

Home Star Energy Retrofit Act of 2010



Columbia University, School of International and Public Affairs
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Home Star Energy Retrofit Act of 2010

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Preface

This report concludes the work of the Workshop in Applied Earth Systems Management, a two-semester core course for the Master of Public Administration in Environmental Science and Policy at Columbia University's School of International and Public Affairs. During the summer semester, the group analyzed the environmental problems addressed by the Home Star Energy Retrofit Act of 2010. During the fall semester, the group examined how the policy would be implemented upon passage into law. This report reviews the work of both semesters and provides a program design and implementation plan for the Home Star Energy Retrofit Act of 2010.

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Acronyms and Abbreviations

The Act:	The Home Star Energy Retrofit Act of 2010
BPA:	Blanket Purchase Agreement
BPI:	Building Performance Institute
CO ₂ :	Carbon dioxide
DOE:	Department of Energy
EPA:	Environmental Protection Agency
FTE:	Full-Time Equivalent Employee
Home Star:	Home Star Energy Retrofit Program
NO _x :	Nitrous oxides
PBM SIG:	Performance Based Management Special Interest Group
RESNET:	Residential Energy Services Network
RFP:	Request for Proposals
SO ₂ :	Sulfur dioxide

Executive Summary

American homes waste nearly one third of their energy due to inefficiency. With home energy use accounting for approximately one-fifth of total energy consumption in the country, this presents a serious problem, one that homeowners simply cannot afford. Wasted energy also has serious environmental price. It increases demand for energy produced from fossil fuels, principally coal, exacerbating the environmental problems of ecosystem destruction, air pollution and climate change. But where there is waste, there is opportunity. By undertaking simple retrofits, homeowners can greatly reduce the energy used in their homes thereby reducing the environmental and economic costs associated with excessive energy production. This simple logic underpins the Home Star Program.

The Home Star Energy Retrofit Act of 2010 has two primary goals: to increase residential energy efficiency and to stimulate job creation. The first goal addresses both high utility costs for Americans and the environmental problems associated with energy inefficiency and the overuse of coal-based power. The second goal represents a broader legislative response to the lagging economy, especially in the hard-hit construction sector, and the desire to stimulate the longer-term development of an energy efficiency sector.

To accomplish these goals, the Home Star Energy Retrofit Act establishes a rebate program to encourage American homeowners to perform home energy retrofits. Homeowners can choose between two retrofitting programs: the Silver Star Program which provides rebates for specific energy efficiency measures; and the Gold Star Program which provides rebates for a comprehensive whole home energy efficiency retrofit. The Home Star Program demonstrates that small actions undertaken at the household level can have significant national and global impacts.

Implementation of the Home Star Energy Retrofit Act will be the responsibility of the Department of Energy (DOE), the States, and external government contractors. Our program design outlines four elements critical to achieving the operational objectives of Home Star:

1. **Fund Allocation:** From a budget of \$6 billion, \$2 billion will be allocated each to the Gold Star and Silver Star Programs with the remainder to be allocated by market demand on a first-come, first served basis.
2. **Rebate Aggregators:** Rebate Aggregators serve as the crucial financial intermediary whose role is to ensure efficient transfers of funds from DOE to homeowners. DOE will select one to five national Rebate Aggregators, which will collectively provide coverage to the entire U.S. population.
3. **Public Awareness:** In an effort to guarantee that the public is knowledgeable about the program and its opportunities, DOE will employ a two-tiered public awareness strategy. This will include a national campaign managed by DOE and a regional strategy targeting specific demographics led by the States and the private sector.
4. **Quality Assurance:** To prevent fraud and ensure safety, a system of State-run quality assurance programs will be established with general oversight by DOE.

This report sets forth a comprehensive implementation plan consisting of an organizational and staffing plan, budget, timeline for rollout of implementation, and a performance management system for tracking the program's success. This proposal provides an outline for transforming the Home Star Act into the Home Star Program, and in doing so, addresses the dual goals of energy efficiency and job creation.

Introduction

The purpose of this report is to simulate the implementation of the Home Star Energy Retrofit Act 2010 (the Act). We assume that Congress passes the Act in 2010 and the Department of Energy (DOE) will commence implementation on January 3, the first business day of 2011.

This report is divided into three sections. The first section will define the problem of energy inefficiency in the U.S. residential sector, the associated environmental consequences, and the solution proposed by the Act. This section also highlights the political background of the Act, provides a legislative timeline, and sets out potential political outcomes.

The remaining portion of the report address management questions in detail. The second section provides the program design structure, identifying both the mandatory and discretionary elements of the program. The third section presents our recommended implementation plan for the Act, including an organizational plan, budget, calendar, and performance measurement system.

The Problem: Energy Inefficiency

Energy inefficiency is a significant problem in the United States. Home energy use accounts for 22% of total energy consumption nationally and approximately 4.4% of all carbon emissions globally (DOE EIA, 2009). U.S. homes are also extremely inefficient energy users, wasting nearly one third of their energy due to inefficient use (EPA: “Energy Star,” 2003). This results in higher utility bills for homeowners who may already be struggling financially due to the lengthy U.S. recession. Energy inefficiency essentially means money is escaping through the cracks in the home.

U.S. residential energy use accounts for 4.4% of global carbon emissions

Energy inefficiency has a number of causes: poor insulation, leaky windows and doors, and old appliances, amongst others. Inefficient homes require more energy to heat in winter and cool in summer. Of the total energy consumed in a home, approximately 52% is for heating and cooling. Nearly 85% of heating and cooling is powered by either natural gas or electricity (DOE EIA, 2009). U.S. electricity generation is heavily dependent on fossil fuel combustion. The primary source of power generation for residential homes is coal (52%), followed by nuclear (21%), natural gas (17%), renewable energies (9%) and petroleum (1%) (DOE EIA, 2009).

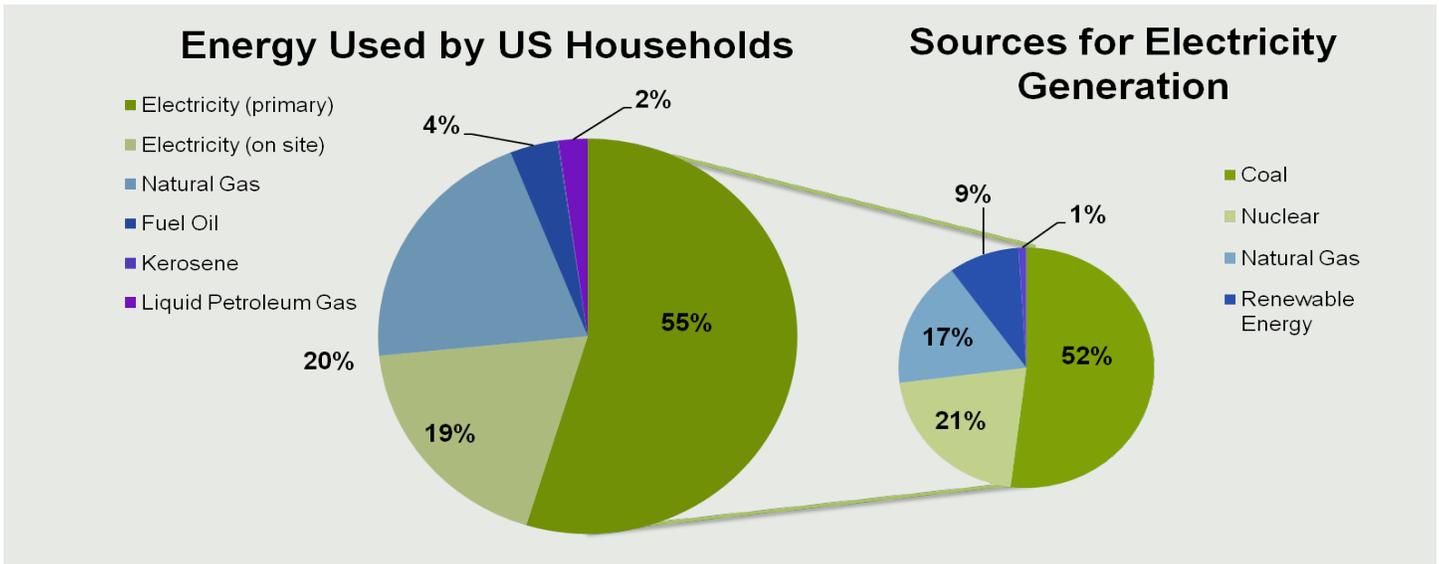


Figure 1: 2009 Energy Use by U.S. Households/Electricity Generation

Given that coal is so central to U.S. electricity generation, the analysis that follows focuses on the importance of coal in the residential energy sector and its impact on the environment. The extraction, transport, burning and disposal of coal causes several environmental harms including ecosystem destruction, air pollution and global climate change. Reducing the amount of coal used in the United States, by decreasing wasted energy, is likely to reduce the extent of these environmental problems.

The life cycle of coal causes ecosystem destruction, air pollution and global climate change



Mountaintop Removal at a Strip Mine in West Virginia

Coal consumption is responsible for 50% of total mercury released into the U.S. environment

Ecosystem Destruction

The extraction and burning of coal has significant chemical and physical impacts on local ecosystems. First, all forms of coal mining require varying degrees of disruption to local landscapes, ranging from loss of topsoil to complete removal of mountaintops. This mining can permanently alter critical habitats and also generate high levels of acidic surface water when leachates, metals and sediment from exposed bedrock flow into rivers and streams. This process, called acid mine drainage, contaminates both aquatic systems and drinking water sources (Tewalt, 2010).

Second, the combustion of coal damages ecosystems on a regional level, particularly through the release of acidic compounds and heavy metals both into the atmosphere and onto land and water surfaces (EPA: "Acid Rain," 2007). Dangerous gases, such as nitrous oxides (NO_x) and sulfur dioxide (SO_2) are released during coal combustion and contribute to acid rain that precipitates and acidifies ecosystems. Affected ecosystems experience reduced productivity, soil degradation and harm to vegetation.

Third, the residue of coal combustion typically ends up in landfills where it can leach into groundwater and contaminate local ecosystems. This leaching releases a number of substances that are harmful to public health including arsenic, cadmium, lead, selenium, and mercury. Mercury is a chemical of significant concern due to its impacts throughout ecosystem trophic levels. When mercury enters surface waters it is consumed by microorganisms, which convert it into a toxic form called methylmercury. This mercury becomes more concentrated through a process known as bioaccumulation when larger organisms eat exposed organisms. Consumption of contaminated fish has been linked to damage to the heart, kidney, lungs, immune system and neurological functions of infants and young children (EPA: "Mercury," 2007, Grandjean, 2006).



Coal Powered Electricity Generation Plant in Ohio

Air Pollution

Coal combustion has a significant impact on ambient air quality. As coal is burned, it produces numerous harmful by-products including ozone, SO_2 , NO_x , particulate matter, hydrogen chloride, hydrogen fluoride, arsenic, cadmium, chromium and mercury (Clean Air Task Force: "Cradle to Grave," 2010). Ground-level ozone is a secondary pollutant formed when NO_x emissions react with sunlight. Ground level ozone and sulfur dioxide are both linked to respiratory illness and disease (WHO, 2010). Coal also produces extremely small particles (particulates) of sulfur, nitrogen, carbon, acids, metals and airborne toxins. When inhaled, these compounds are small enough to pass through lung tissue and enter the bloodstream, increasing the risks for blood clot, cardiovascular disease, and lung disease (Clean Air Task Force: "Dirty Air, Dirty Power," 2010).

As coal is burned, it releases numerous harmful by-products that are damaging to human health



Melting Glacier in Greenland

Coal power plants are the largest contributor of carbon dioxide emissions in the United States, emitting 1.97 billion tons of CO₂ in 2005

Climate Change

Coal is among the most carbon intensive energy sources and contributes heavily to global climate change. Coal power plants are the largest contributor of carbon dioxide (CO₂) emissions in the United States, and the EPA estimates that in 2005, 1.97 billion tons of CO₂ were emitted from coal power (EPA, 2010). CO₂ is a potent, long-lived greenhouse gas that absorbs longwave radiation emitted from the earth, and re-emits that energy back to the surface, leading to atmospheric warming (the greenhouse effect). As the concentration of CO₂ and other greenhouse gases in the atmosphere increases, this warming effect amplifies and disrupts the global climate system. The Intergovernmental Panel on Climate Change (IPCC) has definitively concluded that the mean global temperature is increasing, and this increase is due to anthropogenic greenhouse gas emissions (IPCC, 2007). The effects of a changing climate include: increased likelihood of severe heat waves, increased frequency and severity of storms, increased drought and desertification, extension of vector-spread diseases, and sea level rise.

In addition to the environmental problems outlined above, there are further issues associated with energy inefficiency in the U.S. residential sector. First, the current economic recession has resulted in widespread unemployment in the construction sector, peaking at 27.1% in February 2010, and still at 17.3% at the time of writing in October 2010 (Bureau of Labor Statistics, 2010). In addition, homeowners are paying unnecessarily high utility bills during an especially difficult time. Finally, there are many well-documented financial and informational barriers associated with implementing energy efficiency. These include high upfront costs and general lack of awareness of the benefits associated with energy efficiency. The Home Star Energy Retrofit Act of 2010 aims to address these problems.

Home Star Energy Retrofit Act of 2010

Energy waste in the U.S. residential sector is an unmistakable problem, but also presents a great opportunity. Improving energy efficiency is the “low-hanging fruit” in the transition away from fossil fuels. It is the easiest, quickest, and most cost-effective way to boost energy supply, tackle environmental problems associated with coal, and stimulate the American economy.

Retrofits have the potential to reduce home energy bills by \$21 billion annually, paying for themselves over time

Small actions taken at the individual home level can have global consequences. For example, if residential energy efficiency increased by 20%, total U.S. CO₂ emissions would decrease by approximately 4% (DOE EIA, 2009). The United States Council on Environmental Quality estimates that home energy use can potentially be reduced by up to 40% per home by utilizing existing retrofitting techniques and technologies. Retrofits also have the potential to reduce home energy bills by \$21 billion annually, paying for themselves over time (Council on Environmental Quality, 2009). Although homeowners will make money over the long term from energy efficiency, the high upfront costs incurred by homeowners represent a barrier to wider uptake. The Home Star Energy Retrofit Act overcomes this barrier by subsidizing these retrofit costs.

The Act has two primary goals: to increase U.S. residential energy efficiency and secure a more sustainable energy future; and to stimulate job creation and the development of an energy efficiency sector. These goals simultaneously aim to address the environmental problems associated with energy waste and coal based energy, while also stimulating the American economy by encouraging demand for skilled labor in the distressed construction and manufacturing sectors.

The Act authorizes the Secretary of Energy (the Secretary) to establish a Home Star Retrofit Rebate Program (Home Star) to provide rebates to homeowners. Home Star allows homeowners to choose between two rebate programs: Silver Star and Gold Star. The Act authorizes \$6 billion over two years and it will not replace funding for existing energy efficiency programs, thereby allowing homeowners to take advantage of Home Star in addition to existing State-funded programs. The Act is federal debt neutral and funding will be suspended if proven to have a negative effect on the national deficit.



Thermal Image Shows Energy Escaping from U.S. Home

Home Star Homeowners

The Act targets single-family homes for retrofits, but large apartment or condo buildings with more than 5 units are not eligible. The Act also provides \$7,500 for manufactured home or modular homes built prior to 1976. This focus on single-family homes means that, in practice, benefits are concentrated in rural and suburban areas, which is unfortunate for the many Americans residing in urban areas. However, if Home Star proves successful, it opens up the opportunity for the program to be extended to include apartments and other dwellings common in urban areas.

The Silver Star Program distributes rebates for specific home energy saving measures

The Silver Star Program

The Silver Star Program distributes funds to homeowners for energy saving measures outlined in the Act. Most applicants are likely to receive a rebate of \$1,000, with total funds capped at \$3,000, or 50% of total cost of goods and labor per household. Homeowners that purchase products and perform retrofit work themselves (“do-it-yourself” projects) are entitled up to 50% of the total cost, with a maximum of \$250 per household.

Silver Star Program energy saving technologies include:

- Whole house air sealing measures
- Attic insulation measures
- Duct sealing or replacement and sealing
- Wall insulation
- Crawl space insulation or basement wall and rim joist insulation
- Window replacement
- Door or skylight replacement
- Heating system replacement
- Air-source air conditioner or air-source heat pump replacement
- Heating or cooling system replacement
- Replacement of a natural gas, propane, or electric water heater
- Storm windows or doors replacement
- Window film

The Gold Star Program distributes rebates for whole home energy savings

The Gold Star Program

The Gold Star Program awards homeowners funds based on how much energy is saved on a whole home level, with a required minimum of a 20% reduction. Rebates of \$3,000 are offered for 20% energy reduction, and a further \$1,000 for each additional 5% reduction, capped at \$8,000 or 50% of the total retrofit cost. Energy saving measures may include those listed in the Silver Star program and any other energy saving measures that are demonstrated to improve energy efficiency. Pre and post-retrofit house energy consumption levels must be thoroughly documented through the use of energy simulation software programs or equivalent performance tests.

Rebate Program	Key Differences	Funding
Silver Star	Provides rebates for specific energy saving measures and technologies	Each measure:\$1,000 (+/-) Max: \$3,000 or 50% of total cost
Gold Star	Provides rebates for whole home energy savings	\$3,000 for 20% energy reduction plus \$1,000 for each additional 5% reduction Max: \$8,000

Table 1: Key Differences between the Silver Star and Gold Star Programs

Distribution of Capital

The Act specifies the flow of money from DOE to homeowners, using a Rebate Aggregator to facilitate transactions. A Rebate Aggregator functions as an intermediary between DOE and rebate recipients. The Rebate Aggregator ensures that eligible homeowners immediately receive rebate benefits as a price reduction in the cost of equipment and services. The flow of money is as follows: homeowners receive discounts at the point of purchase from qualified contractors and vendors. Contractors and vendors then submit claims to the Rebate Aggregator. The Rebate Aggregator processes the applications and distributes rebate payments from DOE to the vendors and contractors.

A Rebate Aggregator functions as an intermediary between DOE and rebate recipients

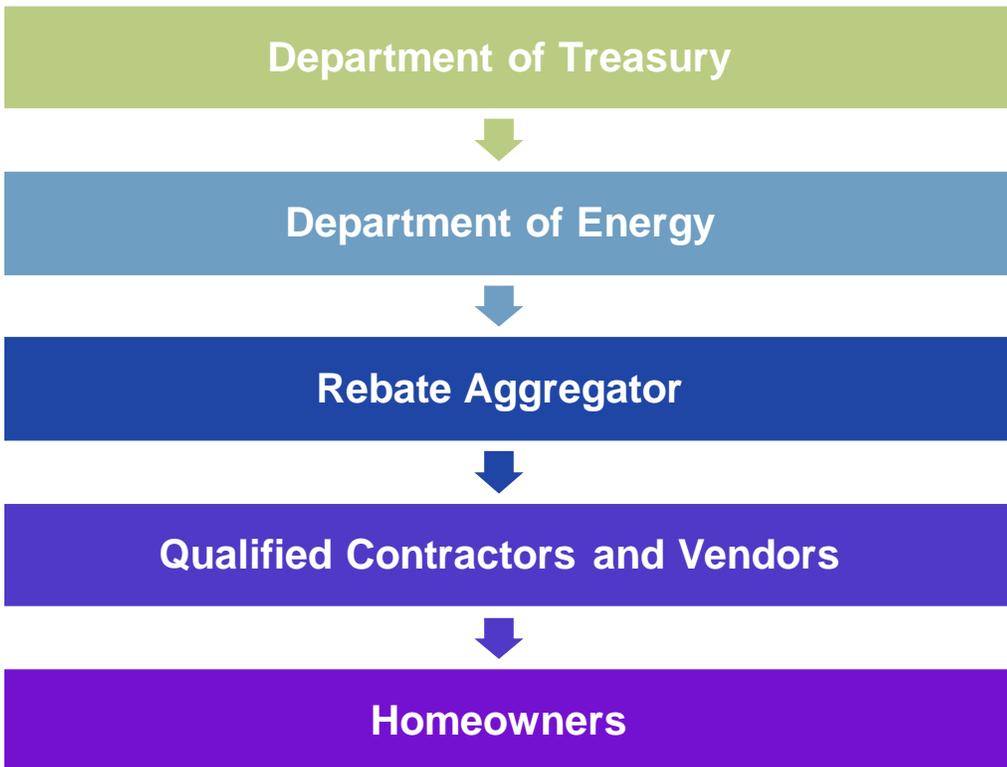


Figure 2: Flow of Capital in Home Star

Lessons from “Cash for Clunkers”

In 2009, Congress passed the Car Allowance Rebate System, commonly known as “Cash for Clunkers.” Cash for Clunkers was a rebate-based stimulus program intended to encourage Americans to trade in older “clunker” cars and buy new, fuel-efficient models. In this program, DOE was directly responsible for issuing rebates and was criticized for the lengthy delays in distribution. Congress specifically included Rebate Aggregators in Home Star as a direct response to the criticism of Cash for Clunkers. The advantage of the Rebate Aggregator position is that DOE need only work with the Rebate Aggregators and not every vendor and contractor, thus shortening the rebate payback period. Additionally, in response to claims of fraudulent behavior in Cash for Clunkers, Home Star mandates quality assurance auditing to ensure this issue is effectively managed.

Case Study: How Do Home Retrofits Save Energy?

Heating and Cooling

Together, heating and cooling account for approximately 56% of the total energy use in a typical U.S. home, making it the largest energy expense for most households (DOE: “Energy Savers,” 2010). To understand how retrofits work, we need to consider the ways that energy escapes from a home through conduction, convection, and radiative energy transfer.

Energy Transfer Through Conduction

Conduction refers to energy transferred through direct contact. Certain materials have qualities that make them better conductors of thermal energy. Home insulation has the ability to hold air in place, acting as a barrier to heat transfer. Just as additional layers of clothing provide more warmth, a thicker layer of insulating material will provide greater reductions in energy loss. The following measures in the Act reduce conductive energy loss:

- wall, attic and basement insulation,
- window replacement, and
- door replacement with higher insulating properties.

Improvements to infrastructure are particularly relevant for energy efficiency as 10-25% of the heat in a home can escape through cracks in windows. In fact, simply installing storm windows can reduce heat loss from windows by 25%-50% (DOE: “Energy Savers Booklet,” 2010).

Energy Transfer Through Convection

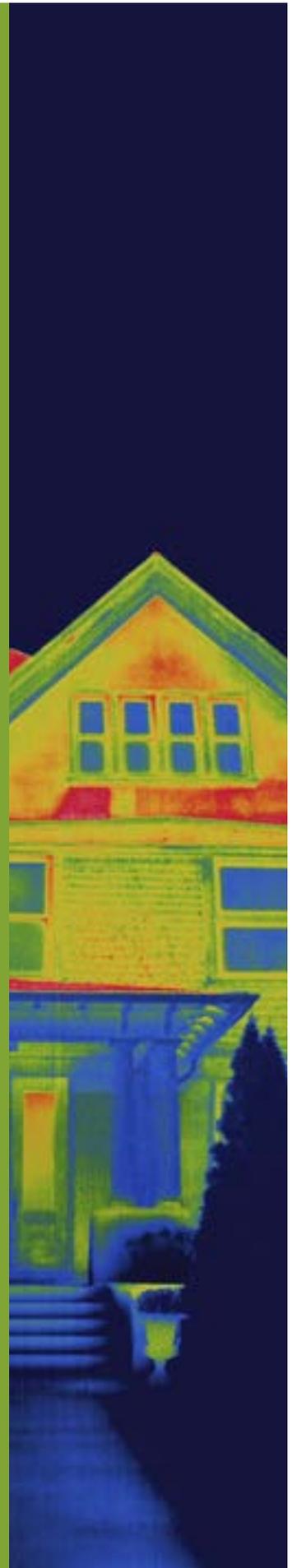
Convection refers to the movement of warm air from inside a house to the outside or when warm air enters a cool house. Heated air is less dense than the surrounding air and more buoyant, causing it to rise and move around. Moving air can find its way outside through gaps in a home’s thermal envelope or the insulating barriers that keep climate-controlled air inside. As air is drawn in from outside, it needs to be heated or cooled to the homeowner’s preferred level. The following measures in the Act reduce convective energy loss:

- whole house air sealing, and
- duct sealing or replacement and sealing.

Radiative Energy Transfer

Radiative energy transfer refers to the movement of energy through electromagnetic radiation, and does not require air movement or direct contact. The principle source of this is solar energy transferred into a house through a window. The following retrofitting measures in the Act address radiative heat transfer:

- window film applications, which act to block certain wavelengths of the Sun’s energy and mitigate the heating effect (relevant for warm climates), and
- rebates for skylights that allow sunlight into the home, helping to reduce heating cost (relevant for cooler climates).



Legislative Context

House Timeline

Mar 18, 2010

Bill taken up in House Sub-committee on Energy and Environment

Mar 24, 2010

Sub-committee on Energy and Environment markup; Republicans add sunset language and \$6 billion cap

Apr 14, 2010

Home Star is introduced in the House

Apr 14, 2010

Sub-committee on Energy and Environment passes Home Star

Apr 15, 2010

Committee on Energy and Commerce passes Home Star

May 6, 2010

Home Star passes in the House

Political Background

The Act was introduced into the House of Representatives (the House) on April 14, 2010, and passed quickly. It was then referred to the Senate on May 7, 2010, where it has since stalled.

Several events created favorable conditions for the bill's passage: Home Star encouraged job creation the midst of a deep recession; the B.P. Deepwater Horizon disaster spilling nearly 5 million barrels of oil into the Gulf of Mexico drew attention to the country's dependence on fossil fuels; and Democrats, the party typically most amenable to environmental bills and government intervention in the face of economic problems, controlled the Senate and House of Representatives with large majorities, as well as the White House. However, working against the bill's passage were Congressional gridlock and a highly polarized American political environment, especially as difficult midterm elections drew nearer.

Home Star has vastly more supporters than it has opponents. The Home Star Coalition boasts over 2,800 groups and brings together environmentalists with organizations and businesses that would not traditionally support environmental legislation. Supporters include the U.S. Chamber of Congress, the Sierra Club, Dow Chemical, and the National Association of Manufacturers.

Support for Home Star is based on its many benefits, particularly job creation, savings for homeowners, development of an energy efficiency sector, and reduced dependence on foreign energy. The potential for new jobs in the struggling construction sector is seen as a key advantage of Home Star. Encouraging retrofits creates work in the struggling construction sector and improves demand for numerous other products and services including: appliances, Heating, Ventilating, and Air Conditioning (HVAC), materials manufacturing, auditing services, and the retail sector. One study estimates that Home Star will create 168,000 jobs across the U.S., with a low net cost to government of \$35,700 for every job created (Aggarwal, 2010). The Act also saves homeowners money on their energy bills, which can then be spent elsewhere in the economy. ICF International estimates that the \$6 billion dollars from Home Star could ultimately generate over \$20 billion in economic activity (Saha and Johnston, 2010).

Over the long-term, supporters argue that Home Star will develop a strong domestic energy efficiency sector and, by reducing overall energy demand, will limit dependence on foreign energy imports. Finally, supporters point to the environmental benefits of reducing energy waste. For example, approximately 4 million tons of CO₂ emissions could be avoided compared to business as usual (Aggarwal, 2010).

Senate Timeline

- Jan-Feb 2010**
Attempt to add Home Star to Senate jobs bill
- Mar 3, 2010**
Introduced in the Senate; paired with Rural Star and Building Star bills
- May-Jun 2010**
Home Star attached to the Senate "Climate Bill"
- Jul 22, 2010**
"Climate Bill" is put aside
- Jul 22, 2010**
Home Star briefly attached to energy package responding to BP oil spill
- Aug 2010**
Oil spill legislation falls apart, Senate leaves for August recess
- Sep 8, 2010**
Senator Reid pronounces "Climate Bill" officially dead

The opponents of Home Star are primarily concerned with deficit spending and the ineffectiveness of government job creation efforts. There are also some libertarians in Congress who believe it is not the role of government to interfere in the economy in this way. Republican opposition to Home Star may also be a political strategy designed to improve the results of the November midterm elections and make future political gains.

It is also true that a very small group generally oppose energy efficiency retrofits like Home Star, and other similar bills on two accounts. First, there is a known, but not rigorously measured, rebound effect wherein consumers that save money and energy through retrofits then use more energy in other areas of their home. Second, critics have pointed out the waste generated from replacing functioning but inefficient appliances and infrastructure in a home, arguing that it would be better for the environment if homeowners waited until the end of the lifecycle of the product before replacing it. Although these issues should be managed, there is a strong consensus that the economic, social and environmental benefits of programs like Home Star strongly outweigh these costs.

Potential Outcomes

Home Star is a popular bill. Surprisingly, due to current Democrat and Republican legislative tactics, its popularity has actually acted as a barrier to passage. Democrats have attached Home Star to many less politically popular bills in an effort to draw votes to these bills (e.g. American Clean Energy and Security Act). These bills have all failed to pass and Home Star remains stalled in the Senate.

Home Star may be retained until next year to again be added to less popular bills or Home Star may need to be taken up alone to improve its chances of passage. If Home Star is delayed until the next session of Congress, it will need to be reintroduced into both the House and Senate for reconsideration. This scenario is increasingly unlikely given the lack of support for any increase in spending by the Republican party, and especially the newly empowered group of "budget hawks" elected through the Tea Party movement in the 2010 midterm elections.

As a workaround, President Obama has initiated or expanded programs through DOE and EPA that accomplish the goals of Home Star but do not require Congressional approval. The Recovery Through Retrofit Program provides consumers with information about their home's energy use, promotes innovative financing options, and develops national worker qualification standards ("Recovery Through Retrofit," 2009). Through the DOE's "Energy Savers" Program, consumers can receive financial assistance for energy efficient purchases and improvements in the form of tax credits, rebates, and energy-efficient mortgages and financing ("EERE: Energy Savers," 2010). Finally, through the EPA's Energy Star, the DOE is authorizing \$300 million in rebates for appliances, funded by the American Recovery and Reinvestment Act of 2009. Under this program, eligible consumers can receive rebates to replace inefficient appliances, exactly like the Home Star program ("Energy Savers: Rebates," 2010).

Regardless, one thing is clear: The Home Star Energy Retrofit Act of 2010 is widely popular across party lines and ideologies. If the political calculus changes in the future, it could be quickly and easily passed.

Program Design

The program design translates the ideas expressed in the Act into implementation activities for DOE. The Act was explicit in its mandates and expressly outlined a number of program details including: the flow of funds, quality assurance standards, types of rebate programs, requirements for contractors, efficiency standards, and measures eligible for rebates. However, as is typical with most U.S. legislation, the Act leaves to the administrators the task of defining how these objectives are to be met. In essence, the Act outlines specifically what it needs done and the administrator's job is to ascertain how it will be done.

DOE is the administrative body that will oversee the program, as mandated in the Act. The primary role of DOE is to ensure the efficient flow of money from the government to homeowners for retrofits. Our analysis has identified four principal program elements critical to achieving Home Star's operational objectives. These functions are classified as either program establishment or ongoing administration. Immediately after the Act is passed, DOE will need to oversee two elements of program establishment:

- 1) how the funds will be allocated, and
- 2) how the rebate process will function.

DOE will also be responsible for managing ongoing administration of Home Star, the main elements of which are:

- 3) how the public will be made aware of the program, and
- 4) how to ensure that the funds are not subject to fraud.



The United States at Night

Fund Allocation

The Act authorizes \$6 billion to be spent over two years, however, it does not specify how the funds should be allocated between the Gold Star and Silver Star Programs. Potential approaches include:

- Allocating money to States: This option would provide money to States based on a fund allocation formula, allowing DOE to target funds for specific desired outcomes. Such allocation could target certain States that are highly reliant on coal, or States with relatively high unemployment in the construction sector.
- Allocating specific amounts to each program: This option allocates a set percentage of money to each program to ensure a minimum level of uptake for each.
- Allocating based on demand: This option does not specify funding allocation. In this case, public demand determines which program and region receives the most funding. This method is the simplest and offers quick dispersal of funds.

We recommend allocating \$2 billion each to Silver Star and Gold Star Programs. The remaining \$2 billion will be available to either program on a first-come, first-served basis

Given these various options and their respective advantages and disadvantages, we recommend an allocation scheme that allocates \$2 billion (1/3 of total funds) each to the Silver Star and Gold Star Programs. The remaining \$2 billion, minus administrative costs of up to \$540 million, will be available to either the Silver Star or Gold Star Programs on a first-come, first-served basis. For example, if the Silver Star Program proves very popular and expends its \$2 billion allocation in the first four months, it can continue by drawing from the first-come, first-served funds.

By allocating a minimum amount of money to each of the programs, DOE is able to balance the strengths of each program. Silver Star has the advantage of rapid uptake of funds, rapid job creation, and broad appeal due to a lower barrier to entry (lower capital costs, less time and inconvenience due to renovations). Gold Star has the advantages of guaranteed energy reduction, enhanced environmental benefits and the development of a more highly skilled energy efficiency sector.



Installing Energy Efficient Windows Can Reduce Heat Loss from Windows by 25-50%

We recommend that Home Star adopt a centralized, national approach to ensure the efficient flow of funds

Rebate Aggregators

An expeditious, efficient, and accessible rebate process is crucial to the overall success of Home Star. The rebate system, centered on a Rebate Aggregator, is explicitly defined within the legislation. The system will work as follows: first, homeowners receive rebates upfront on their bills. For example, if a homeowner purchases attic insulation from a qualified contractor or vendor with a total cost of \$2,500 (for material and installation), the homeowner receives an up-front discount (e.g. \$1,000) and therefore pays the rebate-adjusted price (\$1,500). The contractor or vendor takes that receipt, completes a rebate application and submits it to a Rebate Aggregator for reimbursement. The Rebate Aggregator is responsible for collecting rebate applications and submitting them to DOE. DOE then reimburses the Rebate Aggregator, who distributes the funds to the contractor.

Given that the Rebate Aggregator position is a new addition to federal rebate programs, the Act specifies criteria for entities to be eligible to be Aggregators. Specifically, a Rebate Aggregator must have experience with energy efficiency and demonstrated ability in processing rebates of this kind. The Act grants DOE the discretion to decide on the preferred form a Rebate Aggregator should take and how many Rebate Aggregators may be hired. A Rebate Aggregator could be a bank, contractor, utility, retailer, software company, or any other public or private entity that meets the requirements. A national retailer with experience managing private contractors such as Home Depot or Lowe's might be a good fit for this type of function.

Within these requirements, DOE has the option of pursuing either a national or regional approach when selecting Rebate Aggregators. In the national approach, fewer Rebate Aggregators would be chosen (between one and five), each with a national presence. Collectively, this will provide coverage to the entire U.S. population. In the regional approach, Rebate Aggregators would compete to provide coverage in a specific State or region, and many Rebate Aggregators would be selected.

We recommend that Home Star adopt a centralized, national approach, as this lowers the administrative complexity of the program, ensures smooth integration of IT systems, and ensures the efficient flow of funds from government to contractors. The purpose of the Rebate Aggregator is to decrease the number of parties interacting throughout the process, as a national approach ultimately would do.



Attic Insulation Can Reduce Heat Loss and Save Money on Energy Bills

Public Awareness

Public awareness is critical to Home Star's success. The target audience must know about the numerous opportunities available, how the different programs work, which retrofits are eligible, and how this program complements existing federal and/or State programs. Other DOE programs that did not meet spending targets often failed to adequately promote their offerings. For example, DOE oversaw the Weatherization Assistance Program, which received substantial funding from the American Recovery and Reinvestment Act. Unfortunately, DOE did not meet spending targets for this program partially due to a lack of public awareness and knowledge.

We recommend that DOE employ a two-tiered public awareness strategy to encourage homeowners to take advantage of available retrofit funding. First, DOE should launch a national media campaign which will include a website and hotlines (as mandated in the Act), television, radio, billboard advertisements and education and outreach events. Second, DOE should encourage a secondary campaign focused on regional centers and targeting specific demographics. States should lead this regional strategy in collaboration with the private sector (e.g. hardware stores and manufacturers advertising their products that are eligible for rebates).

We recommend that DOE employ a two-tiered public awareness strategy to encourage homeowners to take advantage of available retrofit funding

Did you know...

32% of all Americans complain that their homes are too drafty in the winter (Residential Energy Consumption Survey).

The number of people reporting poor insulation is 7 times higher in older homes than in new homes (Residential Energy Consumption Survey).

The number of Americans using air conditioning is constantly rising: in 1997, 52% of Americans reported that they leave their AC on all summer long, a 19% rise from 1981 (Residential Energy Consumption Survey).

Decreasing a home's thermostat by 1°F can save an average of \$15-\$40 per season (Residential Energy Consumption Survey).

Correct use of a programmable thermostat can reduce energy consumption by \$180 a year (Residential Energy Consumption Survey).

The U.S residential sector accounts for 22% of all electricity consumed annually; that's about 1,220 million tons of carbon a year (DOE EIA, 2009).

The U.S residential sector accounts for 4.4% of the world's carbon emissions each year. Therefore, an increase in efficiency would have a meaningful global impact (DOE EIA, 2009).

52% of U.S. electricity comes from coal-burning power plants; only 9% of the energy generated comes from renewable sources (DOE EIA, 2009).

10%-25% of the heat in homes is lost through windows. Replacing old windows can reduce energy consumption by up to 50% (DOE: "Energy Savers," 2010).

56% of residential electricity is used for heating and cooling. Switching to energy efficient air conditioners can save homes as much as 25%-50% of their entire energy bill (DOE: "Energy Savers," 2010).

In one year, the total U.S energy consumption is equivalent to burning 99.89 quadrillion matches (EPA: "Energy Star").

The typical U.S. family spends about \$1,900 per year on home utility bills (Energy Savers: Tips).

Only 20% of homes built before 1980 are well insulated (Energy Savers: Tips).

Typically, 43% of a typical utility bill goes for heating and cooling. Heating and cooling systems in the U.S. emit 150 million tons of carbon dioxide each year and generate about 12% of the nation's sulfur dioxide and 4% of nitrogen oxides, the chief ingredients in acid rain (Energy Savers: Tips).

Since 1970, the size of a new house has increased by 50% and electricity consumption per person rose more than 70% (Speth 2009).





Quality Assurance Providers Prevent Fraud and Ensure Safe and Accurate Installation

Quality Assurance

As with any federal spending program, DOE will need to actively manage the risk of fraud. The Act mandates that Quality Assurance Providers randomly inspect 10-20% of retrofitted homes. The required percentage varies both with the Gold Star and Silver Star Programs, and whether or not the contractor uses a certified workforce. Quality assurance providers will inspect retrofits to prevent fraud, ensure compliance with safety standards according to the Building Performance Institute and ensure accurate installation of hardware to attain energy reduction goals.

We recommend the creation of a system of State-run quality assurance programs with general oversight by DOE

The Act specifies that quality assurance must be performed and the content of audits, however, it leaves to the discretion of DOE how quality assurance will be structured. One option would be to create a national quality assurance program with a single set of guidance and one oversight body, requiring all States to implement the same quality assurance plan. Alternately, States could be responsible for developing and implementing their own quality assurance programs.

We recommend the creation of a system of State-run quality assurance programs with general oversight by DOE. States will be provided with funding to achieve this goal. States that are unable or unwilling to oversee a quality assurance program can opt out, with the responsibility for quality assurance reverting to DOE.

Implementation Plan

Assuming enactment of the Act, and having analyzed the program options and outlined a program design, we next set to the task of implementing the program. Implementation of Home Star consists of four primary elements:

1. an organization, contracting and staffing plan,
2. a budget,
3. a master calendar for the first year of operation, and
4. a performance measurement and management improvement analysis.

These four program sections are designed to support the overall structure of the Home Star program. Crafted with the four critical functions in mind, the implementation plan is able to effectively leverage the program's strengths.

Who will implement the program?

Administering Home Star will require the creation of a new division within DOE: the Home Star Energy Retrofit Program Office. This Office will be responsible for all duties of administering the Home Star Retrofit Rebate Program and reporting to the Secretary of Energy and Congress on the status of the program.

Home Star will employ 16 full-time equivalent employees and up to 20 contractor positions

Home Star will reside within the Weatherization and Intergovernmental Branch of the Office of Energy Efficiency and Renewable Energy (EERE), DOE. The Weatherization and Intergovernmental Office “provides grants, technical assistance, and information tools to states, local governments, community action agencies, utilities, Indian tribes, and overseas U.S. territories for their energy programs.” By reducing barriers to the adoption of renewable energy and energy efficiency technologies, the Office aims to increase energy efficiency in the United States (DOE: “Weatherization and Intergovernmental Program”, 2010). Given this mission, it is most appropriate that the program reside within this office. The Weatherization and Intergovernmental Office is the office most likely to have the expertise and knowledge required to administer the program.

There will be 16 full-time equivalent employees (FTE) as well as up to 20 contractor positions devoted to the program in 2011 dispersed over four organizational units. Efficient hiring of employees and quickly making the program operational will be critical to Home Star’s success, as the Act has mandated a number of early deadlines. In the first year many of these FTEs will need to be borrowed from other areas of DOE or EERE to occupy the positions during the early months of the program (known as “acting” in the role).

Government FTEs will supervise five contracts: the Rebate Aggregator contract, the Federal Rebate Processing System contract, the National Retrofit Website contract, the Contractor and Homeowner Hotlines contract, and the Public Awareness contract. The Rebate Aggregator contract will be subject to competition through the standard Request for Proposal (RFP) process. The remaining four contracts - the Federal Rebate Processing System, National Retrofit Website, Hotlines, and Public Awareness contracts - will not be subject to competition but will be awarded through existing contracting arrangements within DOE, or Blanket Purchase Agreements (BPAs).

The outsourced nature of this work will require strong oversight and program analysis by DOE. For this reason, program managers will come from senior ranks GS 13-14, as well as program managers and analysts at an average of GS 10-11. We believe that the seniority of DOE staff is essential to ensuring proper supervision of outsourced components.

Working with Contractors

Given the ambitious timelines and extensive program outlined in the Act, Home Star will make heavy use of contractors. The Rebate Aggregator contract will be competed with the standard Request for Proposals (RFP) process. An RFP is a formal bidding process whereby vendors or contractors submit competitive bids/applications for a service or product.

The Federal Rebate Processing System, National Retrofit Website, Hotlines, and Public Awareness contracts will not be subject to competition through the RFP process. These contracts will be awarded to existing contractors under current Blanket Purchase Agreements (BPA) within DOE. A BPA is a standing agreement with a panel of vendors that allow departments to request services or supplies without having to engage in a full RFP, thereby simplifying the purchasing process.

Home Star will be comprised of four organizational units:

1. *Program Operations*
2. *Rebate Operations*
3. *Public Awareness*
4. *Quality Assurance*

Overview of the Home Star Energy Retrofit Program Organization

The Program will be comprised of four sections, each mirroring one of the four components identified in the program design: Program Operations, Rebate Operations, Public Awareness, and Quality Assurance. Figure 4 shows the proposed organizational chart for Home Star. To follow are the primary functions of each section. For each branch's job descriptions and responsibilities, see Appendix A.

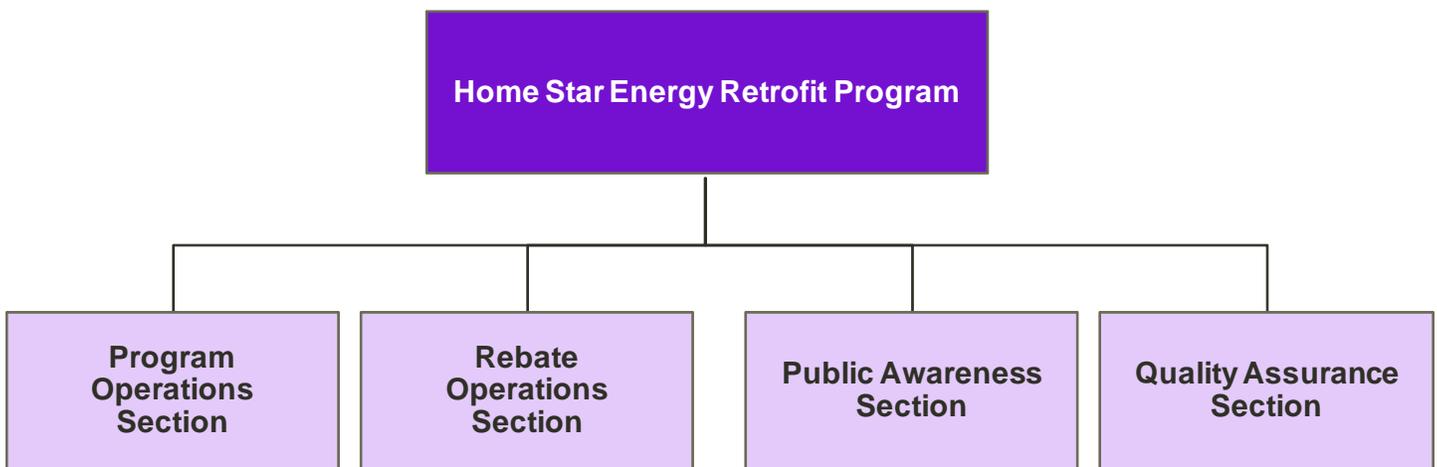
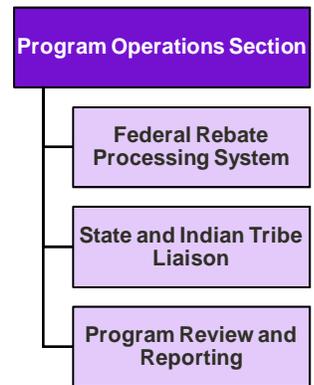


Figure 4: Program Organization Chart

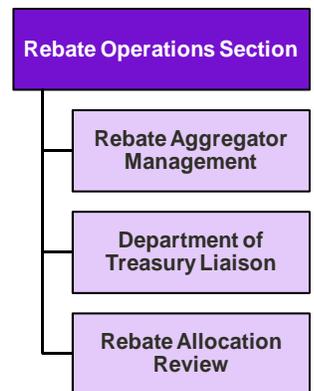
Program Operations Section: 5 government FTEs and 3-4 contractors

The Program Operations Section will be responsible for overseeing the internal operations of Home Star. This involves establishing and maintaining the Federal Rebate Processing System, liaising with States and Indian Tribes, developing model forms and data protocols, and reviewing and reporting on the program. The Section will oversee the creation of the Federal Rebate Processing System, which will be DOE's administrative structure for managing and monitoring fund allocation for rebate payments and the database for information on financial accounting, efficiency gains, environmental impacts and job creation. The Section will work in close consultation with the Building Performance Institute and the National Home Performance Council to develop the model forms and data protocols to be published on the National Retrofit Website. This Section will also be responsible for providing administrative and technical support to State governments and Indian Tribes. Finally, this Section must gather performance metrics from across the program offices and develop Program Review documents as required under legislation or requested by Congress.



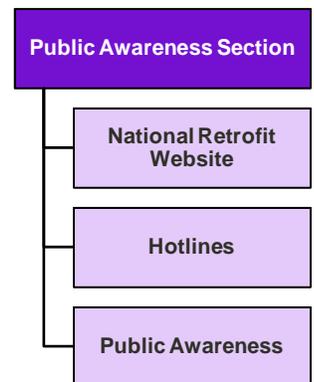
Rebate Operations Section: 5 government FTEs and 3-4 contractors

The Rebate Operations Section will be responsible for ensuring that rebate funds move efficiently from DOE to contractors via a Rebate Aggregator. This Section is chiefly responsible for drafting a RFP to select a Rebate Aggregator, assessing proposals, choosing a contractor, and finally, managing the Rebate Aggregator. The Rebate Operations staff will need to work quickly to establish contracts with national Rebate Aggregators and to ensure the rebate framework is operational. This Section will also be responsible for liaising with the Department of Treasury and certifying that the rebate amounts remain appropriate over time.



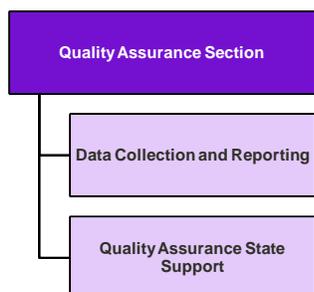
Public Awareness Section: 1 government FTEs and 9-12 contractors

The Public Awareness Section will be responsible for carrying out the national public awareness, advertising, and marketing campaign for the program. The Section will oversee the creation and maintenance of the National Retrofit Website and the contractor and homeowner hotlines. The website is to include: all eligible energy efficiency measures included in the program, directions for participation, a link to the Building Performance Institute's website, links to requisite forms for contractors, vendors, and Quality Assurance Providers, and an online chat function. The Public Awareness Section will create a comprehensive Public Awareness Plan that shall include: broad strategy goals, national television, print and radio advertisements, and educational materials and events. The Section will also coordinate and oversee State and regional media campaigns and approve and manage any public-private partnerships with utilities, energy service companies, retailers and others who may assist in marketing efforts.



Quality Assurance Section: 3 government FTEs

The Quality Assurance Section will be responsible for ensuring compliance with all requirements under the Act and minimize fraud in the program. Where States elect to develop their own quality assurance framework, this Section must approve or deny their framework plans and oversee ongoing activity. This Section must also develop a federal quality assurance framework for States that elect not to develop their own. It can be used as a model framework for States when developing their own plans.



Staffing and Contractor Plan

Figure 5 displays the organizational chart with job titles and position level provided for each Section and Branch. An asterisk (*) represents an employee position.

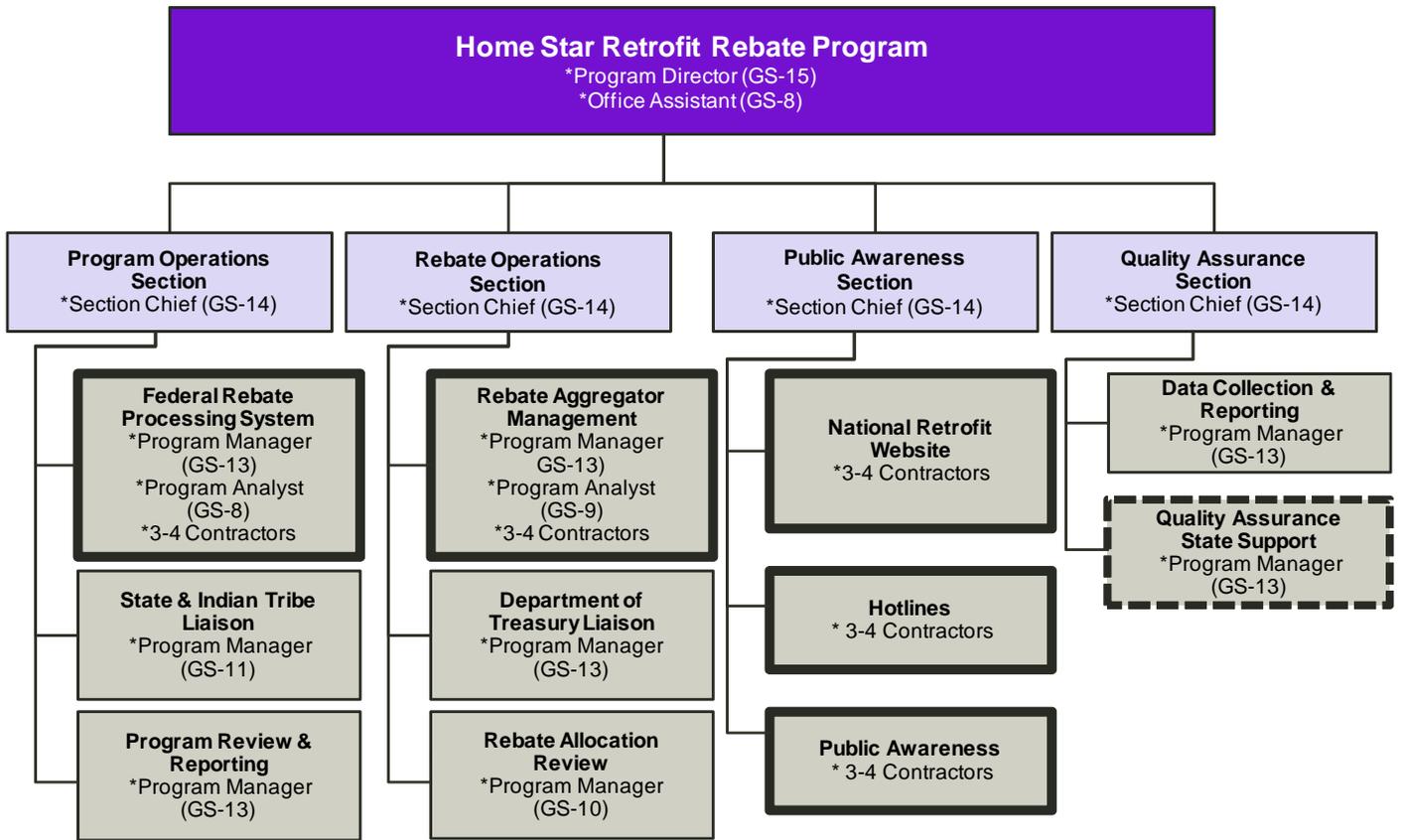


Figure 5: Home Star Retrofit Rebate Program Staffing and Contractor Plan

Legend

-  Office will manage a contract with an outside vendor/contractor
-  Office is conditional

How will money be spent?

The Act allocates a total of \$6 billion to be spent over two years. The budget has two components: program funds to be used for rebates and administrative costs. The program funds are split between the Silver Star and Gold Star Programs. Following our program design, we recommend allocating \$2 billion each to the Silver Star and Gold Star Programs with the remaining program funds allocated on a first come, first-served basis. DOE allocates \$324 million (5.4% of \$6 billion) for administration of the program. In addition, the Act authorizes up to \$216 million (3.6% of \$6 billion) to the States for:

Over 90% of the total \$6 billion allocated to Home Star will be distributed as rebates. The remaining funds will cover administrative costs

- administrative costs of the Act;
- development and implementation of Quality Assurance frameworks;
- oversight of Quality Assurance programs; and
- establishment and delivery of financing capacity for the Act.

The major components of the program budget are summarized below.

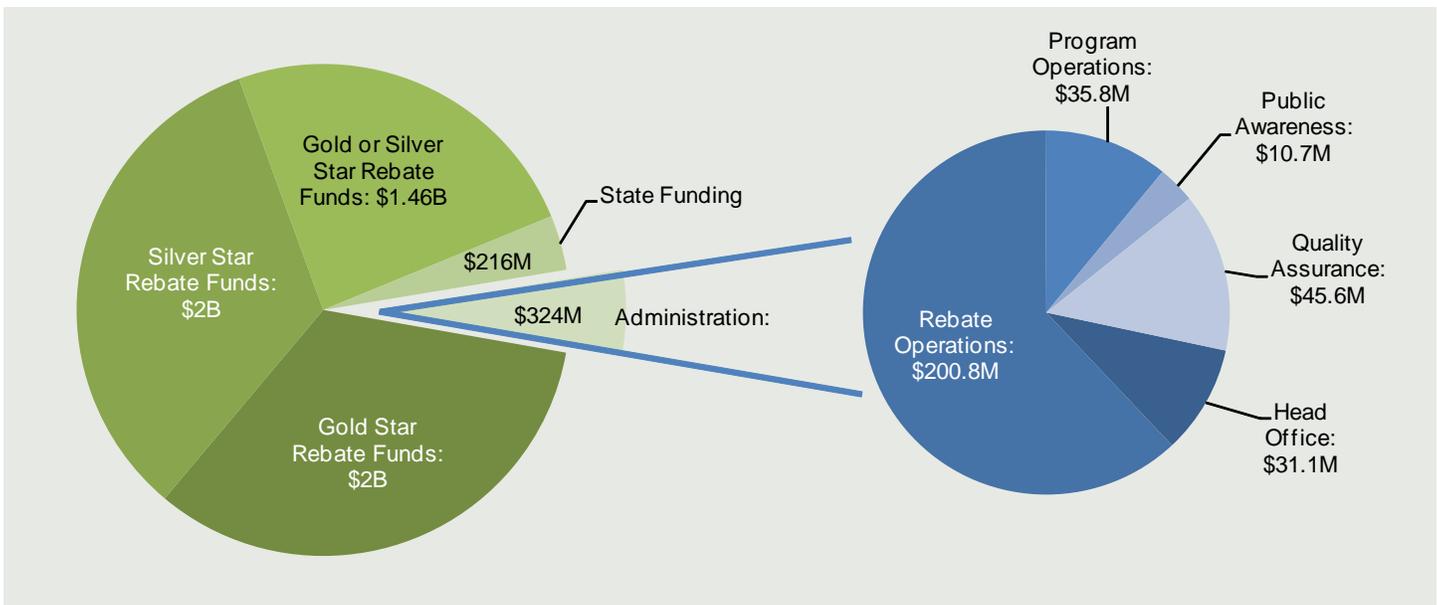


Figure 6: Home Star Program Budget

The Silver Star and Gold Star Programs have been placed under a common administrative structure within DOE, as indicated in the organizational plan. The four major program components under the common administrative structure are the Program Operations Section, Rebate Operations Section, Public Awareness Section, and Quality Assurance Section. Each of these program Sections has an associated line-item budget. Refer to Appendix B for the full 2011-2012 Home Star Program Budget.

What are the major milestones?

The Home Star Master Calendar incorporates all of the elements of the program design, highlighting the functional components of the organizational and staffing plan, budget and performance management plan for the 2011 calendar year. Responsible organizational units are assigned to each task with allotted time periods and deadlines. Due to expected revisions, the calendar allows for flexibility and midcourse corrections throughout the year. The full master calendar can be found in Appendix C.

The official implementation of Home Star will begin on Monday of the first working week of the year: January 3, 2011. In order to meet many of the short deadlines as mandated, staff must already be in place, so it was assumed that DOE and EERE employees would be available to be immediately detailed to the Home Star Office. As mentioned above, contractors would be relied upon heavily to meet early deadlines.

Given that the Act mandates the \$6 billion to be spent within two years, the program design must adhere to an aggressive timeline, particularly in the first year. The key milestones are: selecting Rebate Aggregators, developing the Federal Rebate Processing System, and funding retrofits as soon as possible. The milestones are broken down by section: Program Operations, Rebate Operations, Public Awareness and Quality Assurance. Highlight of the major milestones are displayed below.

The key milestones are: selecting Rebate Aggregators, developing the federal rebate processing system, and funding retrofits as soon as possible



Figure 7: Milestone Timeline

The Home Star Master Calendar provides a chronology of the milestones that must be achieved within the first year. Dividing these milestones into four time periods allows managers to see how the various components of the program will work together to meet targeted deadlines.

How will we measure success?

Establishing an integrated performance management system and innovation process is essential to the success of the program. The ability to effectively measure and evaluate success is among the program’s most critical management tools. The Secretary is accountable under the Act and will be scrutinized by the Administration, Congress, the American public, and the press. An integrated performance management system is essential to successfully delivering the program and addressing issues as they arise.

The ability to effectively measure and evaluate success is a critical management tool

Specific performance management categories were determined by DOE’s Performance Based Management Special Interest Group (PBM SIG). We have identified over 50 specific measures to be included in our performance management plan, all of which can be found in Appendix D. The key themes are set out below:

Type of Measure	Example Measures
Input <i>(Used to monitor human and capital resources)</i>	Personnel and office resource use Time for money to be allocated through organization Time taken to develop the Federal Rebate Processing System
Process <i>(Used to track and guide intermediate steps)</i>	Average time for rebate aggregator review Average time dispersal of Treasury funds Average time per web-chat help session
Output <i>(Used to measure services provided)</i>	Number of retrofits completed Number of homes audited Number of website hits
Outcome <i>(Used to evaluate performance against bill mandates)</i>	Consumer money saved on energy bills Direct and indirect employment Results of quality assurance
Impact <i>(Used to track indirect outcomes from implementation of the program)</i>	Reduction in carbon dioxide emissions Reduction in pollutants (e.g. CO ₂ and NO ₂) Waste created from efficiency retrofits

Table 2: Performance Measures

Given that the specified objectives of the Act are to increase the energy efficiency of U.S. homes and to create jobs, we have focused heavily on these criteria. However, in our earlier analysis of the Act we identified harmful environmental impacts of energy waste. To that end, the program performance measurement system ties home retrofitting to environmental impacts, so success will be measured by reduction of home energy use and the associated environmental outcomes.

Success will be measured by reduction of home energy use and the associated environmental outcomes

Reporting

The reporting structure is divided into two categories: internal reporting and external reporting. Internal reporting is concerned with input and process indicators associated with the program's implementation. This data will be collated and incorporated into a "balanced dashboard," designed to provide simple, accessible information about the overall functioning of the program and will include financial, feedback, and internal process indicators.

The "balanced dashboard," will provide simple, accessible information about the overall functioning of the program

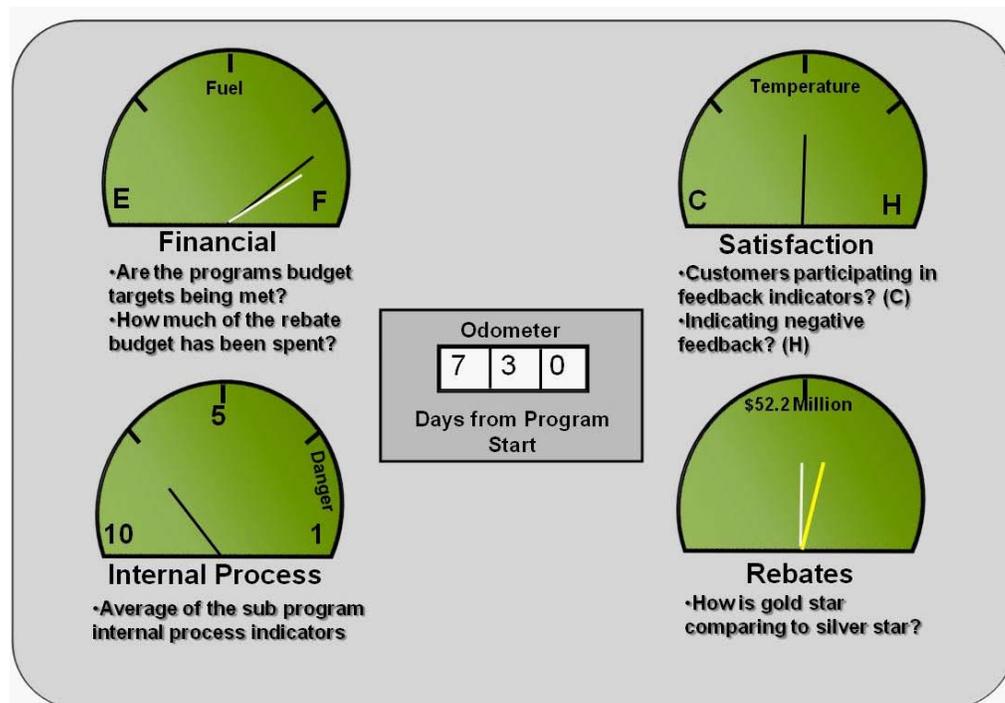


Figure 8: Balanced Dashboard (O' Connel, 2001)

External reporting is concerned with various reporting requirements as mandated in the Act. The key reports required are:

Ongoing performance management provides the information for constant re-evaluation, innovation and improvement

- A report on job creation and energy reduction due one year after enactment to the Committee on Energy and Natural Resources of the Senate and the Committee on Energy and Commerce of the House of Representatives.
- A report due at the end of the implementation period to the Comptroller General.
- A study due within one year after enactment to Congress comparing the life-cycle efficiency of various products.

Feedback

Home Star must constantly improve its systems and incorporate feedback that it receives both internally and externally. Ongoing performance management provides the information for constant re-evaluation, innovation and improvement. Feedback begins during program implementation and continues throughout the Program. After data collection and review, performance indicators are fed back into strategic planning, resource planning, performance planning, and resource allocation. This feedback will be moderated through internal reporting and external reporting. Internal reporting consists primarily of indicators that ensure that program elements are meeting the financial and programmatic benchmarks established.

Conclusion

Energy efficiency is the United States' greatest potential energy source: it is cheap, simple, local and abundant. Home Star aims to take advantage of this vast opportunity to lower energy bills, create jobs, stimulate the economy and create a secure energy future. While Home Star is not an explicitly environmental program, the structural and behavioral changes it encourages will be beneficial for the environment. By reducing energy waste, Home Star decreases the amount of energy produced by coal power, thereby ameliorating the environmental problems associated with coal: ecosystem destruction, air pollution and global climate change. It is a win-win program that illustrates how small actions taken at home can have significant national and global impacts.

Although the current political climate does not favor Home Star's passage, the proposed program design and implementation plan provide a road map to success should Home Star become law. It is a proposal that harnesses the expertise of DOE and the private sector to save taxpayers' money and meet the ambitious timelines set in the bill. We remain optimistic about the opportunities for Home Star in Congress and, if ultimately passed, the opportunities the it represents for the American people.

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Appendix A: Job Descriptions

Home Star Energy Retrofit Program Head Office
Director, Home Star Retrofit Rebate Program
The Home Star Retrofit Rebate Program Director will be responsible for overseeing the Program, ensuring that rebate funds move from the Department of Energy to contractors for home energy retrofits. The primary tasks will be managing the four Sections: Program Operations Section, Rebate Operations Section, Public Awareness Section and Quality Assurance Section.
Program Operations Section
Section Chief, Program Operations Section
The Section Chief, Program Operations Section, is responsible for overseeing the operations of the Home Star Retrofit Rebate Program that are internal to the Department of Energy. This primarily involves establishing and maintaining the Federal Rebate Processing System, liaising with States and Indian Tribes, developing model forms and data protocols, and reviewing and reporting on the Program.
Federal Rebate Processing System Branch
The Federal Rebate Processing System Program Manager and her staff will be responsible for establishing the Federal Rebate Processing System as outlined in Section 101(b) of HR 5019. The Federal Rebate Processing System Program Manager and her staff will establish the system within 30 days of the enactment of HR 5019. The Program Manager and her staff will engage with other Information Technology (IT) entities at the Department of Energy to determine if the Federal Rebate Processing System can become a part of an existing IT system. If not, the Federal Rebate Processing System Program Manager and her staff will issue a Task Order under a current Blanket Purchase Agreement (BPA) to engage with an IT database contractor to establish the Federal Rebate Processing System.
The Federal Rebate Processing System Branch will work closely with the Rebate Aggregator Management Program Manager to establish requirements for the Federal Rebate Processing System and to ensure that the Federal Rebate Processing System is compatible with the Rebate Aggregator's IT system.
The Federal Rebate Processing System Branch will be responsible for developing model forms for use by contractors that will be carrying out the home energy retrofits under this Program. These forms and data protocols will be published on the National Retrofit Website to be used by contractors, vendors, and quality assurance providers. The Branch will work in close consultation with the Building Performance Institute and the National Home Performance Council to develop the model forms and data protocols.
State & Indian Tribe Liaison Branch
The State & Indian Tribe Liaison Program Manager will be the primary point person for communication between the Home Star Energy Rebate Program and State governments and Indian Tribe entities. The Program Manager will provide administrative and technical support to States and Tribes as is necessary to carry out the Program. The State & Indian Tribe Liaison Program Manager will send out communications to the Governor and Energy Department of each State to establish a line of communication. She will also interact with the Leaders of Indian Tribes. She will work to identify State home energy rebate programs and work with States to reduce redundancy and maximize efficiency in government rebates.
In addition, the Program Manager will be responsible for collecting Quality Assurance data from States that choose to establish their own Quality Assurance programs. She will establish a framework for obtaining quality assurance information from the States and will convey that information to the Data Collection and Reporting Branch, Quality Assurance Section. The Quality Assurance Section will then process the information and report on quality assurance metrics.
Program Review and Reporting
The Program Review and Reporting Program Manager will be responsible for gathering performance metrics from across the Program and developing Program Review documents. The Act requires that "Not later than 180 days after the date of enactment of this Act, the Secretary shall prepare and transmit to Congress a State-by-State analysis and review the distribution of Home Star retrofit rebates under this title." The Program Review and Reporting Program Manager will be responsible for creating this report, gaining approval from the Program Director, and ensuring timely delivery to the Secretary of Energy.
The Act also outlines the creation of two annual reports. Both annual reports will be transmitted from the Secretary of Energy to the Committee on Energy and Natural Resources of the Senate and the Committee on Energy and Commerce of the House of Representatives. The Program Manager will be responsible for creating these reports and adhering to the requirements as outlined in Section 106.
Rebate Operations Section
Section Chief, Rebate Operations Section
The Section Chief, Rebate Operations Section, will be responsible for ensuring that rebate funds move from the Department of Energy to contractors for home energy retrofits. This will be facilitated by a mandatory Rebate Aggregator and thus, the Rebate Operations Section will be responsible for creating a Request for Proposals for a Rebate Aggregator, assessing proposals, choosing a contractor, and finally, managing the Rebate Aggregator. The Section Chief, Rebate Operations Section, will also be responsible for liaising with the Department of Treasury and certifying that the rebate amounts remain appropriate over time. The Section Chief, Rebate Operations Section will oversee three employees: two devoted to Rebate Aggregator Management and one Department of Treasury Liaison.
Rebate Aggregator Management Branch
The Rebate Aggregator Management Program Manager will be responsible for managing the selected Rebate Aggregators for the Home Star Energy Retrofit Program. The Rebate Aggregator Management Program Manager will "approve or deny an application from a person seeking to become a rebate aggregator not later than 30 days after receiving such application." During the first two months of the Program, the Rebate Aggregator Management Program Manager and her staff will solicit and review applications for a national Rebate Aggregator. The Rebate Aggregator Management Program Manager and her staff will work with other members of the Home Star Retrofit Rebate Program to design and develop a Request for Proposals (RFP) that communicates the standards outlined in the Act.
Section 102 (b) states that "Not later than 60 days after the date of enactment of this Act, the Secretary shall identify a sufficient number of rebate aggregators in each State to ensure that rebate applications can be accepted from all qualified contractors. Not later than 90 days after such date of enactment, the Secretary shall ensure that rebate aggregation services are available to all homeowners in the United States at the lowest reasonable cost." Thus, Rebate Aggregator Management Program Manager and her staff will need to work quickly to establish a contract with the National Rebate Aggregator and to ensure rebates are operational.

Department of Treasury Liaison Branch

Section 101 (1) of HR 5019 states that the Secretary of Energy shall work in consultation with the Secretary of Treasury to establish the Home Star Retrofit Rebate Program. The Department of Treasury Liaison Program Manager will be responsible for identifying a counterpart at the Department of Treasury. The Department of Treasury Liaison Program Manager will set up meetings with the Department of Treasury and develop agendas to maintain effective communication throughout the Program tenure. She will ensure that the Department of Treasury understands the Home Star Retrofit Rebate Program and the requirements of the Department of Treasury. The Program Manager will also facilitate the exchange of funds from the Department of Treasury to the Department of Energy to fund the Home Star Retrofit Rebate Program.

Rebate Allocation Review Branch

The Rebate Allocation Review Program Manager will be responsible for working closely with the Program Review and Reporting Program Manager in the Program Operations Section to track and monitor the status of the Program and determine if rebate amounts require adjustment. The Rebate Allocation Review Program Manager will create a memorandum, in consultation with the Program Operations Section, no less frequently than once every 30 days for the Program Director. This memorandum will report on rebate amounts and make a recommendation for static rebate amounts or adjusted rebate amounts. The Rebate Allocation Review Program Manager may choose to direct a memorandum to the Program Director at any time to recommend rebate adjustments.

Public Awareness Operations**Section Chief, Public Awareness Section**

The Section Chief, Public Awareness Section, will be responsible for carrying out the National Public Awareness, Advertising, and Marketing campaign for the Home Star Retrofit Rebate Program. The Public Awareness Section Chief will oversee the creation and maintenance of the National Retrofit Website and the contractor and homeowner hotlines. Within the first 30 days of the implementation of the Home Star Retrofit Rebate Program, the Section Chief will submit the comprehensive media Plan created by the Public Awareness Manager to the Program Director. The Public Awareness Section Chief will also track website and hotline traffic and evaluate the effectiveness of the plan.

National Retrofit Website Branch

The National Retrofit Website Branch will be responsible for establishing the National Retrofit Website and for ongoing maintenance of the site. The website is to include: all eligible energy efficiency measures included in the Program, directions for participation, a link to the Building Performance Institute's website, links to requisite forms for by contractors, vendors, and quality assurance providers, and an online chat function. The office will issue a Task Order under an existing Blanket Purchase Agreement for the creation of the website. The primary tasks of the National Retrofit Website Branch will be to ensure timely completion of the site and ongoing maintenance.

Hotlines Branch

The Hotlines Branch shall establish two hotlines: one for contractors and one for homeowners to call to obtain information about the Program. The hotlines will be managed by a contract under an existing BPA. The Public Awareness Section Chief will oversee creation of the hotlines program and manage the contract work. The Hotlines Branch will work closely with the National Retrofit Website Branch and the Public Awareness Branch to ensure a coherent and coordinated message is presented to the public in each information venue.

Public Awareness Branch

The Public Awareness Branch will be responsible for the creation of a comprehensive media plan within 30 days of implementation of the Program and will submit the plan to the Home Star Energy Retrofit Program Director with approval from the Public Awareness Section Chief. The plan shall include: broad strategy goals, national television, print and radio advertisements, and educational materials and events. The Public Awareness Chief will place a Task Order with an existing Blanket Purchase Agreement for a media firm to implement the plan established by the office. The Branch will also coordinate and oversee state and regional media campaigns, which will target select demographics. The Branch will approve and manage any public-private partnerships with utilities, energy service companies, retailers and others who may assist in the marketing efforts.

Quality Assurance Operations**Section Chief, Quality Assurance Section**

The Section Chief, Quality Assurance Section, will be responsible for overseeing all State level quality assurance activities. Within 180 days of enactment of the Act, the Director, Quality Assurance Section will approve or deny each State's quality assurance framework plan. The Quality Assurance Section Chief will oversee the individual State plans as well as develop and implement a quality assurance plan for States who elect not to develop their own framework.

Data Collection and Reporting Branch

The Data Collection and Reporting Program Manager will be responsible for ensuring compliance with home inspection requirements and minimizing fraud in the Home Star Retrofit Rebate Program. The Data Collection and Reporting Program Manager will primarily accomplish this task by aggregating quality assurance information from the States, through the Federal Rebate Processing System, to ensure that the appropriate percentages of retrofitted homes are being audited. The Data Collection and Reporting Program Manager will work closely with the State & Indian Tribe Liaison Program Manager and the Federal Rebate Processing System Program Manager to monitor the spending of funds for the Home Star Energy Retrofit Program. The Data Collection and Reporting Program Manager will also oversee third party auditing of Rebate Aggregators to prevent fraud at the national Rebate Aggregator level.

Quality Assurance State Support Branch

The Quality Assurance State Support Program Manager is a conditional position that will only exist if some States require quality assurance assistance from the Federal government. In this case, the Quality Assurance State Support Program Manager will develop and oversee a federal quality assurance framework plan, which complies with all requirements of the Act to be utilized in States that have not developed their own plans. This may also serve as a model framework plan for States' plans.

Appendix B: Budget

	2011	2012	TOTAL
Home Star Program Head Office			
Gold Star Funds			\$2,000,000,000
Silver Star Funds			\$2,000,000,000
First Come, First Served Funds			\$1,460,000,000
Personnel			
Program Director: (GS 15 Step 8)	\$122,800	\$122,800	\$245,600
Office Assistant (GS 8 Step 1)	\$37,630	\$37,630	\$75,260
OTPS			
Overhead (10% of salary)	\$133,305	\$133,305	\$266,610
Travel	\$60,000	\$60,000	\$120,000
Stationery supplies	\$10,000	\$10,000	\$20,000
Training	\$125,000	\$125,000	\$250,000
Copying	\$7,500	\$7,500	\$15,000
Mail	\$17,500	\$17,500	\$35,000
Equipment	\$5,000	\$5,000	\$10,000
Communications, utilities, Misc.	\$24,000	\$24,000	\$48,000
Fringe benefits (25%)	\$333,263	\$333,263	\$666,525
Contingency	\$14,701,383	\$14,701,383	\$29,402,765
Subtotal			\$5,491,154,760
Program Operations Section			
States Budget			\$216,000,000
Rebate Processing System contract			\$35,000,000
Personnel			
Program Operations Section Chief (GS 14 Step 9)	\$107,280	\$107,280	\$214,560
Rebate Processing Chief (GS 13 Step 8)	\$88,400	\$88,400	\$176,800
Program Analyst (GS 8 Step 1)	\$37,630	\$37,630	\$75,260
States & Tribes Liason (GS 11 Step 9)	\$63,700	\$63,700	\$127,400
Program Review & Reporting Chief (GS 13 Step 5)	\$81,230	\$81,230	\$162,460
3-4 Contractors*	-	-	-
Subtotal			\$251,756,480
Rebate Operations Section			
Rebate Aggregator contract			\$200,000,000
Personnel			
Rebate Operations Section Chief (GS 14 Step 9)	\$107,280	\$107,280	\$214,560
Rebate Aggregator Management (GS 13 Step 8)	\$88,400	\$88,400	\$176,800
Program Analyst (GS 9 Step 7)	\$49,870	\$49,870	\$99,740
Department of Treasury Liaison (GS-13 Step 8)	\$88,400	\$88,400	\$176,800
Rebate Allocation (GS 10 Step 10)	\$59,510	\$59,510	\$119,020
3-4 Contractors*	-	-	-
Subtotal			\$200,786,920
Public Awareness Section			
Media campaign contract			\$8,000,000
Website creation contract			\$500,000
Hotline contract			\$500,000
Education & outreach			\$1,500,000
Personnel			
Public Awareness Section Chief (GS 14 Step 9)	\$107,280	\$107,280	\$214,560
3-4 Website Contractors*	-	-	-
3-4 Hotline Contractors*	-	-	-
3-4 Media and Outreach Contractors*	-	-	-
Subtotal			\$10,714,560
Quality Assurance Section			
Quality Assurance (State Assistance)			\$45,000,000
Personnel			
Quality Assurance Section Chief (GS 14 Step 9)	\$107,280	\$107,280	\$214,560
Data Collection Chief (GS 13 Step 10)	\$93,180	\$93,180	\$186,360
State Support Chief (GS 13 Step 10)	\$93,180	\$93,180	\$186,360
Subtotal			\$45,587,280
TOTAL			\$6,000,000,000

*All contractors will be hired through a Task Order under a current Blanket Purchase Agreement (BPA) with DOE, except for those under the Rebate Aggregator Directorate, which will be under the Rebate Aggregator contract with Home Star.

Appendix D: Performance Management

Rebate Operations Section					
Rebate Aggregator Contract Manager					
Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Process	Time	Average time for application review	To monitor efficiency and scope in rebate aggregator review process	Internal	Weekly until rebate aggregator selection deadline (60 days)
Process	Time	Average time from rebate application to review by rebate aggregator	To ensure that the rebate aggregators stay within the 10 day processing limit	Internal	Weekly
Process	Number	Total number of rebate aggregator applications applied for	To monitor efficiency and scope in rebate aggregator review process	Internal	Weekly until rebate aggregator selection deadline (60 days)
Process	Percentage of total	% of rebate aggregator applications reviewed	To monitor efficiency and scope in rebate aggregator review process	Internal	Weekly until rebate aggregator selection deadline (60 days)
Output	Percentage of total	Rebates approved per aggregator	To monitor differences in rebate aggregator approval rates and monitor in case rebate forms are complicating approval ratings.	Federal Rebate Processing System	Monthly
Outcome	Number that week/Percentage above or below weekly average	Number of complaints about rebate aggregators	To ensure that there rebate aggregators are providing expected service to customers	Hotline/Website	Weekly
Department Treasury Liaison					
Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Process	Total number/Monthly number/Percentage above or below monthly average	Number of meetings with treasury	To ensure proper communications between HSE program staff and department of treasury	Internal	Monthly
Process	Time	Avg time to dispersal of treasury funds to rebate aggregators after application received to Federal Rebate Processing System	To ensure that the 10 day limit in time to dispersal mandated in bill is observed.	Internal	Weekly
Rebate Allocation Review					
Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Process	Number/Average Time	Number and length of meetings with Program Operations Director and Operations	To ensure open lines of communication and that the minimum of one meeting every 30 days is met	Internal	Monthly
Output	Percentage	% change in rebate requests by rebate	To inform rebate allocation review	Federal Rebate Processing System	Monthly
Output	Number	Total rebate requests	To inform rebate allocation review	Federal Rebate Processing System	Monthly
Output	Percentage	% total money spent by rebate	To inform rebate allocation review	Federal Rebate Processing System	Monthly
Program Operations Section					
Federal Rebate Processing System					
Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Input	Number	# of system tests run on Federal Rebate Processing System	To ensure proper functioning	Internal	Monthly
Output	Number for that month/Percentage change from monthly average	Errors reported from rebate aggregators	To ensure proper functioning of Federal Rebate Processing System	Rebate Aggregators	Monthly

State & Indian Tribe Liaison					
Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Process	Number for that week/Percentage change from weekly average	State/Tribe Quality Assurance Program review assessments performed	To ensure proper monitoring of state/tribe programs	Internal	Weekly until program assessment period is over (30 days)
Output	Number	Complaints issued about state Quality Assurance	To ensure quality of state/tribe Q/A programs	Hotline/Website	Monthly
Outcome	1-10 scale	Avg grade of performance review assessment	To ensure quality of state/tribe Q/A programs	Internal	Weekly until program assessment period is over (30 days)
Model Forms and Data Protocols					
Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Process	Number	# of informational surveys ran on each model	To ensure ease of use	Internal	Weekly until program assessment period is over (30 days)
Outcome	Number	# of complaints issued about data forms	To ensure that there is not program inefficiencies from cumbersome applications	Website/Hotline	Monthly
Program Review					
Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Output	Total Number/Number for that month/Percentage change from monthly average	# of rebates processed through system by program state and rebate aggregator	For 180 day assessment	Federal Rebate Processing System	Monthly
Outcome	Total Number/Number for that month/Percentage change from monthly average	Efficiency Created	For 180 day assessment	Modeled from Federal Rebate Processing System/augmented by energy data gathering from Quality Assurance	Monthly
Impact	Total Number/Number for that month/Percentage change from monthly average	SO2/NO2 Reduction	For 180 day assessment	Modelled from Federal Rebate Processing System	Monthly
Impact	Total Number/Number for that month/Percentage change from monthly average	Carbon Reduced	For 180 day assessment	Modelled from Federal Rebate Processing System	Monthly
Impact	Total Number/Number for that month/Percentage change from monthly average	Waste Created	For 180 day assessment	Modeled from Federal Rebate Processing System/augmented by Quality Assurance	Monthly
Impact	Total Number/Number for that month/Percentage change from monthly average	Jobs created - Indirect	mandated by bill	Modeled from Federal Rebate Processing System/augmented by Quality Assurance	Monthly

Public Awareness Section

National Retrofit Website

Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Process	Time	Average time per chat	Measure of efficiency	Internal	Monthly
Process	Percentage	% of chats that could be resolved without transfer to another branch	Measure of effectiveness	Internal	Monthly
Output	Total Number/Number for that week/Percentage change from weekly average	Website traffic hits	Measure of overall interest	Website	Weekly
Output	Total Number/Number for that week/Percentage change from weekly average	# of chat services provided	Measure of number of assists given through web support	Internal	Monthly

Hotlines

Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Process	Percentage	Calls answered within 30 seconds or less as % of total	Measure of efficiency	Internal	Monthly
Process	Percentage of total/Percentage change from monthly average	Calls resolved at hotline without transfer to other branch for resolution	Measure of effectiveness	Internal	Monthly
Output	Number	# of Calls made to hotline	Measure of overall interest	Internal	Monthly

Public Awareness

Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Output	Total Number/Number for that month/Percentage change from monthly average	Money spent on television/radio/print ads per state	To maintain budget	Internal	Monthly
Output	Percentage change from monthly average	% change in money spent on television/radio/print ads per state	Aggregate measure	Internal	Monthly
Outcome	Percentage change from monthly average	% change in rebate applications per state	Measure of effectiveness of advertising dollars	Federal Rebate Processing System	Monthly

Quality Assurance Section

Data Collecting and Reporting

Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Output	Percentage change from monthly average/ Percentage of total	% of homes audited by state	To meet 15% mandated in bill	Quality Assurance	Monthly
Output	Percentage change from monthly average/ Percentage of total	% of audited homes that received audit to depth	For baseline measurements to correct for impact modeling errors	Quality Assurance	Monthly
Output	Percentage change from monthly average/ Percentage of total	% of audited homes that meet compliance	Measure of program effectiveness	Quality Assurance	Monthly
Outcome	Time	Average time from non-compliance to contractor correction	Measure of program effectiveness	Quality Assurance	Monthly

Quality Assurance State Reporting

Type	Form	Measurement	Objective	From	Timeframe
Input	Percentage of total/Percentage change from monthly average	Amount of budget spent	Measures the total amount of budget for subprogram spent to date and the change in sending habits over time.	Internal	Monthly
Process	Number	Number of inspections conducted	Measurement of total number of audits of state quality assurance programs conducted per month. Audits will include financial functioning as well as proper implementation of Q/A inspections according to DOA specifications.	Internal	Monthly

