

Increasing the Use of Energy Efficient HVAC Equipment in Homes Through Voluntary and Profitable Pollution Prevention Programs

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There are many hurdles in the road to widespread adoption of energy-efficient heating and cooling (HVAC) equipment in homes. These hurdles include increased first cost, lack of sufficient financing, historic lack of aggressive marketing by HVAC equipment dealers, and lack of consumer awareness. This paper reports on the design and progress of the ENERGY STAR market-based approach to overcome these hurdles to encourage the widespread manufacture and purchase of highly efficient heating and cooling equipment. The paper will focus on several key marketing aspects of the ENERGY STAR HVAC program: program design and marketing methods; manufacturer, utility, financial institution and other key groups' participation in the program; findings on the most important factors in promoting increased market penetration of highly efficient products; and the current status of the program are discussed.

INTRODUCTION

Replacing aging heating and cooling (HVAC) systems with new, highly efficient equipment in homes can produce significant reductions in air pollution and create immediate and dramatic energy bill savings for homeowners. The U.S. Environmental Protection Agency (EPA) recognized that, despite the potential for these significant energy bill savings, most homeowners were not buying higher efficiency equipment. The EPA's ENERGY STAR HVAC program, launched in April 1995, is designed to identify and address the barriers that prevent increased market penetration of energy-efficient HVAC equipment in U.S. residential homes. Chief among these barriers are the following: high initial investment costs for the consumer; lack of consumer awareness of the many benefits of high-efficiency equipment; traditional resistance among HVAC contractors to sell newer technologies; and an incentive structure that manufacturers, distributors, and dealers operate under that does not always make it profitable for them to sell high efficiency equipment.

The ENERGY STAR HVAC program is a partnership between: the EPA; major manufacturers of air source, geothermal and gas-fired heat pumps, central air conditioners, furnaces, and programmable thermostats; and financiers who offer innovative loan packages to buyers of efficient HVAC equipment.

BACKGROUND: MARKET-BASED LABELING PROGRAM AS A SOLUTION

The EPA has found that labeling programs are effective at overcoming the lack of consumer awareness associated with many energy-efficient products. A widely recognized label can lend a desirable attribute or feeling to a product (e.g., "saves money" or "good for the environment"). In addition, the EPA's name adds both credibility and environmental motivation to the consumer to change behavior. The EPA also concluded that labels are particularly effective in helping high-efficiency products stand out in a market already glutted with large numbers of a product. In this way, the EPA's labeling programs play a "matchmaker" of sorts between the manufacturer and purchaser of high-efficiency equipment.

The EPA chose to model the ENERGY STAR HVAC program after the successful ENERGY STAR Computer program (more than sixty percent of computers and printers sold in the U.S. is ENERGY STAR, and the trend is continuing). Under the ENERGY STAR Computer program, the EPA formed a partnership with computer manufacturers who agree to make computers that meet target efficiency levels set by the EPA. The partner may use the EPA's ENERGY STAR label on qualifying computers, and agree to promote

and publicize this equipment. In return, the EPA agrees to promote the benefits of energy efficiency to consumers, publicize the ENERGY STAR program, and provide public recognition to ENERGY STAR partners. For example, the EPA performs analyses of pollution prevented by their equipment, publishes that information, and provides "partners of the year"-type awards at EPA conferences.

The ENERGY STAR HVAC program is working to break down the barriers in order to increase consumer purchases of high-efficiency HVAC equipment by: establishing a labeling program for qualifying equipment; increasing consumer, distributor, and dealer awareness of the benefits of high-efficiency equipment; and working with the financial community to devise new loan packages for purchasers of high-efficiency equipment.

Although the EPA found with its other programs that labels can be effective tools to increase the market penetration of energy-efficient products, the EPA knew that a successful HVAC program had to do more than put labels on HVAC equipment. Because of the unique barriers facing the HVAC market, EPA designed and implemented a marketing and financing strategy to supplement the labeling program. The HVAC marketing plan follows a general strategy of increasing consumer awareness of ENERGY STAR HVAC products through media outreach and direct marketing to target audiences. In addition, the ENERGY STAR HVAC program works with key organizations like HVAC contractor and utility trade associations, financiers, and utilities to come up with the best ways to increase consumer purchases of HVAC equipment. This marketing and financing strategy is crucial to the success of the ENERGY STAR HVAC program.

MARKETING STRATEGY

In Phase I the ENERGY STAR HVAC marketing plan, the EPA developed a pilot ENERGY STAR HVAC program which targeted specific regions of the country. This involved determining target test areas, developing campaign themes and messages, and conducting market testing. Phase II will include moving to full-scale program implementation in those regions that prove to be promising markets.

Determining Target Test Areas

The EPA worked with Lawrence Berkeley National Laboratory (LBL) to determine target test areas for the marketing and communications strategy. The goal of the analysis was to maximize the pilot program's effectiveness by launching it in areas where consumers stand to save the most money by choosing ENERGY STAR HVAC equipment instead of lower efficiency models and to target the marketing efforts at likely program participants within those regions.

The analysis employed a geographic information system (GIS) to estimate the heating and cooling energy consumption of homes in all regions of the United States. LBL estimated the energy and utility bill savings homeowners could achieve by replacing their aging heating or cooling systems with ENERGY STAR equipment rather than standard-efficiency equipment. LBL produced maps showing the resulting cost-effectiveness of the ENERGY STAR technologies (see Figure 1. Note that the EPA performed separate analyses for each ENERGY STAR HVAC technology).

The EPA considered, as candidate pilot areas, those cities where using ENERGY STAR HVAC equipment would be *most* cost-effective for consumers. The EPA narrowed down its choices by selecting only those metropolitan areas that had sufficient servicing and dealership market infrastructures and had at least one other favorable factor such as a strong utility program or other the EPA program activity. The EPA ultimately chose seven metropolitan areas in which to launch its campaign: Atlanta, GA; Columbus, OH; Phoenix, AZ; Pittsburgh, PA; Southern New Jersey (Atlantic City); Tampa, FL; and Washington D.C.

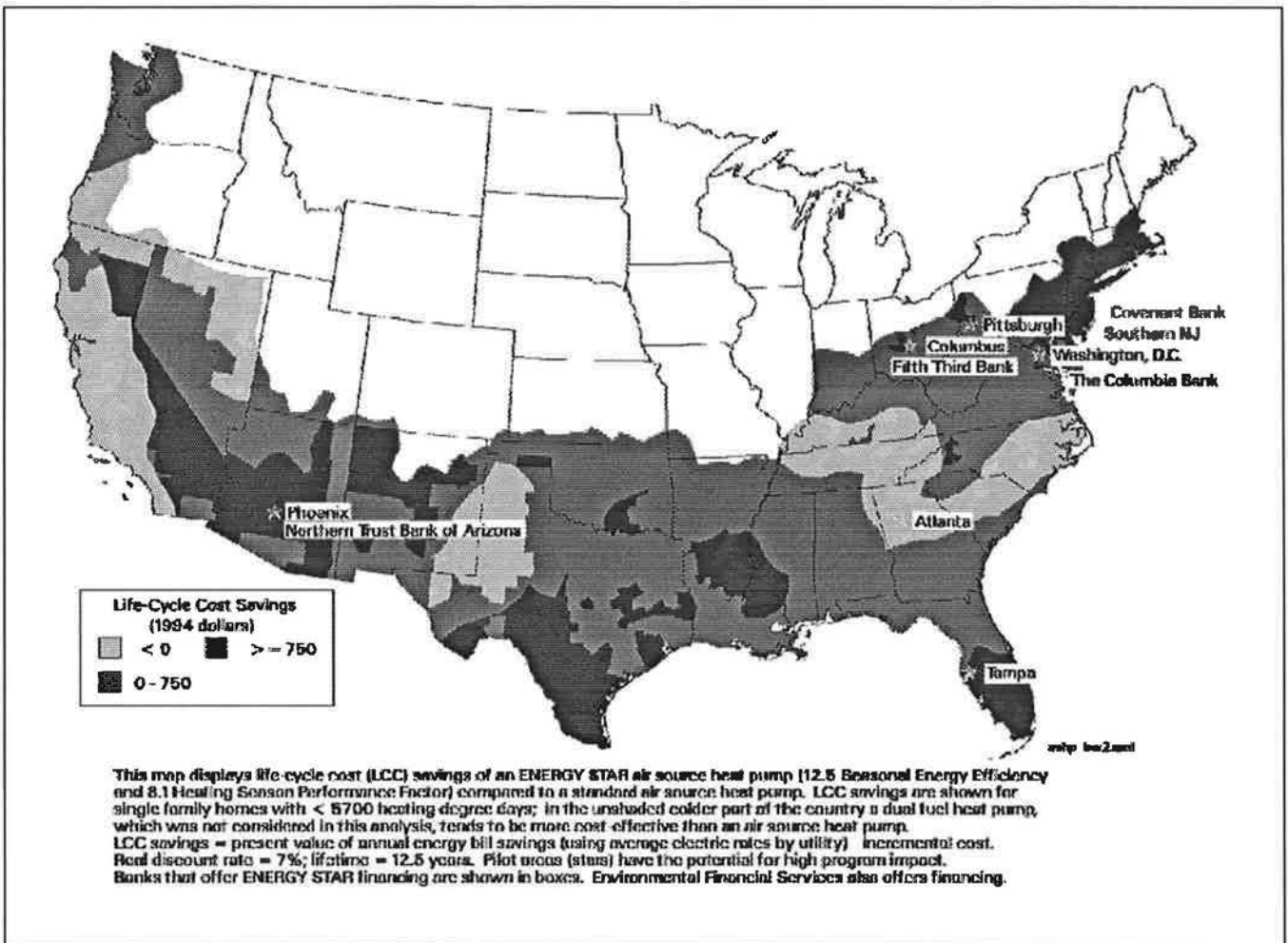
Target Market Segments and Outreach Activities

HVAC equipment is sold to the consumer through a distribution chain: a manufacturer sells to a distributor; a distributor sells to a dealer/contractor (these terms are used interchangeably); and a dealer sells directly to the consumer. The dealer nearly always goes to the consumer's home to conduct the sales transaction; rarely, does a consumer go to a "store" to purchase heating and cooling equipment. In this market, there is a relatively small number of manufacturers, thousands of distributors, and tens of thousands of dealers for HVAC equipment.

The EPA understood very early that the dealers have considerable influence over a consumer's HVAC purchase decision because the dealer conducts the sales transaction and consumers generally are not aware of the benefits of using highly efficient products. Interviews suggested that even when a consumer specifically requested high efficiency equipment, for various reasons, dealers often simply told the consumer not to buy it; therefore, besides wanting to educate dealers on the benefits of high-efficiency equipment, the EPA wanted to convince dealers to promote actively the ENERGY STAR label to consumers. Accordingly, the EPA established dealer outreach as its number one priority.

Faced with tens of thousands of dealers to educate, the EPA sought ways of leveraging existing educational networks to reach most effectively the greatest numbers of dealers. The EPA chose to enlist the assistance of existing HVAC manufacturer partners and distributors to take advantage of their

Figure 1. Profitability of an EPA ENERGY STAR Air Source Heat Pump Compared to a Standard Air Source Heat Pump



extensive communication and dealer training network. The EPA's goal was to have partners and distributors include information on ENERGY STAR in dealer educational newsletters, sales literature, and dealer training modules. The EPA also sought to increase consumer requests for ENERGY STAR HVAC products by having partners and distributors incorporate the ENERGY STAR logo in cooperative advertising sent to dealers. In this way, the consumer co-op ads, that dealers placed in local newspapers, would include the ENERGY STAR message.

A second priority for the ENERGY STAR HVAC marketing strategy was to recruit financial partners to establish special ENERGY STAR loans for HVAC equipment. These loans are designed to make it more economically attractive for a consumer to buy ENERGY STAR HVAC equipment with an ENERGY STAR loan than to buy lower efficiency equipment with a conventional loan.

EPA sought to convince financial institutions that, for several reasons, establishing these loans could be profitable for them.

First, consumers would want to use financing to purchase ENERGY STAR HVAC equipment because of its higher first cost; furthermore, the EPA would be working actively to increase consumer demand for ENERGY STAR HVAC equipment. Both factors would cause the market for ENERGY STAR HVAC equipment loans to grow. Second, ENERGY STAR loans would be very low risk to the financial institution because the consumer would be realizing immediate cash savings on their energy bills.

A third target group for HVAC marketing was organizations that have excellent dealer networks and are a source of leadership and guidance for dealers, including gas and electric utilities and dealer trade associations. The EPA has also tried to involve utility trade organizations, in the hopes of enlisting their utility members to educate dealers.

Finally, homeowners remain an important target market; however, because consumer education efforts might be wasted if dealers are not educated to respond to consumer inquiries about the ENERGY STAR program, initially the

EPA placed a lower priority on direct contact with HVAC purchasers.

To best leverage Phase I of the ENERGY STAR HVAC marketing program, the EPA conducted five specific outreach activities: (1) developing and distributing promotional materials that the EPA's manufacturer partners can use to educate dealers and consumers about the benefits of the ENERGY STAR HVAC program; (2) developing and placing public service announcements (PSAs) in media specifically targeted to the HVAC dealer; (3) meeting with distributors and dealers in the pilot areas to improve our marketing efforts and to learn more about their business; (4) meeting with utilities and trade associations in the pilot areas to leverage their educational and promotional efforts to both dealers and consumers; and (5) meeting with banks and other financial institutions to recruit them as marketing partners.

Developing Campaign Themes and Messages

The EPA developed the ENERGY STAR HVAC campaign themes and messages based on: information gathered from visits with HVAC dealers and distributors; consultations with advertising specialists; and reviews of past research on consumer attitudes toward energy efficiency. The results of these activities reinforced many of the EPA's views on marketing ENERGY STAR HVAC equipment, but did suggest a slightly different type of campaign from the one originally planned.

Testing Our Approach. Initial Public Service Announcement (PSA) concepts were targeted toward both the consumer and the dealer--the PSAs were placed in dealer publications to show dealers what potential customers would be seeing. The initial PSAs were intended to spur the consumer to action. To this end, they emphasized the benefits of replacing aging heating and cooling systems, before failure to avoid expensive repairs, due to equipment breakdowns during peak seasons. The PSAs also contained information on the economical and environmental benefits of ENERGY STAR products, as well as the financing and meaning of the ENERGY STAR label (figure 2).

In addition to the PSAs, the EPA developed several brochures and dealer promotional items including pins, magnets, and stand-up cards intended to help the dealer show the benefits of ENERGY STAR HVAC equipment to consumers. The EPA conducted focus groups with both HVAC dealers and consumers to better understand consumer attitudes towards energy efficiency and HVAC equipment purchases, and to get their reactions to the EPA ENERGY STAR program and advertising concepts. The EPA also wanted to learn more about the ways in which dealers market products and services.

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Figure 2.



Focus Group Results: Consumer Reaction. Consumers consistently identified first cost as the most important factor they consider when purchasing HVAC equipment. Interestingly, while consumers said that they did listen to the product dealer's recommendations, many revealed they were suspicious of such recommendations. Apart from higher initial cost, respondents did not identify disadvantages associated with purchasing energy-efficient equipment. Most indicated that they understood that performance is not compromised with more energy-efficient equipment. Many also believed that because energy-efficient equipment likely contains the latest technology, it would perform better than other, less efficient equipment.

Consumers in focus groups also identified a number of other factors that influenced their purchase decisions. These included the warranty terms, reliability, recommendations from friends, product or utility rebates, financing plans, and brand-name recognition. Many remarked that they did some background research to determine which equipment has the best reputation for quality and performance before purchasing HVAC equipment. Some said they would refer to the publication *Consumer Reports* as an objective guide for making product comparisons.

When asked to offer their suggestions for ad concepts for the campaign, the respondents stressed that the most important factor in replacing or upgrading a residential HVAC system is cost; therefore, cost savings should be a major ad theme. Furthermore, they revealed that comfort is an important theme that should be addressed in the ads. Environmental benefits could be mentioned, they said, but not as a major theme in the ads.

Although respondents were largely unfamiliar with the ENERGY STAR programs and logo, they offered very positive comments about the goals of the programs. Consumers also said they would definitely consider purchasing products with the ENERGY STAR label, if they understood that these products met high levels for energy-efficiency set by the EPA and did not differ significantly in cost from less efficient products at the time of purchase.

Focus Group Results: HVAC Dealer Marketing Methods. Participants in the dealer focus groups stressed that EPA's primary task at this time should be to saturate the market with ads that target consumers in consumer publications and inform them about the existence and mission of the ENERGY STAR program. This reaction was in contrast to EPA's initial primary focus on HVAC dealers. Dealers indicated that if EPA creates consumer demand for ENERGY STAR products through the ENERGY STAR HVAC program, then dealers would embrace the program.

Dealers in the focus groups also revealed that they use a number of methods to market their business services, including local newspaper and magazine ads, Yellow Page ads, radio and television ads, single-piece direct and co-op mailings (e.g., the Value Pak), and utility billing enclosures; however, most of the dealers said that a word-of-mouth referral from a satisfied customer is their most effective marketing tool.

Dealers indicated that the most important factor driving an HVAC purchase is cost, including the equipment's initial purchase price, financing plans, and monthly energy expense. Comfort was another important consideration. Name-brand recognition was the third most important influence on consumer purchases.

Dealers indicated that customers were likely to ask questions about energy-efficiency. As a result, dealers wanted to be educated, about the benefits of energy-efficiency, so they could be perceived as professionals who can respond in a knowledgeable way to customers' questions.

Dealer Reaction to ENERGY STAR Marketing Tools. While a few dealer respondents recognized the ENERGY STAR logo, none were familiar with the ENERGY STAR programs. Most said they would be interested in promoting

ENERGY STAR equipment if the equipment is energy-efficient, maintains or improves performance, sells for a price that is comparable to other energy-saving equipment, and is eligible for rebates or other financial incentives for consumers.

Dealers were shown the same ad concepts as were shown to the consumers, but were also shown one new ad concept that addressed consumers' desire for cost savings information (figure 3). Like the consumer group, the dealer group objected to the older concepts because they felt they did not convey the message of the cost savings of energy efficiency. The group voiced a strong preference for the new ad, which seemed to communicate best that ENERGY STAR equipment will result in cost savings for the consumer. Most respondents suggested using pictures of a real home, explaining that it would be more "friendly" to a general audience. Based on the results of these focus groups, a final PSA concept was developed and further tested. This final ad concept was strongly preferred over any of the earlier ones (see figure 4).

LESSONS LEARNED

From the focus groups and market research, the EPA recognized that building consumer demand is the key to getting

Figure 3.

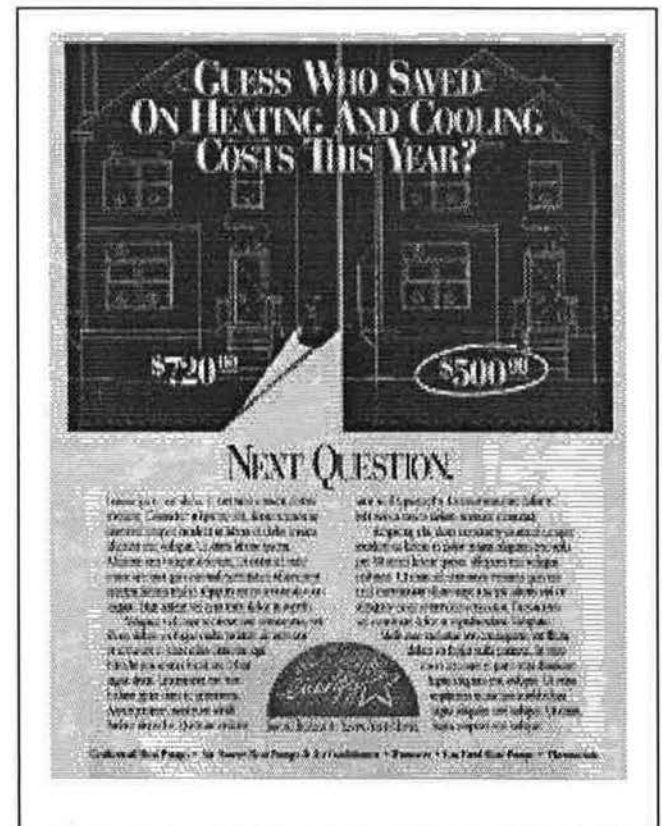
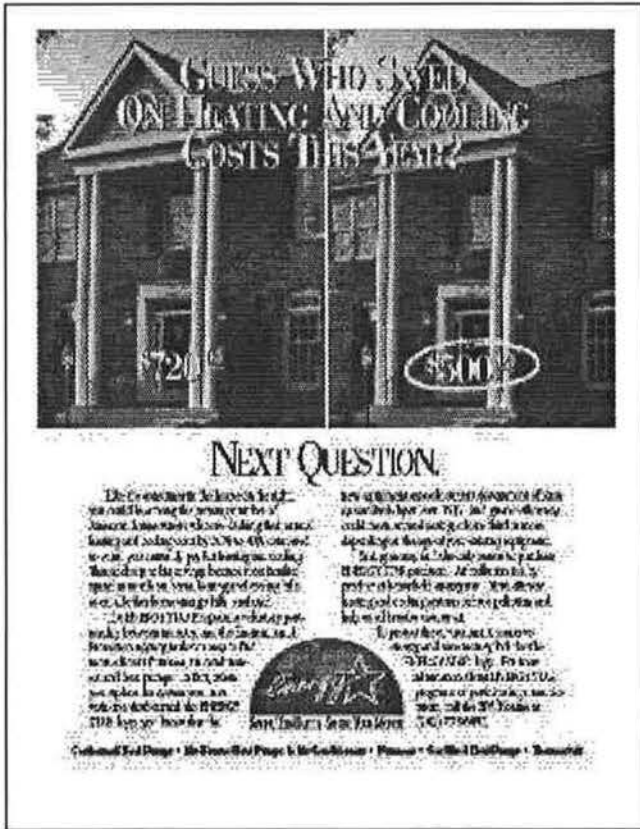


Figure 4.



dealers to buy-in to the program; therefore, the EPA initiated a major shift in the focus of the EPA activities from dealers to consumers. In addition, the EPA discovered that dealers, banks, and utilities were extremely interested in participating in a direct mail campaign. In the campaign, the EPA could provide data to dealers, banks, and utilities on the location of neighborhoods in the targeted regions with high concentrations of old HVAC equipment (see Figure 5 for an example of data the EPA has developed for a direct-mail campaign).

Dealer reactions reaffirmed that financing is an extremely important factor in getting the dealers' support of the program. Dealers were much more receptive to the ENERGY STAR message at the workshops that included presentations by ENERGY STAR financing partners than they were at the workshops that did not include a financing presentation. This suggested that the EPA should continue to work with the financial community when establishing new ENERGY STAR programs for additional HVAC products to meet the need for a strong link between dealers and lenders; furthermore, the EPA could coordinate financing partner and dealer marketing activities.

The EPA found that meetings with dealers were extremely valuable to help learn how dealers conduct their business:

what motivates them, how they view the market, and how they sell to customers? In addition, because conducting individual meetings with dealers in pilot areas would be impractical, the EPA has decided to hold dealer educational workshops to more effectively reach the dealer community; however, a key barrier remains in convincing HVAC dealers that a sizeable market exists for energy-efficient HVAC equipment. A dealer will still usually make a sale even if it does not include high-efficiency equipment; a customer will simply choose to purchase the less efficient product at a lower price.

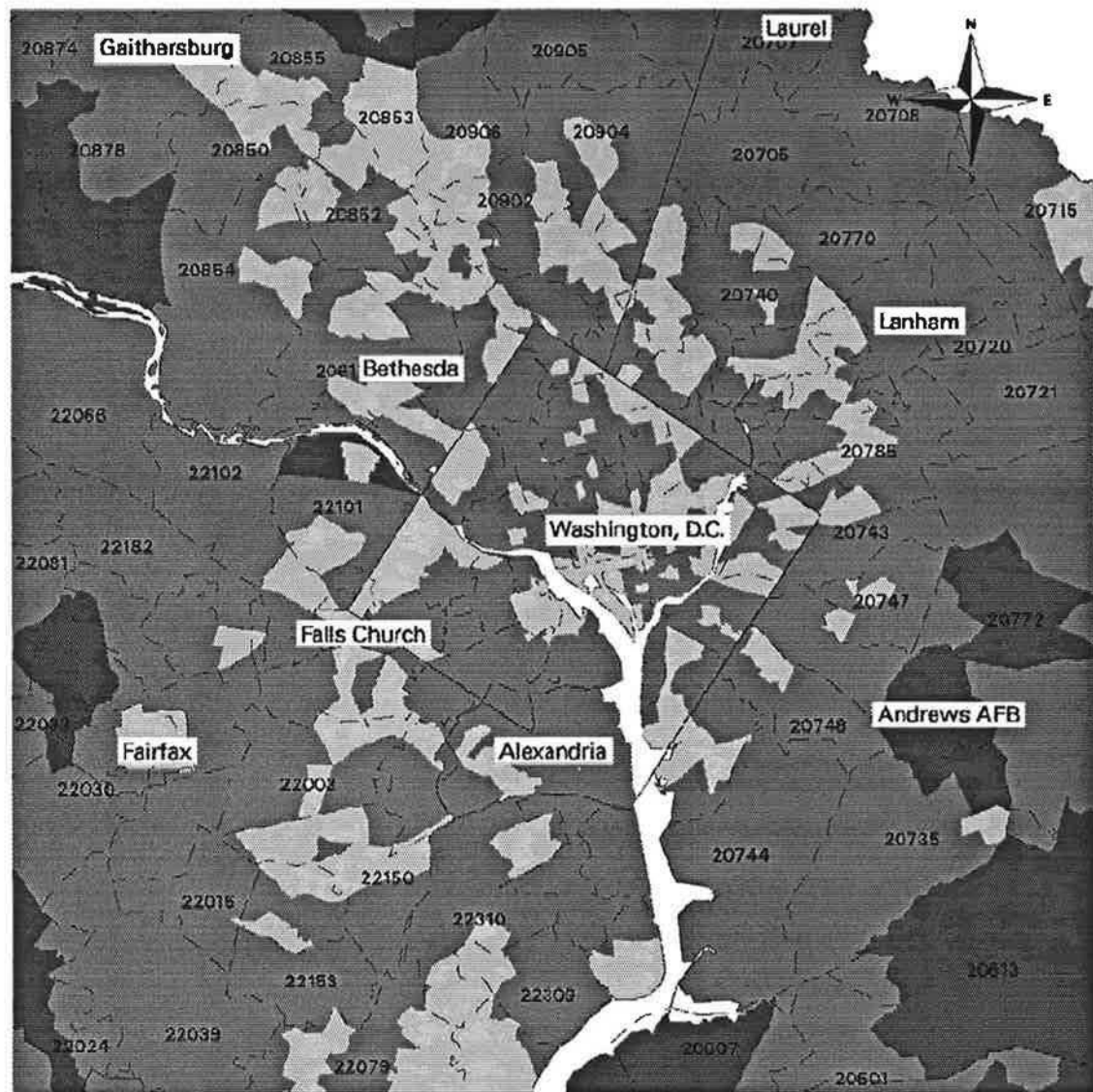
WHERE IS THE CAMPAIGN NOW?

The current priority for the ENERGY STAR HVAC program is to build consumer demand and to work closely with utilities and trade allies to most effectively reach consumers and HVAC dealers. On a national level, EPA is working to build consumer demand by launching a broad brand awareness campaign to educate the public that energy efficiency can help prevent air pollution. The HVAC program will build on this brand awareness campaign and promote ENERGY STAR HVAC products at national and local levels. The core message for the HVAC promotions is that ENERGY STAR HVAC equipment saves energy, saves money, and helps the environment--in other words, it is the smart choice.

HVAC marketing and outreach activities include the following: placing yellow page public service advertisements in the top twenty-five markets in the U.S.; placing articles, editorials, and public service announcements in and trade magazines directed to the HVAC industry, lenders, builders, realtors, architects, trade associations, and utilities; placing radio spots and editorials on weather programs; displaying ENERGY STAR HVAC equipment at shopping malls; participating in industry conferences and trade shows, and developing case studies of consumers who have saved money by installing ENERGY STAR HVAC equipment. The ENERGY STAR HVAC program will also be working with manufacturers to encourage continued advertising and high visibility to consumers for ENERGY STAR equipment.

In the target cities, the EPA will also work to establish partnerships with local utility and trade groups to intensify the EPA's marketing activities. The goal of working with these new partners is to leverage the partners' existing consumer and dealer educational network to most effectively reach target audiences. Examples of activities the EPA will conduct, in cooperation with utility and trade partners, include sales training events and promotions for HVAC dealers and incorporating the ENERGY STAR message in utility bill inserts, utility-sponsored radio shows, and other consumer promotions.

Figure 5. Percent of Single-Family Owner-Occupied Homes in the Washington, DC area that have Old HVAC Equipment



% of single-family, owner-occ. homes
 [Light Gray Box] < 50% [Dark Gray Box] 50% - 75%
 [Black Box] > = 75%

Zipcode boundary County boundary
 0km 10km
 0mi 10mi

Shading is at the census tract level (census tracts are comprised of an average of 1500 homes in the Washington, DC area). "Old heating and cooling equipment" = oil, gas, LPG, and electric central furnaces that are 10 years or older; plus electric heat pumps and central air conditioners that are 7 years or older. Old equipment in mobile homes is not included.