



Tax Incentives for Advanced Energy-Efficient Technologies: Costs, Benefits, and Legislative Recommendations

One of a Series of ACEEE Fact Sheets

Why Tax Incentives for Advanced Energy-Saving Technologies?

Tax incentives can provide a critically important inducement for manufacturers to begin mass production and marketing of innovative energy-saving technologies. Tax incentives also help buyers offset the relatively high first cost premium for such new technologies, thereby helping to build sales and market share. In contrast to the energy efficiency tax credits of the 1970s, which targeted “tried and true” technologies and had a high level of “free riders” (i.e., consumers who would have installed efficiency measures even if no tax credit were offered), new tax credits should target advanced technologies that currently have low market share. Tax incentives for these technologies can encourage manufacturers to introduce new products and can help stimulate consumer interest. Once the new technologies become widely available and are produced on a significant scale, costs decline and tax incentives can and should be phased out.

What Are the Benefits and Costs?

The table below summarizes ACEEE’s estimates of the energy savings, federal cost, energy savings per federal dollar, net benefits, and overall benefit-cost ratio (including both federal and consumer costs) for each of the specific tax incentives we recommend.

Tax Credit	Total Energy Savings (Quads)	Federal Cost (2002–2006) (\$million)	Energy Savings per Federal Dollar (mmBtu/\$)	Net Overall Benefits (\$billion)	Overall Benefit-Cost Ratio	Rank*
Combined heat & power (CHP)	29	1,000	29	62	3.1	1*
Commercial buildings	18	1,400	13	30	5.4	1*
New homes	6.3	940	6.8	4.7	1.6	3
Heat pump water heaters	2.2	250	8.9	4.5	2.5	4
Fuel cell cogeneration	4.2	100	42	2.1	1.2	5
Gas heat pumps	0.9	120	7.5	1.1	1.6	6*
Transformers	0.9	290	3.1	1.6	3.9	6*
Hybrid vehicles	3.1	760	4.1	3.9	1.3	8
Gas furnaces	2.3	750	3.1	2.0	1.4	9
Central air/heat pumps	1.5	1,000	1.5	2.0	1.4	10
Appliances	0.8	440	1.8	0.5	1.2	11
Electric & fuel-cell vehicles	0.4	290	1.3	(2.2)	0.5	12
TOTAL	70	7,300	9.6	110	2.3	

* Tied rankings. See endnote for assumptions and definitions.

Specific Recommendations for Energy Efficiency Tax Incentives

- **Commercial buildings:** a tax deduction of \$2.25 per square foot for investments in commercial buildings and multifamily residences that achieve a 50% or greater reduction in heating and cooling costs compared to equivalent buildings meeting current model energy codes. Appropriate language is included in H.R.4, S.207 (Smith), and S.596 (Bingaman). S.207 is preferred because its language incorporates several technical improvements.

- **Combined heat and power (CHP):** either a 10% investment tax credit, or 7-year depreciation period, for CHP systems with an overall efficiency of at least 60 to 70%, depending on system size. Reasonable legislative language for a 10% investment tax credit is included in S.389 (Murkowski), S.596 (Bingaman), and H.R.1945 (Quinn). H.R.4 suffers from two deficiencies: first, tax credits are only available for CHP systems greater than 50 kW; and second, systems with a tax life of 15 years or less must use a 22-year depreciation schedule to receive the credit. Small CHP systems need the credit even more than large systems, and lengthening the depreciation period for many participating systems will nullify much of the benefit of the tax credit. We recommend that these two House provisions be deleted.
- **New homes:** a two-tiered tax credit, with \$750 to \$1,000 for new homes exceeding current model energy codes by at least 30% and \$2,000 to \$2,500 for improvements exceeding current codes by 50% or more. These would stimulate efficiency and help lower housing costs for American families. The credit should be conditioned upon the certification of energy savings by independent experts. S.207 (Smith) and S.596 (Bingaman) meet these criteria. H.R.4 lacks incentives for homes achieving 50% savings and provides an overly generous incentive (up to \$2,000) for homes meeting the 30% savings target. The Smith and Bingaman bills would provide more energy savings than H.R.4 (due to the 50% savings tier) at a lower total cost to the federal treasury. There are a few technical details pertaining to fuel neutrality, development of a prescriptive approach, and fixed versus percent incentives that are treated better in the Smith bill than the Bingaman bill.
- **Building equipment:** a 20% investment tax credit, with caps, for innovative building technologies. Included would be highly efficient furnaces, stationary fuel cell power systems, electric heat pump water heaters, distribution transformers, electric central air conditioners and heat pumps, and gas-fired heat pumps. Reasonable language is included for all or most of these products in S.596 (Bingaman) and H.R.2392 (Inslee). One significant difference is that Inslee revised and improved upon the Bingaman language for distribution transformers. Other bills, such as S.207 (Smith), include some but not all of these credits. H.R.4 includes only fuel cell power systems; the other products should be added.
- **Hybrid electric, battery electric, and fuel cell vehicles:** tax credits of up to \$4,000 for hybrid electric vehicles, \$6,000 for battery electric vehicles, and \$8,000 for fuel cell vehicles (more for heavy duty vehicles in all three categories). These provisions, which are included in S.760, the CLEAR Act (Hatch), would help jump-start the introduction and purchase of these innovative, fuel-efficient vehicle technologies. Credits should be based primarily on energy performance and use of advanced technology, and require reduced emissions. H.R.4 violates these last two provisions as it includes extra incentives that bypass fuel economy targets and also deletes emissions limits. These House provisions would substantially increase the costs of the credit with little compensating benefit. The Hatch bill is much preferred.
- **Appliances:** a \$50 to \$100 tax credit per machine for manufacturers of highly efficient clothes washers and refrigerators, with a cap on the total credit per manufacturer. This credit will lead to the next generation of super-efficient appliances, thereby saving energy and water. Specifically, we support the language in H.R.4; this includes some modest improvements relative to previous versions of this credit included in S.686 (Lincoln) and S.596 (Bingaman).

Endnote: Quad = quadrillion Btu (U.S. used about 100 Quads in 2000); mmBtu = million Btu. Total energy savings are lifetime savings from measures installed through 2020. Direct costs are given in nominal dollars. Benefit-cost ratios are based on 2002 dollars and a 5% real discount rate. Average rank is based on ranking each credit on total energy savings, energy savings per federal dollar, and overall benefit-cost ratio, then averaging these three ranks.