



Home Energy Tune-uP[®] Report

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Dear Mr. Smith:

This Home Energy Tune-uP[®] report shows you:

- Opportunities for improving the energy efficiency of your home;
- An estimate of the savings and costs, and a list of those improvements whose savings exceed their cost;
- A detailed explanation of the recommendations;
- A contractor database to help implement the recommendations;
- Additional ways to lower your energy bills;
- Financing information and special tax incentives; and,
- Maintenance prescriptions.

Implementing these recommendations will reduce your energy bills through increased energy efficiency and make your home more comfortable and more valuable. It will also help the environment. The monthly energy savings you will realize by making the improvements listed in Table 2, \$118, will more than pay for the monthly cost of the improvements when financed. Thus you will improve your house and make money.

Structure type:	Detached home
Date built (est.):	1961
# of bedrooms:	4
House size:	2,200 sq. ft.
House volume:	17,600 cu. ft.
Primary Heating fuel:	Natural gas
Price of heating fuel:	\$2.06 /therm
Price of electricity:	\$0.081 /kWh

The estimates in this Tune-uP Report are based on data obtained from a detailed inspection of your home. The data were analyzed using CMC Energy Services' Tune-uP software, which takes account of local weather, energy prices and implementation costs. CMC's experience, based on more than 250,000 home energy inspections since 1977, has shown the accuracy of CMC estimates to compare favorably to others. Savings estimates do not take account of variations in the behavior of the occupants or future weather changes. Nor do the cost estimates reflect the complexity of the job or price variations among contractors and suppliers, or differences in tastes.

Sincerely,

John Inspector

CMC Energy Services does not offer any warranty, either expressly or implied, for the estimated savings or costs in this Report. Should you find a seeming error in the Report, please call us at 888-203-5262. The liability of CMC Energy Services for any errors or omissions in this Report is limited to the fee paid for this Report.

Energy Efficiency Improvement Opportunities

The following table summarizes the analysis performed on your home. It identifies the energy efficiency improvement opportunities available, an estimate of the annual savings and cost, as well as the payback (cost divided by the annual savings).

Table 1

Feature	Age/ Design Life	Recommendation	Annual Savings	Cost	Payback (Years)*
Insulation					
Ceiling Insulation		Add Insulation	\$51	\$731	11
Outside Wall Insulation		Add Insulation	\$350	\$1,960	6
Knee Wall Insulation		Add Insulation	\$43	\$77	2
Basement Wall Insulation		Add Insulation	\$120	\$1,912	16
Air Seal-Up					
		Obtain Seal-uP	\$179	\$624	4
Heating System	15/20	Replace with ENERGY STAR® model	\$266	\$2430	9
Programmable Thermostat		Install	\$381	\$190	<1
Water Heater	16/12	Replace	\$144	\$657	5
Appliances					
Refrigerator	20/10	Replace with ENERGY STAR® model	\$61	\$630	10
Refrigerator	10/10	Replace with ENERGY STAR® model	\$26	\$810	32
Freezer	22/12	Replace with ENERGY STAR® model	\$34	\$510	15
Clothes Washer	13/10	Replace with ENERGY STAR® model	\$45	\$555	12
* Simple payback = Cost ÷ annual savings					

Implementing all these recommendations would result in an annual reduction of Greenhouse Gases equivalent to not driving a car for **23** months.

Improvements that Save More than they Cost

The table below identifies the group of improvements you cannot afford to pass up because if financed, the monthly energy savings they create exceed their monthly costs (including interest). Furthermore, they will increase the value of your home while also making it more comfortable. (These estimates are based on a 15-year loan with an 8% interest rate.)

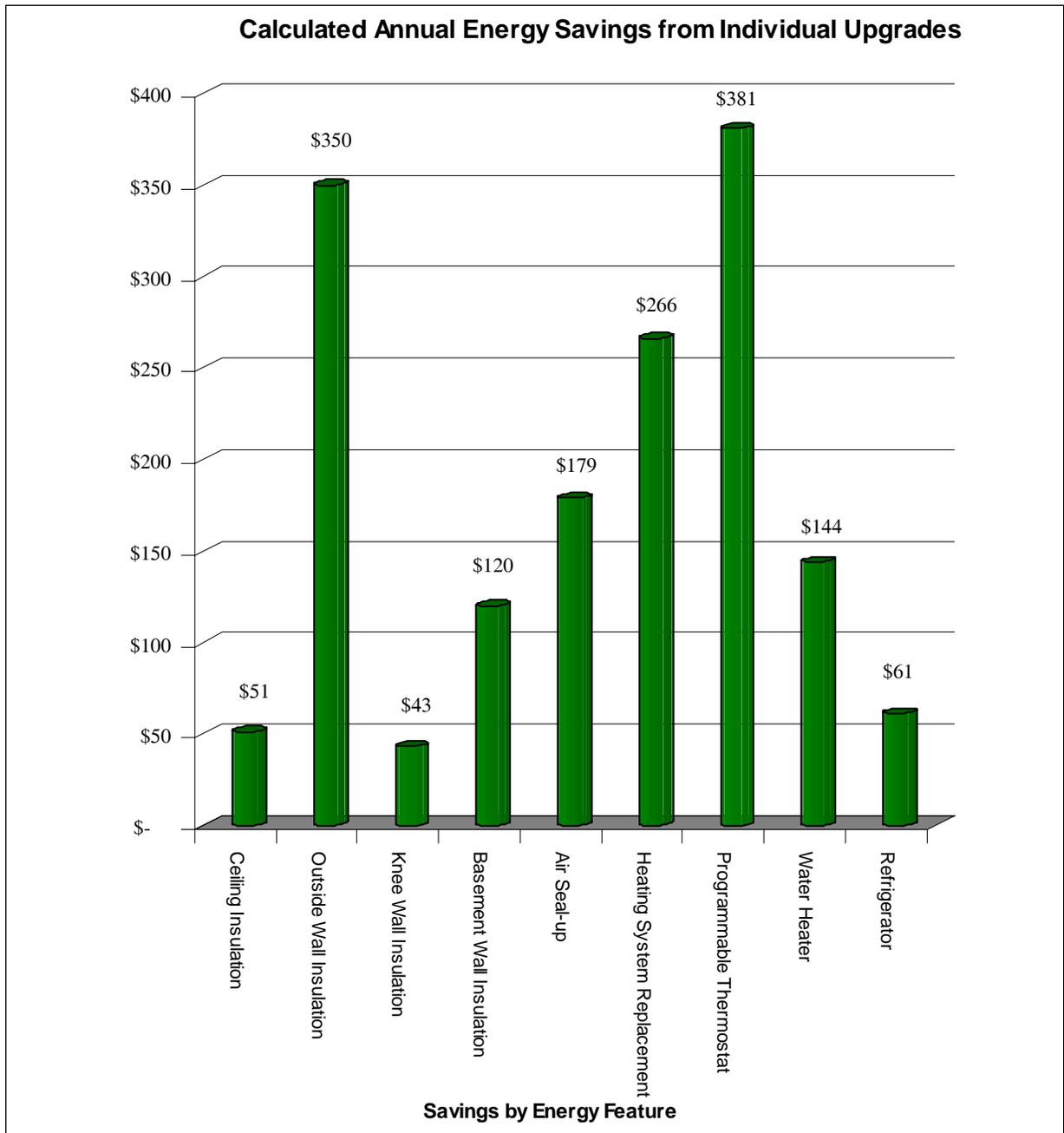
Table 2

Feature	Age/ Design Life	Recommendation	Estimated	
			Annual Savings*	Costs
Insulation				
Ceiling Insulation		Add Insulation	\$49	\$731
Outside Wall Insulation		Add Insulation	\$336	\$1,960
Knee Wall Insulation		Add Insulation	\$41	\$103
Basement Wall Insulation		Add Insulation	\$115	\$1,912
Air Seal-Up				
		Obtain Seal-uP	\$173	\$624
Heating System				
	15/20	Replace with ENERGY STAR® model	\$195	\$162
Programmable Thermostat				
		Install	\$217	\$190
Water Heater				
	16/12	Replace	\$144	\$613
Appliances				
Refrigerator	20/10	Replace with ENERGY STAR® model	\$61	\$760
Freezer	22/12	Replace with ENERGY STAR® model	\$34	\$510
Clothes Washer	13/10	Replace with ENERGY STAR® model	\$45	\$555
Monthly Totals			\$118	\$97

* The savings estimates take account of the interaction between the measures and may therefore be less than the annual savings divided by 12. For example, if the efficiency of the heating system is improved *and* insulation is added, the savings from the improved heating system will be less because the added insulation reduces the heating load, and likewise the savings from the improved insulation will be less because the new heating system will be more efficient.

Recommendations

The major factors that affect the comfort of your home—and your utility bills—are insulation, windows, air leaks, heating and cooling systems, water heater and major appliances. Those features relevant to your home are discussed in this section to provide information you need to make informed decisions regarding your home. The chart below illustrates the annual savings associated with the upgrades you can make.



Insulation, Ceiling

Insulation type:	Blanket/Batt – Fiberglass
Existing insulation R-value:	16
Area (sq. ft.):	750
Attic floored:	No
Roof type:	Pitched
Ceiling type:	Flat
Is it feasible to add insulation:	Yes
Recommendation:	Insulate to R38
Estimated cost of adding insulation:	\$731
Estimated annual savings:	\$51

A well-insulated ceiling reduces energy loss, makes your home more comfortable, and lowers your energy bills. It also helps protect your home from fire and moisture damage, and is an effective sound-proofing material. During warm weather, ceiling insulation reduces the heat transfer from the hot attic to the rooms below. The recommended ceiling insulation for your geographic area is R-49. Blown-in cellulose or fiberglass insulation are good choices for homes in which access to the attic is limited.

Inspector Comments:

For safety, do not install attic insulation before replacing knob & tube wiring in attic.



Attic Insulation

Homeowner Notes:

Insulation, Outside Walls

Location:	Bottom Floor	Top Floor
Outside wall insulation present:	No	No
Is it feasible to add insulation:	Yes	No
Area of outside walls (sq. ft.):	1,100	850
Recommendation:	Insulate to R13	None
Estimated cost of adding insulation:	\$1,960	
Estimated annual savings:	\$350	

Walls are the largest part of the house exposed to the outside, and the walls of many older houses are not insulated. Above-grade walls are insulated through holes drilled from inside or outside the house. Loose cellulose or fiberglass insulation is blown into these holes by a contractor. Though more expensive than insulating the floor or ceiling, insulating walls will often more than pay for itself when financed and will make the house more comfortable.

Inspector Comments:

The home's current siding makes it feasible to blow insulation into the walls on the bottom floor with little cosmetic damage. The walls appear to be very weak on the top floor of the house. As a result, it does not appear feasible to blow insulation into them without risking wall failure.

Homeowner Notes:

Insulation, Knee Walls

Are knee walls insulated?	No
Knee wall area (sq. ft.)	180
Recommendation:	Insulate to R13
Estimated cost:	\$77
Estimated annual savings:	\$43

Knee walls separate the short wall of a finished attic room from the unconditioned roof area. While this is a relatively small portion of the total wall, it is important to insulate otherwise heat may be lost and the temperature in the room will be difficult to control. The top of the insulation should fit snugly against the angled roof in order to minimize air passage. Batt and blanket insulation are frequently used.

Inspector Comments:

When installing batts on the knee walls, it is important to make sure there are no gaps for air to flow through. This installation can often be done by a homeowner.

Homeowner Notes:

Insulation, Basement Walls

Area of all outside basement walls (sq. ft.):	1,200
Area of basement walls to be insulated (sq. ft.):	840
Recommendation:	Insulate to R13
Estimated cost:	\$1,912
Estimated annual savings:	\$120

Exterior basement walls should be insulated if the basement is heated. If the basement is partially below ground, the entire length of the walls should still be insulated. Since moisture not only makes insulation less effective, but can result in mold, insulation should be installed with a vapor barrier facing the conditioned area. Any other conditions causing dampness in the basement should be resolved before insulating.

Inspector Comments:

The homeowner has reported there are no moisture problems that need to be addressed before adding insulation.

The basement walls are partially insulated. That section that is insulated should be covered. Currently the insulation is exposed.

The presence of roughed in walls should reduce the cost listed in the report.



Basement wall insulation

Homeowner Notes:

House Air Leakage

Estimated air leakage condition:	Average
Recommendation:	Obtain air seal-up
Estimated cost air seal-up:	\$624
Estimated annual savings:	\$179

Many homes, especially older ones, have air leaks that allow heated and cooled air to escape when the air pressure differs between the inside and the outside of the home. Because these leaks allow unconditioned air to enter as conditioned air is lost, air leaks can be a significant waste of energy and money. They also make the house drafty. Many homes have hidden air leaks that require a professional weatherization person to find the leaks and seal them. CMC recommends that you find a seal-up technician who uses a blower door to help identify where the air is leaking and, after sealing the leaks, verifies the reduction in leakage. In general, a leaky home experiences about one complete air change per hour, whereas a tight home experiences about one complete air change every three hours. The minimum amount of natural or mechanical ventilation required for proper air quality is about one air change every three hours for small homes and one air change every four to five hours for large homes. Homes with indoor air pollution caused by such things as improper combustion heating, tobacco smoking, or moisture problems require more ventilation.

Inspector Comments:

The homeowner has not experienced problems with drafts. There are indications that air is infiltrating through the walls and up through the attic insulation, reducing the insulation's effectiveness. An air seal-up would increase insulation effectiveness as well as reduce infiltration heat loss.



Fireplace air leakage

Homeowner Notes:

Heating System

Type:	NG Furnace
Age/Design Life (years):	15/20
Size (Btu per hour):	100,000
Efficiency (AFUE)	
Existing:	78
ENERGY STAR®:	90
Industry Best:	95
Percent of heating supplied:	100
Recommendation:	Replace with an ENERGY STAR® model
Estimated cost:	\$266
Estimated annual savings:	\$2,430

A heating system is expected to last an average of 30 years, depending on the system. If the system is past its design life, it is better to replace it sooner rather than later to avoid being without heat for several days when it fails. This will also provide you with time to determine which system is best for you, compare bids, check references, and ensure that the contractors are bonded and insured. A load calculation for the house should be made to determine the proper size based on the current conditions of the house since older homes often have heating systems that are oversized.

Inspector Comments:

The gas furnace appears to be in good condition; however, when tested there was some orange in the flame. A tune-up is recommended to ensure the system is operating as efficiently as possible.

Using a ceiling fan in conjunction with the heating system will improve warm air circulation and make your house feel warmer. As a result, you will be able to lower the thermostat temperature and save money while staying comfortable.



Notice the orange flame.

Homeowner Notes:

Programmable Thermostat

Heating system type:	NG Furnace
Central cooling system type:	Split System
Recommendation:	Install
Estimated cost:	\$190
Estimated annual savings with night setback:	\$248
Estimated annual savings with day and night setback:	\$381

A programmable thermostat allows you to control the temperature in your home by adjusting the temperature settings when no one is home or when you are sleeping. Setting the thermostat back during the day and night will save the most energy; however, if someone is home during the day, you may only want to set the thermostat back during the night to keep the house comfortable while occupied. A programmable thermostat is an inexpensive improvement that can save you 15% - 20% on heating and cooling bills. Homes with heat pumps require a special thermostat. These thermostats should have "adaptive recovery" capabilities, which allow them to control home heating more efficiently.

Inspector Comments:

None

Homeowner Notes:

Refrigerator

Location:	Kitchen	Garage
Age (years):	10	20
Size (cubic feet):	22	18
Condition:	Good	Poor
Annual cost to operate:	\$71	\$98
Recommendation:	None	Replace with an ENERGY STAR® model
Estimated replacement cost:	\$760	\$630
Estimated annual savings:	\$26	\$61

Refrigerators consume more electricity than any other appliance in most homes, and today's efficient refrigerators use about 1/2 the electricity of those made 15 years ago. If the house has two refrigerators, see if you can substitute them for one larger one. When you buy a refrigerator, ask for an ENERGY STAR® model. An ENERGY STAR® model will use 10% less energy than a model that meets minimum energy efficiency standards.

Inspector Comments:

None



Homeowner Notes:

Freezer

Location:	Garage
Age (years):	22
Size (cubic feet):	18
Condition:	Poor
Annual cost to operate:	\$81
Recommendation:	Replace with an ENERGY STAR® model
Estimated replacement cost:	\$510
Estimated annual savings:	\$34

If there is an old freezer in the house that you do not need, get rid of it since it uses nearly as much electricity as a refrigerator. If you want to keep it, consider buying a new one if it is more than 10 years old since today's freezers use about half the electricity used by older ones. Chest freezers use about 10% - 25% less electricity than upright freezers.

Inspector Comments:

The freezer is in poor condition and is probably not working as efficiently as it should be. Consider replacement.

Homeowner Notes:

Clothes Washer

Location:	Utility Room
Age (years):	13
Condition:	Good
Recommendation:	Replace with an ENERGY STAR® model
Estimated cost:	\$555
Estimated annual savings:	\$45

The energy used for washing clothes is primarily (85%) determined by the temperature of water used, not by the efficiency of the washing machine. To save energy, use cool water. With today's detergents, most laundry can be successfully washed in cold or warm water, and all can be rinsed in cold water. Also, washing two small loads uses approximately twice as much energy as combining them into one full load.

Front-load washers use less water than top-load machines and have high-speed spin cycles that remove more water from washed clothes so they require less time in the dryer. In tests, front-load washers were also found to clean clothes better. Since the front-loading machines "wash whiter", "spin dryer" and are quieter than the top loading machines, they deserve serious consideration.

Inspector Comments:

None

Homeowner Notes:

Implementation and Contractors

Finding experienced, professional contractors and suppliers to implement home improvements can be difficult. CMC recommends you work with contractors and suppliers you know and trust. Contractor and supplier information is provided below for your convenience and to facilitate the implementation of the report recommendations. *CMC does not recommend or endorse any contractors or suppliers.*

A technical expert is available at the Tune-uP help-line to advise you. Call 888-203-5CMC between 8 AM and 5PM EST for assistance.

Nation-Wide Contractor Resources

Contractors.Com. Visit the contractors section of the Home Energy Tune-uP® website (www.hometuneup.com/contractors) to obtain information about contractors in your area. Home Energy Tune-uP® has partnered with companies specializing in online contractor listings, to provide a database of over one million contractors listed by zip code and service type. This will allow you to search for contractors in your area, review contractor profiles, read service ratings and testimonials provided by past clients of the contractor, visit the contractor Web sites, and submit projects to obtain free estimates from contractors.

Additional Energy Efficiency Measures

Lighting Options. Compact fluorescent light bulbs use only one-third the electricity consumed by incandescent bulbs, yet last up to thirteen times longer. They produce less heat, are available in warm colors, and can be screwed into your existing light fixtures. While they cost more initially, their energy savings and long-life saves money and hassles in the long run. To make your home's lighting even more energy efficient, consider installing hardwired fluorescent lights in your study or den and in your kitchen. If you have outside lights, you may wish to consider putting them on a sensor so that they are lit only when someone approaches the house.

Ceiling Fans. During the winter, ceiling fans set at slow speed can push warm air away from the ceiling and move it around the room, spreading heat evenly and making you feel more comfortable without creating a draft. During the summer, ceiling fans will move the air to make you feel cooler.

Fireplace. A fireplace can be a major drain on home energy. A fire requires air to burn and will draw warm air from your rooms to be replaced by cold outside air. Also, warm air will escape through the chimney to the outside when the damper is not completely closed or completely sealed, often causing an uncomfortable draft. The fireplace should have well-closing glass doors and a direct source of outside air. Make sure the fireplace flue is closed when you are not using it, and if you do not use your fireplace at all, seal the damper in order not to lose warm air up the chimney. There are products available in hardware stores and online to temporarily seal off the flue and stop air from escaping up the chimney. One product is an inflatable plug or balloon that you insert into the fireplace beneath the damper. This product is easy to use and can often pay for itself in one mid-winter heating bill.

Energy-saving showerheads. Energy-efficient showerheads have become more common in recent years and have been required in new homes since 1994. A good quality efficient showerhead saves a significant amount of energy and water.

Appliance Energy Settings. Use the energy-saving settings on all your appliances, such as refrigerators, dishwashers, washing machines, and clothes dryers.

Dishwasher. ENERGY STAR® dishwashers are 30% more efficient than the 1994 standards. Models with an "energy-saver" or short-wash cycle option use less hot water. Reduce the total number of loads washed by running full loads. Turn off the drying heater so that dishes air dry.

Stove and Range. Solid disk elements and radiant elements take longer to heat up, and use more electricity than halogen and induction elements. Self-cleaning ovens use less electricity than ovens without that feature because they are better insulated. Use a microwave, or toaster oven, rather than a full-sized oven or the stove. Smaller appliances use less energy than a stove and can reduce cooking time.

Homeowner Resources

- U.S. Department of Energy homeowner information: 1-800-363-3732 or http://www.eere.energy.gov/consumer/your_home/ or <http://www.doe.gov/yourhome.htm>
- U.S. Department of Energy Energy Savers: Tips on Saving Energy & Money at home: 1-877-337-3463 or http://www.eere.energy.gov/consumer/tips/pdfs/energy_savers.pdf
- EPA ENERGY STAR® consumer information: 1-888-782-7937 or <http://www.energystar.gov/>
- Alliance to Save Energy resources: <http://www.ase.org/section/audience/consumers>

Guidance on Indoor Air Quality

Weatherizing Your Home

Most older homes need be weatherized to reduce energy loss. Measures such as installing storm windows, weather stripping, caulking, and blown-in wall insulation can reduce the amount of outdoor air infiltrating the home. Consequently, after weatherization, the home may have inadequate ventilation and concentrations of indoor air pollutants from sources inside the home can increase. Residents should be alert to the emergence of signs of inadequate ventilation, such as stuffy air, moisture condensation on cold surfaces, or mold and mildew growth (see www.epa.gov/mold). If the house appears to be too tight, an air-to-air energy recovery ventilator should be installed to increase air circulation without losing much heat. Having an adequate air exchange rate is important for maintaining good indoor air quality.

Reducing Toxins

Equally important is using less toxic materials in the home. Unfortunately, many home improvement products have significant “off-gassing,” where the chemicals leach out of the product and into the indoor air. Painting and carpeting are the two most common household improvements that people make when moving into a house, and both contain toxic chemicals

Paints

There are serious health and environmental concerns surrounding paint. Using paints that are free of Volatile Organic Compounds (VOCs) such as benzene and toluene, free of heavy metals such as lead or cadmium, and/or made of post-consumer recycled content can aid in reducing exposure to toxics for both you and your environment. However, the fact that a paint is VOC-free does not necessarily mean that it is free of toxins such as formaldehyde, ammonia, acetone or odor-masking agents. Fortunately, paints with reduced levels of VOCs, or even VOC-free, are available.

Carpeting

Scientists have not yet determined whether the chemicals emitted by new carpets are responsible for causing a variety of symptoms in household residents. Therefore, if you are installing new carpet, you may wish to take the following steps:

- Ask the carpet retailer for information on emissions from carpet.
- Ask the retailer to unroll and air out the carpet before installation.
- Ask for low-emitting adhesives (if adhesives are needed).
- Consider leaving the premises during and immediately after carpet installation
- Make sure the installer follows the Carpet and Rug Institute's installation guidelines.
- Ventilate the house during and after installation to exhaust fumes to the outdoors for 48 to 72 hours after the new carpet is installed.
- Contact your carpet retailer if objectionable odors persist.
- Follow the manufacturer's instructions for proper carpet maintenance.

Resources

The Environmental Protection Agency (EPA) has a consumer booklet, *The Inside Story: A Guide to Indoor Air Quality*. www.epa.gov/iaq/pubs/insidest.html

New American Dream has information on Green Seal certified paint manufacturers: www.newdream.org/consumer/paint.php

Financing Energy Efficiency

Energy improvements are unique because they create a stream of income in reduced monthly energy bills that may cover the monthly cost of the investment. The improvements discussed in the *Improvements that Save More than they Cost* section of this Report should always qualify for financing. Financing energy efficiency improvements as part of your home mortgage is the best possible way to go—you have the advantage of (i) low monthly payments due to a 30-year term and a relatively low interest rate; and (ii) interest that is deductible from your income tax.

Nation-Wide Financing Resources

Streamlined (k). The **Streamlined (k) Limited Repair Program** allows homebuyers and existing homeowners to make energy-efficiency improvements and upgrades to existing homes. Homebuyers can finance up to an additional \$35,000 in their mortgage for improvements which may have been identified by a home inspector or FHA appraiser.

Features of the financing include: no minimum repair cost threshold; the maximum mortgage amount for repair costs is \$35,000; the loan can be issued by any FHA lender.

The improvements can include: replacement or upgrade of existing HVAC systems; weatherization, including storm windows and doors, insulation, and weather stripping; purchase and installation of appliances, including free-standing ranges, refrigerators, washers/dryers, and dishwashers; Window and door replacements and exterior wall re-siding.

HUD's Mortgagee Letter 2005-50 explains the Streamlined (k) Limited Repair Program in detail. A hyperlink to this letter is available on our website at www.hometuneup.com/financing.asp.

Fannie Mae Energy Loan. Some lenders offer an unsecured **Fannie Mae Energy Loan** for \$1,000 to \$20,000. The approval for this loan is fast and simple. The Energy Loan's 10 year term and interest rates are generally better than those offered by contractors or suppliers.

Local Financing Resources

Utility Loan Program. Within your state there are a number of utilities that offer special energy loan programs. Program details may vary from what energy efficiency measures qualify for a loan to what the rate and term of the loan are. In some cases, utility loans may be the most favorable loans available to homeowners. Visit your utility's website to find out if it offers energy efficiency loans. Additional information may also be available at www.dsireusa.org, a website dedicated to tracking state incentives for energy efficiency and renewable energy development.

Energy Efficiency Tax Credit

During 2006 and 2007, you can recoup your investment in energy efficient improvements by lowering your energy bills *and* by saving up to \$500 on your tax bills.

- Replacing your older air conditioner, heat pump, or water heater could save \$300 from your tax bill;
- Replacing windows could save you a maximum of \$200; and
- Installing insulation may allow you to take a credit for 10% of the material costs.

The table below shows the required efficiency for equipment.

<i>Equipment</i>	<i>Minimum Rating</i>	<i>Tax Credit</i>
Central Air Conditioner	15 SEER	\$300
Heat Pump	HSPF 9, SEER 15	\$300
Furnace or Boiler	AFUE 95	\$150
Water Heater	80% efficiency	\$300
Main Circ. Fan	Max 2% of furnace energy use	\$50

- All purchases must be made during 2006 or 2007;
- For IRS purposes, the costs are considered paid when the original installation of the item is completed;
- The tax credit can be claimed on your taxes only at the end of the year;
- You must keep your dated receipts for all eligible purchases; and,
- The energy efficiency improvements must be for your primary residence.
- See the following IRS publications (these links are posted on our website at www.hometuneup/taxcredit.asp):
 - IRS 2006 www.irs.gov/publications/p553/ch01.html#d0e1110
 - IR-2006-34 www.irs.gov/newsroom/article/0,,id=154657,00.html
 - IRS Notice 2006-26 www.irs.gov/pub/irs-drop/n-06-26.pdf
 - Clarification of Notice 2006-26 www.irs.gov/pub/irs-drop/n-06-53.pdf

What is a Tax Credit?

There is an important difference between a tax credit and a tax deduction. A **tax deduction** is subtracted from income before total tax liability is computed. On the other hand, a **tax credit** is subtracted directly from the total tax liability. This means that a deduction and a credit have very different values, with a credit being three or more times more advantageous to the taxpayer than a deduction. For example, a tax credit of \$500 for someone in the 28% tax bracket is equivalent to a tax deduction of \$1,785.