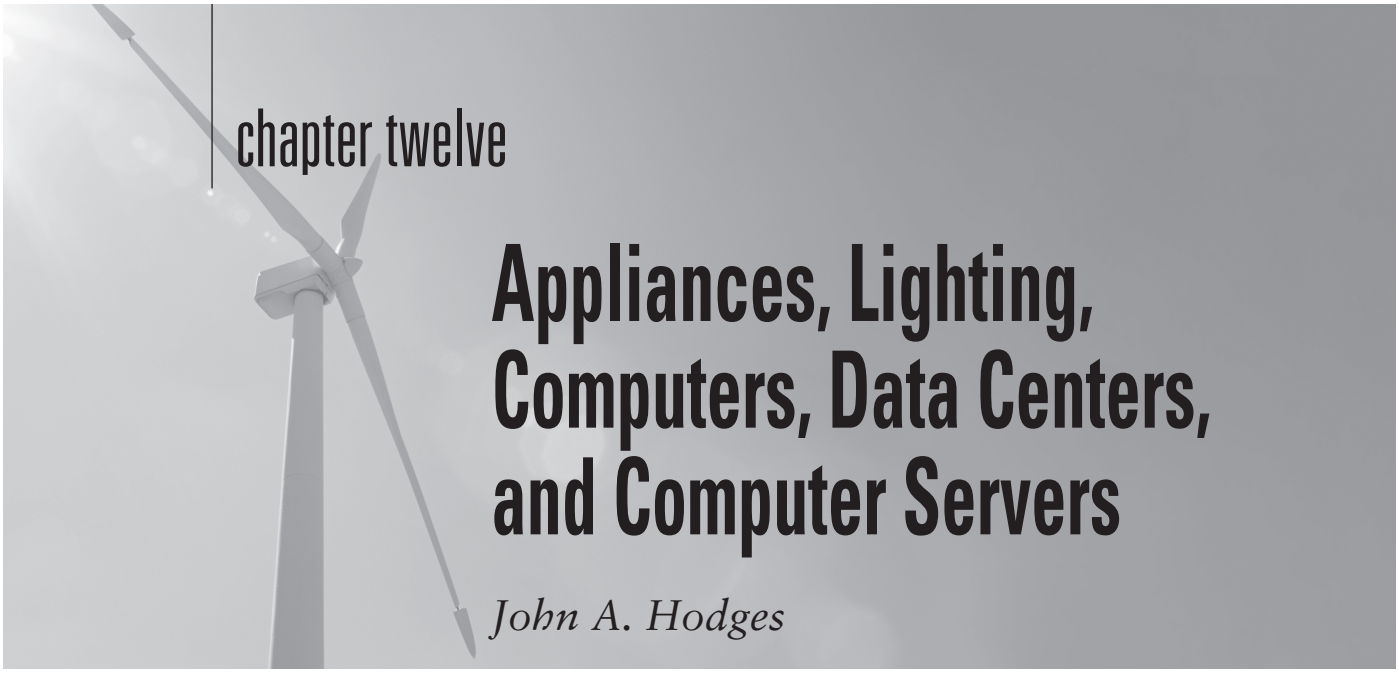

chapter twelve

Appliances, Lighting, Computers, Data Centers, and Computer Servers

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Appliances are a key element in the development of energy efficiency law. The scope of appliance rules has expanded since the oil crises in the 1970s and now includes a broad range of residential and commercial products. This includes not only traditional household appliances but also such products as lighting, computers, data centers, and computer servers.

The development of appliance efficiency law has engaged the three branches of the federal government and many other players, including industry, standards developers, efficiency conservation advocates, states, and foreign governments. The history of the law has been marked both by conflict and by instances of consensus—in which the appliance industry and energy conservation advocates have hammered out important agreements and presented them to government for adoption.

The push for appliance efficiency is further accelerating under the Obama administration. It is seeking to eliminate the backlog of rulemakings, increase enforcement, and adopt ambitious new requirements. Efforts to increase efficiency are gaining additional urgency in light of difficulties in adopting comprehensive climate change legislation. In comparison with climate change legislation, energy efficiency is relatively low-hanging fruit.

The Framework for the Federal Appliance Efficiency Program

Appliance efficiency falls within the Energy Policy and Conservation Act (EPCA), signed into law in 1975.[1] It provides for establishment of test procedures for appliances, efficiency standards, labeling, and preemption of state requirements. Standards and test procedures are administered by the Department of Energy (DOE),[2] and labeling is administered by the Federal Trade Commission (FTC).[3]

EPCA prohibits manufacturers, distributors, and retailers from making any representation concerning energy efficiency or energy use of a "covered product" for which there is a DOE test procedure unless the product has been tested in accordance with the test procedure and such representation fairly discloses the results of the testing.[4]

Mandatory efficiency standards use the DOE test procedures.[5] Labeling of products pursuant to EPCA is subject to requirements of the FTC, which are to follow DOE test procedures.[6]

EPCA contains stringent provisions for preemption of state regulations on energy efficiency, energy use, or water use of covered products.[7] Narrow exceptions to preemption are provided for certain state procurement standards and certain building code requirements.[8] There are also rules for potential waivers of preemption for state regulations under carefully defined circumstances.[9]

EPCA has extensive enforcement provisions.[10] Appliance industry third-party testing and certification programs supplement federal enforcement.[11]

EPCA also covers the voluntary Energy Star program for appliances (discussed below), which involves both DOE and the Environmental Protection Agency (EPA).[12]

History of the Federal Appliance Efficiency Program

The federal appliance efficiency program was provided for in 1975 through EPCA as part of a "comprehensive national energy policy."[13] Initially, EPCA required the Federal Energy Administration (FEA), a predecessor to DOE, to issue voluntary energy efficiency improvement targets for thirteen "covered" appliances. If FEA were to determine that manufacturers were unlikely to achieve the target for an appliance by 1980, it was to commence a proceeding to prescribe a mandatory efficiency standard for that appliance. In 1978, impatient for efficiency improvements, Congress enacted the National Energy Conservation and Policy Act (NECPA),[14] amending EPCA to abandon the target approach and require DOE to issue mandatory standards for the thirteen covered appliances, unless DOE determined that a standard was not justified.

In response, DOE, under the Reagan Administration, conducted a rulemaking resulting in the issuance of so-called "no-standard standards" for most of the covered appliances.[15] This determination was based on DOE's position that standards for these appliances were not justified. Under EPCA, the "no-standards standards" had preemptive effect against state standards.[16]

DOE's determination was overturned by the Court of Appeals for the District of Columbia Circuit.[17] The court took DOE behind the woodshed. In a highly detailed, strongly worded opinion, the court ruled that DOE had established too-stringent criteria to measure whether energy savings from an appliance standard would be "significant." It also ruled that DOE had "failed to determine the maximum technologically feasible improvements in efficiency for covered products and limited the technologies it was willing to consider for standards without sufficient explanation."[18] In addition, it ruled that DOE "made persistently pessimistic assumptions about the burdens of standards and was conspicuously reluctant to address their benefits."[19] The court sent the matter back to DOE for further rulemaking, which would require a "comprehensive reappraisal of the appliance program."[20]

The court's decision had a galvanizing effect. Energy conservation advocates had won a victory but were facing the resulting prospects of prolonged rulemaking before

new DOE standards would be issued and become effective. Appliance manufacturers faced uncertainty. The court's overturning of federal standards had the effect of eliminating preemption that flowed from the standards. Even before the court's decision, states had been issuing their own requirements, and the court's decision was sure to stimulate further state activity. "Appliance manufacturers, accordingly, were confronted with the absence of Federal appliance standards for the immediate future, and a growing plethora of differing state regulations, complicating industry's long-term planning."[21]

The interests of all sides converged, and the stage was set for a legislative solution. Negotiations between appliance manufacturers and energy conservation advocates ensued. These resulted in an agreement that Congress adopted virtually intact as the National Appliance Energy Conservation Act of 1987 (NAECA) amendments to EPCA.[22] NAECA set forth congressionally established uniform national standards,[23] stronger preemption of state requirements,[24] and new and more stringent criteria, making it much more difficult for a state to obtain a waiver of preemption.[25] NAECA also provided a schedule for DOE rulemakings to periodically review and update the standards.[26] The amended standards were to set levels that achieve the maximum improvement in energy efficiency that was technologically feasible and economically justified.[27]

NAECA has provided the template for further legislative amendments expanding coverage to other products and increasing the stringency of rules for products already covered. For example, the amendments to EPCA relating to commercial and industrial equipment contained in the Energy Policy Act of 1992 (EPAct)[28] follow the approach of NAECA.

Due to dissatisfaction with DOE's procedures under EPCA, Congress enacted a moratorium on proposing or issuing energy conservation appliance standards for the remainder of fiscal year 1996.[29] In addition, the National Performance Review made recommendations on regulatory reform.[30] In light of these, DOE halted rulemaking activity and set about developing extensive new procedures for carrying out its appliance rulemakings.[31] These include such things as providing for early input from stakeholders and highly detailed analyses.

As a result of the rulemaking moratorium, the high degree of analysis involved in appliance efficiency rulemaking, and DOE's heavy workload, DOE fell behind in its rulemaking. Predictably, DOE was sued by states and energy conservation advocates, which argued that DOE was violating statutory schedules. The litigation led to a settlement in which DOE agreed to conduct further rulemakings based on an agreed-upon schedule.[32] DOE is also addressing additional standards and test procedure requirements included in the Energy Policy Act of 2005[33] and the Energy Independence and Security Act of 2007 (EISA).[34] On February 5, 2009, President Obama issued a memorandum to DOE requesting that it "take all necessary steps . . . to finalize legally required standards rulemakings as expeditiously as possible consistent with all applicable judicial and statutory deadlines."[35] This all has escalated the pace of DOE appliance rulemaking. "This ambitious schedule reflects a 6-fold increase in standards activity compared to the previous 18 years."[36]

Congress has streamlined some of the time-consuming DOE rulemaking process. Under EISA, where a fairly representative group of interested persons jointly submits a recommended standard and no adverse public comments are received, DOE may issue a "direct final rule" establishing a standard.[37] In addition, Congress has removed the requirement for an Advance Notice of Proposed Rulemaking (ANOPR) for certain products.[38] In such cases, instead of an ANOPR, DOE is posting analyses on its website and holding public meetings on DOE's preliminary analyses.[39]

EISA also amends EPCA to require that DOE review test procedures at least once every seven years and amend them where warranted.[40]

EISA further provides for DOE consideration of establishing regional standards for central air conditioners, furnaces, and heat pumps.[41] This provision has caused substantial concern for manufacturers, who generally have wished to have uniform national standards, which has been a central tenet of EPCA.[42] (See further discussion of regional standards below.)

The scope of products subject to standards will inevitably increase. For example, the Waxman-Markey bill called for additional lighting standards[43] and standards for water dispensers, food handling cabinets, and electric spas.[44] While the bill was not adopted, its appliance energy efficiency provisions may well be a harbinger of things to come.

The Waxman-Markey bill would have mandated a "Best-in-Class Appliances Deployment Program."[45] This would have required DOE to establish a program to provide bonus payments to retailers or distributors for sale of best-in-class high-efficiency appliances, installed building equipment, and consumer electronics. It would have also provided for bounties to retailers and manufacturers for the replacement, retirement, and recycling of old, inefficient, and environmentally harmful products. Premium awards would have been paid for developing and producing new "Superefficient Best-in-Class Products." In carrying out these provisions, the bill would have required DOE to define product classes broadly and generally to designate as Best-in-Class Product models no more than the most efficient 10 percent of the commercially available models in a class that demonstrate, as a group, a distinctly greater energy efficiency than the average energy efficiency of that class. Thus, this would have been a way to obtain, on a voluntary basis, efficiencies beyond mandatory minimums and beyond the incentives provided by the Energy Star program.[46]

Due to the inability of Congress to pass a comprehensive energy bill, Senator Bingaman in September 2010 introduced a new bill, the "Implementation of National Consensus Appliance Agreements Act" (INCAAA).[47] INCAAA packaged a number of elements as to which there purported to be consensus, including new or amended standards negotiated between industry and energy-efficiency advocates. The bill included standard provisions for central air conditioners, heat pumps, furnaces, room air conditioners, refrigerators and freezers, clothes washers and dryers, dishwashers, portable lighting fixtures, pole-mounted outdoor lighting fixtures, drinking water dispensers, hot food holding cabinets, and electric spas. It also included provisions for accelerated rulemaking and updated decision-making criteria, and new developments

such as smart-grid technologies. INCAAA died at the end of the 111th Congress. The 2010 congressional midterm elections may potentially affect the prospects for adoption of any similar bill in the next Congress.

DOE Appliance Efficiency Rulemaking

There have been extensive, highly complex DOE rulemakings to consider amendments to appliance standards, taking into account such factors as technological feasibility and economic justification.

The typical proceeding involves issuance of an ANOPR,[48] along with a draft Technical Support Document setting forth potential appliance energy efficiency standard levels; the technology configurations available to achieve each level; and the costs and benefits of achieving each level. After obtaining public comments on the ANOPR, DOE issues for public comment a Notice of Proposed Rulemaking (NOPR) with a specific proposed standard. After a further round of public comment, DOE issues a Final Rule setting forth its decision as to a standard. Lead times are provided for manufacturers to achieve the new levels, with standards to apply to products manufactured on or after a specified date. Lock-in periods help ensure that manufacturers are able to recover costs before standards are amended again.[49]

In determining whether an appliance standard is economically justified, DOE is to determine whether the benefits of the standard exceed its burdens by, to the greatest extent practicable, considering a number of factors. In brief, these include (1) the economic impact of the standard on the manufacturers and on the consumers of the products; (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 that are likely to result from the imposition of the standard; (3) the total projected amount of energy savings, or as applicable, water 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 by the Attorney General, that is likely to result from the imposition of the standard; (6) the need for national energy and water conservation; and (7) other factors DOE considers relevant.[50]

If DOE finds that the additional cost to the consumer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy savings, and, as applicable, water savings during the first year that the consumer will receive as a result of the standard, as calculated under the applicable test procedure, there is a rebuttable presumption that the standard level is economically justified. A DOE determination that this criterion is not met is not to be taken into consideration in DOE's determination of whether a standard is economically justified.[51]

DOE may not prescribe an amended or new standard if, among other things, DOE determines that the establishment of the standard will not result in significant

conservation of energy or, in the case of showerheads, faucets, water closets, or urinals, water, or that the establishment of the standard is not technologically feasible or economically justified.[52]

DOE may not prescribe an amended or new standard if it finds that the standard is likely to result in the unavailability in the United States in any covered product type (or class) of performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the United States at the time of DOE's finding. The failure of some types (or classes) to meet this criterion is not to affect DOE's determination of whether to prescribe a standard for other types (or classes).[53]

A finding that a standard is not justified has the same preemptive effect as a finding that a standard is justified.[54] On this basis, the so-called "no-standard standards" of the Reagan-era DOE had preemptive effect.[55]

In November 2010, DOE announced changes to expedite its rulemaking process.[56] First, in some instances, it will speed issuance of an NOPR. Typically, DOE has not issued an NOPR until it has completed a framework document, followed by a preliminary analysis. DOE announced that henceforth in appropriate cases, it will gather the needed preliminary data informally and begin the public rulemaking process with the issuance of an NOPR. Second, DOE has typically provided, in the Federal Register standards document, extensive summarization of underlying analytical information available in other documents. DOE announced that it intends to provide references in the rulemaking documents to such analytical information. DOE says that this will shorten the rulemaking documents, allow the process to proceed more efficiently, "and allow the public to focus on the policy choices made by the rulemaking."[57] Third, DOE announced that it will use negotiated rulemakings "as a means to engage the public, gather data and information, and, attempt to reach consensus among interested parties in order to advance the rulemaking process."[58]

Rulemaking proceedings are often hard fought, reflecting the high stakes involved. But they can also involve consensus. An example is the standards for central air conditioners.

The 1987 NAECA amendments to EPCA included a standard of 10 SEER (seasonal energy efficiency ratio) for central air conditioners—a level that had been negotiated by the appliance industry and energy efficiency advocates as part of the package they presented to Congress for adoption.[59] After an extensive rulemaking, DOE in January 2001, as one of the last acts of the Clinton administration, issued a rule for central air conditioners setting an energy efficiency standard of 13 SEER.[60] DOE in the Bush administration promptly commenced further rulemaking, which resulted in DOE's rejection of 13 SEER and adoption of 12 SEER.[61] States and environmental groups sued DOE to invalidate the 12 SEER rule. The Second Circuit determined that the 12 SEER rule violated what the court deemed to be an "anti-backsliding" provision in EPCA, since it was lower than 13 SEER (even though it was higher than the 10 SEER standard provided in EPCA and even though manufacturers were not yet obliged to produce units at the 13 SEER level).[62] Industry also brought a challenge

in the Fourth Circuit to the 13 SEER rule,[63] but ultimately determined to halt its challenge and accepted the 13 SEER rule. The 13 SEER standard went into effect in 2006.[64]

There have been negotiations for a further set of increases for central air conditioners. The Air-Conditioning, Heating, and Refrigeration Institute (AHRI) (formerly Air-Conditioning and Refrigeration Institute [ARI]), individual manufacturers, and numerous energy advocate organizations signed an agreement in October 2009 supporting new standards for residential central air conditioners, furnaces, and heat pumps.[65]

The agreement provides for regional standards, which are currently contemplated for these products due to the EISA amendments to EPCA.[66] Energy advocates have pushed for years for regional standards. Benefits to manufacturers from the agreement include certainty and lead times and the avoidance of rulemakings.[67] The agreement provides for standards to go into effect in 2013 for nonweatherized furnaces, and 2015 for air conditioners, heat pumps, and weatherized furnaces. The effective date for the next iteration of these standards will be 2019 for nonweatherized furnaces, and 2022 for air conditioners, heat pumps, and weatherized furnaces. The agreement also provides for amendment to EPCA's preemption provisions for building codes.[68]

DOE is moving forward with its rulemaking for central air conditioners and furnaces. This includes an NOPR for amended test procedures,[69] and steps leading toward an NOPR for amended standards.[70]

Standby Power

Standby power (also called, e.g., "sleep mode") for appliances is a subject of increasing regulation. This focus is a natural consequence of the increasing use of appliances that are controlled by remote controls and thus are usually in a standby mode rather than in an off mode.

EPCA has been amended to provide that DOE test procedures must be amended, on a scheduled basis, to include "standby mode and off mode energy consumption," taking into consideration the most current versions of Standards 62301 and 62087 of the International Electrotechnical Commission (IEC), with such energy consumption integrated into the overall energy efficiency, energy consumption, or other energy descriptor for each "covered product" unless DOE makes certain findings. DOE is generally to incorporate standby mode and off mode energy use into energy efficiency standards.[71] Congress has specifically mandated standards for certain products, such as battery chargers and external power supplies, that are to take into account existing definitions and test procedures used for measuring energy consumption in standby mode and other modes.[72]

DOE has moved to carry out these requirements. Its rules provide for regulation and measurement of standby power for various products.[73] In addition, the Energy Star program (see discussion below) has a number of provisions governing standby power. These products include, e.g., set-top boxes, audio equipment, DVD players,

VCRs, televisions, TV/VCR combos, cordless phones, battery charging systems, digital-to-analog (DTA) converters, and computer equipment.[74]

Exceptions and Waivers

One way for DOE to handle special situations prior to a general amendment of an appliance test procedure or efficiency standard is to consider requests for exceptions and waivers.

An exception petition would be appropriate for a product that contains a valuable feature, not yet recognized in the DOE rules, that requires additional energy. DOE could adjust a standard to take the feature into account.

An example of this concerns exceptions that were granted for automatic defrost refrigerator-freezers, with bottom-mounted freezer and through-the-door ice service. The exceptions created a separate class and standard for these products. The standard takes into account the additional energy involved in through-the-door ice service and adds it to the energy equation established for refrigerator-freezers—automatic defrost with bottom-mounted freezer without through-the-door ice service (Class 5).[75] Subsequently, DOE has proposed to amend its standards to establish a class (Class 5A) for automatic defrost refrigerator-freezers, with bottom-mounted freezer and through-the-door ice service.[76]

A waiver petition would be appropriate where an appliance has a characteristic that either prevents testing pursuant to the DOE test procedure, or the test procedure may evaluate the product in a way so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. DOE may provide a waiver of the DOE test procedure and impose an alternative test procedure for the product until it changes its rules to address the product.[77]

An example is so-called multi-split central air conditioners. A multi-split consists of one outdoor unit, with a compressor with variable capacity, that can connect to multiple indoor units in zoned systems and that uses variable refrigerant flow and control systems. Because numerous indoor units can be matched with each related outdoor unit and an outdoor unit can be connected with numerous separate indoor units, there may be hundreds of thousands, or even millions, of possible indoor units that can be matched in a system configuration. The regular DOE test procedure did not specify how such a product could be evaluated, and it is not practical to test each possible combination. DOE therefore granted test procedure waivers to a number of manufacturers, providing an alternative method for them to rate multi-splits.[78] DOE has sought to resolve this situation by amending the test procedure regulations to define "tested combinations" of multi-splits.[79]

Enforcement

EPCA contains stringent provisions for enforcing its appliance requirements, including fines and penalties, injunctive enforcement, and citizen suits.[80] DOE under the

Obama administration has escalated enforcement of these requirements. And it has done so in a more public manner than in prior administrations.

In October 2009, DOE issued guidance on enforcement.[81] DOE stated, for example, that under its interpretation, a failure to properly certify a covered product and retain records in conformity with its regulations may be subject to enforcement action, including fines, penalties, and injunctive relief, to prohibit distribution of an offending basic model. DOE took the position that it need not test an improperly certified product (or otherwise determine its noncompliance with an applicable efficiency standard) before seeking to enforce. At the same time, DOE stated that it intended "to exercise its enforcement authority more rigorously in the future." As part of this, DOE asserted that it would begin this effort by initiating a compliance review of certification reports and "hold manufacturers accountable for any failure to certify covered products in accordance with DOE rules."[82]

DOE announced in December 2009 a thirty-day grace period for manufacturers to submit accurate certification reports and compliance statements.[83] At the end of that period, DOE announced that it had received certifications from over 160 manufacturers for over 600,000 residential appliances in fifteen product categories. DOE then said that it will "aggressively pursue" manufacturers who fail to comply with the certification rules or whose products violate DOE efficiency standards.[84]

In May 2010, DOE issued guidance on imposition of civil penalties for energy efficiency violations.[85] DOE stated that its goals in assessing penalties are "(1) to deter future violations; (2) to ensure consistency and equity in the assessment of penalties; and (3) to encourage complete and timely resolution of any instances of noncompliance."[86] DOE's guidance stated that for knowingly distributing a product that violates a mandatory conservation standard, it will seek the maximum civil penalty—$200 per unit distributed in commerce. For failure to certify, DOE was adopting an approach of assessing a penalty of $7,300 per basic model—10 percent of the $200 maximum penalty ($20 per day) per model for one year (subject to various adjustments). It has adopted a rebuttable presumption that a model has not been reported for one year. In assessing a penalty, DOE would also take into account other factors in order to ensure the fair and reasonable application of penalties. These include, but are not limited to, the size of the violator; the extent of deviation from the EPCA requirements; the technical reason, if any, for the noncompliance; the violator's history of compliance or noncompliance; the violator's ability to pay; self-reporting of violations; and corrective actions taken. DOE may also adjust penalties as appropriate to encourage the prompt and comprehensive resolution of cases.

On September 16, 2010, DOE issued an extensive NOPR on certification, compliance, and enforcement.[87] The proposal underscores the strong enforcement orientation of DOE under the Obama administration. For example, it proposes to include an annual reporting requirement for all covered products and covered equipment. It proposes to expand the information submitted by manufacturers in certification reports. It also proposes to establish a standardized process for seeking injunctive

relief, civil penalties, or other remedies for violations of conservation standards and/or certification requirements.

In November 2009, DOE announced a $13.9 million grant to the National Energy Technology Laboratory in Morgantown, West Virginia, to construct a 35,000 square foot Performance Verification Laboratory to perform nearly seventeen thousand verification tests per year on a broad range of residential and commercial appliances.[88]

In November 2010, DOE launched a new Fraud Reporting web page "to make it easier for members of the public to report suspected incidents of fraud, waste, and abuse, and to enable the Department to keep the public better informed about potential fraud involving DOE programs." DOE will examine allegations and refer matters for action, "including—where appropriate—the institution of criminal proceedings."[89]

The FTC has also been active in enforcement. For example, in November 2010, it announced penalties of over $400,000 against three retailers for failure to post EnergyGuide labels on their websites. And it notified two other online sellers that it would seek a total $640,000 in penalties from them.[90]

Energy Star

An increasingly important feature of federal appliance efficiency efforts is the voluntary Energy Star program.[91]

Begun in 1992 by EPA, Energy Star involves both EPA and DOE. The program has gathered steam over the years due to the value in the market of an Energy Star label. Manufacturers in designing products generally ask themselves not only whether a product meets a federal mandatory standard but also whether it will meet Energy Star criteria. The Energy Star program has gained substantial additional heft due to such things as Executive Order 13123, which requires federal agencies to select, where life-cycle cost-effective, Energy Star and other energy-efficient products when acquiring energy-using products[92] and utility rebate programs that key off of Energy Star.[93]

The program entails manufacturers entering into voluntary agreements with DOE or EPA, depending on the product involved, and allowing the manufacturer to use the Energy Star logo for products that meet certain criteria. These criteria generally are that a product is substantially more efficient than the applicable mandatory federal efficiency standard. Energy Star often has added criteria, and the program includes coverage of some products that are not subject to DOE mandatory standards.

Energy Star has been able to move relatively quickly in comparison with the DOE mandatory efficiency program, which is subject to extensive rules on determining whether an appliance standard is technically feasible and economically justified (see discussion above).

In response to criticisms that the program was being operated within insufficient opportunity for public comment and insufficient lead times, Congress amended EPCA to require the Energy Star program generally to obtain comments on proposed criteria and to provide lead times of 270 days before they go into effect (unless the program specifies otherwise). The effective dates are supposed to take into account the timing

requirements for manufacturing, product marketing, and distribution processes of the products involved.[94]

Televisions are an example of an Energy Star program for products for which there is not a mandatory federal efficiency standard. (DOE intends to establish a standard for televisions.[95]) Energy Star had set on-mode power consumption levels for non-high definition, high definition, and full high definition televisions, and imposed a requirement that standby power consumption not exceed 1 watt.[96] New rules that took effect on May 1, 2010, and that will ramp up further on May 1, 2012, increase the stringency of the program, including new on-mode power criteria, ensure a satisfactory level of brightness, and curb energy associated with downloading program guide data.[97] Energy Star has asserted that the 2010 rules offer consumers a savings of more than 40 percent and that the 2012 rules will be as much as 65 percent more efficient than models currently on the market.[98]

In September 2009, DOE and EPA entered into a Memorandum of Understanding (MOU) making EPA the lead agency on the Energy Star program, but continuing to provide an important role for DOE.[99]

The MOU provides that the Energy Star program will be enhanced in four ways.

1. Specifications will be set so that the Energy Star logo is applied consistently with established program principles and with approximately only the top quartile of products eligible.[100]
2. Product coverage will be expanded to include new consumer products with high energy saving potential. The MOU states that "the program will aim to cover as many energy using consumer products as possible, with a focus on product categories in widespread use and with significant energy consumption." The goal is "doubling the annual addition of products from the current level, based on the availability of resources."
3. An "Energy Super Star" program will be nested within the Energy Star program to enable consumers to identify the top-performing products.
4. Verification of compliance with program requirements will be increased and efforts will be enhanced to identify and address product performance issues.

EPA is to manage the Energy Star products program and the Energy Super Star program, while DOE takes the lead in development of product testing procedures and metrics. Specifications are to be set by EPA, with technical support from DOE. Each agency is to support the other as necessary.

DOE and EPA have taken further steps to carry out the increased verification of compliance with Energy Star rules.[101] In March 2010, they announced that DOE had begun tests on six of the most common product types (freezers, refrigerator-freezers, clothes washers, dishwashers, water heaters, and room air conditioners) at third-party independent laboratories. In addition, the agencies stated that they were developing an expanded system that would require all products seeking the Energy Star label to be tested in approved laboratories and require manufacturers to participate in an ongoing verification testing program that will ensure continued compliance.[102]

Energy Star was stung by a Government Accountability Office (GAO) report in March 2010. The report found that the Energy Star product qualification process is vulnerable to fraud and abuse.[103] GAO investigators were able to obtain Energy Star qualification for fifteen bogus products (including a gasoline-powered alarm clock and a purported room air cleaner that was a space heater with a feather duster and fly strips attached to it). The problem seemed to stem primarily from Energy Star not verifying manufacturers' energy-savings data. Energy Star responded quickly, stating on March 30, 2010, that it was accelerating program enhancement efforts related to qualification and verification and was taking the following steps effective immediately:

- Products may no longer be labeled by manufacturers until qualifying product information, including a lab report, is submitted to and approved by EPA.
- EPA's automated review process was being temporarily suspended and qualified product information sheets were being held.
- New Energy Star partners would no longer be granted access to the Energy Star mark upon joining the program; going forward, the mark would be made available to partners only after a qualifying product is submitted and approved.[104]

In April 2010, EPA and DOE fleshed out the details of changes to strengthen the Energy Star program. Manufacturers wishing to qualify their products as Energy Star "must submit complete lab reports and results for review and approval by EPA prior to labeling." EPA is no longer relying on an automated approval process; all new qualification applications "will be reviewed and approved individually by EPA." By the end of 2010, all manufacturers must submit test results from "an approved, accredited lab for any product seeking the Energy Star label."[105] In October 2010, Energy Star finalized for all product categories requirements for third-party certification of product performance and testing in EPA-recognized laboratories. EPA is requiring use of revised Partnership Commitments, including participation in third-party certification, as a condition of participation in the Energy Star program. And the Energy Star program is strengthening its infrastructure of controls, audits, and other enforcement measures, such as adoption of DOE's Energy Star Verification Testing Pilot Program.[106]

Further refinements of the Energy Star program were proposed in the Waxman-Markey bill.[107] The bill would have required EPA to establish a rating system for Energy Star products, periodically review and update Energy Star product criteria, and periodically verify compliance with those criteria.[108] As discussed above, the bill was not adopted. Nonetheless, some of its concepts are being carried out, such as updating and verifying compliance with Energy Star criteria.

Lighting

Over the years, more and more lighting products have been added to the DOE energy efficiency program. The program applies to numerous lighting products, and there is a robust Energy Star lighting program.

Initially, the DOE standards program covered fluorescent lamp ballasts. The 1988 amendments to EPCA[109] established standards for certain fluorescent lamp ballasts.[110] The amendments also required DOE to conduct two rulemaking cycles to determine whether to amend the standards for these products and whether to amend the standards to apply to additional fluorescent lamp ballasts.[111] In 2000, DOE published a rule in the first rulemaking,[112] and it is moving forward with the second rulemaking.[113] Congress in the Energy Policy Act of 2005 established supplementary standards for ballasts that operate additional types of fluorescent lamps.[114] In 2007, Congress passed EISA, requiring that DOE amend its test procedures to include standby mode and off mode[115] and to include these modes in any amended or new standard adopted after July 10, 2010.[116] DOE has amended its test procedure to include these modes.[117] It has also initiated a rulemaking to amend the test procedure for active mode energy consumption.[118]

The 1992 amendments to EPCA established standards for some fluorescent lamps and incandescent lamps.[119] The amendments also provided for further rulemaking to consider broadening the standards to include additional fluorescent and incandescent lamps if warranted.[120] EISA amended EPCA in 2007 to require DOE to conduct new standards rulemakings and provided additional rules for general service fluorescent lamps, incandescent reflector lamps, and general service incandescent lamps.[121] Thus, for general service incandescent lamps, EISA requires that manufacturers improve the efficiency and lifetime requirements of these lamps over a two-year period, beginning on January 1, 2012. The National Electrical Manufacturers Association (NEMA) has stated that the EISA requirements for general service incandescent lamps "will essentially phase-out the most common incandescent light bulbs by 2012–2014."[122]

In 2009, DOE issued a final rule amending the standards for general service fluorescent lamps and incandescent reflector lamps, effective July 14, 2012. It also established standards and test procedures for additional types of general service fluorescent lamps.[123]

The DOE standards program covers a variety of additional lighting products. These include, e.g., rough service lamps, vibration service lamps, three-way incandescent lamps, 2,601–3,300 lumen general service incandescent lamps, and shatter-resistant lamps;[124] torchieres;[125] traffic signal modules and pedestrian modules;[126] medium-base compact fluorescent lamps;[127] mercury vapor lamp ballasts;[128] ceiling fans and ceiling fan light kits;[129] and metal halide lamp fixtures.[130] DOE has been working closely with standards-setting organizations to accelerate development of solid state lighting (SSL) standards.[131]

EISA also requires the FTC to conduct a rulemaking to consider the effectiveness of its current energy labeling requirements for "lamps," commonly referred to as light bulbs, and to consider alternative labeling approaches.[132] Pursuant to that directive, the FTC has issued a rule, effective in July 2011, that will require a label on the front of the package that will feature the lamp's brightness as measured in lumens, rather than a measurement of watts, and will also include an estimated yearly energy cost. The back of the package must have a "Lighting Facts" panel, including brightness, yearly energy cost, life, light appearance (ranging from warm to cool), energy used (in watts), and presence of mercury.[133]

In addition, an Energy Star program for lighting has been developed. This includes minimum efficacy (lumens/watt), life, and other criteria for compact fluorescent lamps (CFLs),[134] light fixtures,[135] SSL products;[136] and integral LED lamps.[137]

DOE, spurred by Congress, continues to push for improvement in lighting efficiency. In the Energy Policy Act of 2005, Congress directed DOE to create a Next Generation Lighting Initiative "to support research, development, demonstration, and commercial application activities related to advanced solid-state lighting technologies based on white light emitting diodes."[138] It also directed DOE to conduct a program of fundamental research to support the initiative.[139] Consistent with this, DOE has provided several rounds of funding for SSL. In January 2010, it announced more than $37 million in funding from the American Recovery and Reinvestment Act to support seventeen SSL projects, including research, product development, and improving manufacturing.[140] The Waxman-Markey bill[141] contained provisions for additional lighting standards, including outdoor luminaires, outdoor high light output lamps, and portable light fixtures. And the subsequently introduced Bingaman bill[142] contained provisions for lighting standards, including portable light fixtures,[143] GU-24 base lamps,[144] incandescent reflector lamps and reflector lamps,[145] and outdoor lighting.[146]

Computers, Monitors, Data Centers, and Computer Servers

Computers

Computers make economies more efficient.[147] At the same time, the increase in their use and their power is stimulating additional scrutiny on how they can be made more efficient.[148] And, various features such as a mouse, keyboard, or memory stick plugged into a USB port of a computer reportedly can keep a computer active.[149]

While there currently is no mandatory DOE efficiency standard for computers, there is an extensive program under Energy Star. Current eligibility criteria cover desktop computers, integrated desktop computers, notebook computers, workstations, game consoles, small-scale servers, and thin clients.[150] The products not covered by these new criteria are computer servers (as defined in Version 1.0 Computer Server specification), handhelds, PDAs, and smartphones. The eligibility criteria include power supply efficiency; typical energy consumption (TEC) levels, which take into account typical electricity consumed by a product in normal operation during a representative period of time, including power in off, sleep, and idle modes; and power management requirements, including shipping with certain settings for the sleep mode, display sleep mode, wake on LAN, and wake management. The power management is intended to put computers into a sleep mode after a designated period of inactivity.

Monitors

There currently is no mandatory DOE efficiency standard for monitors. Energy Star has a program for them.

A new set of criteria sets a more stringent level and expands the range of display products eligible for the Energy Star label. It also includes digital picture frames and larger commercial displays (up to 60 inches diagonal).[151] The criteria include rules for on mode power consumption levels, maximum sleep mode power consumption, and maximum off mode power consumption. Tier 1 criteria became effective on October 30, 2009, for diagonal screen size less than 30 inches, and on January 30, 2010, for diagonal screen size 30–60 inches. Tier 2 levels go into effect on October 30, 2011.

Data Centers and Computer Servers

There are also an increasing number of initiatives under way concerning energy-efficient data center and computer servers. In 2006, Congress directed EPA to develop a report assessing the rapid growth and energy consumption of computer data centers by the federal government and private enterprise.[152] The study was to cover data centers and computer servers. The law also included a "sense of Congress" that it is in the best interest of the United States for purchasers of computer servers to give high priority to energy efficiency as a factor in determining best value and performance for purchases of computer servers.[153]

In response, EPA in 2007 issued a report on current trends in energy use and energy costs of data centers and computer servers in the United States and emerging opportunities for improved energy efficiency.[154] The report stated that there is significant potential for energy efficiency improvement. It made a number of recommendations, including standardized performance measurements for data centers, federal leadership, private sector challenging, and information on best practices. The report stated that the federal government should work with industry to develop objective, credible energy performance metrics for this equipment. It stated that, using these metrics, the government should also investigate whether the development of Energy Star specifications for these product categories would be an effective strategy to complement whole facility approaches. The report also recommended that if and when Energy Star specifications are developed, federal procurement specifications that build on Energy Star should be implemented.

In May 2009, Energy Star issued criteria for computer servers, defined as computers that provide services and manages networked resources for client devices, such as desktop computers, notebook computers, thin clients, wireless devices, PDAs, IP telephone, other computer servers, and other networked devices.[155]

The Energy Star Tier 1 criteria, which went into effect on May 15, 2009, are limited to computer servers having at most four processor sockets. Also excluded are blade systems, including blade servers and blade chassis; fully fault-tolerant servers; server appliances; multi-node servers; storage equipment, including blade storage; and network equipment.

To qualify for an Energy Star label under Tier 1, computer servers must meet multiple criteria. Among other things, power supplies used in computer servers must meet minimum efficiency requirements. Computer servers must not exceed specified idle power levels. There are additional idle power allowances for extra components

such as additional power supplies, additional hard drives, additional memories, and additional I/O devices.

Energy Star is in the process of developing Tier 2 specifications for computer servers.[156] A focus of Tier 2 development is evaluation of servers while performing actual computing work (active mode efficiency), a criterion deliberately omitted from the first set of criteria in order to allow for additional discussion of the topic.

Energy Star is also developing specifications for data centers.[157] The criteria will include power supply unit (PSU) efficiency, PSU power factor, active state efficiency, idle state efficiency, and power management.

A key event in the data centers specifications process was a meeting in January 2010 of eight organizations (including DOE and EPA) that set or use data center efficiency metrics. They developed an agreement setting forth "guiding principles" for data center energy efficiency metrics.[158]

In brief, these "guiding principles" included the following. (1) Power Usage Effectiveness (PUE) using source energy consumption is the preferred energy efficiency metric for data centers. PUE is defined as "a measurement of the total energy of the data center divided by the IT energy consumption." (2) When calculating PUE, IT energy consumption should, at a minimum, be measured at the output of the uninterruptible power supply (UPS). However, over time, measurement of IT energy directly at the IT load (i.e., servers) should become the common practice. (3) For a dedicated data center, the total energy in the PUE equation will include all energy sources at the point of utility handoff to the data center owner or operator. For a data center in a mixed-use building, the total energy will be all energy required to operate the data center and should include IT energy, cooling, lighting, and support infrastructure for the data center operations.

State Involvement in Appliance Energy Efficiency

Despite strong federal preemptive provisions,[159] some states, particularly California,[160] have remained active in energy efficiency. State involvement has included rules for products that purportedly are not covered by federal mandatory efficiency standards,[161] as well as certain activities consistent with exceptions to preemption, such as federal waivers of preemption,[162] state procurement,[163] and building code requirements meeting certain criteria.[164] State appliance efficiency regulations and preemption are discussed in further detail in chapter 3.

Full-Fuel-Cycle Measurements

DOE appliance efficiency standards are set on the basis of the energy used to operate the appliance, called "site" or "point of use" energy. This reflects the fundamental definition in EPCA of "energy use," namely, "the quantity of energy directly consumed by a consumer product," as determined in accordance with DOE test procedures.[165] Hence, standards are not set on the basis of the energy consumed in producing and distributing the power used to operate the appliances.

There has been considerable focus on whether there should be a "full-fuel-cycle" (FFC) measurement used in setting appliance standards. A congressionally mandated[166] report released by the National Academy of Sciences suggested further investigation into using an FFC measurement where more than one fuel is used in an appliance (e.g., a heating system with a gas furnace and an electric fan) or when more than one fuel can be used for the same application. The report indicated that this would provide consumers with a more complete picture of product efficiency, energy consumption, and environmental impacts.[167] The report indicated that the current use of site energy consumption is effective for setting standards for single-fueled appliances within the same class and should continue without change.

The report was not unanimous: there were two minority opinions. David H. Archer stated that the report diverts attention from the purpose of the DOE energy efficiency program: to assure that appliances are efficient, "not to compare the energy use of appliances using different energy sources on the basis of full fuel cycle energy consumption."[168] Ellen Berman stated that developing a FFC cost methodology is "fraught with complexity and controversy" and that the current measurements best serve the goals of the DOE efficiency program.[169] She further took the position that direct comparisons among fuels would favor one fuel over another, which is beyond the scope of the program.

DOE has taken the report's recommendations into account. In August 2010, it announced a proposed policy to use FFC measures of energy, greenhouse gas (GHG) emissions, and other emissions in the national impact analyses and environmental assessments included in future energy conservation standards rulemakings.[170] FFC would be used rather than the "primary energy" measures DOE currently uses. DOE also announced that it proposed to work collaboratively with the FTC to make FFC energy and GHG emissions data available to the public to enable consumers to make cross-class comparisons.

International Involvement in Appliance Efficiency

Appliance efficiency has an important international component. There are appliance efficiency rules throughout the world.[171] International initiatives on appliance energy efficiency also include the International Partnership for Energy Efficiency Cooperation (IPEEC), formed in 2008 by the G8 countries, China, India, South Korea, and the European Community. The purpose of IPEEC is "to facilitate those actions that yield high energy efficiency gains." These include, inter alia, exchanging information on standards and labeling.[172]

Of substantial interest for the North American market are the appliance standards program of Canada. The Canadian program was established pursuant to the Energy Efficiency Act of 1992.[173] The Act requires compliance with energy efficiency standards and labeling requirements.[174] It is backed by regulations imposing standards for a wide variety of products.[175] The regulations are administered by Natural Resources Canada (NRCan). In addition, there is an agreement between Canada and EPA allowing Canada to use the Energy Star logo for products in Canada. The

Energy Star program in Canada is administered by NRCan. Canadian involvement in appliance efficiency includes not only the Canadian government, but also the Canadian Standards Association (CSA), which conducts testing pursuant to NRCan rules. Mexico also has a program for mandatory and voluntary standards.[176]

The North American Energy Working Group (NAEWG)—established in 2001 by DOE, the Canadian Minister of Natural Resources, and the Mexican Secretary of Energy—seeks to enhance North American energy cooperation, including efficiency programs. NAEWG's focus includes potential harmonization of test procedures, increased mutual recognition of laboratory results, and enhanced cooperation in voluntary enforcement of labeling programs such as Energy Star.[177]

Conclusion

Appliance energy efficiency is an important federal, state, and international policy to achieve environmental, economic and strategic goals. All signs point to much more to come. DOE, EPA, and the FTC are pressing forward vigorously with programs. Mandatory standards will multiply to cover more products and to become more stringent. The Energy Star program will be an even larger carrot to induce efficiency gains above mandatory levels. Procurement rules and rebate programs keying off Energy Star will push efficiencies upward. Enactment of the "Energy Super Star" program, or a program similar to the "Best-in-Class Appliances Deployment Program," could well drive efficiencies even higher. Added to this are increasing efficiency rules throughout the world and greater levels of international cooperation and coordination.

In short, appliance efficiency has come a long way since the Oil Embargo stimulated Congress to act in 1975, and it has an exciting future.

Notes

1. Pub. L. No. 94-163, 89 Stat. 926 (1975).
2. *See* 10 C.F.R. pts. 430, 431.
3. *See* 16 C.F.R. pt. 305.
4. 42 U.S.C. § 6293(c); *see* 10 C.F.R. § 430.23 and related appendices for test procedures.
5. 42 U.S.C. § 6295; 10 C.F.R. § 430.32.
6. 42 U.S.C. § 6294(c); 16 C.F.R. pt. 305.
7. 42 U.S.C. § 6297.
8. *Id*. § 6297(e), (f).
9. *Id*. § 6297(d).
10. *Id*. §§ 6302–6305, 6316.
11. Examples are testing and certification programs for central air-conditioning and heating products managed by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) and the programs for refrigerators and freezers, room air conditioners, room air cleaners, and dehumidifiers managed by the Association of Home Appliance Manufacturers (AHAM).
12. 42 U.S.C. § 6294a.
13. S. Rep. No. 516, 95th Cong., 1st Sess. 116 (1975), U.S.C.C.A.N. 1975, p. 1762 (conference report).
14. Pub. L. No. 95-619, 92 Stat. 3288 (1978).
15. 48 Fed. Reg. 39,376 (Aug. 30, 1983); 47 Fed. Reg. 57,198 (Dec. 22, 1982).

16. 42 U.S.C. §§ 6295(o)(3), 6297.
17. Natural Res. Def. Council v. Herrington, 768 F.2d 1355 (D.C. Cir. 1985).
18. 768 F.2d at 1433.
19. *Id*.
20. *Id*.
21. H.R. Rep. No. 100-11, 100th Cong., 1st Sess., 27–28 (1987); *see* S. Rep. No. 100-6, 100th Cong., 1st Sess. 4 (1987) ("appliance manufacturers were confronted with the problem of a growing patchwork of differing state regulations").
22. Pub. L. No. 100-12, 101 Stat. 103 (1987); *see* H.R. Rep. No. 100-11, at 28.
23. 42 U.S.C. § 6295.
24. *Id*. § 6297(c).
25. *Id*. § 6297(d).
26. *Id*. § 6295.
27. *Id*. § 6295(o)(2)(A).
28. Pub. L. No. 102-486, 106 Stat. 2806 (1992).
29. *See* Department of the Interior and Related Agencies Appropriations Act for Fiscal Year 1996, contained in the Omnibus Consolidated Rescissions and Appropriations Act of 1996, Pub. L. No. 104-134, 110 Stat. 1321 (1996).
30. The National Performance Review began in 1993 when President Clinton initiated a review of the federal government. He placed Vice President Gore as head of the project.
31. 61 Fed. Reg. 36974 (July 15, 1996). These procedures appear at 10 C.F.R. pt. 430, subpart C, app. A.
32. *See* New York v. Bodman, Nos. 05 Civ. 7807 (JES), 05 Civ. 7808 (JES), 2007 U.S. Dist. LEXIS 80980 (S.D.N.Y. Nov. 1, 2007).
33. Pub. L. No. 109-58, 119 Stat. 624 (2005).
34. Pub. L. No. 110-140, 121 Stat. 1549 (2007).
35. Memorandum from President Barack Obama for Secretary of Energy (Feb. 5, 2009) on: Appliance Efficiency Standards, *available at* http://www.whitehouse.gov/the_press_office/ApplianceEfficiencyStandards/.
36. *Appliance Standards Improvement Act of 2009: Hearing Before the S. Comm. on Energy & Natural Resources*, 111th Cong. (Mar. 19, 2009) (statement of David Rodgers, Director, Strategic Planning & Analysis, DOE Office of Energy Efficiency & Renewable Energy).
37. 42 U.S.C. § 6295(p)(4).
38. *Id*. § 6295(m)(1)–(2).
39. Statement by David Rodgers, *supra,* note 36.
40. 42 U.S.C. § 6293(b)(1).
41. *Id*. § 6295(o)(6).
42. See H.R. Rep. No. 100-11, *supra* note 21, at 28 (the 1987 NAECA amendments to EPCA "realize[] a long-term objective of a rigorous, uniform standard effective in all 50 states.").
43. American Clean Energy and Security Act, H.R. 2454, 111th Cong., 1st Sess. § 211 (2009).
44. *Id*. § 212.
45. *Id*. § 214.
46. *See* www.energystar.gov.
47. S. 3925, 111th Cong., 2d Sess. (2010).
48. As previously stated, Congress has amended EPCA to eliminate the requirement for an ANOPR for certain products. *See* 42 U.S.C. § 6295(m)(1)–(2).
49. *See, e.g.*, 42 U.S.C. § 6295(d)(3) (central air conditioners).
50. *Id*. § 6295(o).
51. *Id*. § 6295(o)(2)(B)(ii).
52. *Id*. § 6295(o)(3)(B).
53. *Id*. § 6295(o)(4).
54. *Id*. §§ 6295(o)(3), 6297.
55. *See supra* text accompanying note 16.

56. DOE, Office of the Gen. Counsel, DOE Announces Changes to the Energy Conservation Standards Process (Nov. 16, 2010), http://www.gc.energy.gov/1633.htm.

57. *Id*.

58. *Id*.

59. 42 U.S.C. § 6295(d); see *supra* text accompanying notes 22–23.

60. 66 Fed. Reg. 7170 (Jan. 22, 2001).

61. 67 Fed. Reg. 36368 (May 23, 2002).

62. Natural Res. Def. Council v. Abraham, 355 F.3d 179 (2d Cir. 2004).

63. Air-Conditioning & Refrigeration Inst. v. U.S. Dep't of Energy, No. 01-1370 (4th Cir. 2004).

64. 100 C.F.R. § 430.32(c).

65. AHRI, Agreement on Legislative and Regulatory Strategy for Amending Federal Energy Efficiency Standards, Test Procedures, Metrics and Building Code Provisions for Residential Central Air Conditioners, Heat Pumps, Weatherized and Non-Weatherized Furnaces and Related Matters (Oct. 13, 2009), *available at* http://www.standardsasap.org/documents/furnaceacagreement.pdf.

66. *See* 42 U.S.C. § 6295(o)(6).

67. *See AHRI, Efficiency Advocates Ink Historic Agreement*, Air-Conditioning, Heating, Refrigeration News, Oct. 19, 2009, at 1.

68. AHRI, ACEE, ASE, Fact Sheet on Air Conditioner, Furnace, and Heat Pump Efficiency Standards Agreement, available at http://www.aceee.org/files/pdf/1009hvac_fact_0.pdf.

69. 75 Fed. Reg. 31224 (June 2, 2010).

70. *See, e.g.*, *id*. at 27227 (May 14, 2010) (notice of extension of public comment period, residential central air conditioners and heat pumps); *id*. at 14368 (Mar. 25, 2010) (notice of public meeting and availability of preliminary technical support document, residential central air conditioners and heat pumps); *id*. at 12144 (Mar. 15, 2010) (notice of public meeting and availability of rulemaking analysis plan, furnaces).

71. 42 U.S.C. § 6295(gg).

72. *Id*. § 6295(u). In addition, in procuring appliances, federal agencies are to purchase products that use standby power devices or contain an internal standby power function, and that (if the product is available) use not more than 1 watt in the standby power consuming mode. *Id*. § 8259b(e).

73. *See, e.g.*, 10 C.F.R. § 430.23(c) (dishwashers); *id*. pt. 430, subpart B, app. C (same); *id*. pt. 430, subpart B, app. H (televisions); *id*. § 430.23(aa) (battery chargers); *id*. pt. 430, subpart B, app. Y (same); *id*. § 430.23(bb) (external power supplies); *id*. pt. 430, subpart B, app. Z (same); *see also* 75 Fed. Reg. 75290 (Dec. 2, 2010) (notice of proposed rulemaking, test procedures for residential dishwashers, dehumidifiers, and conventional cooking products (standby mode and off mode)).

74. *See* www.energystar.gov.

75. *See* Decision and Order, DOE Office of Hearings and Appeals, TEE-0022 (June 24, 2005) (Maytag); TEE-0025 (Sept. 27, 2005) (LG Electronics); TEE-0047 (July 16, 2007) (Samsung). Decisions are *available at* http://www.oha.doe.gov/eecases.asp.

76. 75 Fed. Reg. 59470, 59487–59488 (Sept. 27, 2010).

77. 10 C.F.R. § 430.27.

78. *See, e.g.*, 74 Fed. Reg. 66311 (Dec. 15, 2009) (Mitsubishi Electric & Electronics); *id*. at 66330 (Dec. 15, 2009) (LG Electronics); 70 Fed. Reg. 9629 (Feb. 28, 2005) (Samsung); 69 Fed. Reg. 52660 (Aug. 27, 2004) (Mitsubishi Electric & Electronics).

79. 10 C.F.R. § 430.2; *see id*. § 430.24(m)(2) (units to be tested).

80. *See* 42 U.S.C. §§ 6302–6305, 6316.

81. 74 Fed. Reg. 52973 (Oct. 14, 2009).

82. *Id*.

83. *Id*. at 65105 (Dec. 9, 2009).

84. DOE, DOE Steps Lead to Significant Increase in Compliance with Energy Efficiency Reporting Requirements (Jan. 12, 2010), http://www.energy.gov/news/8511.htm.

Thus, for example, DOE announced that it had resolved, for total civil penalties of $165,104, actions against four showerhead manufacturers for failure to submit required documents demonstrating compliance with federal standards. *See* DOE, Civil Penalty Actions for Certification Violations Resolved (May 6, 2010), http://www.gc.energy.gov/1572.htm. DOE also announced that a manufacturer agreed to cease distribution of certain heat pump and air conditioner models that did not meet federal efficiency standards and to pay a civil penalty of $25,000 for violating DOE's certification requirements. *See* DOE, Aerosys Agrees to Pay Civil Penalty and Submit Test Data in Settlement with DOE (July 6, 2010), http://www.gc.energy.gov/1589.htm.

85. DOE, Guidance on the Imposition of Civil Penalties for Violations of EPCA Conservation Standards and Certification Obligations (May 7, 2010), http://www.gc.energy.gov/documents/Penalty_Guidance_5_7_2010__final_(1).pdf.

86. *Id*. at 2.

87. 75 Fed. Reg. 56796 (Sept. 16, 2010); *id*. at 64173 (Oct. 19, 2010) (extension of comment period).

88. DOE, Department of Energy Announces More Than $104 Million for National Laboratory Facilities (Nov. 18, 2009), http://www.energy.gov/8297.htm.

89. DOE, DOE Launches New Fraud Reporting Web Page (Nov. 16, 2010), http://www.gc.energy.gov/1641.htm.

90. FTC, FTC Fines Online Retailers for Failing to Post EnergyGuide Information for Appliances (Nov. 1, 2010), http://www.ftc.gov/opa/2010/11/appliancelabel.shtm.

91. *See* www.energystar.gov.

92. Greening the Government Through Efficient Energy Management, Exec. Order No. 13123, 3 C.F.R. § 13123 (1999).

93. *See, e.g*., Pacific Gas & Electric, Appliance Rebates, http://www.pge.com/myhome/saveenergymoney/rebates/appliance/; PEPCO, Appliance Rebate Program, at http://homeener gysavings.pepco.com/dc/appliance-rebate#rebates.

94. 42 U.S.C. § 6294a.

95. 74 Fed. Reg. 53640 (Oct. 20, 2009) ("DOE will soon begin a rulemaking process to establish a new Federal test procedure and a new Federal energy-efficiency standard for televisions."); 75 Fed. Reg. 54048 (Sept. 3, 1010) (test procedure for televisions; request for information and comments). In March 2010, the FTC proposed labeling for televisions. *Id*. at 11483 (Mar. 11, 2010). And it sought further comments on labeling for cable and satellite set-top boxes, stand-alone digital video recorders (DVR), personal computers, personal computer monitors, game consoles, multifunction devices, and audio/visual equipment. *Id*. In October 2010, it announced adoption of a rule that after May 10, 2011, television manufacturers must display EnergyGuide labels for televisions. FTC, "Starting in 2011, FTC Will Require EnergyGuide Labels for Televisions"; *see* 16 C.F.R. pt. 305 (Jan. 6, 2011), *available at* http://www.ftc.gov/os/fedreg/2010/october/102710appliancelabelingrule.pdf. The FTC also said in the rule's preamble that it is continuing to consider potential labeling for the other products.

96. Energy Star Program Requirements for Televisions, Partner Commitments Versions 4.1 and 5.1, *available at* http://www.energystar.gov/ia/partners/product_specs/program_reqs/tv_vcr_prog_req.pdf.

97. Energy Star Program Requirements for Televisions, Partner Commitments Versions 4.1 and 5.1, *available at* http://www.energystar.gov/ia/partners/product_specs/program_reqs/tv_vcr_prog_req.pdf.

98. Letter from Katharine Kaplan, EPA, Energy Star for Consumer Electronics, to Energy Star TV Partner or Other Interested Stakeholder (Sept. 3, 2009), *available at* http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/television/4-5_Cover_Memo.pdf.

99. Memorandum of Understanding on Improving the Energy Efficiency of Products and Buildings Between the U.S. Environmental Protection Agency and the U.S. Department of Energy (Sept. 30, 2009), *available at* http://www1.eere.energy.gov/office_eere/pdfs/epa_doe_agreement.pdf.

100. For a discussion of considerations relating to periodically adjusting upward Energy Star criteria, see David A. Fahrenhold, *Wide Variance in Products That Qualify for Federal*

Energy Star Program, Wash. Post, Feb. 22, 2010, at A05, *available at* http://www.washingtonpost.com/wp-dyn/content/article/2010/02/21/AR2010022103688.html.

101. An example of enforcement of Energy Star's rules is DOE's notifying twenty-five manufacturers that it was withdrawing their right to use the Energy Star logo on thirty-four models of compact fluorescent light bulbs. DOE stated that its testing revealed that the affected models do not last as long in regular use as Energy Star certification would require. *See* DOE, Office of the Gen. Counsel, Department of Energy Withdraws the Energy Star Label from 34 Compact Fluorescent Light Bulbs (Jan. 26, 2010), http://www.gc.energy.gov/1241.htm.

102. Press Release, Energy.gov, EPA, DOE Announce New Steps to Strengthen ENERGY STAR (Mar. 19, 2010), http://www.energy.gov/news/8775.htm; Kathleen Vokes & Katharine Kaplan, EPA, Energy Star Products, Enhanced Testing and Verification (Mar. 26, 2010), http://www.energystar.gov/ia/partners/downloads/mou/ES_Enhanced_Testing_and_Verification_Presentation.pdf.

103. Report to the Ranking Member, Comm. on Homeland Sec. & Governmental Affairs, U.S. Senate, *Energy Star Program: Covert Testing Shows the Energy Star Program Certification Process Is Vulnerable to Fraud and Abuse*, GAO-10-470, Mar. 2010, *available at* http://www.gao.gov/new.items/d10470.pdf.

104. Letter from Energy Star to Energy Star Product Manufacturer (Mar. 30, 2010), *available at* http://www.energystar.gov/ia/partners/downloads/Letter_to_Stakeholders.pdf.

105. News Release, "EPA, U.S. EPA, DOE Announce Changes to Bolster Energy Star Program" (Apr. 14, 2010), *available at* http://yosemite.epa.gov/opa/admpress.nsf/f0d7b5b28db5b04985257359003f533b/a1681df7e5a27357852577050058fd62!OpenDocument; see Memorandum from Cathy Zoi, Assist. Sec., DOE, and Gina McCarthy, Assist. Administrator, EPA, to Steven Chu, Sec., DOE, and Lisa P. Jackson, Administrator, EPA, "Building a Stronger Energy Star Program" (Apr. 2, 2010), at http://www.energystar.gov/ia/news/downloads/Joint_Letter_with_DOE_EPA_Building_a_Stronger_Energy_Star_Program.pdf; Sonja Ryst, *U.S. Agencies Try To Restore Faith in Energy Star Appliance Testing*, Wash. Post, July 10, 2010, at http://www.washingtonpost.com/wp-dyn/content/article/2010/07/08/AR2010070806804.html.

106. EPA, EPA Response to OIG Evaluation Report (Oct. 2010), http://www.energystar.gov/index.cfm?c=news.nr_news&news_id=http://www.energystar.gov/cms/default/index.cfm/news-and-announcements/hidden-articles/epa-response-to-oig-evaluation-report/; DOE, FAQ for: ENERGY STAR Verification Pilot Testing Program (Aug. 2010), at http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/faqfinal.pdf; Energy Star, Final ENERGY STAR Partner Commitments and Product Specifications, http://www.energystar.gov/index.cfm?c=partners.draft_commitments_and_specs; Letter from Ann Bailey, Chief, Energy Star Labeling Branch, to ENERGY STAR Manufacturing Partner or Other Interested Party (Oct. 26, 2010), *available at* http://www.energystar.gov/ia/partners//downloads/EPA_Cover_Letter.pdf.

107. American Clean Energy and Security Act, *supra* note 43, § 219.

108. *Id*.

109. National Appliance Energy Conservation Amendments of 1998, Pub. L. No. 100-357.

110. *See* 42 U.S.C. § 6295(g)(5). The DOE standards are set forth in 10 C.F.R. § 430.32(m).

111. 42 U.S.C. § 6295(g)(7).

112. 65 Fed. Reg. 56740 (Sept. 19, 2000).

113. On April 26, 2010, a DOE public meeting covered proposed test procedures and standards. *See* 75 Fed. Reg. 14319 (Mar. 24, 2010); *see also id*. at 14288 (Mar. 24, 2010) (notice of proposed rulemaking for test procedures).

114. Pub. L. No. 109-58, § 135(c)(2) (codified at 42 U.S.C. § 6295(g)(8)(A)).

115. 42 U.S.C. § 6295(gg)(2)(B)(ii).

116. *Id*. § 6295(o).

117. 74 Fed. Reg. 54445 (Oct. 22, 2009).

118. *See* 75 Fed. Reg. 14288 (Mar. 24, 2010) (notice of proposed rulemaking); *id*. at 71570 (Nov. 24, 2010) (supplemental notice of proposed rulemaking).

119. Energy Policy Act of 1992, Pub. L. No. 102-486 (codified at 42 U.S.C. § 6295(i)).

120. *Id*. § 6295(i)(5).

121. *Id*.

122. NEMA Summary and Analysis of the Energy Independence and Security Act of 2007, at 5, *available at* http://www.nema.org/gov/energy/upload/NEMA-Summary-and-Analysis-of-the-Energy-Independence-and-Security-Act-of-2007.pdf. NEMA has stated that these EISA initial standards for general service incandescent lamps can be met by advanced incandescent (including halogen) bulbs. *Id*.

123. 74 Fed. Reg. 34080 (July 14, 2009).

124. 42 U.S.C. § 6295(l).

125. *Id*. § 6295(x).

126. *Id*. § 6295(z).

127. *Id*. § 6295(bb).

128. *Id*. § 6295(ee).

129. *Id*. § 6295(ff).

130. *Id*. § 6295(hh).

131. *See DOE* Solid-State Lighting Research and Development: Manufacturing Roadmap 71 (July 2010), *available at* http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/ssl_manuf-roadmap_july2010.pdf.

132. 42 U.S.C. § 6294(a)(2)(D)(iii).

133. *See* 75 Fed. Reg. 41696 (July 19, 2010), *amending* 16 C.F.R. Part 305.

134. *See* Energy Star Program Requirements for CFLs, Partner Commitments (Mar. 7, 2008), *available at* http://www.energystar.gov/ia/partners/product_specs/program_reqs/cfls_prog_req.pdf.

135. *See* Energy Star Program Requirements for Residential Light Fixtures, Partner Commitments, *available at* http://www.energystar.gov/ia/partners/product_specs/program_reqs/fixtures_prog_req.pdf.

136. *See* Energy Star Program Requirements for Solid-State Lighting Products (SSL), Partner Commitments, *available at* http://www.energystar.gov/ia/partners/manuf_res/downloads/ENERGY_STAR_SSL_Program_Requirements_FINAL.pdf.

137. *See* Energy Star Program Requirements for Integral LED Lamps, Eligibility Criteria (Version 1.1) (amended March 22, 2010), at http://www.energystar.gov/ia/partners/manuf_res/downloads/IntegralLampsFINAL.pdf.

138. Codified at 42 U.S.C. § 16192.

139. Codified at *id*. § 16315.

140. Press Release, Energy.gov. Secretary Chu Announces More than $37 Million for Next Generation Lighting (Jan. 15, 2010), http://www.energy.gov/8527.htm.

141. H.R. 2454, 111th Cong., 1st Sess., § 211.

142. S. 3925, 111th Cong., 2d Sess.

143. *Id*. § 4.

144. *Id*. § 5.

145. *Id*. § 18.

146. *Id*. § 22.

147. *See, e.g*., J.A. Laitner, C.P. Knight, V.L. McKinney, & K.E. Ehrhardt-Martinez, American Council for an Energy-Efficient Economy, Semiconductor Technologies: The Potential to Revolutionize U.S. Energy Productivity, Rep. No. E094 (May 2009), http://aceee.org/pubs/e094.pdf?CFID=4364642&CFTOKEN=24098187.

148. *See, e.g*., Int'l Energy Agency, Gadgets and Gigawatts—Policies for Energy Efficient Electronics (OECD Pub. 2009).

149. *See* Tyler Hamilton, *Expectation of Gadgets Predicts Global Power Surge*, thestar.com, May 14, 2009, http://www.thestar.com/news/canada/article/634138.

150. Energy Star Program Requirements for Computers, (Version 5.0), *available at* http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/computer/Version5.0_Computer_Spec.pdf.

151. Energy Star Program Requirements for Displays (Version 5.0), *available at* http://www.energystar.gov/ia/partners/product_specs/program_reqs/displays_spec.pdf.

152. Pub. L. No. 109-431, § 1, 120 Stat. 2920 (2006).

153. *Id*. § 2.

154. EPA, Energy Star Program, Report to Congress on Server and Data Center Energy Efficiency, Public Law 109-431 (Aug. 2, 2007), *available at* http://www.energystar.gov/ia/partners/prod_development/downloads/EPA_Datacenter_Report_Congress_Final1.pdf.

155. *See* Energy Star Program Requirements for Computer Servers (Version 1.0), *available at* http://www.energystar.gov/ia/partners/product_specs/program_reqs/servers_prog_req.pdf.

156. *See* Energy Star, Computer Servers, http://www.energystar.gov/index.cfm?c=revisions.computer_servers.

157. Energy Star, Data Center Storage, http://www.energystar.gov/index.cfm?c=new_specs.enterprise_storage; Energy Star Program Requirements for Data Center Storage, Draft 1, Version 1.0, Partner Commitments, at http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/storage/StorageDraft1Version1Specification.pdf.

158. Energy Star, Data Center Industry Leaders Reach Agreement on Guiding Principles for Energy Efficiency Metrics (Feb. 1, 2010), *available at* http://www.energystar.gov/ia/partners/prod_development/downloads/DataCenters_AgreementGuidingPrinciples.pdf.

159. *See* 42 U.S.C. § 6297.

160. *See* Cal. Energy Comm'n, Appliance Efficiency Regulations, Cal. Code Regs., tit. 20, §§ 1601–1608.

161. *See, e.g*., *id*. § 1605.3(v) (consumer audio and video equipment).

162. 42 U.S.C. § 6297(d).

163. *Id*. § 6297(b)(2), (c)(1), (e).

164. *Id*. § 6297(f).

165. 42 U.S.C. § 6291(4).

166. Energy Policy Act of 2005, § 1802, Pub. L. No. 109-58 (2005), requires DOE to contract with the National Academy of Sciences "to examine whether the goals of energy efficiency standards are best served by measurement of energy consumed, and efficiency improvements, at the actual site of energy consumption, or through the full fuel cycle, beginning at the source of energy production."

167. Nat'l Research Council, Review of Site (Point-of-Use) and Full-Fuel-Cycle Measurement Approaches to DOE/EERE Building Appliance Energy-Efficiency Standard, Letter Report (May 2009), *available for free download at* http://www.nap.edu/catalog/12670.html.

168. *Id*. attachment H, Minority Op. of David H. Archer.

169. *Id*. attachment I, Minority Op. of Ellen Berman.

170. 75 Fed. Reg. 51423 (Aug. 20, 2010).

171. A worldwide listing of standards is contained in the website of the Collaborative Labeling and Appliance Standards Program (CLASP), www.CLASPonline.org. CLASP was formed in 1999 by the International Institute for Energy Conservation, Lawrence Berkeley National Laboratory, and the Alliance to Save Energy to establish regional standards.

172. Declaration, International Partnership for Energy Efficiency Cooperation (IPEEC), *available at* http://www.enecho.meti.go.jp/topics/g8/ipeecsta_eng.pdf.

173. Energy Efficiency Act, S.C. 1992, c. 36 (Can.).

174. *Id*. § 4.

175. Regulation Respecting Energy-Using Products and Requirements Pertaining to their Importation and Interprovincial Shipment (SOR/94-651).

176. *See* Ley Federal Sobre Metrología y Normalización (1992), *available at* http://www.diputados.gob.mx/LeyesBiblio/pdf/130.pdf.

177. *See* NAEWG, North American Energy Efficiency Standard and Labeling, *available at* http://www1.eere.energy.gov/buildings/appliance_standards/pdfs/naewg_report.pdf.