# Consumer Energy Tax Credit

## Overview of Tax Credit

Energy efficiency incentives for upgrades to existing homes are now available for 2009 and 2010. These tax incentives have been enhanced and extended through the *American Recovery and Reinvestment Tax Act of 2009*. The financial cap for these incentives, which cover existing home envelope improvements, as well as heating, cooling and water heating equipment, is $1,500. These incentives are calculated at 30 percent of the product cost, up to the $1,500 cap.

Eligible building envelope improvements for this financial incentive include: installing Energy Star-rated windows; increasing insulation levels in the roof, floor or walls; and replacing an existing furnace, air conditioner or heat pump with a high-efficiency model.

On-site renewables (solar photovoltaic and hot water systems, small wind systems and geothermal heat pumps) are also eligible for tax incentives worth 30 percent of the total cost, without a cap. These incentives are available for both new and existing construction. Incentives for plug-in electric vehicles and plug-in conversion kits are also included.

Additional incentives may be available from utilities and local municipalities.

## Tax Credit Process

There are a few criteria that must be met to qualify for a tax credit on a home improvement project:

The energy upgrade must be placed in service from January 1, 2009, through December 31, 2010. The IRS defines "placed in service" as when the property is ready and available for use. Improvements made in 2009 will be claimed on your 2009 taxes (filed by April 15, 2010). IRS Tax Form 5695 (2009 version) will be used to claim the tax credit.

The energy upgrade must be for the taxpayer's principal residence. Other residences used by the taxpayer can also qualify for tax credits when geothermal heat pumps, solar water heaters, solar panels and small wind-energy systems are installed.

The maximum total amount that can be claimed for all products placed in service in 2009 and 2010 for most home improvements is $1,500. Geothermal heat pumps, solar water heaters, solar panels, fuel cells and small wind-energy systems are not subject to the $1,500 cap.

## New Construction

Those building a new home can qualify for the tax credits for geothermal heat pumps, photovoltaics, solar water heaters, small wind-energy systems and fuel cells only. These features are typically eligible for up to 30 percent of the cost.

**Figure 1 Wall Insulation**

This brochure contains information on the available tax credits for residential projects and the requirements applicable to the credits. References are provided for additional information for each of the credits when available.

## Building Envelope

Building envelope tax credits are available for the following product types:

- Efficient window and door replacements.
- Cool roofs, and wall, ceiling and floor insulation upgrades (see Figure 1).

Each residence is eligible for up to 30 percent of the cost of the products up to $1,500. For example, a project that proposes to replace windows and add ceiling insulation for a total cost of $5,000 would be eligible for a maximum tax credit of $1,500 (30 percent of $5,000). These credits are available for existing homes only.

## Efficient Window and Door Replacement

**Figure 2 Window and Door Replacement**

Replacing older, less efficient windows and doors (see Figure 2) can reduce the energy use in a house. In Northern climates, double pane, Low-E windows can reduce the heat loss from a residence, reduce condensation on windows and increase comfort. In Southern climates, the Low-E coating blocks solar heat gain and helps keep the house cool. Exterior doors can be replaced with an efficient weatherstripped foam core door that reduces heat loss and gain, and minimizes drafts. Windows and doors must meet the criteria in Table 1.

**TABLE 1: WINDOW AND DOOR CRITERIA**

| PRODUCT TYPE[1] | TAX CREDIT SPECIFICATION | TAX CREDIT |
|---|---|---|
| Windows & Doors | U-factor ≤ 0.30<br>SHGC ≤ 0.30 | 30% of cost, up to $1,500 |
| Exterior Doors | U-factor ≤ 0.30<br>SHGC ≤ 0.30 | 30% of cost, up to $1,500 |

**Note:** Visit the National Fenestration Rating Council (NFRC) web site, www.NFRC.org, for a listing of windows and doors that meet the tax incentive requirements.

## Cool Roofs

**Figure 3 Cool Roof System**

An effective measure for blocking solar heat gain through roofs is to give the roof a reflective coating (see Figure 3). The reflective coating, in addition to roof insulation, can reduce cooling costs in a hot climate by 10 to 40 percent, depending on the climate. A tax credit is available for installing a roof system with a reflectance listed in Table 2. Energy Star-qualified roof products meet the reflectance requirement for both low and steep slope roof systems.

**TABLE 2: COOL ROOF CRITERIA**

| PRODUCT TYPE | TAX CREDIT SPECIFICATION | TAX CREDIT |
|---|---|---|
| Roofing | Low Slope Roofs (≤ 2:12 Roof Pitch): Initial Solar Reflectance: 0.65<br>3 Year Solar Reflectance: 0.50<br><br>Steep Slope Roofs (> 2:12 Roof Pitch): Initial Solar Reflectance: 0.25<br>3 Year Solar Reflectance: 0.15 | 30% of cost, up to $1,500 |

**Note:** Information on Energy Star roofs and cool roofs can be found at www.energystar.gov/index.cfm?c=roof_prods.pr_roof_products or www.coolroofs.org.

## Roof, Wall and Floor Insulation

**Figure 4 Ceiling and Wall Insulation**

Adding insulation to the roof/ceiling, wall and floor of a residence is a cost effective upgrade that will reduce heat loss during heating months and reduce heat gain during cooling months (see Figure 4). To qualify for the tax credit, the insulation must be installed to meet the minimum *R*-value requirements listed in the 2009 *International Energy Conservation Code*® (IECC®, see Table 3). The tax credit is for up to 30 percent of the total material cost or $1,500, whichever is less, and is available for existing homes only. The *R*-value is shown on the insulation sold in stores.

**TABLE 3: MINIMUM R-VALUE**

| CLIMATE ZONE[e] | CEILING R-VALUE | WOOD FRAME WALL R-VALUE | FLOOR R-VALUE |
|---|---|---|---|
| 1 | 30 | 13 | 13 |
| 2 | 30 | 13 | 13 |
| 3 | 30 | 13 | 19 |
| 4 except Marine | 38 | 13 | 19 |
| 5 and Marine 4 | 38 | 20 or 13+5[a] | 30[b] |
| 6 | 49 | 20 or 13+5[a] | 30[b] |
| 7 and 8 | 49 | 21 | 38[b] |
| | Basement[c] Wall R-value | Slab[d] R-value & depth | Crawl[c] Space Wall R-value |
| 1 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 |
| 3 | 5/13 | 0 | 5/13 |
| 4 except Marine | 10/13 | 10, 2 ft | 10/13 |
| 5 and Marine 4 | 10/13 | 10, 2 ft | 10/13 |
| 6 | 15/19 | 10, 4 ft | 10/13 |
| 7 and 8 | 15/19 | 10, 4 ft | 10/13 |

a. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of the

exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

b. Or insulation sufficient to fill the framing cavity, R-19 minimum.

c. "15/19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Zones 1 through 3 for heated slabs.

e. Check with the local building department for your climate zone location (see Figure 9).

Figure 5 High-efficiency Water Heater

## Water Heater Upgrades

Water heating energy counts for approximately 15 percent of total energy use for a typical residence. Replacing an older water heater with a higher Energy Factor gas, oil or propane water heater or installing a heat pump water heater will reduce the energy use in a residence (see Figure 5). A tax credit is available for up to 30 percent of the product cost or $1,500, whichever is less. See Table 4 for more information.

### TABLE 4: WATER HEATING EFFICIENCY REQUIREMENTS

| WATER HEATER TYPE | EFFICIENCY REQUIREMENT | TAX CREDIT |
|---|---|---|
| Gas, Oil, Propane Water Heater | Energy Factor 0.82 or a thermal efficiency of at least 90% | 30% of cost, up to $1,500 |
| Electric Heat Pump Water Heater | Energy Factor 2.0 | 30% of cost, up to $1,500 |

**Note:** For a partial list of qualifying products visit the Air-Conditioning, Heating and Refrigeration Institute (AHRI) web site at: www.ahrinet.org/Content/FederalTaxCredits_896.aspx.

**Note:** All Energy Star gas tankless water heaters will qualify for the tax credit in addition to Energy Star electric heat pump water heaters.

## Residential Heat and Cooling System Replacement

Figure 6 High-efficiency Furnace

Homeowners can get credits for installing efficient air conditioners and heat pumps; gas or oil furnaces and furnace fans; and geothermal heat pumps in new or existing homes (see Figure 6). Tax credits are also available for biomass stoves (e.g., pellet stoves). Tables 5, 6 and 7 list the minimum efficiencies for heating and cooling equipment that qualify for the tax credit. Homeowners are eligible for 30 percent of the cost of the equipment and installation up to $1,500. For geothermal heat pumps, a homeowner is eligible for 30 percent of the cost of the system with no cap. These credits are available for new or existing homes.

### TABLE 5: MINIMUM HVAC EQUIPMENT EFFICIENCIES

| HVAC SYSTEM TYPE | EFFICIENCY | TAX CREDIT |
|---|---|---|
| Central A/C | *Split Systems:*<br>EER ≥13<br>SEER ≥ 16<br>*Package systems:*<br>EER ≥ 12<br>SEER ≥ 14 | 30% of cost, up to $1,500<br>For a list of qualified products, go to the Consortium for Energy Efficiency web site at: www.cee1.org |

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| HVAC SYSTEM TYPE | EFFICIENCY | TAX CREDIT |
|---|---|---|
| Air Source Heat Pumps | *Split Systems:*<br>HSPF ≥ 8.5<br>EER ≥ 12.5<br>SEER ≥ 15<br>*Package systems:*<br>HSPF ≥ 8<br>EER ≥ 12<br>SEER ≥ 14 | 30% of cost, up to $1,500 |
| Natural Gas or Propane Furnace | AFUE ≥ 95 | 30% of cost, up to $1,500 |
| Oil Furnace | AFUE ≥ 90 | 30% of cost, up to $1,500 |
| Gas, Propane, or Oil Hot Water Boiler | AFUE ≥ 90 | 30% of cost, up to $1,500 |
| Advanced Main Air Circulating Fan[a] | No more than 2% of furnace total energy use | 30% of cost, up to $1,500 |

a. Advanced main circulating fans use direct current (DC) power to spin the blower fan. DC motors use approximately 10 percent of the energy required to operate the fan as opposed to an AC fan.

### TABLE 6: MINIMUM GEOTHERMAL HEAT PUMP EFFICIENCIES

| TYPE | DESCRIPTION | TAX CREDIT |
|---|---|---|
| Geothermal Heat Pump | Minimum Efficiencies<br>Closed Loop:<br>EER 14.1<br>COP 3.3<br>Open Loop:<br>EER 6.2<br>COP 3.6<br>Direct Expansion:<br>EER 15<br>COP 3.5 | 30% of cost |

### TABLE 7: BIOMASS STOVE MINIMUM EFFICIENCIES

| STOVE TYPE | DESCRIPTION | TAX CREDIT |
|---|---|---|
| Biomass Stove | Stove which burns biomass fuels[a] to heat a home or heat water.<br><br>Thermal efficiency rating of at least 75% as measured using a lower heating value. | 30% of cost, up to $1,500 |

a. Biomass fuel means any plant-derived fuel available on a renewable or recurring basis, including agricultural crops and trees, wood and wood waste, and residues (including wood pellets), plants (including aquatic plants), grasses, residues and fibers.

## Solar Systems for Water Heating and Electric Generation

**Figure 7 Solar Water Heating System**

Tax credits are available for solar water heating systems and also systems that produce electricity for use in a residence (photovoltaic systems). Photovoltaic systems (PV systems) convert sunlight into electricity when sunlight comes in contact with silicon. PV systems are becoming more common on residences to provide the electricty needed to power the home. For more information please visit the U.S. DOE National Renewable Energy laboratory web site at: www.nrel.gov/learning/ho_photovoltaics.html. The credit is available for the heating of domestic hot water only for use in the residence and not for swimming pools or hot tubs. Homeowners are eligible for up to 30 percent of the cost of the system.

### TABLE 8: SOLAR SYSTEM REQUIREMENTS

| TYPE | DESCRIPTION | TAX CREDIT |
|---|---|---|
| Solar Water Heating | SF 0.5[a] OG-300 Certification from the SRCC[b] | 30% of cost |
| Photovoltaic Systems | Photovoltaic systems must provide electricity for the residence, and must meet applicable fire and electrical code requirements | 30% of cost |

a. Solar Fraction (SF): Solar Fraction is the portion of the total conventional hot water heating load (delivered energy and tank standby losses) provided by solar energy. The higher the SF is, the more efficient the solar water heater.
b. For more information, see the Solar Rating Certification Corporation's web site: www.solar-rating.org.

If you are considering a solar water heating system for your house Energy Star recommends the following for best results:

1. The collector location should receive direct sunlight from 10 a.m. to 4 p.m. year round.
2. The collector location should be placed within (+ or -) 15 degrees of South.
3. The roof should be sturdy with the roofing material in good condition.

## Small Wind Energy and Fuel Cells

**Figure 8 Small-scale Wind Generation**

Credits are available to homeowners who install qualifying systems for small-scale wind energy generation and fuel cells (see Figure 8). The wind generation must have a maximum name plate capacity of not more than 100 kilowatts (kW, see Table 9). Tax credits for wind energy are available for up to 30 percent of the total cost.

Visit the U.S. Departmernt of Energy's Wind and Hydropower Technologies web site for information on small wind generation systems: www.eere.energy.gov/windandhydro. This site contains information and guidance on ensuring that installing the small-scale wind generation is right for your site.

Fuel cells are an advanced technology to generate electricity at the site of use through a chemical reaction using hydrogen and oxygen. Fuel cells produce water as a by-product. The electric current produced by the fuel cell can be used to power your house. Table 10 lists the minimum criteria for meeting the tax credit and the corresponding available tax credit. To qualify for the fuel cell credit, the new home you are building must be planned as your principle residence.

For more information on fuel cell technology, visit the U.S. Department of Energy's Hydrogen, Fuel Cells and Infrastructure web site at: www.eere.energy.gov/hydrogenandfuelcells/. The web site also contains information on safety codes and standards that apply to the installation of fuel cells and the safe storage of hydrogen gas.

### TABLE 9: MAXIMUM WIND GENERATION CAPACITY

| TYPE | DESCRIPTION | TAX CREDIT |
|---|---|---|
| Residential Small Wind Turbines | Has nameplate capacity of not more than 100 kilowatts | 30% of cost |

### TABLE 10: MINIMUM FUEL CELL CRITERIA

| TYPE | DESCRIPTION | TAX CREDIT |
|---|---|---|
| Residential Fuel Cell and Microturbine System | Efficiency of at least 30% and must have a capacity of at least 0.5 kW | 30% of the cost, up to $500 per 0.5 kW of power capacity |

**Abbreviations and Definitions:**

A/C: Air Conditioning

AFUE: Annual fuel utilization efficiency is a rating for gas and oil-fired furnaces that accounts for losses from the chimney, jacket and cycling, averaged over all seasons.

COP: The coefficient of performance measures heating efficiency for a heat pump.

DOE: United States Department of Energy

EER: Energy efficiency ratio is a measurement of room air conditioners, measured in British thermal units per hour (Btu/h) divided by the watts of power.

Energy Factor: A measure for water heaters that accounts for recovery efficiency, stand-by losses and cycling losses.

Energy Star: Energy Efficiency Guidelines developed by the DOE.

Geothermal Heat Pump: A heat pump that uses the near constant temperature of the earth below surface to provide cooling or heating.

Heat Pump: A mechanical system that both heats and cools, and works based on the concept of heat transfer.

HVAC: Heating, Ventilation and Air Conditioning

ICC: International Code Council®

IECC: *International Energy Conservation Code*® published by the ICC.

kW: Kilowatt—1,000 watts—a measure of power consumption of tools and equipment.

Low-E Windows: Low-emissivity windows allow light to pass through, but block heat.

OG-300 Protocol: A solar water heating system rating and certification program developed by SRCC. It evaluates system design, safety, installation procedures, operations and maintenance materials, and system performance.

*R*-value: Resistance-value is a measure of thermal resistance.

SEER: Seasonal energy efficiency ratio measures central air conditioner efficiency, measured in British thermal units per hour (Btu/h), divided by watts of power.

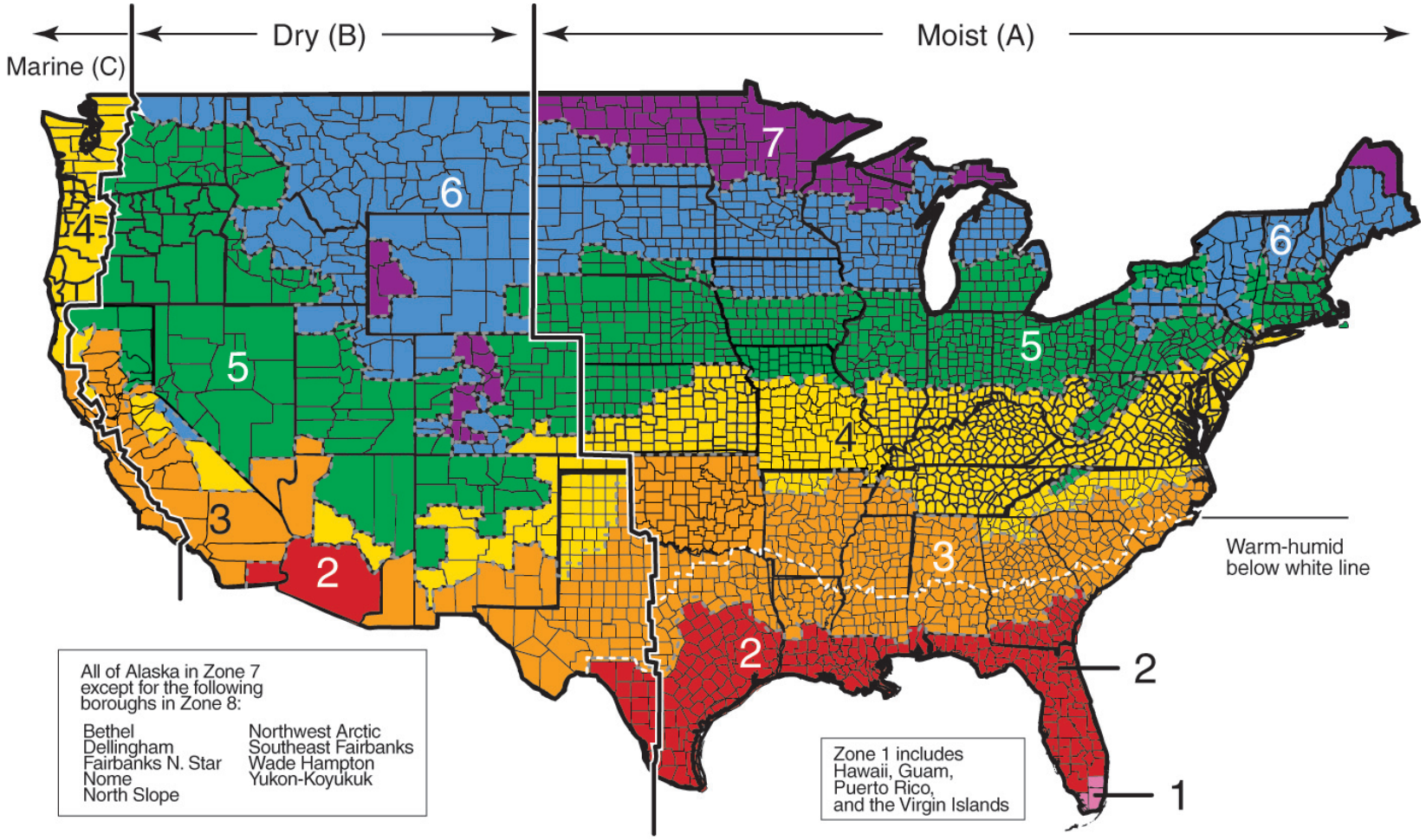
SF: Solar Fraction. See note to Table 8 for definition.

SHGC: The solar heat gain coefficient is the ratio of transmitted, and absorbed and reradiated heat gain to incident solar heat.

Split System A/C: An air conditioning system that is split into two sections indoor and outdoor.

SRCC: Solar Rating and Certification Corporation

*U*-factor: The *U*-factor measures how well a product prevents heat from escaping, measured in Btu/h · ft$^2$ · °F, and is usually 1/*R*-value.




**Climate zone map**

**Figure 9 United States Climate Zone Map**

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