The Federal Energy Policy Act of 2005 and its Implications for Energy Efficiency Program Efforts

Steven Nadel

September 2005

Report Number E053

1001 Connecticut Avenue, NW, Suite 801, Washington, D.C. 20036
202-429-8873 phone, 202-429-2248 fax, http://aceee.org Web site

CONTENTS

ABSTRACT

In August 2005, the Energy Policy Act of 2005 was signed into law. This is the first major piece of federal energy legislation since 1992. The new law took five years to develop as many controversial provisions were considered but ultimately not included. The new law includes two major energy efficiency provisions: (1) manufacturer and consumer tax incentives for advanced energy-saving technologies and practices; and (2) minimum energy efficiency standards on 16 products. The law also includes a host of smaller efficiency provisions.

The tax incentive provisions provide more than $2 billion for advanced energy-saving technologies and practices beginning in 2006 and generally extending for two years.

- Utilities and other agencies implementing electricity-saving programs should gear their programs to complement these new tax incentives, including enhanced programs to promote efficient new homes; new commercial buildings; appliances; heating, air conditioning, and water heating equipment; and retrofits to existing homes.
- State agencies and others interested in distributed generation should consider policy initiatives and promotions to complement federal incentives for stationary fuel cells and microturbines.
- States and others interested in promoting advanced cars and trucks should use federal hybrid, fuel cell, and advanced diesel vehicle tax credits to support their efforts.

The standards provision adopts standards on 16 products and directs the U.S. Department of Energy (DOE) to conduct rulemakings to revise some of these standards and to consider standards on several additional products. Program planners and implementers should consider increasing efforts to promote adoption of efficient products that will soon be subject to these DOE rulemakings, including refrigerated beverage vending machines, external power supplies, dehumidifiers, many types of commercial refrigeration systems, and ice makers. By helping to better establish these advanced products in the market, program operators can increase the chances that DOE will adopt standards that achieve substantial savings.

ACKNOWLEDGMENTS

Funding for this research was provided by grants from the Energy Foundation and Pew Charitable Trusts and a contract with the U.S. Department of Energy through Oak Ridge National Laboratory. Bill Prindle assisted with the research for this report. Helpful comments on a draft were provided by Neal Elliott, David Goldstein, Therese Langer, Glenn Reed, and Marci Sanders. To all of these people and organizations we are grateful.

INTRODUCTION

Congress has worked on new energy legislation since 2001. This is the first major piece of federal energy legislation since the Energy Policy Act of 1992. A bill was almost enacted in 2003, but ultimately failed when the Senate refused to approve a conference report developed by a limited number of Senators and Representatives. In 2005, Congress started work afresh. The House passed a new bill in April 2005 and the Senate followed suit in June. A House-Senate conference committee worked hard through July and the conference report was approved by both houses of Congress in late July and signed into law by the President on August 8, 2005. The 2005 effort was successful because the Senate and conference worked in a bipartisan manner and ultimately agreed to drop several controversial provisions that unified opposition to the 2003 conference agreement.

The new law contains 18 titles dealing with such subjects as energy efficiency, renewable energy, oil and gas, coal, nuclear power, vehicles and fuel, hydrogen, research and development, electricity, tax incentives, ethanol, and motor fuels (U.S. Congress 2005). The new legislation contains several energy efficiency provisions. This report briefly reviews some of the most significant of these provisions and discusses the implications of these provisions for energy efficiency program planners and implementers. The new federal legislation will have a significant impact on the market for some efficient products and services; program planners need to understand these provisions in order to design their activities to best complement the bill, so that the federal legislation plus regional, state, and local programs provide the largest possible quantity of cost-effective energy savings. This new legislation, combined with existing programs, provides an opportunity to transform several markets for energy-saving technologies and practices so that efficient goods and services become the norm.

The new law contains two significant energy efficiency provisions that deserve particular attention. First, it contains tax incentives for several types of advanced energy-saving technologies and practices. Second, it sets new minimum-efficiency standards on several products and directs DOE to set standards on several other products. These two provisions will save a substantial amount of energy—and will save even more energy if complementary regional, state, and local programs are offered. In the following sections, we discuss these two major provisions and their implications for program planners and implementers. We then briefly discuss several other provisions that program planners should be aware of, discuss what's not in the bill, consider future legislative prospects, and finally draw a few conclusions.

ACEEE has written this report now to help program planners and implementers develop their programs for 2006 and succeeding years.

TAX INCENTIVES

The new law includes substantial energy efficiency tax incentives. According to Congress' Joint Tax Committee, the bill provides more than $2 billion for energy efficiency tax credits (including efficient vehicles), primarily in 2006 and 2007 (JCT 2005). The subsections below describe these energy efficiency provisions in the new law.[1]

New Homes

The new legislation includes a credit of $2,000 for builders who build homes that use 50 percent less energy for space heating and cooling than homes built according to the 2003 International Energy Conservation Code (IECC), including supplements in effect as of the date when the bill was enacted. In addition, there is a $1,000 manufacturer tax credit for manufactured homes that either use 30 percent less energy than this reference code or that meet the then-current ENERGY STAR® criteria for manufactured homes. For homes meeting the 50 or 30 percent savings criteria, at least 10 percent savings (one-third of the 30 percent savings or one-fifth of the 50 percent savings) must be obtained through building envelope improvements—all the savings cannot be obtained with heating, ventilating, and air conditioning (HVAC) improvements (this provision does not apply to ENERGY STAR manufactured homes). These tax credits cover homes acquired between January 1, 2006 and December 31, 2007. Details on how new homes will be certified need to be set by the Secretary of the Treasury in consultation with DOE.

Many residential new construction programs are now based on the ENERGY STAR New Homes program, which calls for 30 percent space heating, space cooling, and water heating savings relative to the 1993 Model Energy Code. The U.S. Environmental Protection Agency (EPA) is now revising these criteria and has proposed that for site-built homes, the criteria become 15 percent in the South and 20 percent in the North *whole home* energy savings (e.g., appliances and lighting are now included) relative to a new updated and expanded HERS baseline (ENERGY STAR 2005a). For virtually all new homes, the tax credit criteria are significantly more stringent than either the old or new ENERGY STAR criteria. In addition, the tax credit and ENERGY STAR differ in that the tax credits are based on only energy used for space heating and cooling while ENERGY STAR also includes water heating energy use (and in the new ENERGY STAR criteria, lighting and appliances as well). In 2004, ENERGY STAR homes accounted for 8.4 percent share of new home construction nationally (Ng 2005), but 10–54 percent in a dozen states (EPA 2005). However, homes meeting the 50 percent energy savings criteria were probably less than 1 percent of new construction, even in leading states.

A major source of ideas on ways to build homes meeting the 50 percent energy savings target is DOE's Building America program. This program is researching cost-effective ways to reduce new home energy use by 50 percent or more and has built thousands of research homes to help develop and refine these techniques. The program has built many homes that meet the 50 percent savings target and is now developing a set of design ideas for different climate zones on

[1] The law also includes several renewable energy tax incentives, which we do not discuss here as they are beyond our scope.

ways to most cost-effectively meet the 50 percent savings target. These materials will be posted on the Building America Web site (http://www.eere.energy.gov/buildings/building_america/) when completed (expected before the end of October, 2005).

For manufactured homes, the savings target is significantly lower, particularly in 2006 during which the current ENERGY STAR specification can still be used. EPA is now considering changes to the ENERGY STAR specification for manufactured homes and may tighten the criteria some. Originally, EPA proposed no changes to the manufactured home specification but some tightening is likely. For a discussion of many of the issues involved, see RESNET (2005). EPA plans that the new criteria will apply to homes permitted after July 1, 2006, or completed after January 1, 2007. While final decisions on the new ENERGY STAR criteria for manufactured homes will not be made until about October, 2005, absent a radical change in direction by EPA, the market share for new ENERGY STAR manufactured homes is likely to be substantial, particularly in the South.[2]

The federal government will probably take some steps to promote the tax credits. It will not be able to provide much marketing or technical assistance at the local level; local energy efficiency programs can and should fill this gap. For site-built homes, we recommend promoting both ENERGY STAR and the 50 percent savings target using a "good" (ENERGY STAR) versus "best" (50 percent savings) approach. Modest incentives may be useful for homes just meeting ENERGY STAR, while the 50 percent target will require a mix of extensive technical assistance (since few builders know ways to meet the 50 percent target cost-effectively) and the $2,000 tax credit, plus additional local incentives (we recommend an additional incentive of around $2,000 per home, making for a total incentive of about $4,000, which should cover a large portion of the cost of meeting the 50 percent savings target).[3] We recommend that program operators offer this incentive at least through 2009, so as to assure builders that incentives will be available for a long enough period for it to be worth their while to modify home designs and crew training to meet the 50 percent savings criteria (the two years the federal tax incentives are available will probably be too short to convince many home builders to make these investments). If the federal tax credit is extended (this possibility is discussed near the end of this report), then program operators can consider reducing the local $2,000 incentive in 2008 or beyond. For manufactured homes, local promotion and technical assistance will be useful as well, although given the more modest qualifying criteria for the manufactured home tax incentives, no further incentives are likely to be needed beyond the $1,000 tax credit.

New Commercial Buildings and Major Upgrades to Existing Buildings

The new law provides a tax deduction of up to $1.80 per square foot for new commercial buildings that reduce regulated energy use by 50 percent relative to the requirements in the 2001 new construction standard developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE 90.1). The law also allows owners of new and existing buildings (those placed in service prior to the date of enactment) to earn a partial deduction of

[2] The proposed ENERGY STAR criteria do little to address window heat gain in the South and also include weak air conditioning efficiency criteria for the baseline home. This latter issue is likely to be addressed in the final criteria.
[3] Good estimates of the incremental cost to meet the 50 percent savings criteria are not available, but informal estimates start at about $4,000 and go up from there.

$0.60 per square foot per system for upgrading one or two major building systems (envelope, lighting, or HVAC) to 50 percent more efficient than ASHRAE 90.1 standards, instead of all three (e.g., a $1.20 per square foot deduction for upgrading lighting and HVAC). Detailed implementing regulations are to be developed by the Treasury Department, with input from DOE. These deductions apply to new buildings placed in service between the date of enactment and December 31, 2007 or retrofits to existing buildings during the same period.

The savings threshold to earn a tax credit is about twice the level of savings being targeted by most commercial new construction programs. Thus program operators are likely to continue their current programs but should also consider promoting and providing technical assistance for the higher savings incentivized under the tax credits. The New Buildings Institute has published a new commercial buildings guideline that provides technical guidance on ways to meet the 50 percent savings threshold as well as a more modest threshold with approximately 20–25 percent savings. The Institute also has prepared handbooks for building owners and designers on use of this guideline (NBI 2005). In addition, since the federal incentives are scheduled to end in 2007, local program operators could promise to provide incentives in 2008 or 2009 if the federal incentives are not extended. Since many buildings designed in 2006 and 2007 will not be completed until 2008 or later, absent a promise of post-2007 incentives, it will be difficult to convince developers and designers to develop complying buildings, unless they are sure construction will be completed in 2007.

The lighting section includes additional provisions and merits a little more explanation. While long-term rules will be developed by the Secretary of the Treasury, the law establishes interim rules allowing a deduction of $0.30 per square foot for buildings (or portions of buildings) that achieve at least 25 percent lighting savings relative to the ASHRAE 90.1-2001 lighting power density (Watts per square foot) requirements (but excluding ASHRAE's "additional lighting power allowances") *and* that also use bi-level switching. This credit increases progressively to $0.60 per square foot for using bi-level switching and achieving 40 percent lighting savings.[4] This section can provide an incentive for major upgrades to lighting systems in existing buildings, particularly in buildings that still have inefficient lighting systems (the combination of large savings plus the "sweetener" from the Treasury could push many building owners to remodel the lighting in their existing buildings). Local lighting programs should mention and promote this incentive in their marketing efforts, although due to the 25 percent savings requirement, the federal deduction is probably not a replacement for local lighting incentives.

Appliances

The new legislation provides credits *to the manufacturer* for very efficient refrigerators, clothes washers, and dishwashers. Unless otherwise noted below, the incentives are for products sold in 2006 and 2007, relative to sales by each manufacturer in the previous three years (i.e., if a manufacturer sold an average of 50,000 eligible clothes washers in the preceding three years, then only sales beyond 50,000 earn an incentive). For refrigerators, there are three efficiency

[4] The rationale was that bi-level switching and excluding the additional lighting power allowances save substantial energy and thus on average bring spaces in line with the 50 percent savings goal.

tiers—a $75 credit for each refrigerator that uses 15–19.9 percent less energy than a unit just meeting the 2001 federal minimum-efficiency standard (15 percent savings is the current ENERGY STAR level), a $125 credit for units saving 20–24.9 percent, and a $175 credit for units saving 25 percent or more.[5] For clothes washers there is only one efficiency tier—a $100 credit for units meeting the 2007 ENERGY STAR level. DOE is now finalizing the new ENERGY STAR level and expects to announce its final decision in September 2005 (its draft proposal was a Modified Energy Factor [MEF] of 1.72 or more and a Water Factor [WF] of 8.0 or less). For dishwashers, there is also one efficiency tier based on the 2007 ENERGY STAR level. However, DOE has not yet proposed a specific new ENERGY STAR level and therefore Congress decided to make the amount of the tax incentive depend on the level DOE finally sets. Under the new law, the dishwasher credit will be $3 for each percentage point of energy savings relative to the current ENERGY STAR spec. Thus, if the new ENERGY STAR is set at an Energy Factor of 0.65, this is 10.77 percent savings relative to the current spec, and the credit per unit will be $32.31 ($3 x 10.77). All of the appliance credits also only apply to products produced in the United States, which could affect the foreign production plans of U.S. manufacturers and also means that imported products are not eligible. There is also a total cap per manufacturer of $75 million, a figure some of the larger manufacturers may reach but the smaller manufacturers will not.

With the federal tax credits, it is likely that manufacturers will reduce the prices of complying refrigerators, clothes washers, and dishwashers. Energy efficiency programs can help promote products that meet these levels. This includes refrigerators that exceed the ENERGY STAR level. Due to the federal tax credits, additional financial incentives for qualifying appliances are unlikely to be needed for 2006 and 2007. However, local programs should promote eligible products to consumers, such as by working with retailers and through marketing campaigns, just as many programs now promote ENERGY STAR. In addition, since the incentives end in 2007, local programs should consider incentives in 2008 and beyond for refrigerators that save 25 percent or more. There are presently very few products at this level, so the availability of continued incentives could influence manufacturer decisions to bring these highly-efficient products to market in 2006 or 2007. Product availability and sales at this level could influence the level of new federal refrigerator standards—we expect DOE to begin a rulemaking on these standards in 2006 and make a final decision in 2008 or 2009. On the other hand, we don't recommend incentives after 2008 for ENERGY STAR clothes washers and dishwashers and for refrigerators that save 20 percent, since by 2008, we expect these products to have substantial market share.

Air Conditioners, Heat Pumps, Furnaces and Water Heaters

The bill provides tax credits for very efficient new central air conditioners, heat pumps, furnaces, and water heaters used in non-business applications. The credits apply to equipment placed in service in 2006 and 2007. Specific eligibility levels and amounts are summarized in Table 1.

[5] For refrigerators, there are two additional quirks. First, the 15 percent incentive only applies for units sold in 2006. Second, baseline sales are multiplied by 110 percent before determining the number of units that earn an incentive (e.g., 50,000 in the example above becomes 55,000).

Table 1. Summary of HVAC Tax Credits

Equipment Type	Qualifying Efficiency	Credit Amount
Central air conditioners	15 SEER and 12.5 or 13 EER*	$300/unit
Central air-source heat pumps	15 SEER, 9 HSPF, and 13 EER*	$300
Ground-source heat pumps Closed loop Open loop Direct expansion (DX)	All systems must provide water heating 14.1 EER and 3.3 COP** 16.2 EER and 3.6 COP** 15.0 EER and 3.5 COP**	 $300 $300 $300
Gas, oil, or propane furnace or boiler	95% AFUE	$150
Furnace blower	Electricity use <2% of total furnace site energy use***	$50
Electric heat pump water heater	2.0 EF	$300
Natural gas, propane, or oil water heater	0.80 EF	$300

* For central AC, the bill refers to the highest efficiency tier of the Consortium for Energy Efficiency (CEE), in effect as of Jan. 1, 2006. CEE is now discussing this tier. The SEER level is likely to be 15, and CEE is debating between EER 12.5 and 13. In the case of heat pumps, the legislation specifies SEER 15, HSPF 9, and EER 13. However, this may be modified in a "technical corrections" bill to parallel the AC provision and refer to the highest CEE specification.

** These are the same as the ENERGY STAR specification.

*** This is the CEE/GAMA specification (see "Air Handling [Electric Use] Performance Level" at www.cee1.org/gas/gs-ht/gas_heat_specs.pdf).

Note: There is a $500 lifetime cap per taxpayer for the HVAC and existing home credits combined. "Lifetime" means in 2006 *plus* subsequent years.

These specifications only include very high efficiency equipment with very low market shares.[6] This equipment is generally not widely promoted. In addition, in the case of boilers and oil-fired furnaces, there are just a few qualifying units on the market and this equipment can be hard to find. Local programs should promote these efficiency levels and the availability of federal tax credits, particularly for gas furnaces where eligible equipment is available from many manufacturers. Furthermore, the credit amounts will generally cover no more than half of the incremental cost of qualifying equipment, so additional local incentives may be useful.

Even with the federal tax credits and local promotion, due to the very high efficiency levels, sales of this equipment are likely to be modest. These credits are generally intended to spur introduction of new models meeting these levels, allowing some market share growth and better positioning this equipment for the future. Therefore, for local programs that desire significant participation and savings, these tax credits are not a substitute for local promotion and incentive programs for more moderate efficiency levels such as the new ENERGY STAR air conditioner and heat pump specification or the various CEE efficiency tiers.

[6] There are two qualifications to this statement. First, many ground-source heat pumps meet these specifications (although ground-source systems only account for a small fraction of heat pump sales). Second, many (but far from all) furnaces with 92 percent AFUE or more will meet the furnace blower specification.

Envelope Improvements to Existing Homes

The new bill provides a 10 percent tax credit up to $500 for upgrading building envelope components to be in compliance with model codes for new homes (however, for replacement windows, the cap is $200). This $500 limit applies to 2006 plus subsequent tax years (e.g., if $400 is used in 2006, only $100 is available for subsequent years). HVAC incentives (discussed in the section above) also count against the $500 cap. The details of the provision are oriented towards new windows, insulation upgrades, and ENERGY STAR metal roofs, although other measures that are included in the prescriptive criteria in the 2000 IECC code plus amendments and that are "specifically and primarily designed to reduce the heat loss or gain of a dwelling" are also eligible. Under this last provision, it is possible that duct sealing and infiltration reduction measures are eligible, although implementing rules will likely be needed to clarify this. These credits apply to upgrades installed between January 1, 2006 and December 31, 2007. Certification details are still to be decided by Treasury in consultation with DOE.

This tax credit will be useful for promoting sales of insulation and, if ruled eligible, duct sealing and infiltration upgrades. The credit for windows is very modest and we expect this credit to be dominated by free riders. While windows and insulation tend to sell fairly briskly even without tax credits, the inclusion of duct sealing and infiltration upgrades should be helpful for programs that promote these measures. If duct sealing and infiltration are ruled eligible, we would recommend that other program operators consider such programs. Local incentives will probably be needed, as for a $1,000 job, the federal credit will only be $100.

This credit can also be useful for promoting comprehensive retrofits (along the lines of these promoted under several existing Home Performance with ENERGY STAR programs—see Thorne 2003). Other program operators should consider offering Home Performance with ENERGY STAR programs to encourage and assist homeowners to install comprehensive packages of efficiency measures. Again, some supplemental local incentives may be useful since the federal credit is only 10 percent. For local incentives, we recommend that incentives be based on energy savings achieved, not project cost, so as to reward home owners who maximize savings. Technical assistance is particularly important for existing homes, as few homeowners know how to identify the most cost-effective package of measures.

Stationary Fuel Cells and Microturbines

The new law includes several provisions related to fuel cells. First, the bill provides a 30 percent business or individual tax credit for stationary fuel cell power plants up to $1,000/kW (stated as $500 per 500 watts). As current system costs are roughly $5,000/kW or more, the credit will generally be at the $1,000/kW ceiling. For business applications, the fuel cell system must be 500 kW or greater and have an efficiency of 30 percent or more (details on how to determine efficiency will be provided in regulations). For residential applications, the 500 kW and 30 percent efficiency floors do not apply. Both of these credits apply to systems placed in service during 2006 and 2007.

Second, the electricity title of the bill includes the possibility of production tax credits under the Advanced Power System Technology Incentive Program (Section 1224). This section

provides for production tax credits of 1.8 cents/kWh (or 2.5 cents/kWh for systems certified for certain homeland security purposes) for an "advanced fuel cell, turbine or hybrid power system or power storage system to generate or store electric energy." However, this section is subject to annual appropriations from Congress, an uncertain proposition. The law authorizes $10 million annually for this provision, so even if funded, the production tax credit program will be fairly small.

Third, fuel cells are sprinkled liberally throughout other sections of the bill, including the possibility of grants under the clean coal and hydrogen titles of the bill.

In the case of microturbines, the law provides for a 10 percent investment tax credit for "stationary microturbine power plants." The credit is capped at $200/kW and only applies to systems with a capacity of less than 2,000 kW that have an efficiency of at least 26 percent (measured at ISO conditions). As with the other credits, the microturbine provision applies to systems placed in service during 2006 and 2007.

These tax credits will help address the economic barriers to fuel cell and microturbine systems, increasing sales and contributing to long-term price reductions due to economies of scale. But these and other distributed generation systems also face a variety of other barriers such as inconsistent and often cumbersome interconnection and emissions regulations. In order to complement the federal tax credit, ACEEE recommends that efforts to address these other barriers should be expanded. Specific suggestions can be found in *CHP Five Years Later* by ACEEE (Brown and Elliott 2003).

Hybrid, Fuel Cell, and Advanced Diesel Vehicles

The new law provides credits for hybrid, fuel cell, and "advanced" diesel vehicles. Alternative fuel vehicles are eligible for credits as well but are not discussed here.

For hybrid and lean-burn light-duty vehicles (those 8,500 pounds or under), the credit includes two components—one for fuel economy improvement relative to the average fuel economy[7] for vehicles of similar type and weight sold in 2002, and one for annual fuel savings relative to the equivalent 2002 vehicle fuel economy baseline. For example, the 2005 Toyota Prius is eligible for a $2,400 fuel economy credit (for a fuel economy more than 250 percent that of a 2002 vehicle in its class) plus $750 for conserving at least 2,400 gallons of fuel over its lifetime, for a total of $3,150. On the other hand, a 5,000-pound hybrid light truck that gets 20 miles per gallon would get no credit for improving fuel economy relative to the 16.1 mpg average for its weight and class in 2002, but would receive $250 for saving approximately 1,400 gallons of fuel over its lifetime. The purpose of the fuel savings provision is to provide some credits for modest improvements to particularly inefficient vehicles such as pickup trucks and SUVs. Diesel vehicles, however, are not eligible for the fuel savings credit if they do not achieve at least 25 percent fuel economy improvement over the applicable baseline.

[7] Unadjusted city fuel economy, modified for energy equivalency.

In addition, to be eligible, vehicles 6,000 pounds or under must meet the fairly stringent Tier 2 bin 5 emissions limits, while vehicles of 6,001–8,500 pounds need to meet the far less stringent Tier 2 bin 8 emissions limits. Approximately 10 models now on the market are eligible for the credits. Other eligible vehicles will be introduced over the next few years (see www.aceee.org/transportation/hybtaxcred.htm#table for a list of current and expected eligible vehicles).

These credits generally apply to vehicles purchased between January 1, 2006 and December 31, 2010. However, each manufacturer is allowed sales of only 60,000 vehicles before credits ramp down to zero over about a 15-month period. In the case of Toyota and Honda which have been actively selling hybrid vehicles for several years, the 60,000 vehicle level will likely be reached in 2006 or 2007.

The bill also provides for credits for hybrid vehicles of 8,500 pounds or more, with credits ranging from 20–40 percent of the "qualified incremental hybrid cost of the vehicle" relative to a "comparable" non-hybrid vehicle, with the percentage depending on the fuel economy improvement attributable to the hybrid. Many details need to be worked out via regulation including test procedure specifics and how to define "comparable vehicle." Other than buses, heavy-duty hybrids have very limited availability, but vehicles of many types are now being tested. These credits expire at the end of 2009.

In addition, the bill provides tax credits for fuel cell vehicles purchased through 2014. Again there is a fuel economy component, with credits of $1,000–4,000 depending on fuel economy. In addition, a second component gives credits for fuel cell vehicles based on weight, with a credit of $8,000[8] for vehicles under 8,500 pounds to one of $40,000 for vehicles over 26,000 pounds. Currently no fuel cell vehicles are commercially available.

The federal tax incentives are probably high enough to spur sales of qualifying vehicles. Manufacturers can be expected to actively promote sales of eligible light-duty vehicles, but additional promotion of heavy-duty hybrids and light-duty hybrids that achieve fuel economies at least 50 percent higher than their conventional counterparts may be useful.

STANDARDS

The legislation includes provisions setting new federal minimum-efficiency standards on 16 specific products and directing DOE to set standards on several other products. Table 2 summarizes the standards set in the legislation. Table 3 summarizes the DOE rulemakings called for under the bill.

[8] $4,000 for models placed in service after December 31, 2009.

Table 2. Standards Set in the Energy Policy Act of 2005

Product	Effective Date*	Standard
Residential		
Ceiling fan light kits	2007	Packaged with ENERGY STAR v2 screw-in CFLs or meet ENERGY STAR Residential Light Fixture v4 specification. Standard for specialized products determined by DOE by 1/1/07.
Dehumidifiers	Oct. 2007	ENERGY STAR v1 specification
Compact fluorescent lamps	2006	ENERGY STAR v2 specification
Torchiere lighting fixtures	2006	190 W maximum
Commercial		
Air-conditioners and heat pumps (unitary equipment 240–760k Btu/hr)	2010	Capacity Minimum EER (AC/HP) 65–134k Btuh 11.2/11.0 135–239 11.0/10.6 240–759 10.0/9.5 (EER 0.2 lower for units with integrated heating that is not electric resistance) For HP, also 3.2 COP@47◦F except 3.3 for 65–134k Btuh equipment.
Clothes washers	2007	MEF at least 1.26 and WF no more than 9.5
Distribution transformers (low voltage)	2007	Meet NEMA standard TP-1-2002
Exit signs	2006	ENERGY STAR v2 specification
Fluorescent lamp ballasts (F34 and F96ES types)	2009	Closes loophole in DOE regulations so that these ballasts will be electronic, like other covered ballasts
Ice-makers (cube type, 50-2,500 lbs/day)	2010	California Energy Commission (CEC) standard, which is almost identical to Consortium for Energy Efficiency (CEE) Tier 1.
Mercury vapor lamp ballasts	2008	Bans sale of mercury vapor lamp ballasts
Pedestrian signals	2006	ENERGY STAR v.1.1 specification
Pre-rinse spray valves	2006	Maximum 1.6 gallon/minute
Refrigerators and freezers (packaged)	2010	California Energy Commission (CEC) standard, which is almost identical to ENERGY STAR specification
Traffic signals	2006	ENERGY STAR v1.1 specification
Unit heaters	Aug. 2008	Must be equipped with an intermittent ignition device and have power venting or an automatic flue damper

* Effective in January unless otherwise specified.

Table 3. Standards to Be Set by DOE Rulemaking

Product	Rulemaking Completion Date
Ceiling fan light kits (niche products—candelabra base, halogen, etc.)	Jan. 1, 2007
Battery chargers	Aug. 8, 2008
External power supplies	Aug. 8, 2008
Commercial refrigeration—ice-cream freezers, packaged units without doors, remote-condensing equipment	Jan. 1, 2009
Refrigerated beverage vending machines	Aug. 8, 2009
Dehumidifiers (revised standard)	Oct. 1, 2009
Commercial clothes washers (revised standards)	Jan. 1, 2010 and Jan. 1, 2015
Commercial packaged refrigerators & freezers (revised standards)	Jan. 1, 2013 and 3 years after revised standard takes effect
Ice-makers (revised standards)	Jan. 1, 2015 and 5 years after revised standard takes effect

In addition, the bill allows DOE to consider and set standards on fans used in residential furnaces to distribute heated or cooled air throughout a house. DOE has been investigating such a standard but questioned whether it had the legal authority to set this. This provision ends this uncertainty. A rulemaking on furnace efficiency standards is now underway; it is likely that furnace fans will now be considered as part of this rulemaking. In a similar manner, the law authorizes but does not require DOE to set air movement standards for ceiling fans (the law regulates ceiling fan *light kits* but leaves air movement efficiency standards to DOE's discretion).

These provisions have several implications for energy efficiency programs. First, for the products for which standards are set, financial incentive programs can be scaled back in anticipation of the federal standards that will take effect, sometimes as early as 2006. Even when standards do not take effect for several years, manufacturers will be gradually ramping up production of qualifying products, achieving some energy savings even before the standards take effect. Second, for products for which DOE rulemakings will take place, promotional efforts should probably be increased, in order to increase the market share of efficient products and lay the groundwork for the strongest efficiency standards possible. For these products, state standards will also be useful to set a foundation for strong federal action. Third, for quite of few of these products, under the law (see Table 2), the current ENERGY STAR specification is mandated, which means that EPA and DOE will need to update the ENERGY STAR specification in order to differentiate the best products in the market from those that just meet the new federal minimum efficiency standard.

Based on the second implication, we recommend that state and regional program operators and policymakers consider programs and standards for the following products.

- *Vending machines*: The existing ENERGY STAR specification has a very high market share but a new specification has been established that will take effect in 2007. This second tier should be promoted by utility, state, and other programs.
- *External power supplies*: We recommend promoting the new ENERGY STAR specification (ENERGY STAR 2005b). Qualifying products are moderate in cost, so local incentives are probably not appropriate, but promotions to increase consumer awareness and encourage purchases will be helpful.
- *Dehumidifiers*: EPA has just set a new ENERGY STAR specification (ENERGY STAR 2005c). We recommend that local programs promote it.
- *Commercial refrigeration*: With the new standards, ENERGY STAR will generally become standard practice. We recommend promotion of CEE Tier 2. In the case of ice cream freezers, we recommend promotion of ENERGY STAR as this standard was not established in the legislation and instead will be set by DOE. In addition, programs should explore appropriate specifications for equipment without doors and for remote condensing units, in anticipation of a DOE rulemaking on these equipment classes.
- *Ice-makers*: Under the legislation, CEE Tier 1 will become standard practice. We recommend promotion of CEE Tier 2. CEE is now revising this specification. The revised specification should hopefully be completed by December 2006.

Further research is needed on battery chargers, so we do not recommend specific promotional activities at this time.

The first and third implications will also require some adjustments to local programs.

OTHER EFFICIENCY PROVISIONS

In addition to these two major efficiency provisions, the new energy bill included a variety of other smaller efficiency provisions as follows.

- *Industrial voluntary commitments:* Encourages DOE to enter into agreements with large industrial firms and/or their trade associations to achieve improvements in energy intensity (energy use per unit of product produced) of at least 2.5 percent per year (in excess of recent trends). DOE will provide technical assistance, assuming Congress appropriates the necessary funds. This program could be a useful complement to industrial energy management programs that several regions are now piloting (e.g., see NEEA 2002).
- *Appliance labeling:* Directs the Federal Trade Commission (FTC) to review the effectiveness of its current Energy Guide label and to make appropriate revisions. This provision will likely lead to improvements in the current labeling program and will make the program more effective in achieving its goals of informing consumers and providing energy savings. These improvements will likely also better tie ENERGY STAR into the Energy Guide label and provide other enhancements that will make the label more useful for promoting efficient appliances. Specific recommendations for the new label have been prepared by ACEEE (Thorne and Egan 2002) and are likely to receive extensive discussion during the FTC proceeding.

- *ENERGY STAR:* Authorizes the ENERGY STAR program and makes clear Congress' support for it. Currently, the program is proceeding under broad authority granted to DOE and EPA to save energy and reduce pollution. This new legislative provision is general enough that it will not have much direct impact on the program, other than calling for notification and comment on key ENERGY STAR program changes, but this provision could contribute to increased appropriations for the program. One specific item in the legislation is a directive to generally provide nine months lead time to manufacturers between when a new or major revision to an ENERGY STAR specification is published and when it takes effect. Federal agencies, however, retain the right to waive this requirement.
- *Consumer education on HVAC maintenance:* Directs DOE to conduct an education program on the benefits of proper air conditioning, heating, and ventilation maintenance. It is unclear whether DOE will have much funding for this program, but if the program is funded it could be a useful complement to local programs that promote improved HVAC installation and maintenance practices.
- *Appliance rebates:* Establishes a program to provide federal matching funds for state energy office-run ENERGY STAR appliance rebate programs and authorizes up to $50 million annually for five years. However, the funds are dependent on annual appropriations. Given the tight federal budget, it is questionable if funds will be available to implement this provision.
- *Federal energy efficiency:* Establishes updated targets for energy used in federal buildings and also addresses equipment procurement and performance contracting, providing additional tools to help federal facilities to achieve these targets. It reauthorizes DOE's Energy Service Performance Contracting (ESPC) program for ten years. This is a key step in sustaining the private funding for federal efficiency projects. The bill also sets updated performance standards for new federal buildings and asks DOE to consider even more stringent performance levels.
- *Efficient public buildings:* Creates a grants program for energy-efficient public buildings, including both new and renovated buildings. The bill authorizes $30 million annually, but as with the appliance rebate program, how much gets accomplished will depend on funding.
- *Housing:* Includes a housing provision that creates a public housing energy office at U.S. Housing and Urban Development. Allows longer terms for performance contracts to enable more comprehensive improvements to public housing through energy service companies. Requires public housing to purchase ENERGY STAR equipment, public housing agencies to integrate capital planning and utility management, and new public housing construction to meet recent energy codes.
- *Combined heat and power (CHP):* Directs states to consider adopting model interconnection standards. Provides for a study by DOE on the potential benefits of distributed generation and methods for valuing these benefits. To the extent states improve their interconnection standards and correctly value the benefits of distributed generation, CHP and other distributed generation will increase.
- *Public awareness campaign:* Authorizes a major campaign by DOE on how to save energy and the benefits of doing so. It has been many years since DOE undertook such a campaign. If done well, such campaigns can provide substantial energy savings, as shown by the campaign undertaken by the state of California to help address its 2001

electricity crisis (Global Energy Partners 2003). A federal campaign, however, will be dependent on appropriations from Congress.

- *Energy efficiency resource standards:* Energy efficiency resource standards are energy savings targets that electric and/or gas utilities must meet. Such programs have already been established in several states (e.g., Texas, Connecticut, and Nevada). The federal legislation authorizes a pilot program with additional states and calls for a study by DOE in consultation with the National Association of Regulatory Utility Commissioners (NARUC) and the National Association of State Energy Officials (NASEO) on state and regional policies to promote energy efficiency, with an emphasis on programs carried out by utilities. The study may provide useful information to states. The pilot programs are dependent on Congress appropriating funds.
- *Building energy codes:* Prior law established a technical assistance program to states on building code adoption. This provision adds to prior law by calling for increased funding and adding a component on code implementation. Like many other provisions, this provision is dependent on Congress appropriating funds in the future.
- *Daylight savings time:* The new law extends daylight savings time by one month (three weeks in the spring, one week in the fall). This provision should modestly reduce evening electricity use.

WHAT'S NOT IN THE BILL

Several items received extensive discussion but ultimately are not in the bill. First, the bill does virtually nothing to reduce U.S. oil use. Neither the House nor the Senate elected to take any significant action regarding passenger vehicle fuel economy. However, the conference report marginally weakened the existing CAFE situation by extending the "dual-fuel loophole" that gives manufacturers CAFE credit for making vehicles than can burn an alcohol fuel, even if the vehicle never uses such fuel. ACEEE analysis indicates that full use of this loophole could erode actual fuel economy of the U.S. fleet by up to 5 percent. Likewise, the conference report also left out a major oil savings provision in the Senate bill, which would have required the President to take steps that would save 1 million barrels of oil annually by the year 2013. This section was opposed by the Administration and rejected by the House.

Second, the bill included neither a renewable portfolio standard (RPS) nor an expanded standard that includes renewable energy, energy efficiency, and possibly other energy sources. The Senate passed a RPS provision requiring that 10 percent of electricity be renewable by 2020. The House responded with an offer that added clean coal, nuclear power, and other sources to the mix. A possible compromise advanced by ACEEE that received some interest was to include renewable energy, energy efficiency, CHP, and recycled energy (use of waste heat), but not nuclear or clean coal. However, this compromise was not advanced by either the House or Senate in conference and ultimately no provision was included as the House and Senate remained far apart.

Third, several tax incentives included in the 2005 Senate bill (and included in bills passed by the House in earlier years) were dropped as part of conference negotiations. The items eliminated included three tax incentive provisions—for CHP plants, for site-built homes reducing energy use by 30 percent but less than 50 percent, and for accelerated depreciation for

advanced meters used in demand response programs. Inclusion of these incentives would have increased energy savings. All were dropped as part of efforts to reduce the overall cost of the bill. In general, the efficiency tax incentives in the 2005 bill were not as generous as those in the 2003 House-Senate conference report.

Many other items were left out as well, but these are probably the biggest omissions.

ESTIMATED ENERGY SAVINGS

Overall, ACEEE estimates that the energy efficiency sections of the new law will reduce U.S. energy use in 2020 by about 2.5 quadrillion Btu (quads), which is about 2 percent of projected U.S. energy use in that year. In 2010, savings are only about 0.7 quads, which is about 0.6 percent of projected U.S. energy use in that year. Savings are much lower in 2010 since savings from many provisions mount over time as existing equipment is replaced with more efficient equipment. Of the 2020 savings, 40 percent are due to new standards, 20 percent to tax incentives, and 40 percent to various other provisions. Included in the 2020 savings are natural gas savings of about 1.4 trillion cubic feet and peak electric savings of about 63,000 MW, energy bill reductions of more than $20 billion, and about 15 million metric tons of carbon reductions (carbon, in the form of carbon dioxide, is a major contributor to global warming).

Unfortunately, the final bill saves only about half the energy of the Senate bill and less than one-quarter of the energy of ACEEE's estimates for a bill that contains robust efficiency provisions (described in Nadel, Elliott, and Langer 2005). Items dropped from the Senate bill included the one million barrel per day oil savings provision and a CHP tax credit. Also, the Senate bill generally provided efficiency tax credits for three or four years, not the two years in the final bill. Missing from the Senate bill relative to a robust bill were vehicle fuel economy standards, electricity efficiency provisions such as an energy efficiency resource standard, and funding for various items that are only authorized in the final bill. A more detailed estimate of energy savings from the final bill can be found in the appendix to this report.

FUTURE LEGISLATION

Reaction to the Energy Policy Act of 2005 has generally been that it contains some useful provisions, but does not do enough to address our nation's energy problems. The lack of energy provisions to reduce oil use has been criticized in particular by many editorial boards, as noted in the following editorial titles:

- "Energy Shortage," *New York Times,* July 28, 2005
- "Energy Deficient," *Washington Post,* July 28, 2005
- "An Inefficient Energy Policy," *San Francisco Chronicle,* July 28, 2005
- "Heat Wave—As Nation Swelters, Congress Agrees to Tepid Energy Bill," *Santa Rosa Press Democrat,* July 28, 2005
- "Energy Bill Isn't Coherent Solution," *Jacksonville* (NC) *Daily News,* Aug. 1, 2005
- "An Energy Policy About Half Right," *Seattle Times*, Aug. 1, 2005
- "The Blowhard Energy Bill," *Philly Daily News,* Aug. 2, 2005

- "Stuck in Neutral on Energy Policy," *Times Tribune* (Pennsylvania), Aug. 2, 2005
- "Energy Bill Ducks Tough Issues," *Indianapolis Star,* Aug. 2, 2005
- "A Low-Octane Energy Bill," *Tampa Tribune,* Aug. 4, 2005
- "Holes in the Energy Law," *Boston Globe,* Aug. 12, 2005
- "U.S. Missed the Boat for Oil Conservation," *Albuquerque Tribune,* Aug. 12, 2005
- "Expending Energy on the Status Quo," *Virginian Pilot,* Aug. 12, 2005
- "Energy Bill Falls Short," *Charlotte Observer,* Aug. 12, 2005
- "Energy Bill Doesn't Offer Enough," *Cincinnati Enquirer,* Aug. 14, 2005

With energy prices rising, particularly oil prices, there is a chance that Congress will try to address this issue in 2006. The problem will be trying to reach agreement on meaningful action, as a substantial number of Congressmen are philosophically opposed to government action in this area, believing that "the market" will respond appropriately. Creative compromises will be needed if any legislation is to pass.

With most of the efficiency tax credits lasting only two years, in 2007 Congress is likely to consider extensions to many of these provisions. A colloquy in the *Congressional Record* indicates that an extension of the commercial building tax incentive will be under consideration, as two years is a short time to influence new building design and construction practices (Congressional Record 2005). For the same reason, we expect that there is a very good chance that the new homes provision will be extended. There is also a reasonable chance for an extension of the appliance credits, but with updated efficiency requirements. Possibilities for extending the other provisions are less clear.

Finally, at some point Congress will consider additional energy legislation. In our view, this could happen as soon as 2007 or as late as the next decade. The ultimate schedule will depend on the degree the public cares about energy issues, as well as the makeup of future Congresses.

CONCLUSIONS AND RECOMMENDATIONS

From an energy efficiency perspective, the new energy law is notable for two things. First, it does contain several modest but useful provisions to promote energy efficiency in the United States. Second, it only takes modest steps to promote efficiency and leaves the biggest energy-saving items (e.g., an energy efficiency resource standard and increased CAFE standards) on the table.

The tax credit provision will likely provide on the order of $2 billion for advanced energy-saving technologies and practices, primarily over the 2006–2007 period. By way of comparison, utility and public benefit program energy efficiency spending have totaled approximately $1.3 billion annually in recent years (York and Kushler 2005), so these new tax credits could have the effect of increasing public spending on efficiency programs by roughly 70 percent. Utilities and other agencies implementing electricity-, gas-, and oil-saving programs should develop programs to complement these new tax credits, including enhanced programs to promote efficient new homes; existing homes; new and existing commercial buildings; heating,

air conditioning, and water heating equipment; and appliances. In addition, state agencies and others interested in distributed generation and advanced cars and trucks should consider policy initiatives and promotions to complement stationary fuel cell and microturbine, and hybrid, fuel cell, and lean-burn diesel vehicle tax credits.

In order to aid these regional efforts, national organizations should develop materials at the national level on the new tax credits, such as a Web site and appropriate written material. Local program operators can then use and reference this national material, allowing them to concentrate their resources on local promotion and not on general material development.

The standards provision adopts standards on 16 products and directs DOE to conduct rulemakings to consider standards on several additional products. Program planners and implementers should consider increasing efforts to promote adoption of efficient products that will soon be subject to these DOE rulemakings, including refrigerated vending machines, external power supplies, commercial refrigeration systems, dehumidifiers, and ice makers. By helping to better establish these advanced products in the market, program operators can increase the chances that DOE will adopt standards that achieve substantial savings.

Overall, ACEEE estimates that the tax credit, standards, and other efficiency provisions in the energy bill will reduce peak electric generating needs in 2020 by about 63,000 MW and reduce natural gas use by about 1.3 trillion cubic feet in that year. However, to achieve these savings, DOE will have to set reasonable new efficiency standards, and tax credits will need to be complemented with adequate promotion and technical assistance. Regional, state, and local energy efficiency programs can provide many of these services, thereby helping to make the new federal law as effective as possible while also increasing the effectiveness of existing energy efficiency programs.

While the legislation does provide some useful savings, it only captures a small portion of the available efficiency resource. For example, if an energy efficiency resource standard, higher CAFE standards, longer tax credits, and adequate funding were included in the bill, ACEEE estimates that savings from the bill would increase approximately four-fold. The United States now faces many energy-related problems including concerns about electric system reliability, volatile fuel and electricity prices, rising dependence on imported oil, and global climate change. In order to address these problems, the United States will need to do much more to promote energy efficiency than the items included in the new 2005 energy bill. We therefore expect that Congress will need to return to the energy issue in a few years' time, and hopefully then they will adopt a more comprehensive solution to our energy problems. In the meantime, it is up to federal agencies and regional, state, and local energy efficiency programs to make the provisions in the current legislation as successful as possible.

REFERENCES

Brown, Elizabeth and R. Neal Elliott. 2003. *CHP Five Years Later: Federal and State Policies and Programs Update.* Washington, DC: American Council for an Energy-Efficient Economy.

Congressional Record. 2005. Colloquy between Senators Snowe and Grassley. July 29. p. S.9358. Washington, D.C.: *Congressional Record.*

ENERGY STAR. 2005a. "ENERGY STAR Qualified Homes [Draft 8/16/05] National Performance Path Requirements." http://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/Performance_Path_Draft_081605.pdf. Washington, D.C.: U.S. Environmental Protection Agency.

———. 2005b. "ENERGY STAR Program Requirements for Single-Voltage External AC–DC and AC–AC Power Supplies, Eligibility Criteria. http://www.energystar.gov/ia/partners/product_specs/program_reqs/EPS%20Eligibility%20Criteria.pdf. Washington, D.C.: U.S. Environmental Protection Agency.

———. 2005c. "ENERGY STAR Program Requirements for Dehumidifiers, Eligibility Criteria." http://www.energystar.gov/ia/partners/prod_development/revisions/downloads/Final%20Draft_V2_Dehum_Spec.pdf. Washington, D.C.: U.S. Environmental Protection Agency.

EPA (U.S Environmental Protection Agency). 2005. *1995–2005, A Decade of Change in Home Building with ENERGY STAR.* Washington, D.C.: U.S. Environmental Protection Agency.

Global Energy Partners. 2003. *California Summary Study of 2001 Energy Efficiency Programs.* Lafayette, Calif.: Global Energy Partners, LLC.

[JCT] Joint Committee on Taxation. 2005. "Estimated Budget Effects of the Conference Agreement for Title XIII of H.R. 6, the 'Energy Tax Incentives Act of 2005'." JCX-59-05. Washington, D.C.: U.S. Congress, Joint Committee on Taxation.

Nadel, Steven, R. Neal Elliott, and Therese Langer. 2005. *A Choice of Two Paths: Energy Savings from Pending Federal Energy Legislation*. Washington, DC: American Council for an Energy-Efficient Economy.

[NBI] New Buildings Institute, Inc. 2005. "Power Your Design." http://www.poweryourdesign.com/. White Salmon, Wash.: New Buildings Institute, Inc.

[NEEA] Northwest Energy Efficiency Alliance. 2003. *Envinta One-2-Five Pilot, Special Report Product Assessment, No. 2.* E03-116. http://www.nwalliance.org/resources/reports/116.pdf. Portland, Oreg.: Northwest Energy Efficiency Alliance.

Ng, Brian (U.S. Environmental Protection Agency). 2005. Personal communication with S. Nadel. Sept.

[RESNET] Residential Energy Services Network 2005. "RESNET Comments on Proposed EPA Specifications." http://www.natresnet.org/hotnews/epa_newspecs/050819-resnet_comments.pdf. Oceanside, Calif.: Residential Energy Services Network.

Thorne, Jennifer. 2003. *Residential Retrofits: Directions in Market Transformation*. Washington, D.C.: American Council for an Energy-Efficient Economy.

Thorne, Jennifer and Christine Egan. 2002. *Evaluation of the FTC EnergyGuide Appliance Label: Final Report and Recommendations*. Washington, D.C.: American Council for an Energy-Efficient Economy.

U.S. Congress. 2005. *Energy Policy Act of 2005, Conference Report.* House Report 109-190. Washington, D.C.: U.S. Government Printing Office.

York, Dan and Martin Kushler. 2005. *ACEEE's 3rd National Scorecard on Utility and Public Benefits Energy Efficiency Programs: A National Review and Update on State Level Activity* (forthcoming). Washington, D.C.: American Council for an Energy-Efficient Economy.

Conference Report 2005

ACEEE staff analysis August 2005

	2010 Savings								2020 Savings							
Policy Initiative	**TWH**	**MW**	**Direct Gas BCF**	**Total Gas BCF**	**Oil MBD**	**Quads**	**$ million**	**Carbon (MMT)**	**TWH**	**MW**	**Direct Gas BCF**	**Total Gas BCF**	**Oil MBD**	**Quads**	**$ million**	**Carbon (MMT)**
1. Appliance Efficiency Standards	21	6,655	56	170	0.00	0.28	$2,105	5.3	90	30,227	96	563	0.00	1.03	$8,239	19.4
2. Tax incentives																
a. New Homes	1	188	5	9	0.00	0.01	$91	0.2	3	787	21	36	0.00	0.05	$393	0.9
b. Central AC/HP	1	191	0	4	0.00	0.01	$71	0.2	8	2,170	0	42	0.00	0.08	$858	1.6
c. Gas water heaters	0	0	2	2	0.00	0.00	$18	0.0	0	0	22	22	0.00	0.02	$166	0.3
d. HP water heaters	0	35	0	1	0.00	0.00	$10	0.0	1	174	0	3	0.00	0.01	$53	0.1
e. Furnaces	1	192	2	5	0.00	0.01	$65	0.2	5	1,239	12	36	0.00	0.06	$464	1.1
f. Appliances	0	123	11	13	0.00	0.02	$117	0.3	3	816	72	88	0.00	0.10	$779	1.7
g. Comm. Bldgs.	1	179	2	6	0.00	0.01	$67	0.2	3	854	11	27	0.00	0.04	$338	0.8
h. Fuel cell cogen.	0	0	0	0	0.00	0.00	$0	0.0	0	0	0	0	0.00	0.00	$1	0.0
i. Fuel cell vehicles	0	0	0	0	0.00	0.00	$1	0.0	0	0	0	0	0.00	0.00	$12	0.0
j. Hybrid vehicles (light duty)	0	0	0	0	0.01	0.02	$209	0.3	0	0	0	0	0.03	0.06	$826	1.1
k. Hybrid vehicles (heavy duty)	0	0	0	0	0.00	0.00	$11	0.0	0	0	0	0	0.01	0.03	$355	0.5
l. Existing homes	0	26	2	3	0.00	0.00	$24	0.1	0	77	6	8	0.00	0.01	$71	0.2
3. CHP and Recycled Energy	11	2,000	0	35	~0	0.04	$539	2.3	30	4,600	0	107	~0	0.11	$1,578	6.0
4. RD&D authorizations	2	502	10	20	0.01	0.05	$411	0.9	12	3,130	60	120	0.06	0.30	$2,678	5.3
5. Misc. efficiency provisions																
a. Voluntary industrial commitments	2	553	13	21	0.01	0.03	$222	0.8	5	1,244	38	62	0.02	0.13	$725	2.2
b. Labeling of appliances	8	2,025	8	49	0.00	0.09	$652	1.7	23	6,075	25	141	0.00	0.26	$2,068	4.9
c. Federal facilities	1	377	3	4	0.00	0.02	$134	0.4	4	978	6	25	0.00	0.05	$365	0.9
d. High performance public buildings	0	90	1	2	0.00	0.00	$31	0.1	1	271	2	7	0.00	0.01	$100	0.3
e. A/C maintenance education	0	391	0	2	0.00	0.00	$26	0.1	1	1,174	0	5	0.00	0.01	$83	0.2
f. Public housing	0	71	1	2	0.00	0.00	$42	0.1	1	212	3	7	0.00	0.01	$93	1.0
g. Real-time pricing	2	1,927	0	9	0.00	0.02	$105	0.4	5	5,782	0	26	0.00	0.05	$334	1.0
h. Energy efficiency resource standard	2	580	8	19	0.00	0.03	$228	0.6	3	928	12	29	0.00	0.05	$384	0.9
i. Daylight savings time	3	916	0	18	0.00	0.04	$265	0.7	4	1,082	0	21	0.00	0.04	$329	0.8
6. Building Energy Codes	0	101	3	5	0.00	0.01	$55	0.1	3	678	21	34	0.00	0.05	$393	2.2
7. Public Awareness Campaign	6	1,648	19	52	0.01	0.11	$970	2.1	4	974	10	29	0.01	0.06	$594	1.2
8. Transportation																
a. Extend dual fuel loophole	0	0	0	0	-0.05	-0.09	-$1,101	-1.6	0	0	0	0	-0.05	-0.09	-$1,115	-1.6
TOTAL	63	18,770	145	452	0.00	0.72	$5,368	15.3	206	63,474	419	1,438	0.10	2.55	$21,162	52.7

Conference Report 2005

ACEEE staff analysis August 2005

Policy Initiative	Cumulative through 2010							Cumulative through 2020						
	TWH	Direct Gas BCF	Total Gas BCF	Oil Billion Bbls	Quads	$ million	Carbon (MMT)	TWH	Direct Gas BCF	Total Gas BCF	Oil Billion Bbls	Quads	$ million	Carbon (MMT)
1. Appliance Efficiency Standards	53	140	425	0	0.71	5,261	13.3	675	723	4,219	0	7.79	$62,954	145.2
2. Tax incentives														
a. New Homes	2	15	26	0.00	0.04	$279	0.7	21	148	254	0.00	0.36	$2,751	6.3
b. Central AC/HP	2	0	9	0.00	0.02	$178	0.4	44	0	226	0.00	0.45	$4,587	8.7
c. Gas water heaters	0	4	4	0.00	0.00	$33	0.1	0	125	125	0.00	0.13	$946	1.8
d. HP water heaters	0	0	2	0.00	0.00	$30	0.1	4	0	22	0.00	0.04	$333	0.8
e. Furnaces	2	4	15	0.00	0.03	$183	0.5	27	70	212	0.00	0.35	$2,710	6.5
f. Appliances	1	32	39	0.00	0.05	$353	0.7	18	425	518	0.00	0.61	$4,642	9.8
g. Comm. Bldgs.	2	7	17	0.00	0.03	$200	0.5	21	72	183	0.00	0.29	$2,250	5.3
h. Fuel cell cogen.	0	0	0	0.00	0.00	$0	0.0	0	1	1	0.00	0.00	$5	0.0
i. Fuel cell vehicles	0	0	0	0.00	0.00	$1	0.0	0	0	0	0.00	0.00	$51	0.1
j. Hybrid vehicles (light duty)	0	0	0	0.01	0.04	$586	0.8	0	0	0	0.09	0.48	$6,172	8.5
k. Hybrid vehicles (heavy duty)	0	0	0	0.00	0.00	$21	0.0	0	0	0	0.02	0.12	$1,564	2.2
l. Existing homes	0	6	8	0.00	0.01	$73	0.2	2	52	64	0.00	0.08	$574	1.2
3. CHP and Recycled Energy	28	0	88	~0	0.09	$1,348	5.9	177	0	621	~0	1.83	$9,348	35.3
4. RD&D authorizations	5	25	50	0.01	0.13	$1,029	2.2	87	450	900	0.17	2.25	$20,084	39.9
5. Misc. efficiency provisions														
a. Voluntary industrial commitments	4	32	53	0.01	0.08	$555	1.9	35	287	466	0.06	0.96	$5,435	16.6
b. Labeling of appliances	19	21	122	0.00	0.22	$1,630	4.3	169	188	1,061	0.00	1.93	$15,508	36.4
c. Federal facilities	2	4	15	0.00	0.03	$228	0.7	36	63	250	0.03	0.50	$4,149	11.2
d. High performance public buildings	1	1	6	0.00	0.01	$79	0.2	8	13	51	0.00	0.10	$852	1.9
e. A/C maintenance education	1	0	5	0.00	0.01	$66	0.2	8	0	39	0.00	0.08	$620	1.5
f. Public housing	1	3	6	0.00	0.01	$105	0.2	6	24	55	0.00	0.11	$938	2.0
g. Real-time pricing	4	0	22	0.00	0.04	$323	0.9	37	0	193	0.00	0.39	$3,053	7.4
h. Energy efficiency resource standard	5	19	49	0.00	0.08	$581	1.5	45	154	388	0.00	0.62	$5,079	11.5
i. Daylight savings time	17	0	91	0.00	0.18	$661	3.6	54	0	279	0.00	0.56	$4,425	10.8
6. Building Energy Codes	1	8	13	0.00	0.02	$138	0.3	19	158	255	0.00	0.38	$3,172	6.5
7. Public Awareness Campaign	15	48	130	0.01	0.28	$2,426	5.2	69	206	565	0.06	1.25	$10,723	22.6
8. Transportation														
a. Extend dual fuel loophole	0	0	0	-0.05	-0.24	-$2,988	-4.4	0	0	0	-0.28	-1.43	-$17,913	-26.0
TOTAL	165	369	1,195	-0.01	1.88	$13,377	39.9	1,562	3,158	10,947	0.17	20.24	$155,012	373.9