for residential low-rise buildings (although the IECC is also the mechanism by which the ASHRAE standard is codified). The program:

- Recommends amendments to the model codes
- Seeks adoption of all technologically feasible and economically justified energy efficiency measures
- Participates in the industry process for the review and modification of the model energy codes. [16]

Both the IECC and ASHRAE 90.1 are developed, revised, and adopted in open public forums, through a voluntary consensus process. The consensus and hearing processes are critical to widespread support for their adoption. Stakeholders representing a cross section of interests in the energy codes are involved in updating the IECC and ASHRAE 90.1 they include:

- Designer, including architects, lighting, and mechanical designers
- Regulators, including building code officials, representatives of code organizations, and state regulatory agencies
- Owners, operators, and builders
- Building component and equipment manufacturers
- Utility companies
- Energy efficiency advocacy groups
- Academia
- Federal, state, and local government representatives, including the Department of Energy and the BECP

Compromise is fundamental to the voluntary consensus process. Each stakeholder has an opportunity to voice their opinion and concern. Building science and building energy efficiency are not the only considerations in approving proposed code changes. Market viability, industry fairness, construction costs and other considerations are all brought forth in the public hearing processes as well the impact on other parts of the code involving fire, safety, and structural issues. The resulting codes and standards are compromise documents which balance a wide range of issues and concerns.

[16] ECPA section 307(b).

7.1.1. IECC Upgrading

Every three years the IECC goes through a complete revision process.

Anyone may suggest a revision to the IECC by submitting a code change proposal and substantiation. BECP regularly submits code change proposals intended to increase efficiency and compliance of the code. At the public hearing, testimony for and against each code change proposal is presented to the Code Development Committee. The committee is typically comprised of seven to 11 individuals appointed by the International Code Council which oversees and maintains development of the IECC. The committee is represented by government members, code officials, home builder representatives, industry groups and other interested and affected parties. The committee receives testimony and then votes to approve, deny, or revise each change. The committee publishes its results. Those wishing to have a proposed change reconsidered may submit a challenge to the committee's recommended action. Proponents and opponents present additional information at a second public hearing, followed by a vote by the full ICC membership. This outcome may be appealed to the ICC Board of Directors.

When adopting their own energy codes, states and local governments typically adopt the full-published IECC or develop a state specific amended code. Several states, such as California, Washington, Oregon, and Florida have state energy codes which are independent of the IECC and ASHRAE 90.1.

7.1.2. ASHRAE 90.1 Upgrading

Like the IECC, ASHRAE 90.1 is developed in an open, voluntary consensus forum on a three year development cycle. However, the process is different from that of the ICC.

ASHRAE establishes working committees of 10 to 60 voting members which includes representatives from other standards organizations including IESNA, ANSI, American Society of Testing and Materials (ASTM), the Air Conditioning and Refrigeration Institute (ARI), and the Underwriters Laboratories (UL). The committees also include broad representation of stakeholders, as noted above. The Building Energy Codes Program (BECP) is a voting member of the full 90.1 committee and of a sub-committee. The Building Energy Codes Program also provides a great deal of technical support to ASHRAE for analysis of revisions and determining of potential energy savings.

Changes to the standard as proposed within the committee. After the committee approves a proposed change, all proposals are made public and written comments are received for a given period of time. The committee usually incorporates non-substantive changes into the standard without another review. Substantive changes require additional public review. Occasionally, mediation is necessary to resolve differing views. When a majority of the parties reach consensus, the revised standard is submitted for approval to the ASHRAE Board of Directors. Those not in

agreement with the decision may appeal to the Board. If an appeal is upheld, further revision, public comment, and resolution occur. If the Board denies the appeal, publication of the revised standard would then proceed.

7.2.Determinations and State Certifications

The Building Energy Codes Program initiates a rulemaking process to make a determination as to whether a model code will improve energy efficiency in the designated building type, as soon as one of the model energy codes is technically finished and ready for administrate review and publication. DOE is required to make a determination within one year of publication of the revised model energy code.[17]

If DOE makes an affirmative determination, States are required to take one of two actions within two years of DOE's determination. If the model code is the IECC, each State is required to certify to the Secretary that it has reviewed the provisions of its residential energy code and made a determination as to whether it is appropriate to revise its energy code to meet or exceed the upgraded model energy code for which DOE has made a determination. DOE is required to permit extensions of the deadlines for the certifications where a state has demonstrated a good faith effort to comply and it has made significant progress in doing so. DOE is required to provide financial and technical assistance to States to implement these requirements.

DOE notifies each state governor, the State Energy Office, and responsible office for code implementation, of the *Federal Register* notice, and of the availability of the technical and financial assistance available to the state. (See financial and technical assistance below.) Six months prior to the two year deadline, States which have not yet submitted certifications are again notified of the requirement, and provided with information about time extensions. Certifications are acknowledged and posted on www.energycodes.gov.

7.2.1. Commercial process

With each new edition of ANSI/ASHRAE/IESNA Standard 90.1, DOE issues a determination as to whether the new edition will improve energy efficiency in commercial buildings. The determination is based on analysis by the BECP and is required by Section 304 of EPCA, as modified by EPACT 1992. DOE has one year to publish the determination after the newest edition of the code is approved. Determination results are published in the Federal Register.

If DOE finds that the newest version of Standard 90.1 is more energy efficient (a "positive" determination) than the previous version, states are required by the EPACT to certify that their building energy codes meet the requirements of the new Standard within two years.

[17] ECPA sections 304(a)(5)(A) and 304(b)(2)(A).

Once DOE issues a positive determination, DOE must provide technical assistance and incentive funding to states to:

- Review and update state energy codes
- Implement, enforce, and evaluate compliance with state energy codes
- Permit certification extensions if the state demonstrates good faith to comply and the state has made significant progress toward compliance.

DOE must also send a letter to the governor of each state, notifying them of the determination and outlining the state's responsibilities. The letter also advises the governor of the availability for technical assistance and incentive funding from DOE, and provisions for time extensions if needed. Each state's energy offices and the responsible state code office receive letters with the same information, but in more detail than the governor's letter. Certifications are acknowledged and posted on www.energycodes.gov.

7.2.2. Residential process

The residential process is similar to the commercial process in that the latest version of the International Energy Conservation Code (IECC) is analyzed against the previous version. Draft analysis and determinations are posted for comment, and are revised accordingly. Final results are published in the Federal Register.

If the analysis shows that the revised code is more energy efficient than the earlier code, each state is required to certify that it has reviewed its residential building energy code regarding energy efficiency and made a decision as to whether it is appropriate for that state to revise its residential building code to meet or exceed the revised code.

DOE may provide technical assistance to states to improve and implement state residential building energy codes or to otherwise promote the design and construction of energy efficient residential buildings. (See financial and technical assistance below.)

DOE may also provide incentive funding to states to implement stronger residential building energy codes. The amount of funding will be based on the actions proposed by the state to improve and implement residential energy codes and to promote energy efficiency through the use of energy codes.

7.3. Develop Performance Codes, Above Code, and Outcome Based Approaches

The program works with voluntary sector codes and standards organizations such as ASHRAE, IESNA, and ICC, as well as many stakeholder organizations such as AIA, NAHB, USGBC, Green Globes, NBI and others, and federal agencies such as EPA, on the development of enhanced and

expanded codes and standards. This includes documents utilizing whole-building performance-based approaches, those implementing green and sustainable design requirements beyond energy, and code-like documents that go "above" minimum code requirements in terms of energy efficiency. These advanced codes that in total or in part address energy may be used as "stretch codes" in progressive states and jurisdictions that want to go further on energy efficient buildings. Also included are provisions that go beyond the traditional plan review and construction inspection process into commissioning and validation of compliance, as measured by energy use at the meter during occupancy.

DOE took a major step in working on building performance standards pursuant to PL 94-385 which directed the establishment of building energy performance standards. Since that time DOE has continued work on building performance-based compliance approaches through the Energy Cost Budget Method (ECB) of ASHRAE/IESNA Standard 90.1 dating back to the 1980s and 1990s. Building performance with respect to ASHRAE 90.1 or the IECC is defined as how a specific building is expected to perform based on computer simulation compared to a code complying version of itself just meeting minimum prescriptive provisions of the code. It does not consider plug and process loads, is not comparable from building to building and does not consider benefits associated with building geometry as a function of floor area. The ECB method is the whole-building compliance alternative to the prescriptive requirements of Standard 90.1. With the development of Standard 90.1-2004 and the rising importance of the US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Rating System, ASHRAE developed Appendix G to Standard 90.1-2004, which formed the basis of the LEED energy calculations. BECP has supported the development of Appendix G from its inception to the present. For the 2009 version of the IECC, BECP developed a similar alternative compliance approach for the IECC that is now Section 506 Total Building Performance, based on the Standard 90.1 ECB method.

To support both Standard 90.1 and the IECC the BECP has also developed software to facilitate compliance on a performance basis. Currently the BECP is working to convert its COM*check* compliance software to a whole-building tradeoff approach based on ECB and Section 506 of the IECC.

DOE's first efforts at creating something that could be used to guide those that wanted to do "better than code" was with the ASHRAE Advanced Energy Design Guide (AEDG) for Small Offices, published in 2004. The AEDG for Small Offices was intended to achieve 30% energy savings over Standard 90.1-1999, but was not written in enforceable code language; hence the term guide. This document was a collaboration between ASHRAE, IESNA, the New Buildings Institute (NBI), and DOE, with BECP providing leadership and technical support for the development of the AEDG for Small Offices. DOE, ASHRAE, and IESNA followed up on the success of this document with a series of documents intended to achieve 30% energy savings over Standard 90.1-2004 for small retail, warehouse, K-12 schools, and small hospitals and healthcare facilities. Work in this area was conducted under DOE's Commercial Building Initiative (CBI) with support from PNNL and NREL.

Work on new AEDGs designed to achieve 50% savings over Standard 90.1-2004 is continuing under CBI.

On the residential side, BECP was a participant in the development of ICC and NAHB National Green Building Standard (ANSI/ICC-700-2008). This standard provides both higher efficiency and sustainable design requirements for all residential buildings.

DOE's next efforts to create something "better than code" for commercial buildings was ASHRAE Standard 189.1 Standard for the Design of High-Performance Green Buildings. Developed over several years under CBI with technical support from NREL, and with the collaboration of IES and USGC, ANSI/ASHRAE/USGBC/IES Standard 189.1-2009 was published in 2009. BECP staff have participated in a review of the document during development and support to DOE staff who served on the committee writing the standard. BECP will be participating in the development and support of Standard 189.1 starting in FY11. BECP staff also sit on the ASHRAE committee writing Standard 189.2 covering high-performance hospitals.

BECP is also participating in the development of the International Green Construction Code (IGCC) at ICC as a member of the drafting committee. BECP is most active in the development of the energy section of the IGCC. The first public version was released in 2010 for comment and included a reference to Standard 189.1. BECP has developed 75 proposed changes to the IgCC, some which establish a new path to energy compliance that is based on the actual performance of the building after occupancy covering all energy uses of the building and also addressing peak connected loads and carbon emissions. These were developed in conjunction with AIA, NBI and EPA.

In 2010, BECP was directed to start development of "stretch codes", energy codes that provide higher levels of energy efficiency than minimum energy codes. Using documents like the AEDG and Standard 189.1 and the IGCC, BECP is currently developing these stretch codes.

Since the early 1990s, BECP has participated in developing mandatory energy efficiency standards for buildings in the Federal sector that exceed voluntary sector standards in stringency. BECP has also worked on developing proposed sustainable building design standards that are similar in scope to leading private sector green building standards and will be mandatory for Federal buildings. The Federal building standards activity is now under the Federal Energy Management Program (FEMP) but was previously managed by BECP.

If DOE makes an affirmative determination, States are required to take one of two actions within two years of DOE's determination. If the model code is the IECC, each State is required to certify to the Secretary that it has reviewed the provisions of its residential energy code and made a determination as to whether it is appropriate to revise its energy code to meet or exceed the upgraded model energy code for which DOE has made a determination. DOE is required to permit extensions of the deadlines for the certifications where a state has demonstrated a good faith effort to comply and it has made significant progress in doing so.

DOE notifies each state governor, the State Energy Office, and responsible office for code implementation, of the *Federal Register* notice, and of the availability of the technical and financial assistance available to the state. (See financial and technical assistance below.) Six months prior to the two year deadline, States which have not yet submitted certifications are again notified of the requirement, and provided with information about time extensions. Certifications are acknowledged and posted on www.energycodes.gov.

7.4.Technical and Financial Assistance to States

Under ECPA section 304, States are required to update their commercial building codes to meet or exceed the latest edition of ASHRAE Standard 90.1, for which DOE has made a positive determination. States are also required to consider whether to update their residential codes to meet or exceed the latest edition of the IECC for which DOE has made a positive determination. In turn, the Building Energy Codes Program is required by ECPA section 304(d) and (e)to provide technical and financial assistance to states to carry out the requirement of updating state building energy efficiency codes. Levels of adoption and enforcement vary widely among states. Full compliance with the updated codes will not be achieved without significant effort. Code compliance pilot studies are currently underway to establish a sound baseline for compliance, but there is consensus that there is significant room for improvement of compliance with energy codes.

In response, the BECP develops core tools, materials, materials and training to support the States in updating, implementing, and enforcing their building energy codes to meet or exceed the most recent upgraded model energy codes about which DOE has made a positive determination. These core materials are designed to be customized for state and local conditions, and for the broad spectrum of stakeholders that are involved in the code adoption, implementation enforcement process.

DOE will continue to act as a catalyst and facilitator in concert with those responsible for actually updating, using, and enforcing codes. In this role, DOE will continue to:

- Seek out and assess needs
- Develop and obtain core materials, training, and "train-the-trainer" programs
- Use and build on existing web and stakeholder networks and programs
- Enlist natural allies and interests
- Implement internal systems to assess resources
- Monitor and evaluate progress

The State Energy Offices (SEO) and other state offices responsible for code adoption, implementation, and enforcement (such as regulatory commissions and community development offices) will be a prime resource in these activities. Their existing networks and programs will be critical in forging links and establishing partnerships with other primary actors. The primary responsibility for updating State codes belongs to State legislators (and their staffs), and those State

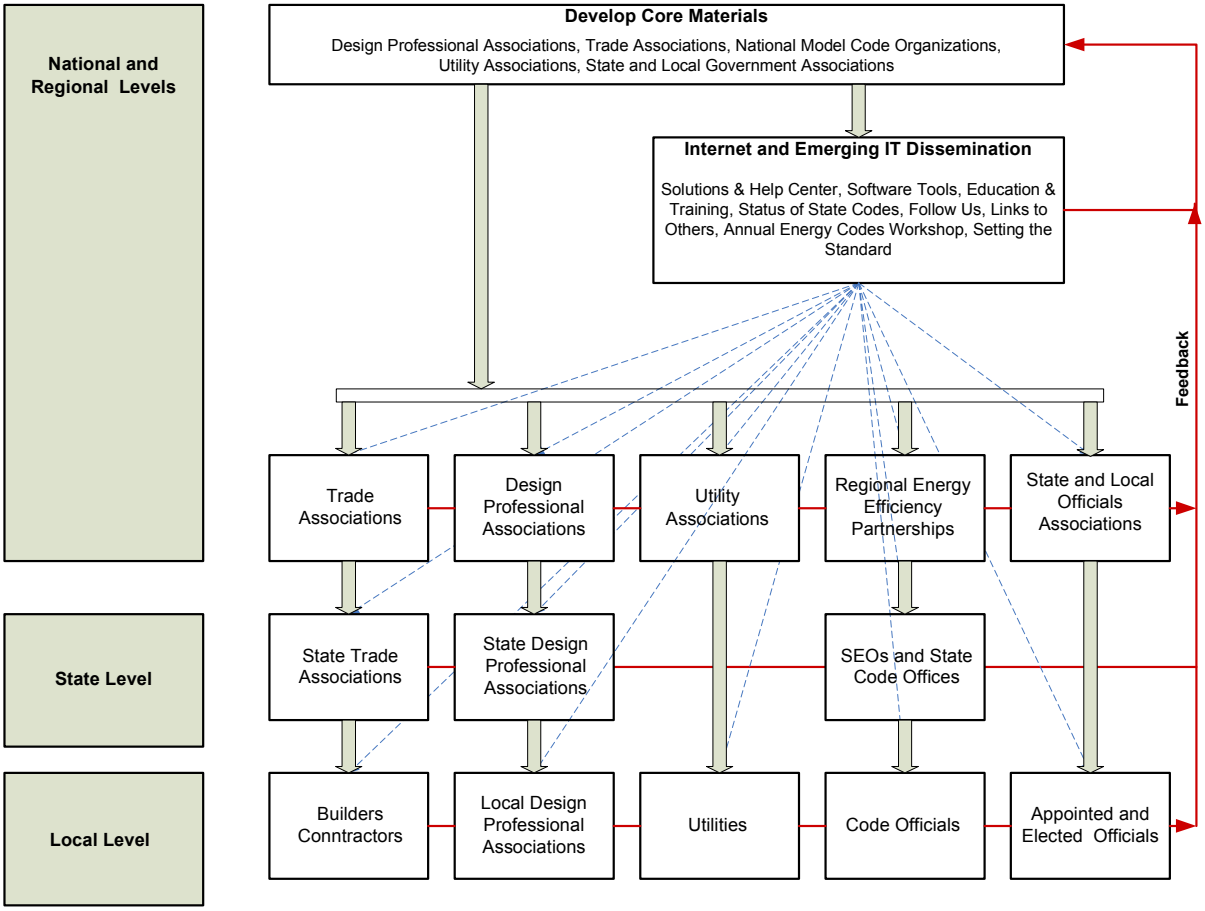
or local officials responsible for revising regulations or codes governing building design and construction. Designers (e.g., architects, engineers, and lighting designers), builders and contractors, and building owners are seen as the primary users of codes. Enforcement is seen as the province of code officials or their surrogates. The actual actors vary from State to State.

The BECP will continue to update its assessment of State and stakeholder needs and how to better respond to those evolving needs by analyzing information obtained from the BECP national training workshop, hotline, web based technical assistance center, and ongoing dialogue with States and stakeholders. A formal request for information was published in the Federal Register in about asking how to assist states to update State energy codes to the 2009 IECC and Standard 90.1-2007 and to achieve 90% compliance by 2017. BECP received 131 responses and will which will be used to develop and updated an updated Building Energy Code roadmap. from this information and Additional information obtained through workshops held by other entities will also be used to update the roadmap. Examples of these workshops include such as the National Association of State Energy Offices (NASEO) Energy Codes Workshop held in February 2010 and the Energy Foundation and NASEO follow-on Building Energy Code Roadmapping and Strategy Workshop held in April 2010.

Existing exemplary State and stakeholder materials and processes that can be transferred to other States will be identified and linked to or packaged. Existing national, regional, and state stakeholder delivery channels and capabilities will be identified and used. These will continue to be a major delivery pipeline to get information and materials to code users. Finally new information technologies will continue to be reviewed and used where appropriate.

Where possible, existing infrastructure will be used from which to launch training programs on updated energy codes and to tailor, customize, and disseminate the materials to the appropriate stakeholders. Delivery of the materials will be achieved through regional, State, and local stakeholders at the State and local level. Figure 7-2 illustrates this strategy.

Figure 7-2 Technical Assistance to States



States need support beyond technical assistance. This includes continued direct funding of activities that the States can best undertake to support their code activities. Targeted incentive grants to States on a competitive, cost-shared basis will be used to support a wide spectrum of State needs in updating, using, enforcing and evaluating compliance with their energy codes. These grants will focus on incrementally upgrading, implementing, enforcing, and assessing compliance with the latest model codes that DOE has made a positive determination about. Preference will be given to activities and results that can be transferred to other States, to multi-state synergistic efforts, and to attaining 90% code compliance with State codes responding to ECPA state code updates.

The BECP will continue to foster the sharing of the results from the above among States and stakeholders at a annual national training and information workshops in different locations around the country. The training and training support materials from and for the above with be gathered together and made available at www.energycodes.gov at an "Energy Codes University."

7.5. Promulgation and Enforcement of Manufactured Housing Energy Efficiency Standards

The Department of Energy is required to amend the energy conservation standards established under section 413 of EISA 2007 within one year after the date of enactment of the Act; and one year after any revision to the IECC.

The energy conservation standards established under this section may take into consideration the design and factory construction techniques of manufactured homes. They may also be based on the climate zones established by the Department of Housing and Urban Development (HUD) rather than the climate zones under the International Energy Conservation Code. Finally, these standards may provide for alternative practices that result in net estimated energy consumption equal to or less than the specified standards.

In its efforts to ensure compliance with energy conservation standards, the Department of Energy actively pursues enforcement actions. Under existing DOE regulations, DOE can take an enforcement action and assess civil penalties if a manufacturer fails to properly certify a covered product and retain records. Any manufacturer of manufactured housing that violates a provision of the regulations under subsection (a) is liable to the United States for a civil penalty in an amount not exceeding 1 percent of the manufacturer's retail list price of the manufactured home.

In addition to developing energy code improvements applicable to manufactured housing, the EISA 2007 requires the Establishment of Energy Efficient Standards. In the section 413 it requires notice and an opportunity for comment by manufacturers of manufactured housing and other interested parties; and consultation with the Secretary of Housing and Urban Development, who may seek further counsel from the Manufactured Housing Consensus Committee.

EISA 2007 has an additional requirement for the use of the energy conservation standards established under the most recent version of the IECC. This requirement applies in cases in which the Secretary finds that the code is not cost effective, or a more stringent standard would be more cost effective, based on the impact of the code on the purchase price of manufactured housing and on total life-cycle construction and operating costs.

8. Multi-Year Schedule and Resource Plans

DOE combines its legal obligations to complete rulemakings, the current administration's goals and priorities, and the program's budgetary constraints to create an implementation plan and schedule for the Building Regulatory Programs. Section 8.1 describes the currently scheduled rulemaking activities for the Appliance and Equipment Efficiency Standards Program. Section 8.1.1 describes activities that DOE will undertake to enhance program effectiveness. Section 8.2 describes scheduled activities for the Building Energy Codes Program. Section 8.3 provides a historical overview of the funding received by the programs that make up Building Regulatory Programs. Section 8.4 presents estimated funding requirements through FY 2016.

8.1. Multi-Year Schedule and Resource Plan for Appliance and Equipment Efficiency Standards Rulemakings

Figure 8-2 presents DOE's multi-year schedule for all anticipated rulemakings through fiscal year 2015. The rulemakings are grouped by rulemaking team, such as lighting or cooling, then by rule type, such as energy conservation standard or test procedure. The driver column indicates the primary reason the rulemaking is scheduled for a particular time period. Some rulemakings are driven by deadlines in statutes such as EPACT 2005 and EISA 2007, and others are driven by the required 6 or 7-year review periods for rulemakings.

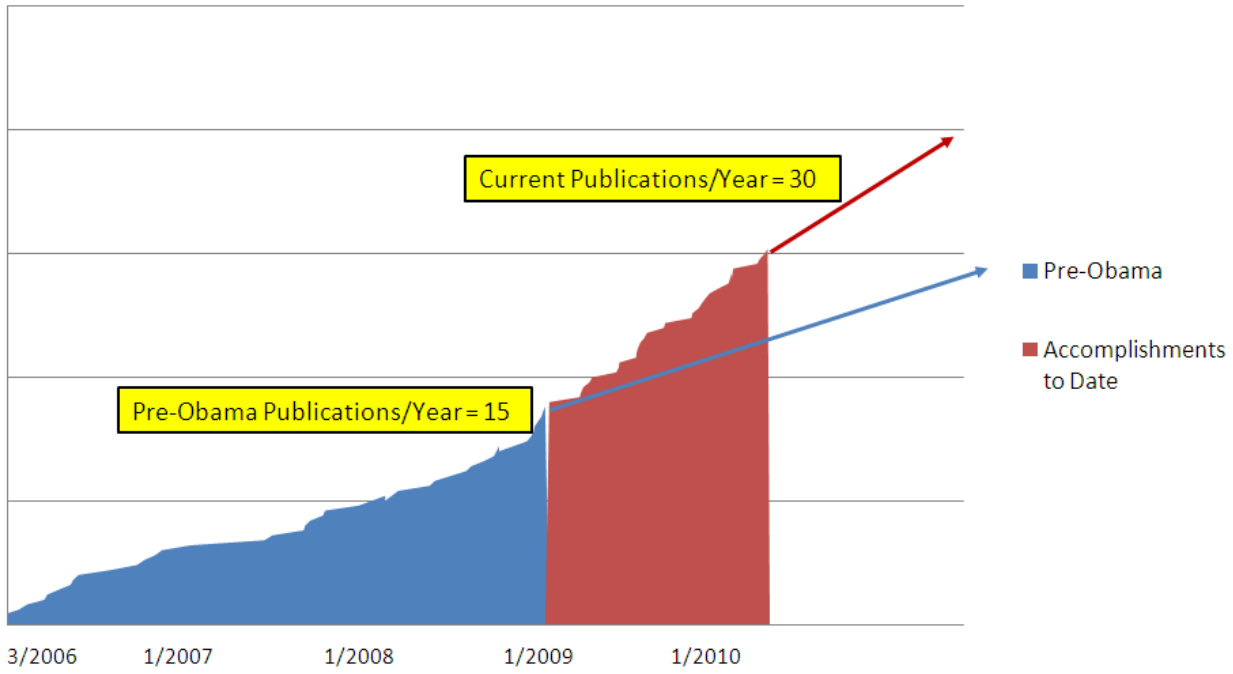
The current schedule addresses the ongoing or upcoming cycle[18] of standards that DOE must develop to comply with backlog of rulemakings covered by the 2006 consent decree requirements, and EPACT 2005 and EISA 2007 statutory requirements. The multi-year schedule also addresses the determination analyses for high-intensity discharge lamps, as required by EPCA. In addition, DOE is beginning the first of the periodic reviews of test procedures (at least once every seven years) and energy conservation standards (not later than six years after issuance of a final rule amending standards) as required under sections 302 and 305 of EISA 2007, respectively. These rulemakings are listed as part of the schedule presented in this report.

BTP is fully committed to improving the productivity and effectiveness of the Appliance and Equipment Efficiency Standards Program. Under the Obama Administration, the Department of Energy has accelerated the pace for finalizing new appliance standards and has placed new resources and emphasis behind the enforcement of these important standards. Since President Obama came to office, DOE has issued or codified new efficiency standards for more than twenty different products, which will save consumers between $250 and $300 billion on their energy bills

[18] For some products, EPCA, as amended by EPACT 2005 and EISA 2007, requires DOE to develop multiple standards over time.

through 2030. These standards are part of a trend of increased rulemaking publications, as demonstrated in Figure 8-1 below.

Figure 8-1 Cumulative Federal Register Publications



The passage of EISA 2007 increased the Department's schedule beyond what DOE committed to in its 5-year plan. Given the aggressive schedule for the rulemaking requirements established in EISA 2007, DOE is working on a greater number of contemporaneous rulemaking proceedings than had been contemplated at the time the consent decree order schedule was submitted to the Court. As a result, in order to address its expanded rulemaking obligations, DOE has designed further enhancements to program productivity and capacity beyond what was foreseen in the initial report to Congress. DOE implemented the productivity enhancements ("bundling" and "valley-filling"[19]) that were discussed in the initial report and established an improved document review and clearance process, identifying the newly established intra-agency crosscutting review team as the cornerstone of this process. In the second half of 2009, DOE implemented a streamlined internal process to accelerate regulatory approvals in the program. In addition, DOE is hiring additional staff and building organizational capacity to address the increased rulemaking workload.

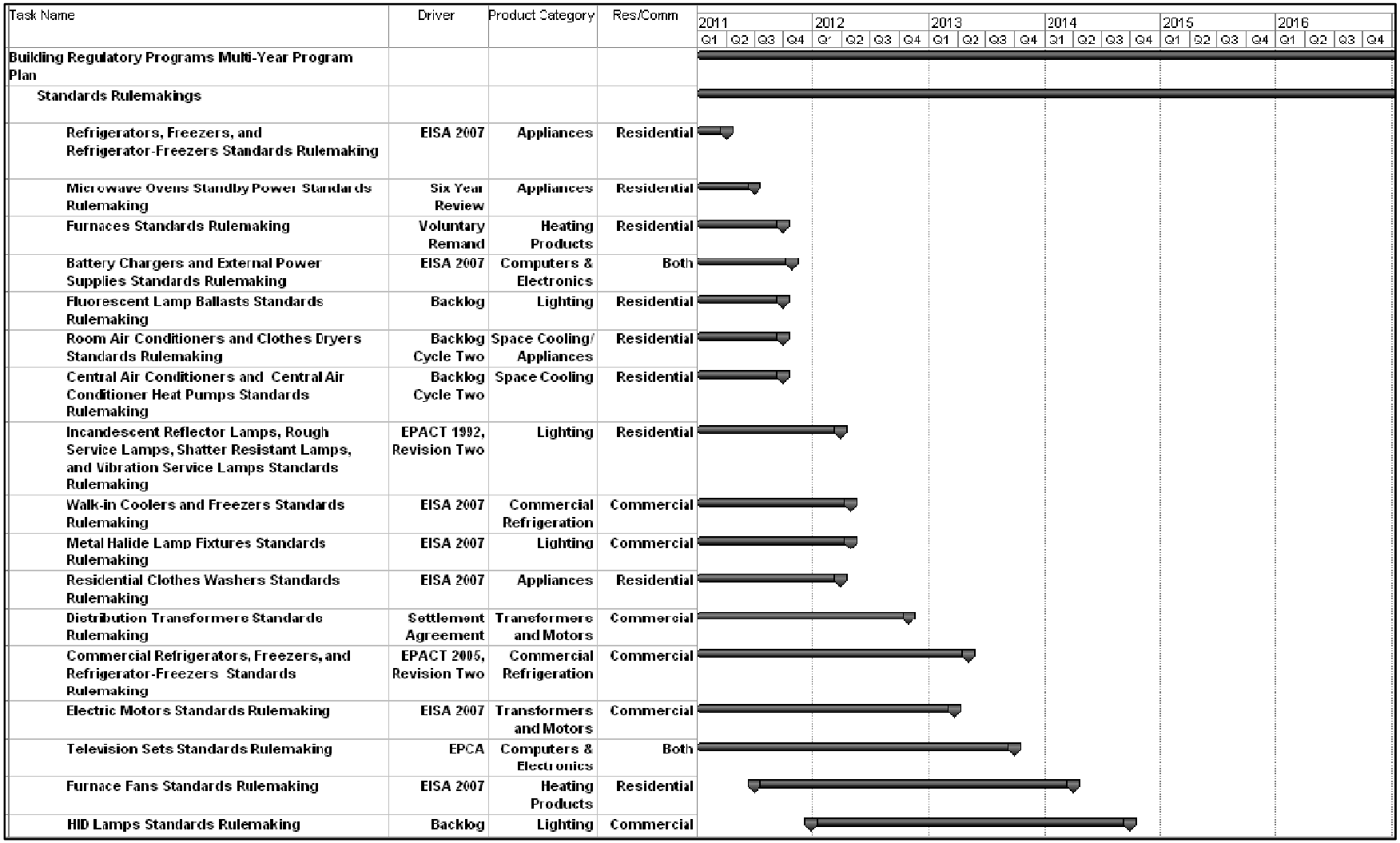
[19] "Bundling" refers to the combination of two or more products within a single rulemaking. "Valley-filling" is a management technique in which an analytical team can divert its resources from one rulemaking to another while waiting for documents to be reviewed.

DOE views the currently scheduled rulemakings as the base upon which it will build an even more effective/impactful program over the next five years. While substantial productivity gains have already been made, DOE plans to take further actions to:

- Reduce the costs of rulemakings
- Reduce the time required for individual rulemakings
- Increase the energy, emission and economic benefits of rulemakings, by
    - Expanding the number and scope of the products covered by efficiency standards
    - Giving priority to those new or updated standards likely to yield the greatest energy, emission and economic benefits
    - Increasing stringency of standards, to the extent permitted by existing law

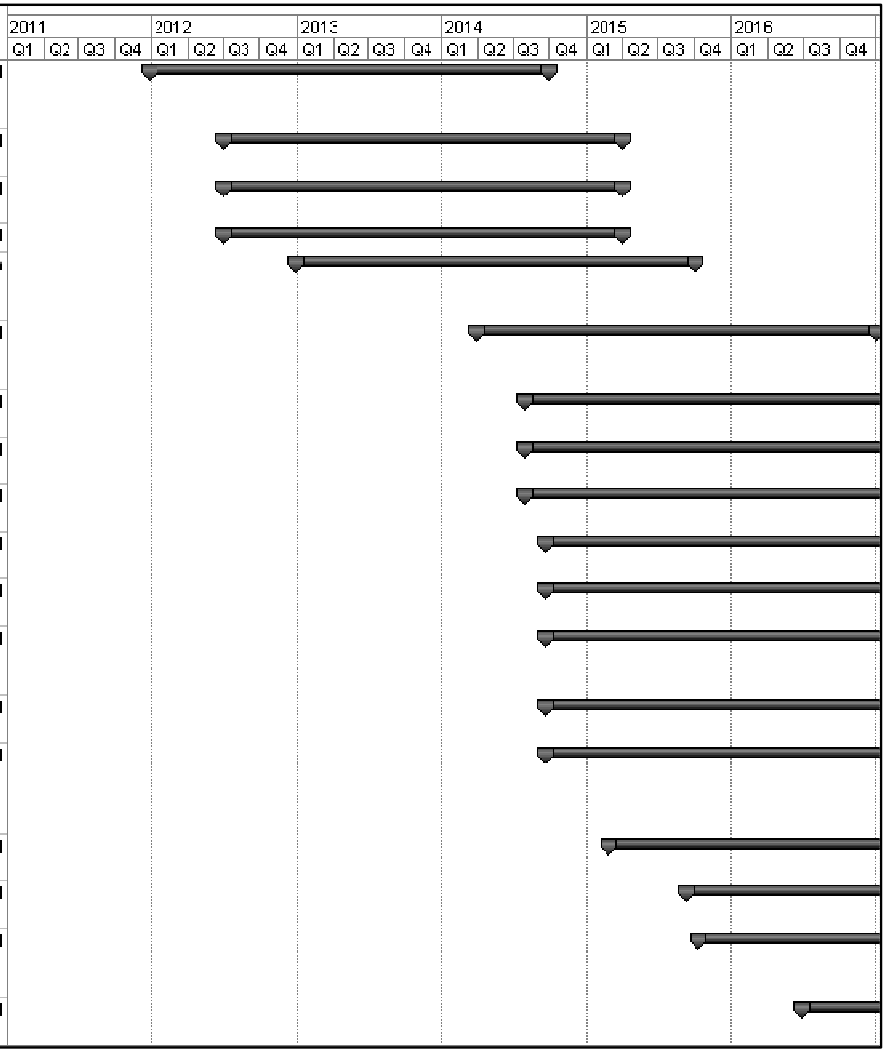
These initiatives are further described in Section 8.1.1 below.

Figure 8-2 Multi-Year Rulemaking Schedule

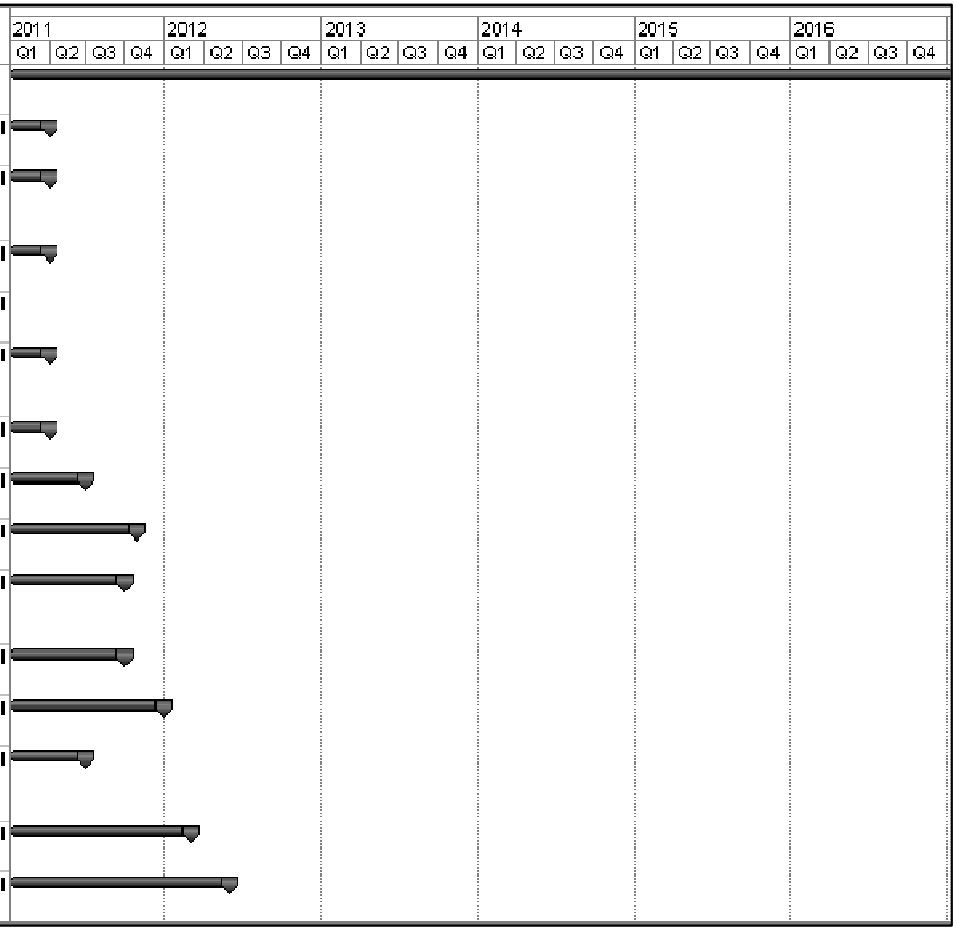


Task Name	Driver	Product Category	Res/Comm
Building Regulatory Programs Multi-Year Program Plan			
Standards Rulemakings			
Refrigerators, Freezers, and Refrigerator-Freezers Standards Rulemaking	EISA 2007	Appliances	Residential
Microwave Ovens Standby Power Standards Rulemaking	Six Year Review	Appliances	Residential
Furnaces Standards Rulemaking	Voluntary Remand	Heating Products	Residential
Battery Chargers and External Power Supplies Standards Rulemaking	EISA 2007	Computers & Electronics	Both
Fluorescent Lamp Ballasts Standards Rulemaking	Backlog	Lighting	Residential
Room Air Conditioners and Clothes Dryers Standards Rulemaking	Backlog Cycle Two	Space Cooling/ Appliances	Residential
Central Air Conditioners and Central Air Conditioner Heat Pumps Standards Rulemaking	Backlog Cycle Two	Space Cooling	Residential
Incandescent Reflector Lamps, Rough Service Lamps, Shatter Resistant Lamps, and Vibration Service Lamps Standards Rulemaking	EPACT 1992, Revision Two	Lighting	Residential
Walk-in Coolers and Freezers Standards Rulemaking	EISA 2007	Commercial Refrigeration	Commercial
Metal Halide Lamp Fixtures Standards Rulemaking	EISA 2007	Lighting	Commercial
Residential Clothes Washers Standards Rulemaking	EISA 2007	Appliances	Residential
Distribution Transformers Standards Rulemaking	Settlement Agreement	Transformers and Motors	Commercial
Commercial Refrigerators, Freezers, and Refrigerator-Freezers Standards Rulemaking	EPACT 2005, Revision Two	Commercial Refrigeration	Commercial
Electric Motors Standards Rulemaking	EISA 2007	Transformers and Motors	Commercial
Television Sets Standards Rulemaking	EPCA	Computers & Electronics	Both
Furnace Fans Standards Rulemaking	EISA 2007	Heating Products	Residential
HID Lamps Standards Rulemaking	Backlog	Lighting	Commercial

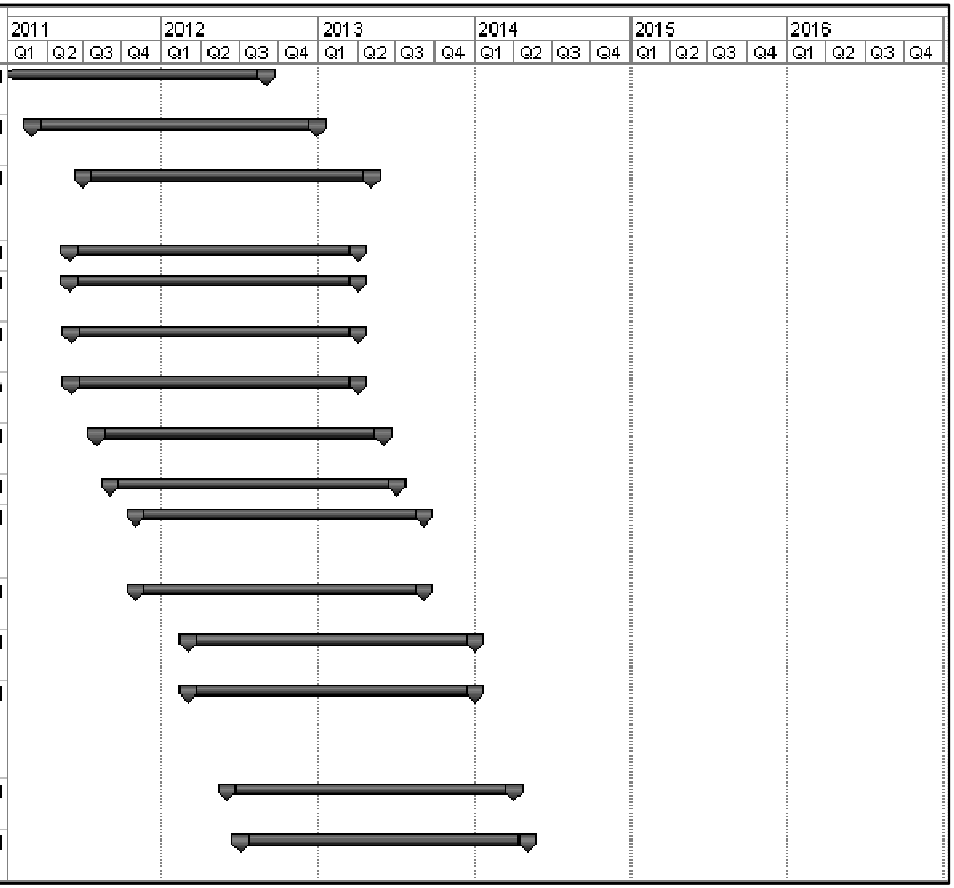
Task Name	Driver	Product Category	Res/Comm
General Service Incancescent Lamps and Incandescent Reflector Lamps Standards Rulemaking	EPACT 1992, Revision Two	Lighting	Residential
Commerial Clothes Washers Update Standards Rulemaking	EPACT 2005, Revision Two	Appliances	Commercial
Automatic Commercial Ice Makers Standards Rulemaking	EPACT 2005, Revision 1	Commercial Refrigeration	Commercial
Dishwashers Standards Rulemaking	EISA 2007	Appliances	Residential
Battery Chargers and Class A External Power Supplies Second Update Standards Rulemaking	EISA 2007	Computers & Electronics	Both
Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps Standards Rulemaking	Six Year Review	Space Cooling	Commercial
General Service Incandescent Lamps Standards Rulemaking	EISA 2007	Lighting	Residential
LED and OLED Lamps Standards Rulemaking	EISA 2007	Lighting	Residential
Medium Base Compact Fluorescent Lamps Standards Rulemaking	EISA 2007	Lighting	Residential
Candelabra and Intermediate Base Incandescent Lamp Standards Rulemaking	Six Year Review	Lighting	Residential
Dehumidifiers Standards Rulemaking	Six Year Review	Appliances	Residential
Very Large Commercial Package Air Conditioning and Heating Equipment Standards Rulemaking	Six Year Review	Space Cooling	Commercial
Kitchen Ranges and Ovens Standards Rulemaking	EISA 2007, Revision Two	Appliances	Residential
Single Package Vertical Air Conditioners, Single Package Vertical Heat Pumps, Small Commercial Package Air Conditioning and Heating Equipment Standards Rulemaking	Six Year Review	Space Cooling	Commercial
Refrigerated Beverage Vending Machines Update Standards Rulemaking	Six Year Review	Commercial Refrigeration	Commercial
Small Electric Motors Update Standards Rulemaking	Six Year Review	Transformers and Motors	Commercial
Residential Water Heaters, Pool Heaters (Gas Fired) and Direct Heating Equipment Update Standards Rulemaking		Heating	Residential
Metal Halide Lamp Fixtures Second Update Standards Rulemaking	EISA 2007, Second	Lighting	Commercial



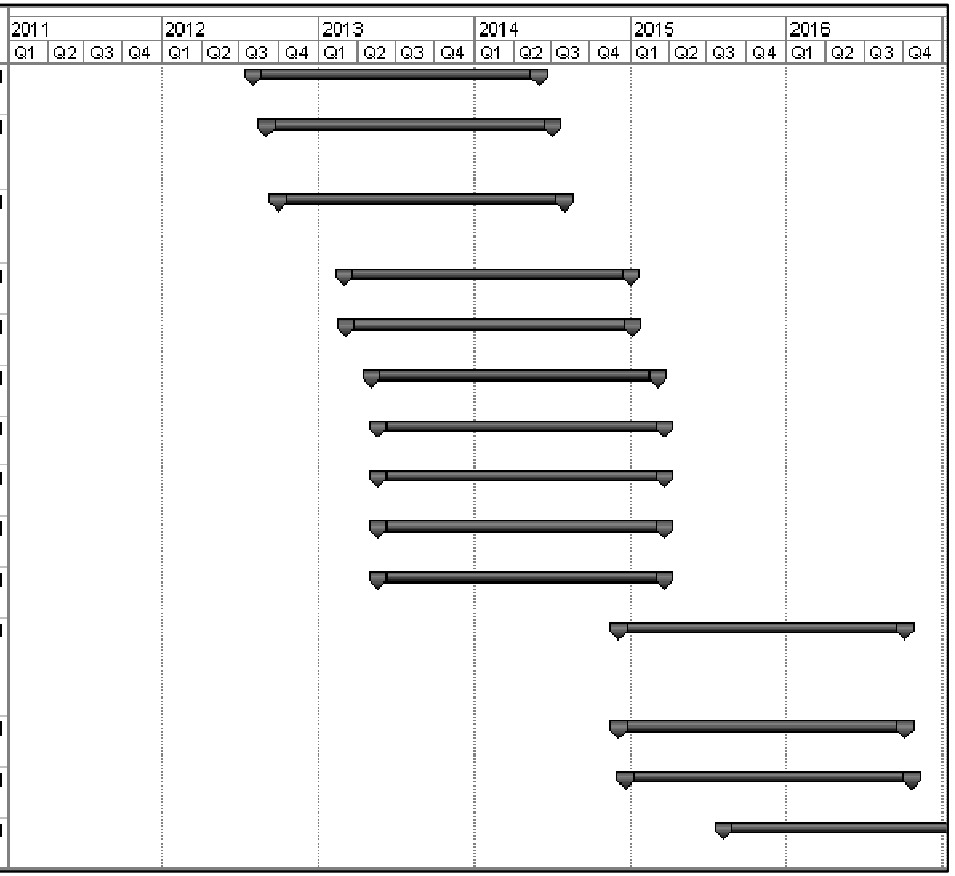
Task Name	Product Category	Res./Comm
Test Procedure Rulemakings		
Walk-in Coolers and Freezers Test Procedure Rulemaking	Commercial Refrigeration	Commercial
Residential Water Heaters, Pool Heaters (Gas Fired) and Direct Heating Equipment (Standby) Test Procedure Rulemaking	Heating	Residential
Furnaces and Boilers (Standby) Test Procedure Rulemaking	Heating	Commercial
Room Air Conditioners and Clothes Dryers Test Procedure Rulemaking	Space Cooling/ Appliances	Residential
Residential Refrigerators, Freezers, and Refrigerator-Freezers Test Procedure Rulemaking	Appliances	Residential
Electric Motors Test Procedure Rulemaking	Transformers and Motors	Commercial
Microwave Ovens (Standby) Test Procedure Rulemaking	Appliances	Residential
Battery Chargers Test Procedure Rulemaking	Appliances	Residential
Central Air Conditioners and Central Air Conditioner Heat Pumps Test Procedure Rulemaking	Space Cooling	Residential
Fluorescent Lamp Ballasts Test Procedure Rulemaking	Lighting	Residential
Residential Clothes Washers Test Procedure Rulemaking	Appliances	Residential
Dishwashers, Ranges and Ovens, Dehumidifiers (Standby) Test Procedure Rulemaking	Appliances	Residential
Automatic Commercial Ice Makers Test Procedure Rulemaking	Commercial Refrigeration	Commercial
Distribution Transformers Test Procedure Rulemaking	Transformers and Motors	Commercial



Task Name	Product Category	Res/Comm
Faucets, Showerheads, Water Closets, and Urinals Test Procedure Rulemaking	Plumbing	Residential
Residential Water Heaters, Pool Heaters (Gas Fired) and Direct Heating Equipment	Heating	Residential
Commercial Refrigerators, Freezers, and Refrigerator-Freezers Test Procedure Rulemaking	Commercial Refrigeration	Commercial
Furnace Fans Test Procedure Rulemaking	Heating	Residential
High-Intensity Discharge Lamps Test Procedure Rulemaking	Lighting	Commercial
Medium Base Compact Fluorescent Lamps Test Procedure Rulemaking	Lighting	Residential
Television Sets Test Procedure Rulemaking	Computers & Electronics	Both
Illuminated Exit Signs Test Procedure Rulemaking	Lighting	Commercial
Dehumidifiers Test Procedure Rulemaking	Appliances	Residential
Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps Test Procedure Rulemaking	Space Cooling	Commercial
Commercial Pre-Rinse Spray Valves Test Procedure Rulemaking	Appliances	Commercial
Commercial Warm Air Furnaces Test Procedure Rulemaking	Heating	Commercial
Commercial Storage Water Heater Instantaneous Water Heaters, and Unfired Hot Water Storage Tanks Test Procedure Rulemaking	Heating	Commercial
Dishwashers Test Procedure Rulemaking	Appliances	Residential
Traffic Signal Modules and Pedestrian Modules Test Procedure Rulemaking	Lighting	Commercial



Task Name	Product Category	Res/Comm
Furnaces and BoilersTest Procedure Rulemaking	Heating	Residential
Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps Test Procedure Rulemaking	Space Cooling	Commercial
Candelabra and Intermediate Base Incandescent Lamps Test Procedure Rulemaking	Lighting	Residential
Unit Heaters Test Procedure Rulemaking	Heating	Commercial
Kitchen Ranges and Ovens and Microwaves Test Procedure Rulemaking	Appliances	Residential
Beverage Vending Machines Test Procedure Rulemaking	Commercial Refrigeration	Commercial
Ceiling Fan Light Kits Test Procedure Rulemaking	Lighting	Residential
Ceiling Fans Test Procedure Rulemaking	Lighting	Residential
Torchieres Test Procedure Rulemaking	Lighting	Residential
LED and OLED Test Procedure Rulemaking	Lighting	Residential
General Service Incancescent Lamps and Incandescent Reflector Lamps , and General Service Fluorescent Lamps Test Procedure Rulemaking	Lighting	Residential
Small Electric Motors Update Test Procedure Rulemaking	Transformers and Motors	Commercial
Packaged Boilers Test Procedure Rulemaking	Heating	Commercial
Metal Halide Ballasts Update Test Procedure Rulemaking	Lighting	Commercial



8.1.1. Program Enhancement Activities

DOE has undertaken the activities described below to help select high impact products for new or accelerated rulemakings, to develop standards and test procedures more rapidly, and to ensure that standards are rigorously enforced.

Program improvements can generally be grouped into two categories – those that decrease the rulemaking cost and the time required to implement a rulemaking, and those that increase the effectiveness of a rule. Decreases in the cost and duration of individual rulemakings will allow DOE to accelerate scheduled rulemakings and to begin analysis of entirely new groups of products. This will be accomplished using a structured priority setting process described in Section 8.1.1.3.

8.1.1.1. Cost Reduction and Schedule Acceleration

DOE plans to implement a number of improvements to its internal operating processes over the next several years. The goals of the following program improvements are to allow DOE to issue rulemakings more rapidly and at lower cost.

Continuous Research and Data Gathering: In order to accelerate standard and test procedure rulemaking activities in FY2011 and beyond, DOE plans to launch a continuous research and data-gathering program. The program will be staffed by a core team of dedicated DOE contractor staff but will also enlist the support of independent sub-contractors and subject matter experts who are familiar with particular research areas and data. Potential tasks to be completed as part of this program include proactive scanning of emerging technologies, energy use verification under typical conditions, sponsorship of round robin testing, design option evaluation, development and validation of energy performance models, prototyping of max tech and highly efficient designs, and metered end-use studies. Elements of this program include developing and maintaining databases of information which are crosscutting in nature, and additional information which applies to specific products. Having this data on hand and continuously updated will allow DOE to skip over many preliminary data gathering activities that take significant time under the current process.

Standardization: In January 2010, the Appliance and Equipment Efficiency Standards program began a process improvement initiative that seeks to establish consistent, up-to-date and standardized guidance for conducting and documenting the analyses most common to its energy conservation standards rulemakings. The purpose of this effort is to reduce errors, contradictions, and duplicate efforts during the creation of federal register notices by standardizing and systematically updating a set of tools and templates to be used by DOE staff and contractors. Secondarily, the documents produced by this effort will help new staff, both internally and at contractors, ramp up on the analytical and administrative processes of the program. This effort will consist of two phases: (1) an initial tool development and process standardization effort, and

(2) an ongoing maintenance effort. Moving forward, DOE's standardization team will continue to generate and share guidance on rulemaking document content and supporting analyses.

Establishment of Appliance Technology Evaluation Center: Through a multi-phase process, the National Energy Technology Laboratory (NETL) is developing the Appliance Technology Evaluation Center (ATEC) at its Morgantown, WV, campus. The Appliance Test Evaluation Center at NETL is the Department's central point for the evaluation of new technologies and the "reverse engineering" of appliances. ATEC also serves as the project management and contracting entity facilitating coordination with other DOE and private sector labs supporting the development of new test methods and verifying manufacturer compliance.

ATEC provides enhanced evaluation capabilities for test procedure program:

- Faster, more reliable, and higher quality customized evaluations of appliances and building equipment.
- Greater ability to meet increasing pace of test procedure development.
- Greater ability to design test procedures that are resistant to circumvention and anticipate future appliance advance

In FY2009, NETL completed Phase I of the Appliance Technology Evaluation Center (ATEC I), which consists of a four fully instrumented test stations. ATEC I also includes computer-based data-acquisition, and facilities to disassemble and evaluate appliances and equipment. In FY2010, NETL began planning for ATEC's expansion which will be implemented in FY 2011. ATEC II will consist of two additional test chambers—one designed for testing refrigerators, refrigerator-freezers or freezers and dehumidifiers and the second for residential central air conditioners, residential heat pumps, room air conditioners, PTAC and heat pumps.

Support of Existing Test Procedure Development Organizations: Many DOE test procedures reference test procedures developed by other standards bodies (ex. AHRI, ASHRAE, ISO, IEC, IES, IEEE, NEMA etc). Often these test procedures form the basis in whole or in part, for DOE's own test procedures. In an increasingly global market these test procedure development efforts involve numerous stakeholders representing a diverse, balanced and International perspective. A complete review of all relevant test procedures is an element of every DOE test procedure rulemaking. DOE recognizes that the pace of development and the completeness of these consensus test procedures are important to meeting the goal to review all test procedures at least every seven years.

DOE will seek opportunities to leverage resources and accelerate the pace of test procedure development by supporting existing test procedure development organizations. Such actions might include active participation in technical conferences, the exchange of information, and for high energy savings potential test procedures, and also might entail technical support such as the development of analytical models, laboratory testing, field tests etc, which accelerate development efforts.

Increased International Collaboration: Where possible, DOE will seek to partner with other nations to combat climate change, reduce the use of fossil fuels, and boost the global clean energy economy. DOE is currently participating in a global initiative, launched with the support of the Major Economies Forum (MEF), to collaborate across borders on test methods for measuring appliance efficiency, the expansion and acceleration of efficiency standards rulemakings, and on efficiency incentives for appliance manufacturers.

8.1.1.2. Priority Setting for New or Accelerated Efficiency Standards Rulemakings

As DOE approaches completion of its obligations under the consent decree, DOE will be increasingly able to schedule rulemakings for energy conservation standards that are beyond those required by statutory deadlines.

There are number of products are within the scope of current legislation for which standards have not been developed. These products will certainly be under consideration as the subject of new rulemakings. Examples include:

- Compressors
- Fans
- Blowers
- Refrigeration equipment
- Electric lights
- Electrolytic equipment
- Electric arc equipment
- Steam boilers -
- Ovens
- Kilns
- Evaporators
- Dryers
- Luminaires -

During FY2011, DOE plans to initiate a formal priority setting process to identify rulemakings with the largest potential energy savings and benefits to the nation. A variety of factors will be considered in the priority setting process, including:

- Estimated scope of energy savings
- Significant technological advances since previous standard
- Ability to bundle with an upcoming rulemaking
- Ability and benefits of harmonizing to non-DOE standards
- State of development of relevant test procedure
- Relative level of resources required

While it is not possible to fully predict what legislation affecting the Building Technologies Program will be passed or when, DOE continues to closely monitor potential energy legislation. This enables DOE to be better prepared for the potential impacts of new statutory requirements on the program and its rulemaking schedule.

8.1.1.3. Improving Compliance

The goals of these initiatives are to improve the real-world effectiveness of efficiency standards and to improve compliance by conducting significantly more product testing.

Increased Emphasis on Test Procedures: The energy savings resulting from energy conservation standards are only meaningfully measurable if test procedures are accurate and repeatable. As such, DOE plans to increase emphasis on test procedures in FY2011 and beyond. This includes amending existing test procedures to better account for all aspects of energy use for a particular product and developing test procedures for new products.

DOE Sponsorship of Round Robin Testing: The objective of Round Robin test is to perform an assessment of the repeatability and reproducibility of appliance efficiency test results when tested in accordance with DOE's test procedures. These tests would be conducted at the NETL Appliance Technology Evaluation Center (ATEC), as well as third party and manufacturer operated facilities. The Round Robin testing will document the variability of test results, both within a single test lab and from test lab to test lab and seek to identify the potential contributors to variability. These results will form the basis of recommended corrective actions for facilities and highlight needed modifications to test procedures.

Aggressive Enforcement: In addition to accelerating the pace of new final standards, the Obama Administration has significantly increased the enforcement of existing conservation standards. To ensure that the appliance standards are as effective as possible, DOE will continue to work aggressively and consistently to enforce energy efficiency standards across the country.

In 2010, DOE renewed efforts to ensure compliance with certification rules. DOE is now in the process of actively collecting and examining the certification records. The energy and water consumption level reported on every certification report is checked against the applicable standard. In cases where the certified consumption does not meet the applicable standard, DOE initiates an enforcement action against the manufacturer. DOE is also pursuing manufacturers who ignore certification reporting requirements for their products.

Beginning December 9, 2009, DOE instituted a 30 day grace period for all manufacturers to immediately review previously submitted certification reports and compliance statements for accuracy and completeness. The grace period also allowed any manufacturers who have not previously submitted the required information to come into compliance.

A new Web-based tool, referred to as the Compliance and Certification Management System (CCMS), will be the preferred mechanism for submitting compliance and certification reports to DOE. CCMS allows compliance and certification reports to be submitted via e-mail and updates the address and contact information used to submit compliance statements and certification reports through certified mail to DOE. CCMS will also allow DOE to effectively and efficiently review and assess compliance and certification information. The system became available for use by manufacturers and third-party representatives June 1, 2010.

DOE is considering revising its enforcement procedures to ensure that all of its energy efficiency regulations are rigorously and consistently enforced. The Department issued an initial request for

information to allow interested parties an opportunity to provide information that will assist DOE in reforming the existing enforcement process. DOE sought comment on how to strengthen its energy and water conservation standards to encourage compliance and to prevent manufacturers who break the law from having a competitive advantage over those that adhere to the rules. The request for information also sought comment along three broad conceptual lines: covering certification, enforcement testing and adjudication, and verification testing. Lastly, the request identifies several areas on which DOE is particularly interested in receiving information. This initial request will be followed by a notice of proposed rulemaking that will be based on the information received as a result of this notice and other data and information gathered by DOE.

Enforcement of Regional Standards: In FY 2010, DOE conducted a preliminary analysis to determine the non-enforcement impacts of regional standards on HVAC distributors, contractors, and general contractors. It was presented at the Rulemaking Analysis Plan public meeting for furnaces and the preliminary analysis public meeting for central air conditioners and heat pumps. Moving forward, DOE must continue to evaluate enforcement options in anticipation of the establishment of regional standards for furnaces and CACHP. While the law does not require that the enforcement plan precede a final rule establishing regional standards, it does require the impacts on the distribution chain be considered in the economic justification of those regions. And those economic impacts may depend significantly on the enforcement plan ultimately established. DOE has developed several scenarios that vary significantly in burden, expected compliance levels, and required enforcement resources. As the applicable rulemakings progress, DOE will further develop these standards, evaluating their costs, legal implications, and stakeholder implications.

Mandatory Lab Accreditation: Verification and enforcement testing raises the bar for test labs in terms of energy testing rigor and thorough documentation of energy test results. Recent DOE enforcement test experience suggests that current test laboratory accreditations to ISO/IEC 17025 and the resulting QC/QA practices may not be adequate.

DOE proposes to develop specific DOE test lab requirements and implement a DOE specific test lab accreditation program that supplements ISO/IEC 17025 test lab accreditation requirements. The specific DOE test lab accreditation requirements will include detail on proficiency testing, uncertainty measurement, reporting of test results as well as specifying test lab participation in continuing periodic round robin test, witness tests and cross tests.

In FY2011, the DOE specific test lab accreditation requirements will be developed and issued in cooperation with accreditation bodies for test labs to include in their accreditation process. Initial prototype round robin programs will be introduced with continuous improvement forums utilized to evaluate round robin results and improve appliance energy testing. DOE energy tests results will be reported utilizing standard templates that include uncertainty measurements.

From FY2012 – 2016, the DOE specific test lab accreditation program will continue strengthening the monitoring and surveillance activities associated with test lab accreditation with repetitive

periodic round robin tests with a continuous improvement forum, witness tests, cross tests and updates to the standardized energy test report templates.

8.2.Multi-Year Schedule and Resource Plan for ENERGY STAR Support

8.2.1. Program Enhancement Activities

ENERGY STAR expends considerable effort maintaining the integrity of its brand. While the program has been broadly successful, it is important not only to continue but to strengthen those efforts. DOE has undertaken the activities described below to ensure that ENERGY STAR standards are rigorously enforced.

8.2.1.1. Improving Compliance

Enhanced ENERGY STAR Test Procedures: Based on the 2009 ENERGY STAR MOU, DOE is responsible for creating new test procedures and updating existing ones, with EPA providing assistance as necessary. Reliable test procedures are critical to maintaining consumer confidence in the ENERGY STAR program.

38 new test procedures will be developed for those ENERGY STAR product classes that are not currently covered by any DOE test procedure. Of the remaining 23 ENERGY STAR product classes, 14 have separate ENERGY STAR and DOE test procedures that must be harmonized. In 2010, DOE updated five test procedures for ENERGY STAR products, and five more are updates are expected for 2011.

DOE will continue support this effort by first developing a prioritized list of the remaining test procedures. Working in concert with standards setting bodies like ASHRAE and with industry groups, DOE will review existing test procedures and draft new or updated ones where needed. DOE expects to complete revisions on all 52 products within five years of the start of the initiative.

ENERGY STAR Verification Testing Program: One of ENERGY STAR's key goals is to ensure that products continue to meet ENERGY STAR performance requirements beyond initial testing and throughout their production life. Demonstrating that ENERGY STAR products work as advertised will help to maintain the integrity of the ENERGY STAR label.

The EPA and DOE are developing an expanded system that will require all products seeking the ENERGY STAR label to be tested in approved labs and require manufacturers to participate in an ongoing verification testing program that will ensure continued compliance. In 2010, DOE began tests on six of the most common product types: freezers, refrigerator-freezers, clothes washers, dishwashers, water heaters and room air conditioners. These product types account for at least 25% of a typical homeowner's energy bill. DOE will test approximately 200 basic models at third-party, independent test laboratories over the course of the year.

DOE will continue to lead this verification effort in 2011 and beyond. DOE will select products using its own internal criteria, to ensure that testing is performed anonymously. DOE will then purchase test products and send them to accredited laboratories to perform the testing based on established test procedures. Products which fail to meet efficiency requirements will be referred to DOE and EPA for action.

8.3. Multi-Year Schedule and Resource Plan for Building Energy Codes Program

The Building Energy Codes Program Multi-Year and Resource Plan has been divided into three sections – Commercial and Multi-Family High Rise Energy Codes, Residential Low Rise Energy Codes, and Manufactured Housing Energy Standards. Detailed descriptions of BECP activities are found in the Sections 8.2.1 – 8.2.3.

Table 8-1 summarizes key milestones for all BECP activities from FY 2011 – FY 2015.

Table 8-1 Key Milestones for the Building Energy Codes Program

Milestone	Date
Commercial and Multi-Family High Rise Energy Codes	
Standard 90.1-2010	October 2010
Upgraded 90.1-2010 Core Tools and Materials	July 2011
Standard 90.1-2010 Determination	October 2011
Standard 90.1-2013	October 2014
Upgraded 90.1-2013 Core Tools and Materials	July 2015
Standard 90.1-2013 Determination	October 2015
Energy Codes Workshop and Training	July Annually
Issue Grants to States	May Annually
Residential Low Rise Energy Codes	
2012 IECC	October 2011
Upgraded 2012 IECC Core Tools and Materials	July 2012
2012 IECC Determination	October 2012
2015 IECC	October 2014
Upgraded IECC Core Tools and Materials	July 2015
Standard IECC Determination	October 2015
Energy Codes Workshop and Training	July Annually
Issue Grants to States	May Annually

Figures 8-3 through 8-5 provide detailed schedules for BECP activities through 2015.

Figure 8-3 Commercial and Multi-Family High-Rise Energy Codes

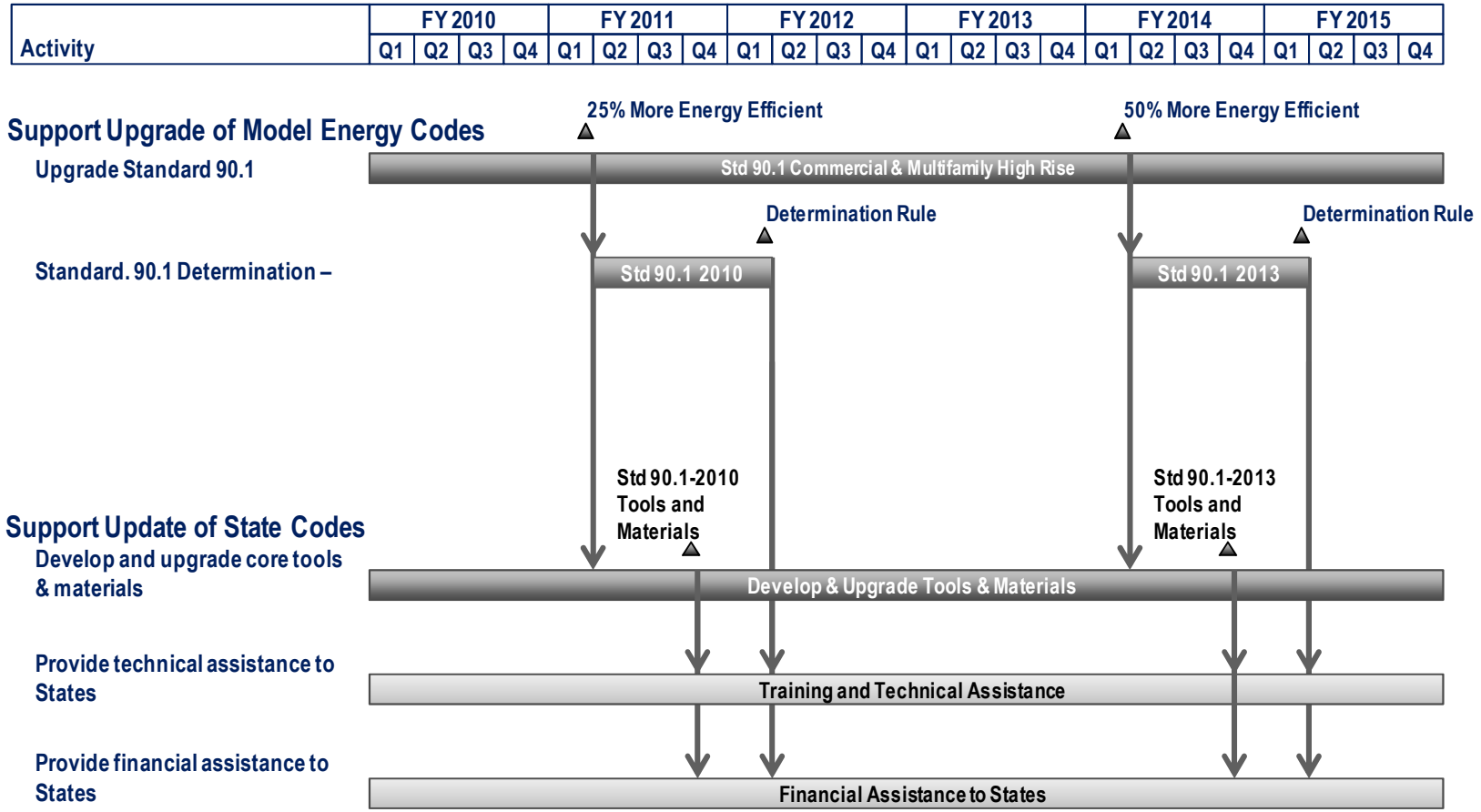


Figure 8-4 Residential Low-Rise Energy Codes

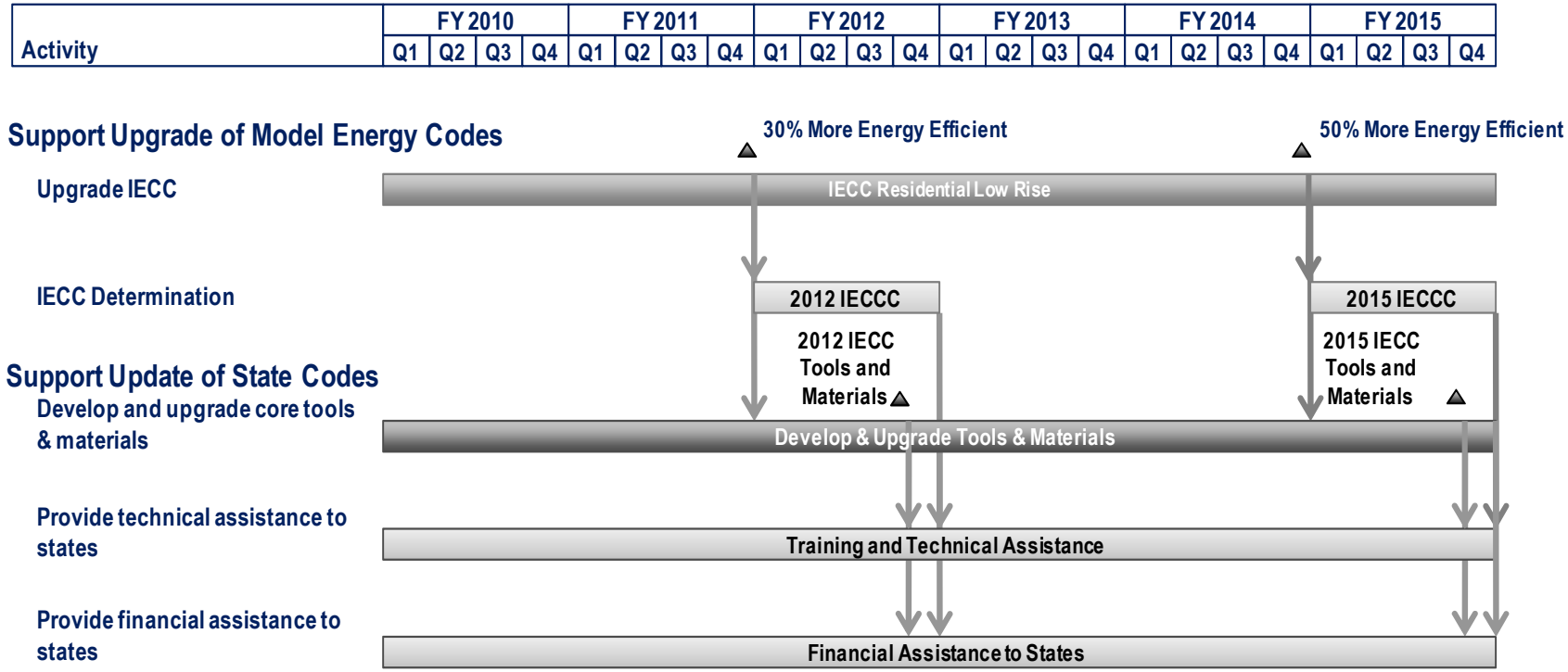
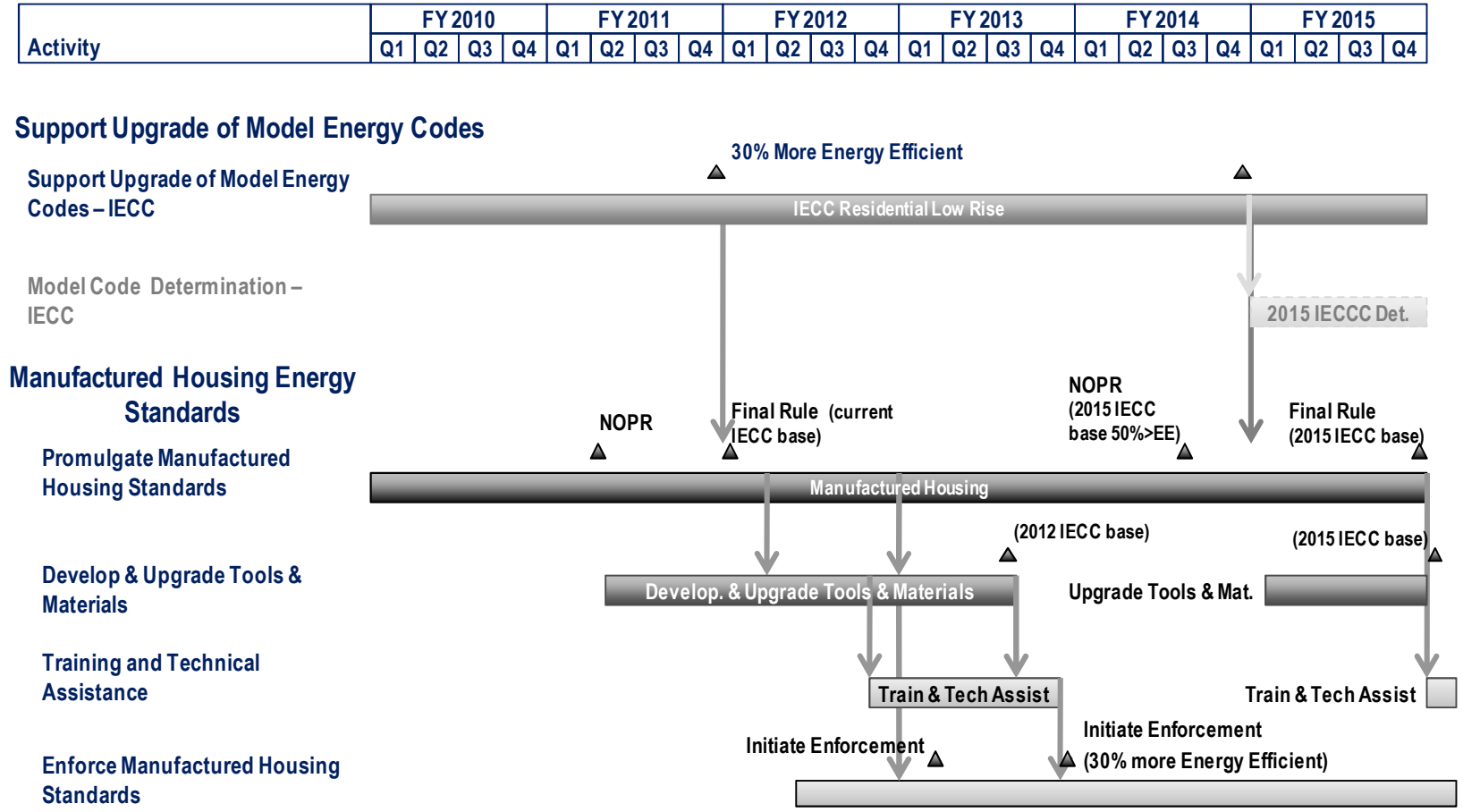


Figure 8-5 Manufactured Housing Energy Standards



8.3.1. Commercial and Multi-Family High-Rise Energy Codes

In FY 2011, support for the upgrading of Standard 90.1 will refocus on achieving a goal of 50 percent beyond the 2004 edition, by 2016. An incremental target of 40 percent has been set for 2013. The results of BTP research and consortia activities, renewable energy research, advanced and stretch state codes, enhanced and expanded model codes, analysis produced in support of recently developed model codes, and continuing analysis, will be used, in a collaborative process with energy code stakeholders and partners. As required by section 307(b) of ECPA the upgrade of the model codes will be based on research results and be technologically feasible and economically justified. For example, in FY 2009 and 2010 the BTP Commercial Building Integration Research produced technical support documents, to produce technical analysis and design guidance for seven building types[20], to achieve whole-building energy savings of at least 50% over ASHRAE Standard 90.1-2004. In turn, in FY 2010 and FY 2011, the medium office technical support document research and other input was used in an project with ASHRAE in the development of a model commercial building stretch code in a Recovery Act funded project. Both products, and other results, will feed the development of the next generation code.

The above work will feed into the development of Standard 90.1-2013, during FY 2012 and FY 2013. As commercial buildings include such a broad rang of building functions and therefore feasible energy use indexes, and as requirements for increasing energy efficiency draws closer to demonstrated performance, it is likely that requirements may vary with building function, much as they now do by climate. It is also likely that energy use indexes may prove a more reasonable goal than percentage improvement goals. In FY 2014, research results, progress, and directions will be reassessed and refined as the model code upgrade focuses on Standard 90.1-2016, during FY 2014 and 2015.

In FY 2011 a determination will be prepared and published as a notice of proposed rule in the *Federal Register* as to whether Standard 90.1-2010 will improve energy efficiency in commercial buildings. After public hearings a final determination rule will be prepared and published in FY 2012. The analyses used in DOE's support of the ASHRAE Standing Standards Project Committee (SSPC) 90.1 and in review of proposals will provide an initial basis for the analyses. Both a qualitative analysis, comparing textual requirements of the previous and new edition of Standard 90.1, and a quantative analysis, comparing differences between the codes that can be quantified in terms of energy savings, will be prepared.

[20] General merchandise, grocery stores, highway lodging, medium box retail, medium office building, small office buildings, and K-12 schools,

In FY 2014 a similar set of activities will be initiated, in response to publication of the upgraded model code, Standard 90.1-2013. A determination will be prepared and published as a notice of proposed rule in the *Federal Register* as to whether Standard 90.1-2013 will improve energy efficiency in commercial buildings. After public hearings a final determination rule will be prepared and published in FY 2015. The analyses used in DOE's support of the ASHRAE Standing Standards Project Committee (SSPC) 90.1 and in review of proposals will provide an initial basis for the analyses. Both a qualitative analysis, comparing textual requirements of the previous and new edition of Standard 90.1, and a quantative analysis, comparing differences between the codes that can be quantified in terms of energy savings, will be prepared.

In FY 2012, and again in 2015, Information regarding the determination and the State responsibilities under section 304 of ECPA will be disseminated to the states and an impact analysis will be prepared for each of the States, framing the energy and cost impacts of updating their codes to Standards 90.1-2010 and 90.1-2013 respectively.

In FY 2011, development and updating of core tools and materials will be focused on preparing to support the State and local adoption, implementation and enforcement of ASHRAE Standard 90.1-2010 to achieve buildings that are 30 percent more energy efficient than buildings built to the 2004 edition of Standard 90.1. This effort will take advantage of an updated Roadmap to assist states, and of Recovery Act funded pilot projects addressing code compliance, development of training materials, and inspection videos. These core tools and materials will be available for use when DOE publishes its determination regarding Standard 90.1-2010, to support the financial and technical assistance to states. The core tools and materials, and technical and financial assistance will be the focus of the Energy Codes 2011 training event.

Also in FY 2011, guided by an updated Roadmap, financial and technical assistance to states will focus on adoption, implementation, and enforcement of Standard 90.1-2007. Supported by Recovery Act funding, a significant effort will be undertaken to assist states to develop and implement plans to achieve 90 percent compliance with their updated codes by 2017. Some assistance will also be made available to early adopters of Standard 90.1-2010.

In FY 2012 and 2013, in response to an expected determination that Standard 90.1-2010 will improve energy efficiency in commercial buildings, financial and technical assistance to states will focus on adoption, implementation, and enforcement of that newer standard (90.1-2010). Support will continue to assist states to develop and implement plans to achieve 90 percent compliance with their updated codes, by 2017 for Standard 90.1-2007, and by 2020 for Standard 90.1-2010. Core tools and materials will be revised or developed based on field experience and user needs assessment, and based on longer term goals. The adoption of Standard 90.1-2010 will be the focus Energy Codes 2012 and code compliance will be the focus of Energy Codes 2013.

In FY 2014, development and updating of core tools and materials will be focus on preparing for State and local adoption, implementation and enforcement of Standard 90.1-2013 to achieve

buildings that are 50 percent more energy efficient than buildings built to the 2004 edition of Standard 90.1. These core tools and materials will be available to support the financial and technical assistance to states once DOE publishes its determination regarding Standard 90.1-2013. The core tools and materials, and technical and financial assistance will be the focus of Energy Codes 2014.

Also in FY 2014, financial and technical assistance to states will focus on implementation and enforcement of Standard 90.1-2010, to design and construct buildings that are 30 percent more energy efficient than the 2004 edition of Standard 90.1. Continued support will be provided to assist states to refine their implement activities to achieve 90 percent compliance with their updated codes, by 2017 for Standard 90.1-2007, and by 2020 for Standard 90.1-2010. Some assistance will also be made available to early adopters of Standard 90.1-2013.

In 2015, development and updating of core tools and materials will be focused on preparing to support the State and local adoption, implementation and enforcement of Standard 90.1-2013 to achieve buildings that are 50 percent more energy efficient than buildings built to the 2004 edition of Standard 90.1. These core tools and materials will be available for use when DOE publishes its determination regarding Standard 90.1-2013, to support the financial and technical assistance to states. The core tools and materials, and technical and financial assistance will be a focus of Energy Codes 2015.

In FY 2017, financial and technical assistance to states will focus on dual objectives, upgrading to standard 90.1-2013, and 90 percent state adoption of equivalent to Standard 90.1-2007 or better, and achieving 90 percent code compliance. In response to the DOE determination, there will be a focus on the adoption, implementation, and enforcement of Standard 90.1-2013, to design and construct buildings that are 50 percent more energy efficient than the 2004 edition of Standard 90.1. A second focus will be on an assessment of both the incremental updating of building energy codes, and on documented compliance with those codes.

8.3.2. Residential Low-Rise Energy Codes

In FY 2011, support for the upgrading of the IECC will focus on the final action hearings to achieve the goal of 30 percent more energy efficient than the 2006 edition. Activities will then shift to refocus on achieving a goal of 50 percent beyond the 2006 edition, by 2015. The results of BTP research activities, advanced and stretch state codes, other enhanced and expanded model codes, analysis produced in support of the recently developed model code, and continuing analysis, will be used, in a collaborative process with energy code stakeholders and partners. As required by section 307(b) of ECPA the upgrade of the model codes will be based on research results and be technologically feasible and economically justified. For example, in FY 2009 and 2010 the BTP Building America research has developed and demonstrated for Builders Challenge and produced Builder's Challenge guidance for hot-dry and mixed-dry climates, to achieve whole-house energy savings of 40% over the 2006 IECC. In FY 2010 BTP reenergized its residential research

by funding its Energy Efficiency Housing Partnerships. Research and demonstration products from these, and other activities, such as EPA's ENERGY STAR, will form the basis for upgrading the next generation residential building energy code.

In FY 2011, research results, progress, and directions will be reassessed and refined as the model code upgrade focuses on meeting the 2015 goal of 50% more energy efficient than the 2006 IECC. The above work will feed into the development of the 2015 IECC, during FY 2012 - 2015 As residential code requirements for increasing energy efficiency draws closer to demonstrated performance, it is likely that energy use indexes may prove a more reasonable goal than percentage improvement goals.

In FY 2011 and 2012, a determination will be prepared and published as a notice of proposed rule in the *Federal Register* as to whether the 2012 IECC will improve energy efficiency in residential buildings[21]. After public hearings a final determination rule will be prepared and published in FY 2013. The analyses used in DOE's proposals to upgrade the 2012 IECC, and in review of proposals by others, will provide an initial basis for the analyses. Both a qualitative analysis, comparing textual requirements of the previous and new edition of 2012 IECC, and a quantative analysis, comparing differences between the codes that can be quantified in terms of energy savings, will be prepared.

In FY 2015 a similar set of activities will be initiated, in response to publication of the upgraded model code, the 2015 IECC. A determination will be prepared and published as a notice of proposed rule in the *Federal Register* as to whether the 2015 IECC will improve energy efficiency in residential buildings. After public hearings a final determination rule will be prepared and published in FY 2015. The analyses used in DOE's proposals to the ICC and in review of proposals by others will provide an initial basis for the analyses. Both a qualitative analysis, comparing textual requirements of the previous and new edition of the IECC, and a quantative analysis, comparing differences between the codes that can be quantified in terms of energy savings, will be prepared.

In FY 2012 and FY 2015 Information regarding the determination and the State responsibilities under section 304 of ECPA will be disseminated to the states and an impact analysis will be prepared for each of the States, framing the energy and cost impacts of updating their codes to the 2012 IECC and 2015 IECC, respectively.

[21] The 2012 IECC is expected to be published the fall of 2011.

In FY 2011 and 2012, development and updating of core tools and materials will focus on preparing to support the State and local adoption, implementation and enforcement of the 2012 IECC[22] to achieve buildings that are 30 percent more energy efficient than buildings built to the 2006 edition of the IECC. This effort will take advantage of an updated Roadmap to assist states, and of Recovery Act funded pilot projects addressing code compliance. These core tools and materials will be available for use to support the financial and technical assistance to states once DOE publishes its determination regarding 2012 IECC. The core tools and materials, and technical and financial assistance will be the focus of Energy Codes 2012.

Also in FY 2011, guided by an updated Roadmap, financial and technical assistance to states will focus on adoption, implementation, and enforcement of the 2012 IECC. Supported by Recovery Act funding, a significant effort will be undertaken to assist states to develop and implement plans to achieve 90 percent compliance with their updated codes by 2017. Some assistance will also be made available to early adopters of the 2012 IECC.

In FY 2012 and 2013, in response to a an expected determination that the 2012 IECC will improve energy efficiency in residential buildings, financial and technical assistance to states will focus on adoption, implementation, and enforcement of the 2012 IECC. Support will continue to assist states to develop and implement plans to achieve 90 percent compliance with their updated codes, by 2017 for the 2009 IECC, and by 2020 for the 2012 IECC. Core tools and materials will be revised or developed based on field experience and user needs assessment, and based on longer term goals. The adoption of the 2012 IECC will be the focus of Energy Codes 2012 and code compliance will be the focus of Energy Codes 2013.

In FY 2014, development and updating of core tools and materials will be focused on preparing to support the State and local adoption, implementation and enforcement of the 2015 IECC to achieve buildings that are 50 percent more energy efficient than buildings built to the 2006 edition of the IECC. These core tools and materials will be available for use when DOE publishes its determination regarding the 2015 IECC, to support the financial and technical assistance to states. The core tools and materials, and technical and financial assistance will be the focus of Energy Codes 2014.

Also in FY 2014, financial and technical assistance to states will focus on implementation and enforcement of the 2012 IECC. Continued support will be provided to assist states to refine their implement activities to achieve 90 percent compliance with their updated codes, by 2017 for the 2009 IECC, and by 2020 for 2012 IECC. Some assistance will also be made available to early adopters of 2015 IECC.

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[22] The Final Action Hearings on the 2012 IECC will be held in October of 2010, and the 2012 IECC is expected to be published in the Fall of 2011.

In 2015, development and updating of core tools and materials will be focused on preparing to support the State and local adoption, implementation and enforcement of 2015 IECC. These core tools and materials will be available for use when DOE publishes its determination regarding the 2015 IECC, to support the financial and technical assistance to states. The core tools and materials, and technical and financial assistance will be a focus of Energy Codes 2015.

In FY 2017, financial and technical assistance to states will focus on dual objectives, upgrading to the 2015 IECC, and 90 percent state adoption and compliance with the equivalent to the 2009 IECC or better. In response to the DOE determination, there will be a focus on the adoption, implementation, and enforcement of the 2015 IECC. A second focus will be on an assessment of both the incremental updating of building energy codes, and on documented compliance with those codes.

8.3.3. Manufactured Housing Energy Standards

In Manufactured Housing DOE issued an Advance notice of proposed rulemaking (ANOPR) in first quarter of 2010 on February 22, 2010 and is currently writing the proposed Notice of proposed rulemaking (NOPR) for fourth quarter of 2010. A Notice of Rulemaking Meeting (NORM) will also be issued so that a public forum can be held to review the rule. After 90 days to receive all agency and public comments, the proposed final rule for implementation will be published on December 16, 2011, to meet the EISA 2007 requirements.

8.4. Budget History

The Office of Planning, Budget, and Analysis (PBA) leads the work in preparing the annual budget-in-brief for EERE. The budget for Equipment Standards and Analysis Program with the Building Technologies Program within EERE has grown steadily over the last five years, as energy efficiency has been increasingly prioritized. In FY 2010, the budget for the Equipment Standards and Analysis Program was $35 million, compared to $20 million in FY 2009, an increase of 75% in just one year. Table 8-2 below displays the budgets for the Appliance and Equipment Efficiency Standards, Building Energy Codes Program, the DOE portion of ENERGY STAR, and overall Building Technologies from 2006 to 2010.[23]

Table 8-2 Program Budget from FY 2006 to FY 2011 ($ in Millions)

Subprogram	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011 (Request)
Appliance and Equipment Efficiency Standards	10	17	22	20	35	40
ENERGY STAR	N/A	9	7	7	10	10
Building Energy Codes	3	2	4	5	10	10
Overall BT Funding	68	103	107	140	238	231

NOTE: ENERGY STAR was not part of Building Technologies in 2006; funding levels are unavailable.

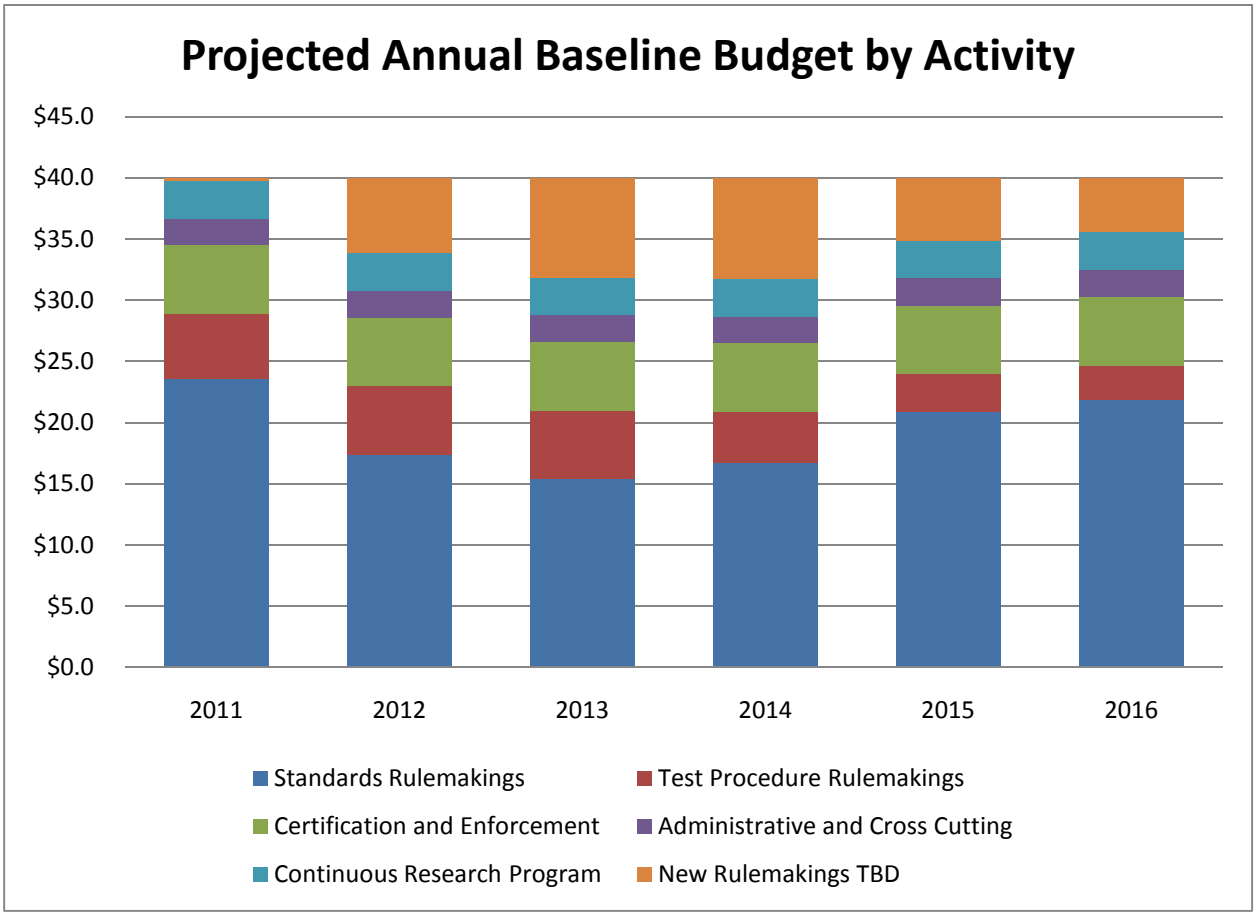
[23] Source: http://www1.eere.energy.gov/ba/pba/budget_10.html

8.5. Multi-Year Plan for Allocation of Requested Resources

8.5.1. Appliance and Equipment Efficiency Standards

Figure 8-6 presents the projected budget for the Appliance and Equipment Efficiency Standards Program. The budget is divided into the major activity areas of the program and shows that from FY 2011 - 2016, the Program can undertake additional Rulemaking activities beyond those already scheduled. These activities will be chosen based on the Priority Setting process outlined in 8.1.1.2, or may be dictated by legislation or other priorities.

Figure 8-6 Projected Budget for Appliance and Equipment Efficiency Standards, ($ in millions)



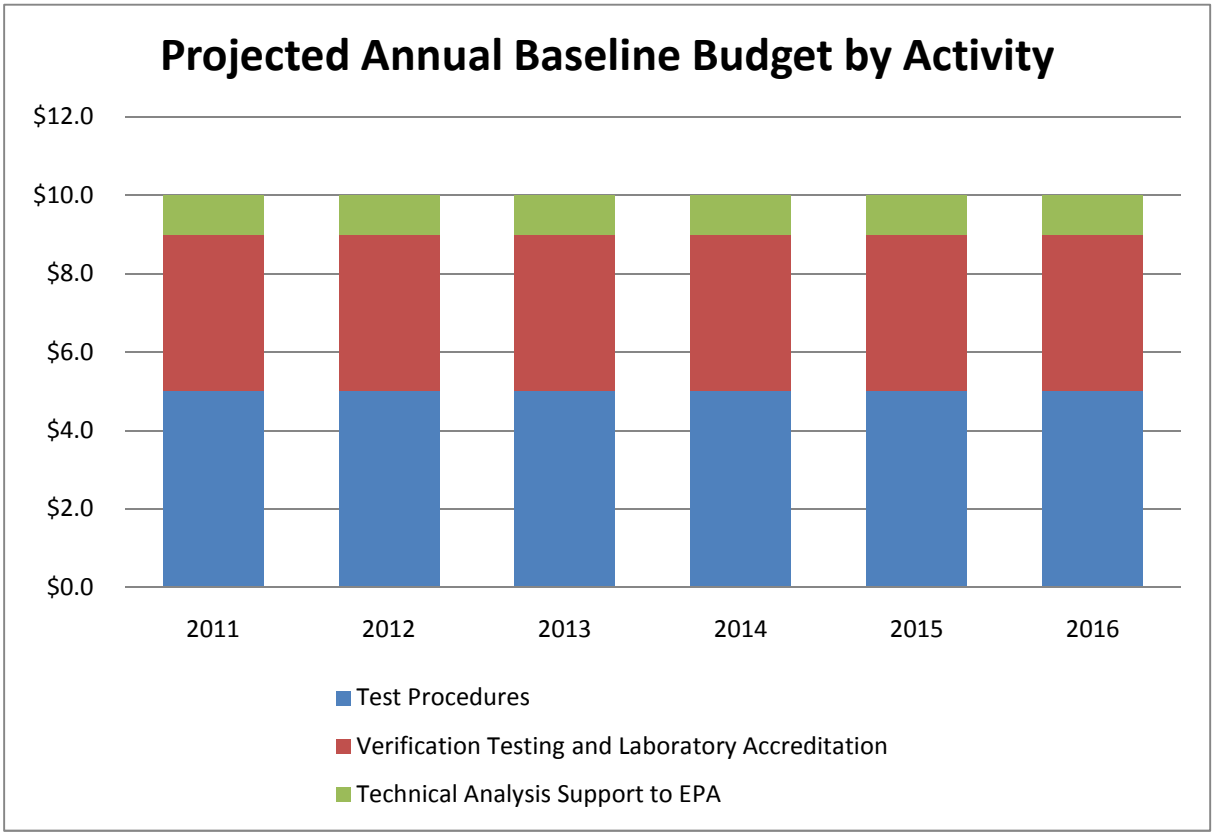
At the time this document was published, the Secretary indicated that he would consider increases in funding for Building Regulatory Programs starting in FY 2011 and continuing through the duration of the plan period.

Energy conservation standards are one the most highly leveraged and beneficial policy tools for mitigating climate change. Standards not only decrease greenhouse gas emissions, but can also contribute to long term increases in standards of living and economic growth. It is common for US energy conservation standards to save several quadrillion BTU (quads) of energy over a 30-year period, reduce CO2 emissions by hundreds of millions of tons over the same timeframe, and produce several billion dollars of net consumer economic savings. Increased funding would enable acceleration of currently scheduled rulemakings, and would support the development of standards and test procedures for products that are not currently covered.

8.5.2. ENERGY STAR

Figure 8-7 provides the projected budget for ENERGY STAR. The budget is divided into the major activity areas of the program from FY 2011 – FY 2016.

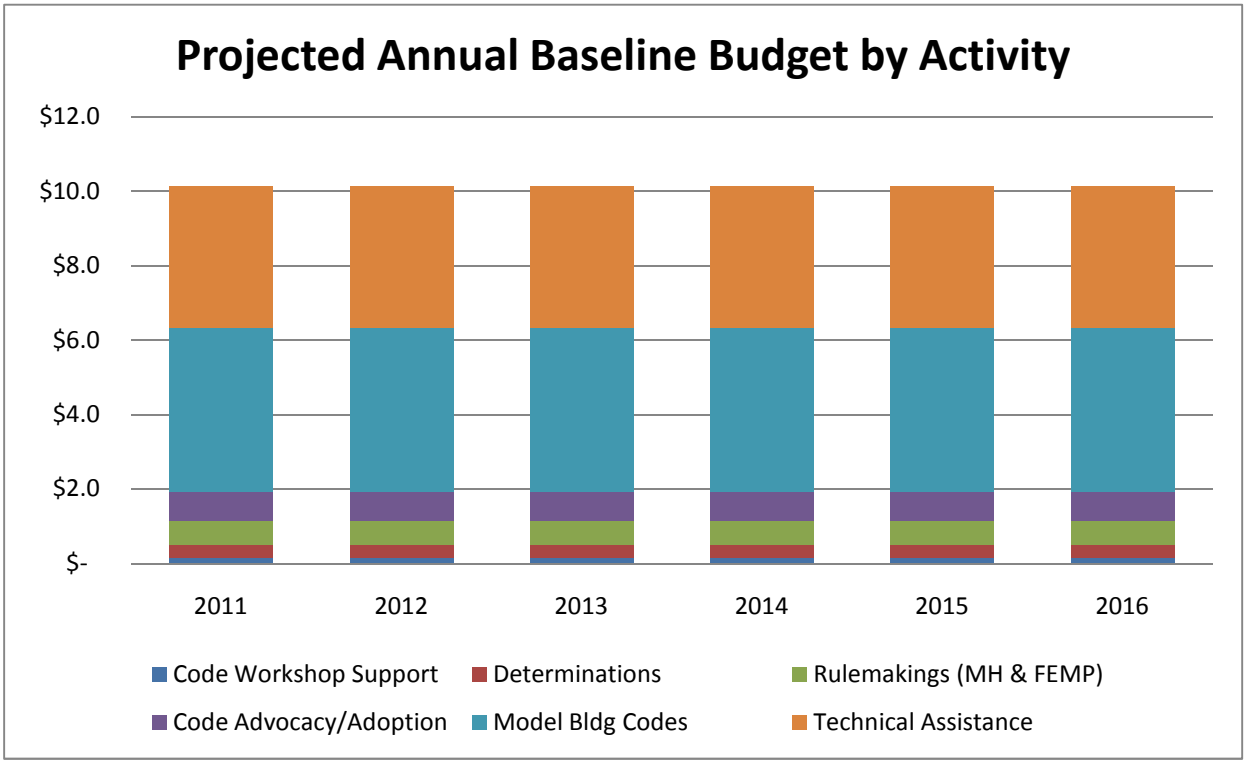
Figure 8-7 Projected Budget for ENERGY STAR, ($ in millions)



8.5.3. Building Energy Codes Program

Figure 8-8 provides the projected budget for the Building Energy Codes Program. The budget is divided into the major activity areas of the program from FY 2011 – FY 2016.

Figure 8-8 Projected Budget for Building Energy Codes Program, ($ in millions)



Appendix 1: DOE Legislative Requirements for Rulemakings

Table A1-1 through Table A1-4 summarize DOE's obligations to conduct rulemakings as indicated in legislative amendments to EPCA. Items identified as "backlog" represent statutory deadlines for amended energy conservation standards that were initially missed by DOE. The January 2006 report to Congress established a timeline for completing all backlogged items, so all backlogged rulemakings in Table A1-1 are scheduled for completion.

Table A1-1 Appliance and Equipment Standards Required by NAECA

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Refrigerators, Freezers and Refrigerator-Freezers	Yes	Jan-90	Jul-89	Jan-93	Nov-89	Jan-93	5 years after previous final rule (Nov. 1994)	5 years after previous effective date (January 1998)	Apr-97	Jul-01
Room Air Conditioners	Yes	Jan-90	Jan-92	Jan-95	Sep-97	Oct-00	5 years after previous final rule (September 2002)	5 years after previous effective date (October 2005)	**Backlog**	**Backlog**
Central Air Conditioners and Central Air Conditioning Heat Pumps	Yes	January 1992 (split), January 1993 (single-package)	January 1994 (SEER and HSPF)	January 1999 (SEER), January 2002 (HSPF)	Jan-01	Jan-06	Jan-01	Jan-06	**Backlog**	**Backlog**
Residential Water heaters	Yes	Jan-90	Jan-92	Jan-95	Jan-01	Jan-04	Jan-00	Jan-05	Apr-10	Apr-15
Pool heaters (Gas Fired)	Yes	Jan-90	Jan-92	Jan-95	Apr-10	Apr-13	Jan-00	Jan-05	**Backlog**	**Backlog**
Direct heating equipment	Yes	Jan-90	Jan-92	Jan-95	Apr-10	Apr-13	Jan-00	Jan-05	**Backlog**	**Backlog**
Residential Furnaces	Yes	Jan-92	Jan-94	Jan-02	Nov-07	Nov-15	Jan-07	Jan-12	**Backlog**	**Backlog**
Residential Boilers	Yes	Jan-92	Jan-94	Jan-02	Nov-07	Nov-15	Jan-07	Jan-12	**Backlog**	**Backlog**

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Small Furnaces	No	NA	Jan-89	Jan-92	Nov-89	Jan-92	Jan-94	Jan-02	Nov-07	Nov-15
Mobile Home Furnace	Yes	Sep-90	Jan-92	Jan-94	Nov-07	Nov-15	Jan-94	Jan-02	**Backlog**	**Backlog**
Residential Dishwashers	Yes	Jan-88	Jan-90	Jan-93	May-91	May-94	5 years after previous final rule (May 1996)	5 years after previous effective date (May 1999)	Mar-09 *Prescribed by EISA 2007*	Jan-10
Residential Clothes washers	Yes	Jan-88	Jan-90	Jan-93	May-91	May-94	5 years after previous final rule (May 1996)	5 years after previous effective date (May 1999)	Jan-01	Jan-04
Clothes dryers	Yes	Jan-88	Jan-90	Jan-93	May-91	May-94	5 years after previous final rule (May 1996)	5 years after previous effective date (May 1999)	**Backlog**	**Backlog**
Kitchen ranges and ovens	Yes	Jan-90	Jan-92	Jan-95	September 1998 (electric products only); April 2009 (for gas products)	October 1998 (electric products only); April 2012 (for gas products)	Jan-97	Jan-00	**Backlog**	**Backlog**
Fluorescent lamp ballasts	Yes	1990/ 1991	Jan-92	Jan-95	Sep-00	Apr-05	5 years after previous final rule (September 2005)	5 years after previous effective date (April 2010)	**Backlog**	**Backlog**

Table A1-2 Appliance and Equipment Standards Required by EPACT 1992

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
General service incandescent lamp	No	NA	3.5 years after FTC rule issued (Nov. 1997)	3 years after final rule (Nov. 2000)	Mar-09 *Prescribed by EISA 2007*	Jan-12/ Jan-13/ Jan-14	Apr-02	Apr-05	**Backlog**	**Backlog**
General service fluorescent lamp	Yes	April 1994 / October 1995	Apr-97	Apr-00	Mar-09 *Prescribed by EISA 2007*	Jun-09/ Dec-10	Apr-02	Apr-05	Jul-09	Jul-12
Incandescent reflector lamp	Yes	Oct-95	Apr-97	Apr-00	Mar-09 *Prescribed by EISA 2007*	Jun-09/ Dec-10	Apr-02	Apr-05	Jul-09	Jul-12
Electric Motors and Pumps	Yes	October 1997 / October 1999	October 1999 / October 2001	October 2002 / October 2004	Mar-09 *Prescribed by EISA 2007*	Dec-10	2 years after effective date of previous standard (12/19/12)	5 years after effective date of previous standard (12/19/15)		
Small commercial package air conditioning and heating equipment	ASHRAE 90.1 (1989)	1992	Triggered by Oct. 1992 revision of ASHRAE 90.1	NA	*Withdrawn* *Preempted by EPACT 2005*		NA			
Large commercial package air conditioning and heating equipment	ASHRAE 90.1 (1989)	1992	Triggered by Oct. 1992 revision of ASHRAE 90.1	NA	*Withdrawn* *Preempted by EPACT 2005*		NA			
Single package vertical air conditioners and single package vertical heat pumps	ASHRAE	1992	Revision has not been triggered by ASHRAE.							

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Packaged boilers	ASHRAE	1992	Triggered by Jan. 2008 revision of ASHRAE 90.1	NA	Jul-09	Mar-12	NA			
Storage water heaters, instantaneous water heaters, and unfired hot water storage tanks	ASHRAE	1992	Revision has not been triggered by ASHRAE.							
Packaged terminal air conditioners and packaged terminal heat pumps	ASHRAE 90.1 (1989)	1992	Not specified	Not specified	Oct-08	October 8, 2012 (standard sizes), October 7, 2010 (non-standard sizes)				
Commercial Air-Cooled AC & HP, 3-phase, <65 kBtu/hr	ASHRAE 90.1 (1989)	1992	Will adopt new ASHRAE standard after ASHRAE acts.							
Commercial warm air furnaces	ASHRAE 90.1 (1989)	1992	Triggered by Oct. 1999 revision of ASHRAE 90.1	NA	Jan-01	Oct-03	There are no specific legal deadlines for final rules and effective dates. If ASHRAE revises Standard 90.1 again, DOE will need to update standards again.			

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Commercial Water-Cooled AC & Water-Source HP	ASHRAE 90.1 (1989)	1992	Triggered by Oct. 1999 revision of ASHRAE 90.1	NA	Jan-01	Oct-03	There are no specific legal deadlines for final rules and effective dates. If ASHRAE revises Standard 90.1 again, DOE will need to update standards again.			
Commercial Water Heaters	ASHRAE 90.1 (1989)	1992	Triggered by Oct. 1999 revision of ASHRAE 90.1	NA	Jan-01	Oct-03	There are no specific legal deadlines for final rules and effective dates. If ASHRAE revises Standard 90.1 again, DOE will need to update standards again.			
Showerheads (except safety shower showerheads)	Yes	Jan-94	12 months after changes to ASME/ ANSI standards or 5 years after previous standard	12 months after final rule	ASME/ ANSI standards have not been revised		12 months after changes to ASME/ ANSI standards or 5 years after previous standard	12 months after final rule		
Faucets	Yes	Jan-94	12 months after changes to ASME/ ANSI standards or 5 years after previous standard	12 months after final rule	ASME/ ANSI standards have not been revised		12 months after changes to ASME/ ANSI standards or 5 years after previous standard	12 months after final rule		

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Water closets	Yes	Jan-94	12 months after changes to ASME/ ANSI standards or 5 years after previous standard	12 months after final rule	ASME/ ANSI standards have not been revised		12 months after changes to ASME/ ANSI standards or 5 years after previous standard	12 months after final rule		
Urinals	Yes	Jan-94	12 months after changes to ASME/ ANSI standards or 5 years after previous standard	12 months after final rule	ASME/ ANSI standards have not been revised		12 months after changes to ASME/ ANSI standards or 5 years after previous standard	12 months after final rule		
Distribution Transformers, MV Dry and Liquid-Immersed	No	NA	October 1996, *if positive determination*	October 1999, *if positive determination*	Oct-07	Jan-10				
High-intensity discharge lamps	No	NA	October 1996, *if positive determination*	October 1999, *if positive determination*	**Backlog, *if positive determination***	**Backlog, *if positive determination***				
Small Electric Motors	No	NA	October 1996, *if positive determination*	October 2001 / October 2003, *if positive determination*	Mar-10	Mar-15				

Table A1-3 Appliance and Equipment Standards Required by EPACT 2005

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Ceiling Fans	Yes	Jan-07								
Ceiling Fan Light Kits	Yes	Jan-07	January 2007 (for those lighting kits not covered by EPACT 2005)	Jan-09	Jan-07	Jan-09				
Medium Base Compact Fluorescent Lamps	Yes	Jan-06								
Dehumidifiers	Yes	Oct-07	Oct-09	Oct-12	Mar-09 *Prescribed by EISA 2007*	Oct-12				
Small commercial package air conditioning and heating equipment	Yes	Jan-10								
Large commercial package air conditioning and heating equipment	Yes	Jan-10								
Very large commercial package air conditioning and heating equipment	Yes	Jan-10								
Unit Heaters	Yes	Aug-08								
Automatic commercial ice makers	Yes	Jan-10	Jan-15	3 to 5 years after final rule date			5 years after previous rule effective date (Jan. 2023 / Jan. 2025)	3 to 5 years after final rule date		

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Commercial refrigerators, freezers, and refrigerator-freezers	Yes	Jan-10	Jan-09	Jan-12	Jan-09	Jan-12	January 2013*	January 2016 (or January 2018 if 3-year compliance period is not adequate)*		
Refrigerated Beverage Vending Machines	No	NA	Aug-09	Aug-12	Aug-09	Aug-12				
Commercial clothes washers	Yes	Jan-07	Jan-10	Jan-13	Jan-10	Jan-13	Jan-15	Jan-18		
Distribution Transformers	Yes	Jan-07								
Fluorescent lamp ballasts	Yes	2009/2010								
Illuminated Exit Signs	Yes	Jan-06								
Mercury Vapor Lamp Ballasts	Yes	January 1, 2008 (Product Ban)								
Torchieres	Yes	Jan-06								
Traffic Signal Modules and Pedestrian Modules	Yes	Jan-06								
Commercial Prerinse Spray Valves	Yes	Jan-06								
Battery Chargers			Will develop if determination notice (due Aug. 2008) is positive - No deadline		Requirement removed by EISA 2007					
External Power Supplies, Class A			Will develop if determination notice (due Aug. 2008) is positive - No deadline		Requirement removed by EISA 2007					

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Ceiling Fans			Optional standard - No deadline							
Ceiling Fan Light Kits			Optional standard - Possible after January 2010				At least 2 years after final rule date			
Combination Appliances [Residential]			Optional standard - No deadline							
Furnace Fans			Optional standard - No deadline							
Automatic Ice Makers [Commercial]			Optional standard - 5 years after optional rulemaking takes effect		3 to 5 years after final rule date		5 years after first amendment takes effect		3 to 5 years after final rule date	
Commercial Refrigerators, Freezers, and Refrigerator-Freezers			Optional standard - No deadline							

*Second update required with final rule due 3 to 5 years after the effective date of the first update.

Table A1-4 Appliance and Equipment Standards Required by EISA 2007

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Candelabra base incandescent lamp	Yes	Dec-07								
Dehumidifiers	Yes	Oct-12								
Dishwashers	Yes	Jan-10	Jan-15	Jan-18						
Electric Motors and Pumps	Yes	Dec-10	Dec-12							
External Power Supplies, Class A	Yes	Jul-08	Jul-11	Jul-13			Jul-15	Jul-17		
General service incandescent lamp	Yes	Dec-07	Jan-17	Jan-20			Jan-22	Jan-25		
Incandescent reflector lamp	Yes	Dec-07								
Intermediate base incandescent lamp	Yes	Dec-07								
Metal halide Lamp Fixtures	Yes	Jan-09	Jan-12	Jan-15			Jan-19	Jan-22		
Residential Boilers	Yes	Jul-08								
Residential Clothes washers	Yes	Jan-11	Dec-11	Jan-15						
Single package vertical air conditioners and single package vertical heat pumps	Yes	Jan-10								
Small commercial package air conditioning and heating equipment	Yes	Jun-08								
Walk-in coolers and walk-in freezers	Yes	Jan-09	Jan-12	Jan-15			Jan-20	Jan-23		
Battery Chargers	No		Jul-11							

Product	Standard Specified in Statute?	Standard Effective Date	First Update (or initial if standard not specified by statute)				Second Update (or first update if no initial standard)			
			Statutory Requirement		Actual		Statutory Requirement		Actual	
			Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date	Final Rule Date	Effective Date
Packaged boilers	No		July 2009/July 2010		Jul-09					
Very large commercial package air conditioning and heating equipment (ASHRAE)	No		July 2009/July 2010		Jul-09					
External Power Supplies, non-Class A [Determination]	No		Dec-09							
Furnace Fans	No		Dec-13							
LED	No		Jan-17	Jan-20						
Medium Base Compact Fluorescent Lamps	No		Jan-17	Jan-20						
OLED	No		Jan-17	Jan-20						
Refrigerators, Freezers and Refrigerator-Freezers	No		Dec-10							

Appendix 2 Products covered by Appliance and Equipment Efficiency Standards or by ENERGY STAR

Category/Product	DOE Covered Product	ENERGY STAR Product
Lighting Products		
Residential:		
3-Way Incandescent Lamp	Yes	No
Candelabra base incandescent lamp	Yes	No
Ceiling Fan Light Kits	Yes	No
Ceiling Fans	Yes	Yes
Decorative Light Strings	No	Yes
Fluorescent lamp ballasts	Yes	No
General Service Fluorescent Lamps	Yes	No
General Service Incandescent Lamps	Yes	No
Incandescent Reflector Lamps	Yes	No
Intermediate Base Incandescent Lamps	Yes	No
Light Emitting Diodes	Yes	Yes
Light Fixtures	No	Yes
Medium Base Compact Fluorescent Lamps	Yes	Yes
Organic Light Emitting Diodes	Yes	No
Rough Service Lamp	Yes	No
Shatter-Resistant Lamp	Yes	No
Torchieres	Yes	No
Vibration Service Lamp	Yes	No
Commercial:		
LEDs	No	Yes
Mercury Vapor Lamp Ballasts	Yes	No
Metal Halide Lamp Ballast	Yes	No
Metal halide Lamp Fixtures	Yes	No
High-intensity discharge lamps	Yes	No
Traffic Signal Modules and Pedestrian Modules	Yes	No
Illuminated Exit Signs	Yes	No
Heating Products:		
Residential:		

Category/Product	DOE Covered Product	ENERGY STAR Product
Direct heating equipment	Yes	No
Furnace Fans	Yes	No
Furnaces	Yes	Yes
Mobile Home Furnace	Yes	No
Pool heaters (Gas Fired)	Yes	No
Residential Boilers	Yes	Yes
Residential Water heaters	Yes	Yes
Small Furnaces	Yes	Yes
Commercial:		
Commercial warm air furnaces	Yes	No
Packaged boilers	Yes	No
Storage water heaters, instantaneous water heaters, and unfired hot water storage tanks	Yes	Yes
Unit Heaters	Yes	No
Space Cooling Products:		
Residential:		
Central Air Conditioners and Central Air Conditioning Heat Pumps	Yes	Yes
Room Air Conditioners	Yes	Yes
Commercial:		
Packaged terminal air conditioners and packaged terminal heat pumps	Yes	No
Single package vertical air conditioners and single package vertical heat pumps	Yes	No
Small commercial package air conditioning and heating equipment	Yes	Yes
Large commercial package air conditioning and heating equipment	Yes	Yes
Very large commercial package air conditioning and heating equipment	Yes	Yes
Small commercial split-system air conditioning and heating equipment	Yes	Yes
Large commercial split-system air conditioning and heating equipment	Yes	Yes
Very large commercial split-system air conditioning and heating equipment	Yes	Yes

Category/Product	DOE Covered Product	ENERGY STAR Product
Commercial Refrigeration Products:		
Automatic commercial ice makers	Yes	Yes
Commercial refrigerators, freezers, and refrigerator-freezers	Yes	Yes
Refrigerated Beverage Vending Machines	Yes	Yes
Walk-in coolers and walk-in freezers	Yes	Yes
Water Coolers	No	Yes
Appliances:		
Residential:		
Clothes dryers	Yes	No
Dehumidifiers	Yes	Yes
Dishwashers	Yes	Yes
Kitchen ranges and ovens	Yes	Yes
Microwave ovens	Yes	Yes
Refrigerators, Freezers and Refrigerator-Freezers	Yes	Yes
Residential Clothes washers	Yes	Yes
Room Air Cleaners and Purifiers	No	Yes
Commercial:		
Commercial clothes washers	Yes	Yes
Commercial Kitchen Packages	No	Yes
Commercial Dishwashers	No	Yes
Commercial Fryers	No	Yes
Commercial Griddles	No	Yes
Commercial Hot Food Holding Cabinets	No	Yes
Commercial Ovens	No	Yes
Commercial Steam Cookers	No	Yes
Computers and Electronics:		
Audio/Video Equipment	No	Yes
Battery Chargers	Yes	Yes
External Power Supplies, Class A	Yes	Yes
External Power Supplies, non-Class A	Yes	Yes
Computers	No	Yes
Cordless Phones	No	Yes
Digital to Analog Converter Boxes	No	Yes

Category/Product	DOE Covered Product	ENERGY STAR Product
Displays (computer monitors, digital picture frames, professional signage)	No	Yes
Imaging Equipment (copiers, fax machines, printers, mailing machines, and scanners)	No	Yes
Set-Top Boxes and Cable Boxes	No	Yes
Television sets	Yes	Yes
Enterprise Servers	No	Yes
Transformers and Motors:		
Commercial:		
Distribution Transformers, MV Dry and Liquid-Immersed	Yes	No
Electric Motors	Yes	No
Small Electric Motors	Yes	No
Plumbing Products:		
Residential:		
Faucets	Yes	No
Showerheads (except safety shower showerheads)	Yes	No
Urinals	Yes	No
Water closets	Yes	No
Commercial:		
Commercial Pre-rinse Spray Valves	Yes	No
Building Products		
Residential:		
Home Sealing and Insulation	No	Yes
Roof Products	No	Yes
Windows, Doors and Skylights	No	Yes

Appendix 3 Table of Acronyms and Abbreviations

Full Name	Acronym or Abbreviation
Advanced Energy Design Guide	AEDG
Air Conditioning and Refrigeration Institute	ARI
American National Standards Institute	ANSI
American Society of Heating, Refrigeration, and Air Conditioning Engineers	ASHRAE
American Society of Testing and Materials	ASTM
Appliance Technology Evaluation Center	ATEC
Automated Residential Energy Standard	ARES
Building Codes Assistance Project	BCAP
Building Energy and Performance Standards	BEPS
Building Energy Codes Program	BECP
Building Technologies Program	BTP
Central air conditioning and heat pump	CACHP
Commercial Building Initiative	CBI
Compliance and Certification Management System	CCMS
Council of American Building Officials	CABO
Energy Cost Budget Method	ECB
Energy Independence and Security Act of 2007	EISA 2007
Energy Policy Act of 1992	EPACT 1992
Energy Policy Act of 2005	EPACT 2005
Energy Policy and Conservation Act of 1975	EPCA 1975
Federal Energy Management Program	FFEMP
Federal Trade Commission	FTC
Greenhouse gas	GHG
Heating Ventilation and Air Conditioning	HVAC
Illuminating Engineering Society of North America	IESNA
International Code Council	ICC
International Council of Building Officials	ICBO
International Energy Conservation Code	IECC
International Green Construction Code	IGCC
Leadership in Energy and Environmental Design	LEED
Life Cycle Cost	LCC
Light Emitting Diode	LED
Memorandum of Understanding	MOU
National Association of Homebuilders	NAHB
National Association of State Energy Offices	NASEO
National Buildings Rating Program	NBRP
National Energy Technology Laboratory	NETL

National Renewable Energy Laboratory	NREL
Net-zero energy buildings	NZEB
Notice of proposed rulemaking	NOPR
Office of Planning, Budget, and Analysis	PBA
Organic Light Emitting Diode	OLED
Pacific Northwest National Laboratory	PNNL
Quadrillion British Thermal Units	Quad
Southern Building Codes Council International	SBCCI
State Energy Efficient Appliance Rebate Program	SEEARP
Technical Support Document	TSD
Underwriters Laboratories	UL
United Stated Environmental Protection Agency	EPA
United States Department of Energy	DOE
United States Department of Housing and Urban Development	HUD
US Green Building Council	USGBC
Voluntary Residential Energy Standard	VOLRES