DETAILED UPGRADE RECOMMENDATIONS REPORT

This is a printable report of the upgrades selected for the home. These upgrades have the potential to save $818 each year on the utility bill.

Upgrade Package Summary:

Estimate Yearly Bill Savings:	**$818**
Estimated Lifetime Energy Savings:	**$13,088**
Estimated Added Cost:	**$368**
Maximum Price for 10 Year Payback:	**$13,236**
Return on Investment:	**23%**
Upgrade Pays for Itself in:	**4 years**

You selected the following upgrades:

- Replace high use incandescent lamps with compact fluorescent lamps
- When re-roofing, choose an ENERGY STAR-labeled roofing material with high solar reflectance cool roof
- When replacing your windows, choose a double-pane solar-control low-E argon gas wood frame window
- When replacing your electric water heater, choose an energy efficient model
- When replacing your central air conditioner, choose an ENERGY STAR-labeled model
- When replacing your clothes washer, choose an ENERGY STAR-labeled model
- Insulate ducts in unconditioned spaces to at least R-6
- Have your ducts professionally sealed to reduce leakage
- When replacing your main refrigerator, choose an ENERGY STAR-labeled model

Note: The economic benefits for each of the upgrades below are evaluated in isolation from the other upgrades. If the efficiency level is changed for one upgrade, its potential impact on other upgrades will not be counted in the individual upgrade estimates. However, these kinds of interactions are included in the "package" totals associated with the whole-house totals and chart at the top of the page (above). For example, if the furnace efficiency is increased, the energy savings from wall insulation will not change in the table below, but the incremental savings from including insulation in the package will be less due to the more efficient furnace's impact on reducing the energy required to make up heat losses through the wall (there is less energy being used, so less to save).

Replace high use incandescent lamps with compact fluorescent lamps

Economic Benefits:

Estimate Yearly Bill Savings:	**$88**
Estimated Lifetime Energy Savings:	**$1,408**
Estimated Added Cost:	**$88**
Maximum Price for 10 Year Payback:	**$880**
Return on Investment:	**97%**
Upgrade Pays for Itself in:	**1 year**

Additional Benefits:

Fluorescent lamps last several times longer than ordinary incandescent bulbs, which saves you the time and expense of replacing bulbs when they burn out.

Upgrade Description:

Replace high-use incandescent lamps with compact fluorescent lamps.These units can save up to 75% of the energy used by an ordinary incandescent bulb.

Purchasing Tips:

- Compare the light output in Lumens of the bulb you are replacing to ensure you are using the appropriate CFL.Most CFLs list their light output and equivalent incandescent wattage on their package.
- CFLs are available in many shapes and sizes, which will allow replacing nearly any incandescent bulb.
- When buying new light fixtures, look for ENERGY STAR qualified models.
- CFLs are a good investment for lights that are used 2-3 hours per day on average or more.

More Information:

- ENERGY STAR qualifying lighting product list
- General information about lighting from DOE

[Return to upgrades list]

When re-roofing, choose an ENERGY STAR-labeled roofing material with high solar reflectance cool roof

Economic Benefits:

Estimate Yearly Bill Savings:	**$72**

Estimated Lifetime Energy Savings:	**$1,152**
Estimated Added Cost:	**$93**
Maximum Price for 10 Year Payback:	**$720**
Return on Investment:	**78%**
Upgrade Pays for Itself in:	**1 year**

Additional Benefits:

Cool reflective roofs reduce solar gains, keeping your home cooler and more comfortable. High temperatures are one of the factors that shorten the lifespan of roofing materials, so cool roofs may last longer than conventional roofs. Cool roofs also help lower the air temperature surrounding your house, which helps fight the urban heat island effect.

Upgrade Description:

When replacing your roof, choose a "cool" roofing material that qualifies for the ENERGY STAR label. These roofing materials reflect more of the sun's energy, staying cooler than typical materials and reducing your air conditioning bill. Our calculations bill savings, typical upgrade costs, and cost-effectiveness are for a low-slope roofing material with the minimum reflectance levels that qualify for the ENERGY STAR label 0.60 reflectance after some weathering. To qualify for the ENERGY STAR label, steep-slope roofs must have an initial solar reflectance of greater than 0.25.

Purchasing Tips:

- The ENERGY STAR criteria differ for low-slope less than 2:12 inches and high-slope roofs. The reflectance requirements are lower for high-slope roofs because in the past it has been difficult to make shingles and tiles highly reflective these materials are typically used for a high-slope roofs. High-reflectance products for high-slope roofs are now becoming more common in the market, so look for the highest reflectance materials you can for your roof type.

More Information:

- target="footnote"HRFF="http://www.energystar.gov/index.cfm?c=roof_prods.pr_roof_products">ENERGY STAR qualifying roofing product list
- Cool Roof Rating Council
- California Energy Commission
- Background about urban heat islands

[Return to upgrades list]

When replacing your windows, choose a double-pane solar-control low-E argon gas wood frame window

Economic Benefits:

Estimate Yearly Bill Savings:	**$321**
Estimated Lifetime Energy Savings:	**$5,136**
Estimated Added Cost:	**$648**
Maximum Price for 10 Year Payback:	**$3,210**
Return on Investment:	**50%**
Upgrade Pays for Itself in:	**2 years**

Additional Benefits:

Energy-efficient windows can make your home more comfortable year-round, reduce condensation, block outside noise, improve fire safety, and cut back on ultraviolet radiation that can fade your carpets and furniture.

Upgrade Description:

When replacing windows, choose a double-pane, solar-control low-E, argon gas-filled, wood or vinyl frame window.

Note: The annual bill savings and cost-effectiveness assume that you replace all of your windows with windows that have U-factor=0.36 and SHGC=0.31 see the links in More Information for an explanation of these units. Bill savings will be less if you do not replace all of your windows, but the cost-effectiveness of replacing less than all of your windows should be approximately the same as shown above. Windows with even better performance are available, and could provide additional energy savings.

Purchasing Tips:

- Choose a window that is appropriate for your climate. ENERGY STAR window labels have a Climate Region Map that indicates which of four broad climate regions Northern, North/Central, South/Central, or Southern the window qualifies for. Make sure the window you choose is appropriate for the region you live in.
- Consider different types of glazing for windows on different sides of your house to benefit from passive solar energy and maximize energy benefits. Install the lowest U-value windows you can afford on north-facing windows. Select windows with appropriate low-e coatings for your location on the east, west, and south sides of your house. [6]
- To maximize energy performance, choose windows with larger unbroken glazing areas instead of multi-pane or true-divided-light windows. Applied grills that simulate true- divided-light windows, however, do not reduce energy efficiency. [6]
- Choose windows with good warranties against the loss of the air seal. If the glazing seal is lost, not only will fogging occur, but also any low-conductivity gas between the layers of glass will immediately be lost.[6]
- If summer heat gain is a problem in your house, look for windows with low-e coatings, especially spectrally selective low-e coatings, which significantly reduce solar heat gain and improve insulation without affecting visible light or color. Tinted windows also reduce solar heat gain, but they transmit less visible light.
- Look for the National Fenestration Rating Council NFRC label to help you compare performance and other features."

- Select windows with low air leakage ratings - between 0.01 and 0.06 cfm/ft. [6]

More Information:

- ENERGY STAR Windows
- Tips about efficient windows from DOE
- General Information from the Efficient Windows Collaborative
- ACEEE Consumer Guide to Windows
- California Energy Commission

[Return to upgrades list]

When replacing your electric water heater, choose an energy efficient model

Economic Benefits:

Estimate Yearly Bill Savings:	**$69**
Estimated Lifetime Energy Savings:	**$1,104**
Estimated Added Cost:	**$195**
Maximum Price for 10 Year Payback:	**$690**
Return on Investment:	**35%**
Upgrade Pays for Itself in:	**3 years**

Additional Benefits:

Efficient gas-fired water heaters may hold their temperature longer following power interruptions and operate more safely.

Upgrade Description:

When replacing your electric water heater, choose an energy-efficient model with an Energy Factor of 0.95.

Note: Our calculations bill savings, typical upgrade costs, and cost-effectiveness assume the efficient water heater has an energy factor of 0.95 and recovery efficiency of 0.98.

Purchasing Tips:

- The most important measure of efficiency for water heaters is the Energy Factor EF. The higher the EF, the more efficient the water heater.
- Purchase a water heater whose tank is internally insulated with at least R-16. [5]
- A water heater that is too large for your home not only has a higher purchase cost but will increase your energy costs due to excessive cycling and standby losses. The resources below provide good, simple guidance on proper sizing of water heaters. The size, or "capacity", of a water heater should be judged by its first hour rating FHR, not its tank size.
- If you have natural gas or propane service at your home, consider switching to a gas-fired water heater to reduce your water heating bills.
- Many types of water heaters are now available, such as "demand" tankless, "indirect" or "integrated", and solar-assisted water heaters. More Information

More Information:

- General Information from DOE
- DOE Water Heating fact sheet
- Top-Rated Energy-Efficient Water Heaters from ACEEE
- GAMA consumer's directory click on "Consumers"
- How to prevent health and safety problems with combustion equipment

[Return to upgrades list]

When replacing your central air conditioner, choose an ENERGY STAR-labeled model

Economic Benefits:

Estimate Yearly Bill Savings:	**$60**
Estimated Lifetime Energy Savings:	**$960**
Estimated Added Cost:	**$218**
Maximum Price for 10 Year Payback:	**$600**
Return on Investment:	**26%**
Upgrade Pays for Itself in:	**4 years**

Additional Benefits:

ENERGY STAR® central air conditioners may operate more quietly, be more visually appealing, have better temperature and/or moisture control, and be easier to maintain than minimum efficiency air conditioners.

Upgrade Description:

When replacing your central air conditioner, choose an ENERGY STAR-labeled model. These units can save 20% or more of your cooling bill.

Note: Our calculations bill savings, typical upgrade costs, and cost-effectiveness are for a model with the lowest efficiency that qualifies for the ENERGY STAR label 14 SEER. Higher efficiency models are available, which would provide additional bill savings.

Purchasing Tips:

- All new central air conditioners are labeled with a Seasonal Energy Efficiency Ratio SEER rating. Use the SEER to compare different models. The higher the SEER, the more efficient the unit.
- For maximum efficiency, ask your contractor to make sure the efficiency ratings for the indoor and outdoor coils match. Have the contractor install removable airtight access panels in the indoor unit so a service technician can clean the cooling coil easily.[4]
- Don't buy an oversized unit. A unit that's too big for your needs will waste energy, have less ability to control humidity, and have a shorter life due to excessive on-off cycling. Ask your contractor for an exact heat-gain calculation following ACCA Manual J procedures to determine the proper size unit for your house. Make sure the contractor sizes the unit based on the latent cooling load as well as the sensible cooling load. Do not rely on rule-of-thumb estimates as they tend to be inaccurate. If you've improved your home's efficiency since the last time you purchased an air conditioner, you may be able to purchase a smaller unit. [4,5]
- Consider buying a two-speed air conditioner, which can run very efficiently at its lower speedduring most of the cooling season, while using its higher speed to provide all the cooling you need on the hottest days.
- Locate the outside unit properly. Install it in a cool, shaded spot about two feet from the north or east side of your home. Avoid direct sunlight, which makes the unit work harder, and keep the unit away from other objects. Don't enclose the unit with a deck or shrubbery - it needs room to breathe.[4]
- If your duct system has leaks or disconnected portions, you will not reap the full energy savings you could get from a high efficiency air conditioner. Consider having your contractor check the entire length of your ductwork for leaks and seal any leaks with mastic-type sealant, not duct tape. It's now possible for a contractor to perform verified duct sealing by using a special fan to test duct system leakage before and after sealing. Also have the contractor check for and repair disconnected ducts - a common problem. Insulate any ducts in unheated spaces with R-6 or higher insulation.
- If you don't already have one, consider purchasing a programmable thermostat and having your contractor install it along with your new air conditioner.

More Information:

- ENERGY STAR central A/C product list
- Top-Rated Energy-Efficient Central A/C from ACEEE
- General Information from DOE
- Sizing Heating and Cooling Equipment

[Return to upgrades list]

When replacing your clothes washer, choose an ENERGY STAR-labeled model

Economic Benefits:

Estimate Yearly Bill Savings:	**$46**
Estimated Lifetime Energy Savings:	**$736**
Estimated Added Cost:	**$180**
Maximum Price for 10 Year Payback:	**$460**
Return on Investment:	**24%**
Upgrade Pays for Itself in:	**4 years**

Additional Benefits:

ENERGY STAR® clothes washers can reduce water use significantly, leave the clothes drier thus reducing drying time and energy consumption, and reduce wear and tear on clothes.

Upgrade Description:

When replacing your clothes washer, choose an ENERGY STAR-labeled model. ENERGY STAR clothes washers can reduce energy consumption by up to 70% and are available in top-loading and front-loading designs. Some ENERGY STAR models use up to 50% less water in addition to saving energy.

Note: Our calculations bill savings, typical upgrade costs, and cost-effectiveness are for a model with the lowest efficiency that qualifies for the ENERGY STAR label.

Purchasing Tips:

- Choose a clothes washer with high-speed spin cycles. This feature removes more water from clothes, which reduces the energy and time required for drying.
- Select a low water-use, high efficiency washer. Front-loading tumble-action washers can cut energy use by up to 70 percent, reduce water consumption significantly, and may actually get clothes cleaner. [1]
- Look for pre-soaking and/or "suds saver" options which conserve energy.
- Clothes washers come with EnergyGuide yellow and black labels. Use these labels to select the most efficient model for the capacity you have chosen.

More Information:

- ENERGY STAR clothes washer product list
- General Information from DOE
- Top-Rated Energy-Efficient Clothes Washers from ACEEE

[Return to upgrades list]

Insulate ducts in unconditioned spaces to at least R-6

Economic Benefits:

Estimate Yearly Bill Savings:	**$198**
Estimated Lifetime Energy Savings:	**$3,168**
Estimated Added Cost:	**$910**
Maximum Price for 10 Year Payback:	**$1,980**
Return on Investment:	**20%**
Upgrade Pays for Itself in:	**5 years**

Additional Benefits:

Well-insulated ducts can help avoid rooftop ice-dam formation during the winter

Upgrade Description:

Insulate all exposed ducts in unconditioned spaces to R-6, unless those ducts are already insulated to at least R-4.The average forced-air duct system loses about 30% of the energy produced by the furnace or air conditioner in the course of distributing air to the rooms. This energy loss can be reduced by sealing duct joints with mastic or high-quality duct tape, and insulating ducts in unconditioned spaces.Note: The annual bill savings and cost-effectiveness assume that you insulate your ducts to R-6.

Purchasing Tips:

When *replacing* your duct insulation, choose R-8 or follow your state or local code.

- Be sure a well-sealed vapor barrier exists on the outside of the insulation on cooling ducts to prevent moisture buildup. [8]
- Remember that insulating ducts in the basement will make the basement colder. If both the ducts and the basement walls are uninsulated, consider insulating both. [8]

More Information:

-
- General Information from DOE
- EPA's brochure "Should You Have the Air Ducts in Your Home Cleaned?"
- An Introduction to Residential [Duct] Systems

[Return to upgrades list]

Have your ducts professionally sealed to reduce leakage

Economic Benefits:

Estimate Yearly Bill Savings:	**$186**
Estimated Lifetime Energy Savings:	**$2,976**
Estimated Added Cost:	**$890**
Maximum Price for 10 Year Payback:	**$1,860**
Return on Investment:	**19%**
Upgrade Pays for Itself in:	**5 years**

Additional Benefits:

Having a professional seal your home's air leaks can make your home more comfortable, reduce the risk of moisture damage, improve indoor air quality and fire safety, and help to prevent frozen water pipes.

Upgrade Description:

Have a qualified professional seal your home's air leaks. Leaky houses waste energy because heated or cooled air can easily escape. Older homes tend to be leakier than newer homes. Tightening up a leaky house will reduce the heating and cooling bills. Recent advancements in air sealing technology allow specialists to go beyond the old techniques of caulking and weatherstripping around obvious places such as doors and windows. The biggest problems are usually hidden leaks in out of the way places such as attics, floors and walls, which are easily found and sealed by a specialist.Note: The annual bill savings and cost-effectiveness assume that your home's air leakage is reduced by 25%.

Purchasing Tips:

- To get the best results, hire a qualified contractor, preferably a "building performance contractor", or "energy auditor" to find out where the leaks are in your home's shell. Make sure the contractor uses a "blower door" test to find the air leaks. An infrared scan can be beneficial in addition to the blower door test. Check with your utility company; some offer no- or low-cost basic energy audits.

However, the extra money you would spend to have the audit done by a home performance contractor is often well worth it. [5,6]

- Make sure your contractor tests the leakage rate after completing the sealing, not only to determine the degree of improvement, but also to ensure that the ventilation in your home is adequate. If you don't already have proper mechanical ventilation, consider installing a ventilation system. Proper home ventilation will make your home healthier and more comfortable.
- Make sure your contractor performs a combustion safety test after sealing your home's air leaks. This test checks for backdrafting and carbon monoxide, and will help assure your home is safe. [9]
- If you choose to do the work yourself, follow the guidance in ENERGY STAR's Do-It-Yourself Guide to ENERGY STAR Homesealing.

More Information:

- ENERGY STAR air sealing including DIY guide to air sealing
- Common Air Leakage Sites in the Home
- Information about Air Leakage Testing
- Does your home have enough ventilation?

[Return to upgrades list]

When replacing your main refrigerator, choose an ENERGY STAR-labeled model

Economic Benefits:

Estimate Yearly Bill Savings:	**$13**
Estimated Lifetime Energy Savings:	**$208**
Estimated Added Cost:	**$87**
Maximum Price for 10 Year Payback:	**$130**
Return on Investment:	**15%**
Upgrade Pays for Itself in:	**7 years**

Additional Benefits:

Energy-efficient refrigerators are quieter, run less often, release less heat into your kitchen, and keep their contents cool longer during power outages.

Upgrade Description:

When replacing your main refrigerator, choose an ENERGY STAR®-labeled model. ENERGY STAR refrigerators must exceed federal efficiency standards by at least 15%. Models that are up to 40% more efficient than the federal standards are available.

Note: Our calculations bill savings, typical upgrade costs, and cost-effectiveness are for a model with the lowest efficiency that qualifies for the ENERGY STAR label.

Purchasing Tips:

- Be especially careful in choosing a refrigerator because it will use more energy than any other kitchen appliance.
- Refrigerators with the freezer on the bottom or the top are the most efficient. Bottom-mounted freezer models use about 16% less energy than side-by-side models. Top-mounted freezer models use about 13% less energy than a side-by side. [1]
- Through-the-door icemakers and water dispensers are convenient and reduce the need to open the door, which helps maintain a more constant temperature. However, these convenient items will increase your refrigerator's energy use by 14 to 20%. [1]
- Too large a refrigerator wastes space and energy. One that is too small can mean extra trips to the grocery store. Decide which size fits your needs, then compare the EnergyGuide yellow and black label on each so you can purchase the most energy efficient make and model. The most efficient refrigerator size is 16-20 cubic feet. [1,2]

More Information:

- ENERGY STAR refrigerator product list
- Consortium for Energy Efficiency refrigerator product list
- Top-Rated Refrigerators from ACEEE
- Energy Saving Tips for refrigerators from "Energy Savers"

[Return to upgrades list]