

HR. 2454 Addresses Climate Change Through a Wide Variety of Energy Efficiency Measures

H.R. 2454, the American Clean Energy and Security Act (ACESA), was reported out of the full House Energy and Commerce Committee May 21, 2009. This bill provides an important step forward in addressing climate change through energy efficiency and other means. The American Council for an Energy-Efficient Economy (ACEEE) has conducted a preliminary analysis of the energy savings from provisions relating to energy efficiency in this significant piece of legislation.

Most notably, the legislation creates a cap-and-trade policy, a market-based incentive to reduce carbon emissions. This has the potential to help people and businesses to become more efficient and to drive adoption of energy-efficient technologies, our country's cheapest and most abundant energy source. In addition, allowances from the sale of carbon credits in the cap-and-trade system will provide funding for a number of important energy efficiency initiatives. The bill includes a number of key policies designed to maximize savings from energy efficiency, including improved building codes, appliance and lighting standards, and residential and commercial retrofits.

Allocations detailed in Section 782g direct 9.5% of allowances in 2012 (and decreasing amounts thereafter) to go into a State Energy and Environmental Development (SEED) account to be used by state and local governments for efficiency and renewables projects. The allocations to the SEED account will provide the funding for the REEP (Retrofit for Energy and Environmental Performance) program, transportation planning, building labeling, and other important energy-efficiency measures. At least 20% of the SEED money must go to funding renewable energy programs. Because the exact allocation of the SEED money will be the choice of local and state authorities, anywhere from 20-80% of the SEED money could go to energy-efficiency measures. Our analysis assumes that 75% will go to energy efficiency, providing savings as high as 2.45 quadrillion Btu's in 2020 and 4.85 quads in 2030 (the average U.S. state uses about 2 quads/year).

Free allowances are given to natural gas utilities beginning in 2016 (Section 782b), one-third of which must be used specifically for energy efficiency. The allowances to efficiency will begin at 3% in 2016 and will ramp down over time. This could provide as much as 0.61 quads of savings in 2020 and 1.59 quads of savings in 2030. In addition, states will receive allowances based upon heating oil consumption (Section 782c), one-half of which must be used for energy efficiency programs. These allowances will be worth 1.875% of the total in 2012, ramping down to .03% in 2029.

The allowances will also be used to fund a number of other important energy efficiency programs, many of which will provide considerable monetary and energy savings for consumers. Section 201 directs 0.5% of the total emissions allowances to go to the implementation of stricter building codes. These codes will provide for 30% improvements in 2010, 50% improvements in 2014 for residential and 2015 for commercial buildings, and 5% additional improvements every 3 years after 2017/2018. Building codes are one of the most significant portions of the legislation, providing 9% of the savings from the bill in 2020, and 13% of the savings in 2030.

In addition, 1.5 % of the total allowances will be used to fund clean energy innovation centers (Section 171), which will conduct R&D on eight different categories of clean energy, including building efficiency and transportation efficiency. These will be administered by the Department of Energy, and the R & D innovations created by the centers are likely to save as much as 3 quads in 2030.

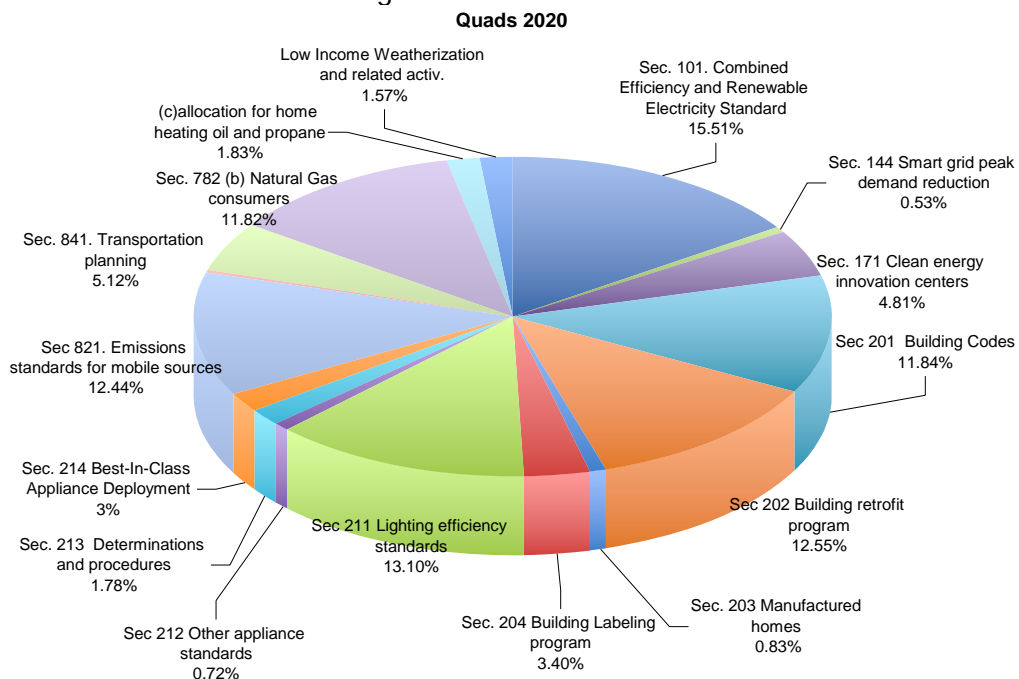
This legislation also includes a number of other important energy saving provisions in addition to those funded by cap-and-trade allowances. In particular, new lighting and appliance standards on items like commercial furnaces, outdoor lighting fixtures, hot food holding cabinets, and electric spas will provide savings of 0.81 quads in 2020 and 1.7 quads in 2030.

The bill also includes a combined renewable and electricity standard requiring that 20 percent of electricity sales be met with a combination of renewable energy and energy efficiency by 2020. Energy efficiency programs can be used to meet 5% of the requirement, and governors can petition to bring the percentage devoted to efficiency up to 8%. Many utilities and states will choose to use the maximum amount of efficiency, as efficiency investments tend to be less expensive than renewable energy. Unfortunately, this will only produce around 3% more efficiency beyond business-as-usual, saving about 0.81 quads in 2020 and 0.83 quads in 2030.

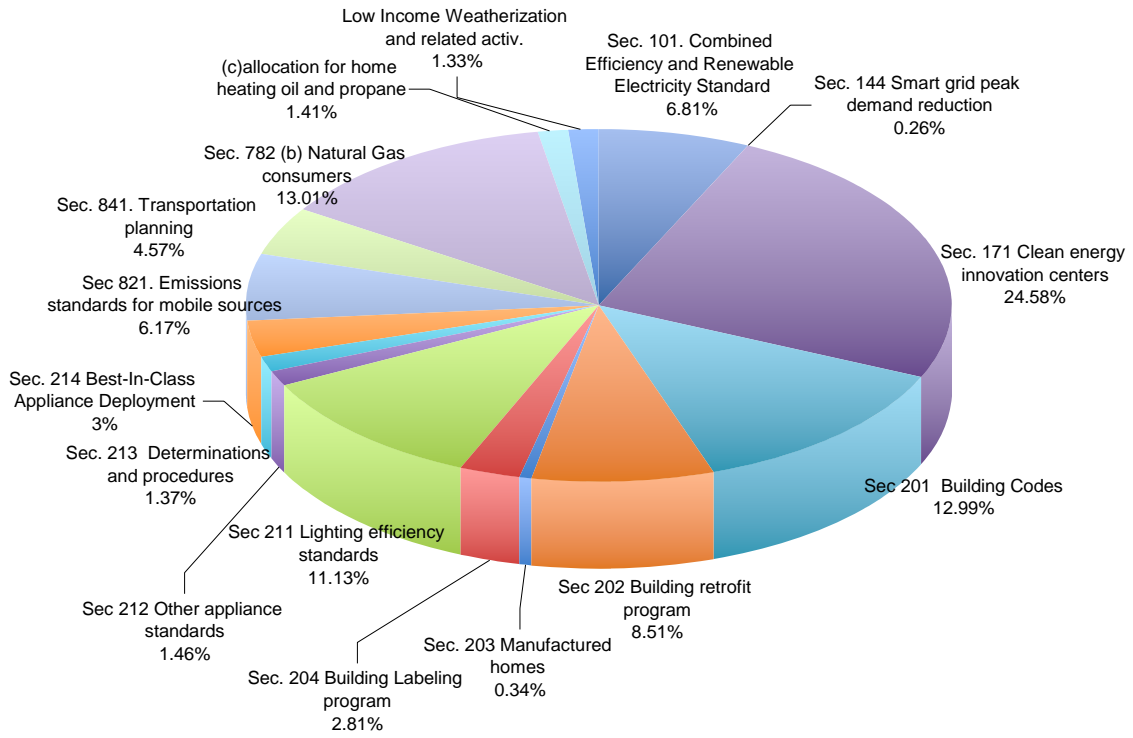
In total, the energy efficiency provisions in H.R. 2454 could reduce U.S. energy use by 4.4 quadrillion Btu's, about 4% of projected U.S. energy use in 2020. These energy efficiency savings are more than the entire current energy use of the state of New York, and are larger than the annual energy use of 47 of the 50 states. These savings will avoid about 293 million metric tons of carbon dioxide emissions in 2020, the equivalent of taking 49 million cars off the road for a year.

Since H.R. 2454 was passed out of the full House Energy and Commerce Committee process but has yet to be considered on the House floor, there are ongoing efforts to improve certain provisions. ACEEE's top two priorities are to work with the renewable energy community to increase the combined renewable energy and energy efficiency standard, and to insert a provision into funding going to electric distribution utilities that at least one-third of these funds need to go for efficiency, like the allowances to gas distribution companies in Section 782b.

Although these potential savings are dramatic, there are many additional cost-effective efficiency opportunities available. ACEEE's studies of energy efficiency's potential indicate that current technologies can cost-effectively save 25-30% of total energy use, and that new technologies could increase the available cost-effective savings.



Quads 2030



2020 Savings Estimates

| Savings Estimates for House Discussion Draft (Waxman-Markey) | | | 2020 | | | | | | | | | | | | | |
|--|---|--|-------------------|--------------------------|------------------------------|--------------------------------|---------------------------------------|--------------------------------|----------------------|--------------|--|--|---|---|--|--|
| ACEEE's preliminary assessment of the potential energy, carbon, and economic savings | | | | | | | | | | | | | | | | |
| 1-Jun-09 | | | | | | | | | | | | | | | | |
| Annual Energy Savings Estimates | | | | | | | | | | | | | | | | |
| Title | Subtitle | Section | Electricity (TWh) | Avoided Peak Demand (MW) | Direct Natural Gas (BCF) (1) | Indirect Natural Gas (BCF) (2) | Oil Savings (Million barrels per day) | Primary Energy Savings (Quads) | Carbon Dioxide (MMT) | Carbon (MMT) | Cumulative Federal Investments (billion 2007 \$) (3) | Cumulative State/Utility Investments (billion 2007 \$) | Cumulative Consumer Investments (billion 2007 \$) | Annualized Consumer Costs (billion 2007 \$) | Gross Annual Consumer Savings (billion 2007\$) (4) | Net Annual Consumer Savings (Billion 2007\$) |
| Title I - Clean Energy | Subtitle A - Combined Efficiency and Renewable Electricity Standard | Sec. 101. Combined Efficiency and Renewable Electricity Standard | 77.3 | 24,853 | 0.0 | 391 | N/A | 0.81 | 46 | 12.6 | N/A | 7.47 | 14.94 | 5.81 | 7.26 | \$ 1.45 |
| | Subtitle E - Smart Grid Advancement | Sec. 142 Smart grid in Energy Star | N/A | 909 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | Sec. 144 Smart grid peak demand reduction | 2.6 | 23,209 | N/A | 13 | N/A | 0.03 | 2 | 0.5 | N/A | N/A | N/A | N/A | N/A | 0.25 |
| | Subtitle H - Centers | Sec. 171 Clean energy innovation centers | 14.4 | 3,885 | 100.00 | 16 | 0.037 | 0.25 | 16 | 4.3 | 11.32 | 0.00 | 11.32 | 1.43 | 2.26 | \$ 0.83 |
| Title II - Energy Efficiency | Subtitle A - Building Energy Efficiency | Sec 201 Building Codes | 43.1 | 11,637 | 166 | 218 | 0.062 | 0.62 | 40 | 11.0 | 2.56 | 0 | 36.40 | 2.80 | 5.57 | \$ 2.77 |
| | | Sec 202 Building retrofit program | 53.6 | 14,477 | 75 | 272 | 0.028 | 0.65 | 43 | 11.8 | 3.30 | 0 | 30.02 | 3.79 | 5.73 | \$ 1.94 |
| | | Sec. 203 Manufactured homes | 3.2 | 859 | 9 | 16 | 0.003 | 0.04 | 3 | 0.8 | 3.85 | 0 | 34.96 | 2.69 | 0.38 | \$ (2.31) |
| | | Sec. 204 Building Labeling program | 13.2 | 3,572 | 35 | 67 | 0.013 | 0.18 | 12 | 3.3 | 0.67 | 0 | 2.07 | 0.47 | 1.56 | \$ 1.09 |
| | Subtitle B - Lighting and Appliance Energy | Sec 211 Lighting efficiency standards | 32.1 | 8,672 | 335 | 163 | 0.125 | 0.68 | 43 | 11.7 | 0.00 | 0 | 4.90 | 0.61 | 6.07 | \$ 5.46 |
| | | Sec 212 Other appliance standards | 0.7 | 202 | 29 | 4 | 0.011 | 0.04 | 2 | 0.6 | 0.00 | 0 | 0.17 | 0.02 | 0.34 | \$ 0.32 |
| | | Sec. 213 Determinations and procedures | 3.9 | 1,057 | 50 | 20 | 0.019 | 0.09 | 6 | 1.6 | 0.00 | 0 | 0.28 | 0.13 | 0.83 | \$ 0.70 |
| | Subtitle C - Transportation Efficiency | Sec. 214 Best-In-Class Appliance Deployment (5) | 8.8 | 2,384 | 8 | 45 | 0.003 | 0.10 | 7 | 2.0 | 3.30 | 0 | 0.00 | 0.00 | 0.90 | \$ 0.90 |
| | | Sec 821. Emissions standards for mobile sources | N/A | N/A | N/A | N/A | 0.34 | 0.65 | 53.8 | 14.7 | 5.00 | 0 | 93.61 | 18.72 | 18.72 | \$ - |
| | | Amendment: Vehicle Scrappage Program | N/A | N/A | N/A | N/A | 0.0044 | 0.01 | 0.70 | 0.19 | 3.80 | 0 | 1.21 | 0.28 | 0.24 | \$ (0.03) |
| Allowance Revenue devoted to Energy Efficiency | Sec. 841. Transportation planning | N/A | N/A | N/A | N/A | 0.140 | 0.27 | 18 | 4.9 | 3.63 | 0 | 38.54 | 3.85 | 7.71 | \$ 3.85 | |
| | Sec. 782 (b) Natural Gas consumers | N/A | N/A | 614 | N/A | N/A | 0.61 | 33 | 9.0 | 9.55 | 0 | 9.55 | 2.17 | 5.59 | \$ 3.42 | |
| | (c)allocation for home heating oil and propane | N/A | N/A | N/A | N/A | 0.050 | 0.10 | 8 | 2.2 | 4.10 | 0 | 4.10 | 0.52 | 2.76 | \$ 2.24 | |
| | Low Income Weatherization and related activ. | 4.0 | 1,091 | 38 | 20 | 0.01 | 0.08 | 5 | 1.4 | 5.12 | 0.00 | 2.16 | 0.27 | 0.73 | \$ 0.46 | |
| Total | | | 180 | 71,954 | 1,459 | 854 | 0.85 | 4.4 | 293 | 80 | 56 | 0 | 269 | 38 | 60 | 22 |

2030 Savings Estimates

| ACEEE's preliminary assessment of the potential energy, carbon, and economic savings | | | 2030 | | | | | | | | | | | | | |
|--|---|--|-------------------|--------------------------|------------------------------|--------------------------------|---------------------------------------|--------------------------------|----------------------|--------------|--|--|---|---|--|--|
| 1-Jun-09 | | | | | | | | | | | | | | | | |
| Annual Energy Savings Estimates | | | | | | | | | | | | | | | | |
| Title | Subtitle | Section | Electricity (TWh) | Avoided Peak Demand (MW) | Direct Natural Gas (BCF) (1) | Indirect Natural Gas (BCF) (2) | Oil Savings (Million barrels per day) | Primary Energy Savings (Quads) | Carbon Dioxide (MMT) | Carbon (MMT) | Cumulative Federal Investments (billion 2007 \$) (3) | Cumulative State/Utility Investments (billion 2007 \$) | Cumulative Consumer Investments (billion 2007 \$) | Annualized Consumer Costs (billion 2007 \$) | Gross Annual Consumer Savings (billion 2007\$) (4) | Net Annual Consumer Savings (Billion 2007\$) |
| Title I - Clean Energy | Subtitle A - Combined Efficiency and Renewable Electricity Standard | Sec. 101. Combined Efficiency and Renewable Electricity Standard | 84.3 | 27,099 | 0.0 | 427 | N/A | 0.83 | 50 | 13.6 | N/A | 8.15 | 16.29 | 0.17 | 8.81 | 8.64 |
| | Subtitle E - Smart Grid Advancement | Sec. 142 Smart grid in Energy Star | N/A | 1,252 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0 |
| | | Sec. 144 Smart grid peak demand reduction | 2.9 | 25,995 | N/A | 15 | N/A | 0.03 | 2 | 0.6 | N/A | N/A | N/A | N/A | \$ 0.55 | \$ - |
| | Subtitle H - Centers | Sec. 171 Clean energy innovation centers | 167.4 | 45,201 | 1,200.00 | 818 | 0.306 | 3.00 | 187 | 51.0 | 13.50 | 0 | 135.03 | 17.06 | \$ 26.68 | \$ 9.62 |
| Title II - Energy Efficiency | Subtitle A - Building Energy Efficiency | Sec 201 Building Codes | 97.0 | 26,192 | 543 | 474 | 0.18 | 1.59 | 100 | 27.3 | 1.47 | 0 | 89.18 | 7.63 | \$ 14.07 | \$ - |
| | | Sec 202 Building retrofit program | 91.8 | 24,786 | 115 | 449 | 0.17 | 1.04 | 73 | 20.0 | 3.30 | 0 | 34.83 | 6.39 | \$ 9.69 | \$ 3.30 |
| | | Sec. 203 Manufactured homes | 3.2 | 859 | 9 | 16 | 0.01 | 0.04 | 3 | 0.8 | 3.85 | 0 | 34.96 | 2.69 | \$ 0.38 | \$ (2.31) |
| | | Sec. 204 Building Labeling program | 25.6 | 6,925 | 67 | 130 | 0.05 | 0.34 | 22 | 6.1 | 1.17 | 0 | 3.44 | 0.78 | \$ 3.02 | \$ 2.24 |
| | Subtitle B - Lighting and Appliance Energy | Sec 211 Lighting efficiency standards | 65.3 | 17,623 | 656 | 331 | 0.12 | 1.36 | 83 | 22.7 | 0.00 | 0 | 6.32 | 0.78 | \$ 12.12 | \$ 11.34 |
| | | Sec 212 Other appliance standards | 0.9 | 239 | 169 | 4 | 0.002 | 0.18 | 10 | 2.7 | 0.00 | 0 | 0.27 | 0.03 | \$ 1.62 | \$ 1.59 |
| | | Sec. 213 Determinations and procedures | 7.0 | 1,903 | 92 | 36 | 0.01 | 0.17 | 10 | 2.8 | 0.00 | 0 | 0.50 | 0.23 | \$ 1.50 | \$ 1.27 |
| | Subtitle C - Transportation Efficiency | Sec. 214 Best-In-Class Appliance Deployment (5) | 35.6 | 9,620 | 13 | 180 | 0.068 | 0.40 | 27 | 7.3 | 5.67 | 0 | 0.00 | 0.0 | \$ 3.47 | \$ 3.47 |
| | | Sec 821. Emissions standards for mobile sources | N/A | N/A | N/A | N/A | 0.40 | 0.75 | 63 | 17.1 | 5.00 | 0 | 218.27 | 14.6 | \$ 21.83 | \$ 7.28 |
| | | Amendment: Vehicle Scrappage Program | N/A | N/A | N/A | N/A | 0.00 | - | 0 | 0.0 | 3.80 | 0 | 1.21 | 0.0 | \$ - | \$ - |
| Allowance Revenue devoted to Energy Efficiency | Sec. 841. Transportation planning | N/A | N/A | N/A | N/A | 0.29 | 0.56 | 36 | 9.9 | 6.07 | 0 | 119.31 | 8.1 | \$ 16.15 | \$ 8.08 | |
| | Sec. 782 (b) Natural Gas consumers | N/A | N/A | 1,588 | N/A | N/A | 1.59 | 86 | 23.3 | 24.70 | 0 | 24.70 | 5.63 | \$ 14.47 | \$ 8.85 | |
| | (c)allocation for home heating oil and propane | N/A | N/A | N/A | N/A | 0.09 | 0.17 | 14 | 3.9 | 7.89 | 0 | 7.89 | 1.0 | \$ 4.98 | \$ 3.98 | |
| | Low Income Weatherization and related activ. | 7.9 | 2,134 | 78 | 40 | 0.015 | 0.16 | 10 | 2.7 | 12.50 | 0.0 | 2.01 | 0.3 | \$ 1.45 | \$ 1.20 | |
| Total | | | 505 | 162,729 | 4531 | 2493 | 2 | 11 | 727 | 198 | 89 | 0 | 678 | 65 | 132 | 69 |

Notes:

1. Direct gas represents the natural gas saved directly by the measures
2. Indirect gas is the gas avoided in electric power generation. Indirect gas and electric carbon emissions reductions are based on national average fuel mix and heat rate as projected in AEO 2009.
3. Where programs require substantial spending, we use funding authorizations, or in absence of a specific authorization, assume continuation of spending through 2020.
4. Gross consumer savings are preliminary estimates assuming AEO 2009 projected energy prices.
5. For BICAD, budget is high enough to pay 100% of incremental cost.