CHAPTER 6

Reducing Energy Use

Energy is an essential element of modern life. From automobiles to cell phones to home heating, energy powers our lives. But while energy is the source of our many conveniences and comforts, its use has substantial environmental consequences. In this chapter, we examine programs that aim to change behavior and promote energy efficiency and conservation. Our focus is on residential energy use, particularly electricity. Worldwide, residential uses of electricity account for about 11% of total consumption, although this percentage is much higher in Western Europe, Australia, and North America.

Over the past 50 years, worldwide energy use has increased steadily. Total production has more than doubled since 1971 (International Energy Agency, 2006, 2010). While there are certainly large international differences in the uses of various energy sources, the large majority (83%) comes from fossil fuels like oil, coal, and natural gas. And while recent years have seen a growth in the use of renewable energy sources like hydro, solar, and wind power, almost all of our energy continues to come from nonrenewable sources.

The Problem

The problems resulting from the use of fossil fuels are many and diverse. First, fossil fuels take millions of years to form—they are residues from organic material that accumulated in the ancient past. As a result, they exist in limited supplies and must be harvested from the earth. Yet our energy infrastructure is built around a plentiful supply, and reasonable estimates indicate that worldwide demand for these nonrenewable resources will soon exceed the supply. In addition, the harvesting process itself (i.e., mining and drilling) has large environmental consequences, whether from the disruption of local ecosystems in the arctic (Arctic National Wildlife Refuge, or ANWR) or oil spills like the Exxon Valdez in Alaska or the recent leakage of the offshore British Petroleum (BP) oil well in the Gulf of Mexico.

Second, the use of fossil fuels and other nonrenewable energy sources results in harmful pollutants. Through the combustion process, fossil fuels are burned, releasing their chemical properties into the atmosphere. These pollutants cause many local and global

environmental problems, including smog, acid rain, respiratory health problems for humans and animals, elevated cancer risks, atmospheric ozone damage, and ultimately global climate change. The contemporary issue of climate change has attracted considerable attention, and despite the rhetoric, the evidence is clear that releasing carbon and other greenhouse gases (GHGs) can cause major disruptions in the earth's weather patterns, including gradual increases in the global temperature (Intergovernmental Panel on Climate Change [IPCC], 2007; National Academy of Sciences, 2010). In Chapter 4, we discussed social marketing efforts aimed at reducing emissions. In this chapter, we examine the related topic of energy use more generally.

Potential Behavior Solutions

There are two major approaches to addressing the problems associated with energy use. The first is oriented around technology and promoting efficient use of energy. From this perspective, the solution to our energy problems can be found in more efficient technologies—that is, devices that provide the same or enhanced services but with a reduced energy footprint. Consider the case of residential lighting, where a compact fluorescent lightbulb (CFL) produces a similar energy output to traditional incandescent bulbs but uses only about one third of the electricity. And recent developments in light emitting diode (LED) technologies offer even more efficient alternatives.

But technological advances are risky, and there is no guarantee that new discoveries or more efficient devices will solve our energy problems. In addition, focusing on efficiency does not necessarily result in reduced consumption. Efficiency is typically defined as a ratio of input to output (e.g., lumens/watts in the CFL example). But this definition poses problems for comparing across technologies. Consider the case of a flat screen television. A highly efficient 60" television might consume only a fraction of the energy consumed by similarly sized models (making it very efficient), yet the consumption may far exceed that of an inefficient 32" television. As Calwell (2010) stated, "Bigger, more powerful, more functional products get to use proportionally more energy or power and still be labeled as efficient or earn rebates, as long as they use less energy than other equally big, powerful, functional products" (p. 9).

In addition, even when there is a more efficient technology available, there is evidence to suggest that usage patterns can result in zero reduction in energy consumed (see Sorrell, 2007, on rebound effects). For example, a person who realizes that the CFL is using less energy might be less likely to turn it off when leaving a room.

While more efficient technologies can certainly play a role in managing our energy needs, it seems clear that behavioral changes will be essential in addressing energy issues. The behavior change perspective emphasizes conservation and using *less* rather than being more efficient. The role of behavior in efforts to reduce energy consumption has attracted considerable attention in recent years, and many governmental agencies and nongovernmental organizations (NGOs) have embarked on social marketing activities to encourage conservation.

In developing social marketing programs to change behavior, it is important to focus on specific actions. And it is important to connect these actions to the desired outcome (e.g., less energy use or less carbon emissions). A recent analysis of energy consumption in the United States provides a good starting point (Gardner & Stern,

2008). Of all the energy consumed in the United States, 22% is used by households and individuals (excluding transportation), 32% is used by industry, 18% by commercial services, and transportation uses 28%. Table 6.1 shows a breakdown of individual and household energy use.

Table 6.1 Percentage of Total U.S. Individual/Household Energy Consumed by End Use, Ranked in Order of Magnitude

End Use	Percent
Transportation	
Private motor vehicles	38.6
Air travel	3.4
Mass transportation and other	1.4
Subtotal	43.4
In-home uses	
Space heating	18.8
Air conditioning	6.2
Space conditioning subtotal	*25.0*
Water heating*	6.5
Lighting	6.1
Refrigeration and freezing	4.3
Electric (heating elements, small appliances, and small motors)	3.9
Clothes washing/drying*	2.5
Color TVs	2.5
Cooking	1.5
Computers	0.6
Propane and natural gas (swimming pool heaters, grills, and lamps)	0.5
Dishwashers	0.2
Other	3.0
Subtotal	56.6
Total	100.0
*Hot water for "Clothes washing" is included under "Water heating."	

Source: Gardner, G., & Stern, P. C. (2008, September/October). The short list: The most effective actions U.S. households can take to curb climate change. *Environment,* 1–10. Retrieved from http://www.environmentmagazine.org/Archives/Back%20Issues/September-October%202008/gardner-stern-full.html

This table provides a useful starting point for developing a social marketing campaign. But the actions are not yet end-state behaviors, so before developing a social marketing campaign, these behavioral domains will need to be focused on specific actions. In addition, it is unclear what is realistically achievable—that is, how changeable are these behaviors?

While social marketers typically conduct surveys and focus groups to better understand their target audience, there are some national-level data from the United States that provide a good starting point. Note that we continue to recommend that program managers utilize local data to understand their target audience, including an assessment of impact, probability, and penetration. But at the national level, data from Dietz, Gardner, Gilligan, Stern, & Vandenbergh (2009) provide a good starting point.

In a report for the National Academy of Sciences, Dietz et al. (2009) estimate the realistically achievable reductions in carbon emissions from U.S. households. Their results identified 17 behavioral areas, and they calculate a *plasticity* estimate using the probability of change utilizing best practices and the percentage of individuals who have not yet adopted the action. Plasticity is calculated as the percentage of the population that has not yet adopted an action (i.e., the inverse of market penetration) multiplied by the effectiveness of the best-practice approach to inducing change over a 10-year period. In Table 6.2, we summarize the key findings from their analysis. To illustrate, household weatherization has a plasticity estimate of 90, because very few households have already adopted this behavior and because best practices identified in prior research has shown that programs can be particularly effective at encouraging residents to engage in weatherization activities such as installing added insulation, caulking and weatherizing windows, and sealing leaks and cracks around exterior doors (Dietz et al., 2009).

Table 6.2 Achievable Carbon Emissions From Household Actions

Behavior Change	Behavioral Plasticity	Percentage Reduction in Total Household Emissions
Weatherization	90	3.39%
HVAC equipment	80	1.72%
Low-flow showerheads	80	.18%
Efficient water heater	80	.86%
Appliances	80	1.87%
Low rolling resistance tires	80	1.05%
Fuel-efficient vehicle	50	5.02%
Change HVAC air filters	30	.59%
Tune up AC	30	.22%
Routine auto maintenance	30	.66%

Behavior Change	Behavioral Plasticity	Percentage Reduction in Total Household Emissions
Laundry temperature	35	.04%
Water heater temperature	35	.17%
Standby electricity	35	.52%
Thermostat setbacks	35	.71%
Line drying	35	.35%
Driving behavior	25	1.23%
Carpooling and trip-chaining	15	1.02%

Source: Dietz, T., Gardner, G., Gilligan, J., Stern, P., & Vandenbergh, M. (2009). Household actions can provide a behavioral wedge to rapidly reduce U.S. carbon emissions. *Proceedings of the National Academy of Sciences*, *106*, 18452–18456. Retrieved from http://www.pnas.org/content/106/44/18452

With this general background in mind, we turn now to specific programs that have attempted to change behavior. All of the examples focus on residential target audiences. For social marketing programs targeting business audiences, see Chapter 12.

CASE #1 The One-Tonne Challenge to Reduce Greenhouse Gas Emissions (Canada)

Background

In response to increasing concerns about global climate change, the Canadian government embarked on an ambitious campaign to change behavior. Beginning in 1998, Environment Canada and Natural Resources Canada sponsored a series of public outreach programs with the goal of reducing GHG emissions. The program was supported through a new Climate Change Action Fund and had a stated goal of educating and raising awareness of the threats of climate change. Following ratification of the Kyoto Protocol in 2002, Canada pledged to reduce its GHG emission by 6% from its 1990 levels.

One of the programs funded under this initiative was the One-Tonne Challenge (OTC). The OTC program challenged Canadians to reduce their annual GHG emissions by 20%, or one tonne. Note that because households account for approximately one third of all GHG emissions in North America, a 20% reduction would achieve the targeted goal of a nationwide 6% aggregated reduction. Whereas previous programs had focused on convincing Canadians about the importance of climate change as an issue, the OTC was designed to "encourage and motivate Canadians to take personal action to

reduce GHG" (Environment Canada, 2006, p. 5). Funding for the program came from several sources but totaled $37 million over a 3-year period.

The focus was on making modifications to daily activities, purchasing, and lifestyle choices. The campaign was built around the notion that raising awareness and understanding of climate change would lead Canadians to take action and change their behavior.

Target Audience(s) and Desired Behaviors

The overall target audience was "Canadians," and the campaign focused on four key market segments: (1) the general public, (2) business and industry, (3) communities, and (4) youth and educators. For each market segment, unique media and localized activities were developed and implemented.

The program began by recognizing that the average Canadian produced five tonnes of GHG emissions per year. Consistent with the preliminary data noted in the opening section of this chapter, these individual and household behaviors represent approximately one third of the total Canadian emission.

The program targeted direct emissions, like driving automobiles, heating and cooling homes, washing and drying clothes, and using home appliances. The program also targeted indirect emissions, including water consumption (emissions come primarily from transporting water from one location to another) and waste generation (emissions come from processing, manufacturing, transportation, and disposal of materials).

Barriers and Benefits

Because the OTC was an extension of existing GHG programs in Canada, program planners had several large-scale surveys to draw from in designing the program. From the existing data, the program identified two barriers to personal action:

1. Lack of information on how to reduce GHG emissions
2. Perceived inconvenience and difficulties in actually reducing emissions

To address these barriers, the campaign focused primarily on linking specific behaviors to GHG emissions and the environmental importance of emission reductions.

Description of the Program

The program had two key components: (1) a national marketing initiative and (2) a series of partnerships with key organizational entities tied to each of the market segments. The marketing initiative consisted primarily of advertising highlighting the importance and societal benefits of reducing GHG and providing resources to consumers. A media-intensive period was conducted for 3 months in early 2004 with a series of public service announcements, print ads in newspapers, radio spots, and ancillary messages across a variety of media

outlets (e.g., MSN, WeatherNetwork) and events (e.g., home and car shows, Earth Day events).

The media portion also contained *Your Guide to the One-Tonne Challenge* and a website that allowed individuals to calculate their personal GHG emission, make a personal pledge, read tips about reducing GHG emissions, and take advantage of existing incentive and rebate programs. The pledge took a variety of forms but typically required the person to use a GHG calculator to identify specific action that would lead to a 20% personal reduction. Then for each action, the person made a pledge by either clicking or writing a check mark. As described in Chapter 1, pledges serve to *commit* an individual to an action, and commitments can serve as an important tool of behavior change.

The partnership portion of the OTC consisted of various organizational and business partners across sectors of Canadian society. These included hubs, community partners, youth organizations, private sector partners, education partners, and "in-reach" to governmental departments and organizations.

Pilot. No specific pilot tests were conducted prior to launching the program.

Implementation. A 2006 report by the Evaluation Division of Environment Canada provides a summary of the project activities and outcomes. Overall, the report notes a high degree of success for OTC messaging and placement. Over the 3-year period, the program distributed 1.2 million *One-Tonne Challenge* guides and received 4.2 million hits to the website. OTC was particularly effective at forming partnerships, and more than 100 organizational partnerships were established to support the campaign.

Evaluation

The effectiveness of the program was assessed through a series of national surveys. In 2003 (prior to the launch of the program), a large national survey was conducted. The results were then compared with results from survey data obtained in 2004 and 2005. Here we highlight three key findings from the survey data.

1. *Exposure.* The survey data showed that the program was very effective at penetrating the target market. In 2004, one year after the launch of the OTC, 6% of survey respondents recognized the program; in 2005, this recognition increased to 51%. When asked where they had heard about the program, a large majority (72%) identified television public service announcements as the primary source. Among Canadians who were familiar with the program, most identified the OTC as a federal program. Survey data also showed that Canadians who were familiar with the program understood what it was trying to accomplish.
2. *Awareness.* The survey data showed that while awareness and concern about climate change was generally high it was not affected by the OTC program. Between 1998 and 2003 (prior to the start of the program), familiarity with climate change as an issue increased substantially (from 54% in 1998 to 77% in 2003). However, between 2003 and

2005 there was no change in the percentage of Canadians who acknowledged that there were steps that they could personally take to reduce GHG emissions.

3. *Behavior.* Of those Canadians who were familiar with the program, more than half reported actively participating in it (i.e., to have personally taken the OTC). And even among those who were not actively involved in the program, 56% reported a willingness to do so in the future. Yet despite their willingness, Canadians reported a strong belief that it will be difficult to achieve a personal target of a 20% reduction. No additional behavioral outcome data is provided, although our review of the 2003 and 2005 survey reports suggests that there were no changes in reported specific behaviors (e.g., sealed leaks or drafts in your home, added or replaced insulation, installed energy-efficient lightbulbs). No assessment was made of any GHG reductions associated with this program.

The OTC program ended in 2006.

Critical Review

The OTC program is prototypical of many large-scale education programs. It was well-funded, coordinated through a governmental agency, and systematically implemented. The program also incorporated a personal commitment element, linked with specific behaviors for each individual.

However, with regard to implementation, the program was more about social advertising than social marketing. Like many large-scale education campaigns, the OTC attempted to target a large and diverse audience—in this case, all Canadians. With such a large and diverse audience there are likely to be a multitude of barriers and benefits to the targeted behaviors and consequently creating focused messages that target one or two selected barriers is difficult. As a result, the campaign resorted to broad-based messages and relied heavily on mass media like television and radio.

The results reported suggest that the program was effective at reaching the target audience. A high percentage of Canadians recognized the program and reported personally taking the challenge. Like many mass media campaigns, the program was successful at penetrating the market and getting information into the hands of residents. However, when it comes to changing behavior, the program came up short. Here we highlight three weaknesses with the OTC, as implemented.

First, the program overemphasized knowledge and awareness. Prior to the launch of the campaign, survey data showed that Canadians were already familiar with the issue of climate change. The campaign, therefore, needed to translate this knowledge into action. Yet campaign messages focused heavily on educating Canadians about the role of individuals in causing climate change, rather than on specific actions that individuals could adopt. As discussed in the introductory chapter of this book, social marketing is about more than education. Research

by behavioral scientists has identified a number of "tools" that can be used to encourage individuals to take action—such as social norms, commitment, financial incentives, or new products or services to increase convenience. Yet these tools were noticeably absent from the OTC. This point was also made in the evaluation report, "... this evaluation concluded that in order to achieve GHG emission reductions, national public education and outreach (PEO) programs like the OTC need to be complemented by additional tools ... to assist Canadians in reducing the GHG emissions they produce" (Environment Canada, 2006, p. 3). The use of a personal pledge on the OTC website is a good start, but it needed to be more strongly emphasized in the campaign materials and focused on one or two specific behaviors.

Second, the campaign failed to emphasize specific end-state behaviors. The program attempted to identify individual behaviors for participants, but the program itself did not isolate specific actions. As a result, each participant in the program was left to identify his or her own unique set of behaviors. As discussed throughout this book, behavior change campaigns are more likely to achieve success when they focus on specific end-state behaviors. Because of this personalized approach, the campaign elements provided broad-based messages rather than guidance about specific behaviors. As we have seen elsewhere in this book, general messages that highlight many different behaviors are unlikely to produce change. A campaign that is focused on reducing GHG emissions is nebulous, and while it can be effective at raising awareness, it is unlikely to produce behavior change. It is possible to use a broad-based message as an "umbrella" or overarching brand, but it is important to consider specific focused program elements underneath.

Third, because each participant in the program had a personal set of behaviors, the program was not able to focus on barriers or benefits. No background research was conducted on the barriers and benefits associated with specific behaviors. In essence, the campaign left it up to each individual to overcome the barriers associated with each behavior rather than identifying these barriers and developing a program of messaging to directly address them.

A notable strength of the campaign was its attempt to integrate evaluation. The use of annual surveys provides a good data source for assessing market penetration, awareness, and behavioral responses to the program. However, behavioral evaluations are strengthened by including observational data, like the percentage of individuals observed walking to work, bus ridership, or household energy consumption—that is, evaluations should to go beyond self-reports about behavior and to draw instead on more objective metrics. The evaluation efforts would also have benefited from a control group. In the case of the OTC, the program could have been rolled out to different regions of the country over a period of years, or certain geographic regions could have been selected not to receive the campaign. And finally, the evaluation would have benefited from a pilot test of the messages, prior to placement. In many cases, running a small field experiment or focus group can allow social marketers to test the efficacy of the campaign materials before they are broadly distributed.

CASE #2 ecoENERGY to Promote Home Energy Efficiency (Canada)

In the opening section of this chapter, we presented data for the various household actions associated with energy consumption. These were summarized in Table 6.2. As shown in the table, several of the specific energy-consuming behaviors are related to the characteristics of a dwelling—including such qualities as weatherization, appliances, water heating, and heating/cooling systems. Thus, with regard to impact, encouraging homeowners to upgrade their properties provides an excellent target for a social marketing campaign. Combined, we refer to these behaviors as *home energy retrofits*.

Background

Home energy retrofit programs date back to the early 1970s. The programs typically begin with a home energy audit in which a specialist comes to the home and provides an assessment of the home's efficiency. Such audits are typically offered to residents through their local electric or gas utility, and many are mandated by governmental policy. Yet while such programs are widely available, only a small percentage of residents request them. In areas where home energy audits are available, typically fewer than 5% of residents will have ever requested one (Stern, 1985; Stern & Aronson, 1984). Interestingly, of homeowners who request an audit, a large percentage will adopt at least some of the recommended behaviors—typically more than 50% will implement one or more of the recommendations, but often as many as 70% depending on the program.

While only a small percentage of residents are likely to request an audit, some program elements elicit a better response (Stern, 1985; Stern & Aronson, 1984). In general, programs with more publicity tend to have higher audit rates, as do programs with more convenience (e.g., offering audits on evenings and weekends, rather than just during normal business hours). There is also some evidence that do-it-yourself audit programs are more likely to be utilized, compared with contractor or utility in-home audits. Most residents prefer not to utilize financing options for either the audit or the recommended retrofit actions. And finally, residents prefer to take less expensive actions that will result in direct cost savings, like caulking, weather stripping, installing programmable thermostats, or water heating blankets (Hirst, Berry, & Soderstrom, 1981).

There are also some demographic differences in the types of people who are likely to request an energy audit. While there is some variability, people requesting home energy audits tend to be older and more educated, have higher incomes, and live in larger and more recently constructed homes. Importantly, such dwellings are typically not the ones most in need of repairs, nor the ones most likely to benefit from retrofit activities.

One of the most effective residential retrofit programs was the Hood River Conservation Project (Hirst, 1987, 1988). The program was conducted between 1983 and 1985, with the goal of "testing the upper limits of a utility retrofit

program." The campaign focused on electrically heated homes in Hood River, Oregon (about 3,500 eligible homes), and was funded with $20 million that was anticipated in savings from avoiding construction of a new coal-fired energy plant. The program elements included an initial period of intensive media promotion followed by in-person communications from program staff, a free energy audit, and following the audit, free installation of the recommend repairs including new insulation and high-efficiency windows. Note that in testing "the upper limits" the program removed all financial barriers—all program elements were free to residents!

Results from the evaluation showed a remarkable success. Of the eligible homes, 91% received an energy audit, and of these, 92% completed one or more major retrofit activities. Most of the participants heard about the program through word of mouth, although a sizable percentage (28%) cited the newspaper as an important source of information. Careful evaluation of energy savings associated with the program showed an average per home reduction of 2,500 kWh/year. This corresponded to a 15% reduction per home. The program costs averaged $4,400 per house. In summarizing their results, Hirst (1988) concluded that

> The key factors leading to high participation include the offer of free measures, determination on the part of HRCP staff to enlist every eligible household, the use of many community-based marketing approaches, extensive word-of-mouth communication among Hood River residents, . . . and the . . . personal contacts by staff among the remaining nonparticipants. (p. 317)

We present the Hood River Conservation Project as an example of a highly effective program. However, the program costs far exceed the budgets of most home energy retrofit programs. Yet many of the elements are transferable to other programs, including the intensive period of media coverage, word-of-mouth communication, and efforts to reduce the barriers to energy-efficiency measures, including low-to-no cost, easy-to-understand program elements, and easy access to the home audit. We turn now to an example of a large-scale retrofit program.

The ecoENERGY Retrofit Program

Building on the Hood River Conservation Project, a recent social marketing program in Canada aimed to increase energy efficiency and reduce GHG emissions. The ecoENERGY program was launched in 2007, with $1.5 billion in federal funding (Daily Home Renovation Tips, 2009; MIG, 2010). The program was managed through Natural Resources Canada, a federal agency (see Natural Resources Canada, 2010).

Target Audience(s) and Desired Behaviors

The program targeted single-family and multifamily dwellings across Canada, although funding was also available for commercial and industrial properties. Although the program was available to all properties, there was special interest in reaching older homes, which are most likely to show reductions in energy consumption due to the retrofit measures.

The program specifically targeted home efficiency retrofits, including draft proofing, added attic insulation, window and door improvements, more efficient space heating, and upgraded water heaters.

Barriers and Benefits

No new data was reported as foundation for the program. However, the program did build on a solid foundation of prior studies, including the Hood River Conservation Project previously summarized. The primary barrier addressed through the program was cost.

Description of the Program

To participate in the ecoENERGY program, homeowners must hire a certified energy advisor to perform an on-site audit. From a social marketing perspective, the audit represents a product and the on-site element is the place. Based on the audit, the homeowner receives a checklist of recommended retrofit measures designed to reduce the energy consumption of the home, along with recommendations for reducing water consumption. Following the audit, the homeowner has 18 months to complete the efficiency improvements. After the improvements are made, a second audit is performed to certify the improvements and document the energy savings. The costs for the improvements—up to $5,000—are reimbursed through the program. Additional grant funding offers residents in certain areas another $5000.

In the 2 years following the launch of the ecoENERGY program, 279,363 households received the initial audit, and 94,011 completed the second audit. This corresponds to approximately 1% of eligible households across Canada completing retrofit activities. In addition, the participation rates showed a dramatic increase, from 17,642 completed retrofits in the first year to 94,011 retrofits in the second year. While the funding allowed up to $5,000 per home (plus an additional $5,000 in matching provincial funds in some regions), the average reimbursed retrofit expenses per home was only $1,095. This resulted in a total of $103 million in reimbursed costs.

Evaluation

Based on pre–post on-site audits, the average household reduced their energy consumption by 19% following the retrofit activities.

Critical Review

Overall, the ecoENERGY program provides an excellent model for retrofit programs. Building on the Hood River example, the program was designed to remove the cost barriers associated with retrofit activities. The program shows an increasing participating rate and high energy savings for households that completed the retrofits.

Despite the success, there are several places where the program could be improved. First, the program requires a financial outlay by the homeowner.

While the program rebates these funds to the resident, the initial outlay could pose a barrier for lower-income homeowners. The fact that participants are only spending $1,095 of the available funds suggests that the up-front costs are a barrier. While the program did provide a mechanism for supporting low-income homeowners, it required a separate (and more complicated) process. Second, the program lacks a marketing and outreach plan, and the program is largely unknown to many Canadians. An easy-to-find website, coupled with targeted outreach in defined geographic areas would go a long way toward increasing participation rates. Especially helpful would be in-person invitations from program staff to residents of older homes.

Finally, only 34% of the households that completed the initial audits followed through with the retrofits. This number is relatively small, and while some residents may have implemented the recommendations outside of the program, it suggests that efforts should be made to identify the barriers preventing these interested households from moving forward. In addition, there are a number of tools that could be incorporated into the audit process, including social norms, vivid language, message framing, or commitments on the part of the homeowner (see Stern & Aronson, 1984, pp. 92–96 for specific examples).

Despite the notable success of the program, the Canadian government suspended the program in April 2010. The program is currently under review and may be reinstated pending outcomes of the evaluation.

Other Notable Programs

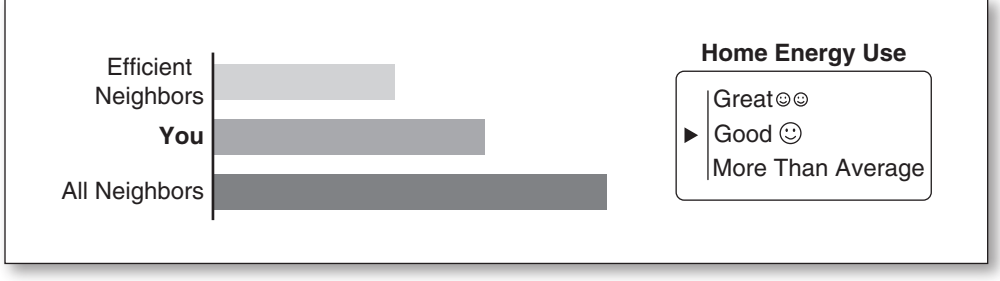
The cases previously presented provide a good sampling of the types of social marketing programs used to promote residential energy conservation. But there are certainly many other excellent examples, and next in the short section, we briefly mention a few other programs.

The Social Norms Approach: OPOWER

Behavioral science research has shown that social norms can provide a strong motivational basis for residential energy conservation. Social norms refer to a person's beliefs about the prevalence and approval for various behaviors among group members. So, for example, the extent to which a person believes that his or her neighbors are doing things to conserve energy—or that his or her neighbors think conservation is important—are specific types of social norms (Nolan, Schultz, Cialdini, Griskevicius, & Goldstein, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). In a series of studies, Schultz (a coauthor of this book) provided residents with normative messages about specific measures that other households in their neighborhood were taking to reduce energy consumption—for example, "77% of San Marcos residents often use fans instead of air conditioning to keep cool in the summer." Results showed that in the weeks after receiving the normative message, households used 10% less electricity compared to a control group that received tips about ways to conserve (but no normative message).

Drawing on these research findings, OPOWER has developed a program whereby residents receive information about their own level of household energy consumption, coupled with information about the norm for their local community (see www.opower.com). For households that consume more energy than the norm, they receive a "below average" message, whereas households that consume less than the norm receive a "great" message plus a smiley face (see Figure 6.1). Currently, more than 1 million households in the United States receive the OPOWER normative feedback. Results from 23 participating utilities across the country have shown that households that receive the normative message reduce their consumption by an average of 2.4% (Ayres, Raseman, & Shih, 2009; Hunt, 2010).

Figure 6.1 Example of OPOWER Normative Feedback Message



Source: Image provided courtesy of OPOWER.com.

The Environmental Protection Agency's ENERGY STAR Program

Launched in 1992 by the U.S. Environmental Protection Agency (EPA), ENERGY STAR has become the most widely recognized symbol of energy efficiency across North America. While the program has grown and changed since its inception, the primary mission remains to provide an objective rating standard for different products (see www.energystar.gov). In 2009, ENERGY STAR was utilized by more than 3,000 manufacturers and differentiated more than 40,000 product models. Similar programs exist in the European Union and in Australia.

For consumers, the ENERGY STAR label is seen as a credible source of information. (See Figure 6.2.) By the end of 2009, 75% of the American public recognized the label, and nearly one third of consumers credited the label as an important factor in their purchasing decisions (ENERGY STAR, 2010). In 2009 alone, more than 300 million ENERGY STAR qualified products were purchased, including appliances, heating and cooling equipment, lighting, and consumer electronics, among others.

While the brand is widely recognized in North America, it is important to look for data about its efficacy at influencing individual purchase decisions. If presented with the two identical models, one with and one without the label, what advantage

would the labeled product have? Determining the efficacy of the ENERGY STAR label on purchase decisions turns out to be difficult, given that models with the ENERGY STAR label also tend to have other desirable features. However, in an interesting comparison of washing machine sales, Wallander (2008) reported a 10% price premium due to the label. This price premium shows the added value associated with the ENERGY STAR label, and provides some tentative evidence for its effectiveness at influencing consumer choices.

The success of the ENERGY STAR program is linked with its perceived credibility and its longstanding position in the marketplace (Interbrand, 2007). With the backing of the U.S. EPA and consistent branding, it is easily recognized and utilized. However, its success has also resulted in a proliferation of ENERGY STAR branded programs, which may eventually dilute its credibility in the marketplace. In addition, the success of the program has led manufacturers to seek out ENERGY STAR certification, and very few new appliances or consumer electronics are sold without the label. Given these two trends (brand leveraging and widespread adoption), there is concern that the label may begin to lose relevance for consumer decisions. Yet despite these concerns, ENERGY STAR illustrates the importance of product labels in affecting consumer decisions. In Chapter 12, we examine the ENERGY STAR program's impact on businesses.

Figure 6.2 The ENERGY STAR Label, Like the One Shown on This Washing Machine, Designates Energy-Efficient Models

Source: The photograph was provided by the authors.

ClimateSmart, Boulder, Colorado

Like many states around the country, Colorado has a long-standing interest in residential energy efficiency. The ClimateSmart program was developed jointly with the City and County of Boulder, using funding from the 2009 American Recovery and Reinvestment Act and a voter-approved carbon tax on electricity (www.beclimatesmart.com). The program focuses on energy efficiency through retrofit activity, encouraging the use of renewable energy sources and community education and training. The program offers home energy audits for a reduced price of $90 and a variety of rebate and loan programs, including Property-Assessed Clean Energy (PACE) financing (for details, see www.pacefinancing.org). PACE financing provides homeowners with funding for retrofit and other energy-efficiency activities by borrowing money to be repaid over subsequent years with a special assessment on their property taxes. To participate in the loan program, homeowners must attend an educational workshop and pay a $75 application fee.

Response to the program has been slow, and even though the program was able to enlist active participation by local utilities and contractors, only 612 residents participated during its first year (the program has funding for up to 2,800 loans). The lackluster results highlight the challenges of overcoming the financial barriers associated with retrofits and illustrates the importance of a simple, convenient, and low-cost program (ClimateSmart, 2010; MIG, 2010). Contrasted with the other retrofit programs described in this chapter, the results from ClimateSmart suggest that financing does not have the same motivational strength as do rebates or direct payment.

Renewable Energy Bonus Scheme, Australia (2010)

In an effort to reduce residential energy consumption, the Australian Department of the Environment launched a program to provide households with a $1,000 direct rebate for replacing an electric water heater with a solar one (see Renewable Energy Bonus Scheme, 2010). The Australian government estimates that water heating accounts for 23% of household electricity use, and a solar system dramatically reduces consumption and carbon emissions. A typical residential solar water heating system costs about $3,500, so the $1,000 rebate is substantial. Within the program, the homeowner selects a licensed contractor to complete the installation, pays for the work, and then submits a rebate form to the government (with signature from the contractor indicating that the work was completed). Payment is made in approximately 8 weeks and deposited directly in the homeowner's bank account. An estimated 1.9 million households will be eligible to receive the rebate. While the program was just recently launched, the simplicity and direct rebate elements of the program are likely to generate a good response. Check www.environment.gov.au for more details.

Flex Your Power

Over a 10-year period, from 2001 through 2010, California funded a massive outreach and education campaign designed to reduce electricity consumption across the state. The campaign included a $200 million advertising campaign

focused on changing the behavior of residents, including purchasing energy-efficient appliances and curtailment behaviors like closing blinds on sunny days and planting shade trees to protect southern exposures. Unfortunately, the program was largely information based and did not target specific barriers to home energy conservation. Like the OTC described earlier in this chapter, the Flex Your Power campaign relied on mass media messages to promote broad-based changes. As a result, the campaign failed to produce substantial changes in behavior (Opinion Dynamics Corporation, 2008, 2010). We present it here to illustrate the importance of creating program materials and messages that go beyond raising awareness and instead target specific barriers or benefits associated with conservation behaviors.

Resilient Homes

In a series of exploratory projects, researchers from the University of Manchester have piloted the use of rewards in inducing households in England to adopt energy-efficient measures (Bichard & Kazmierczak, 2009). Unlike prior social marketing programs described in this chapter, the Resilient Homes project focuses on the outcome rather than the specific actions—that is, the program leaves the specific measures up to the homeowner rather than linking the actions to an in-home audit. If the resident achieves certain conservation goals, they receive rewards in the form of products from local businesses (e.g., fruit or produce, meals at local restaurants, or tickets to local entertainment). The Resilient Homes program is similar to other incentives-based programs used to reduce solid waste, like the Nu Spaarpas program in the Netherlands or Recyclebank in the United States (see Seyfang, 2007, for a review of such programs; see also Chapter 2). Results from a national attitudes study of Resilient Homes showed that two thirds of interviewed residents were receptive to the incentive approach and that local businesses saw it as an opportunity for free marketing to potential customers.

Green Power—A Case From the Netherlands

Throughout this chapter, we have presented cases of social marketing programs that focus on reducing residential energy use. However, another important arena for social marketing efforts has been to encourage residents to purchase energy generated from renewable sources. In many countries, electricity consumers can choose to purchase electricity generated from renewable sources, like wind or solar. Typically, these green power options cost more than traditional power, and residents often pay up to a 30% premium. While green power options have been available in many countries since the early 1990s, only about 1% of eligible customers choose this option (National Renewable Energy Laboratory [NREL], 2002).

One notable example of social marketing activities can be found in the Netherlands. Since 1999, all power providers in the Netherlands have offered a green option. In 1999, there were 100,000 customers who had opted for green energy, but in a 4-month period this number jumped by 40%. The change was associated with two activities. The first was a series of tax exemptions that brought the price for green power to parity with conventional electricity, and in some cases it was cheaper (NREL, 2002; van Rooijen & van Wees, 2006). The second was a

large-scale media campaign conducted by the World Wildlife Fund (WWF), highlighting these new options and making salient the environmental benefits of switching. In the years following this initial push, Netherlanders have continued to adopt green power, which accounted for 9% of use in 2009. The government has since pledged to continue the tax exemptions and has set a target for 20% of its energy to come from renewable sources by 2020.

Importantly, this case illustrates the strength of combining program elements (i.e., reduced costs) with messaging and awareness. It is unlikely that the WWF campaign would have had near the impact without the tax exemptions; likewise, the tax exemptions needed the media messages to penetrate the market.

Summary

Residential energy use is an important area of work for social marketers. Internationally, the residential sector accounts for a substantial percentage of total electricity use. While renewable sources are slowly increasing in market share, the vast majority of electricity continues to come from nonrenewable sources like coal, oil, and gas. This chapter summarizes some of the many social marketing programs and campaigns aimed at promoting reductions in consumption. We began with a critical look at media-heavy campaigns aimed at raising awareness about energy consumption, and we argued that programs like Canada's OTC tend to produce little in the way of behavior change.

The chapter then focused on a number of very successful social marketing campaigns. Examples include residential retrofit programs, like the Hood River Conservation Project, Canada's ecoENERGY campaign, and the Renewable Bonus Scheme in Australia. We also summarized a range of other strategies, including the OPOWER residential energy reports, and EPA's EnergyStar volunteer labeling program. Taken altogether, these programs illustrate the potential for social marketing programs in the residential energy arena and serve as excellent examples for developing new campaigns.

Questions for Discussion

1. One of the programs discussed in this chapter is Colorado's ClimateSmart residential retrofit program. As mentioned, residents have been slow to respond to the program. What specific strategies might program staff implement to increase response? Discuss at least one program-based change and one marketing or media strategy. Try to utilize the lessons available from other programs discussed in this chapter, but be creative!
2. This chapter began with a summary of the Hood River Conservation Project. What elements of the program do you think were most central to its success?
3. Using the data presented in this chapter about the behaviors associated with energy consumption—and the realistically achievable reductions (see Tables 6.1 and 6.2)—identify three nondivisible, end-state behaviors that could be targeted through a social marketing campaign. For each, discuss potential barriers and benefits that might be addressed with your campaign.

4. Wendy is a program manager for StopWaste.Org, a public agency. Her organization was just awarded a large federal grant to develop and implement a social marketing campaign focused on making homes more energy and resource efficient. Wendy has hired you as a consultant to help in developing the campaign. How might you approach this program? Where would you begin? And what are the key considerations that you would use in developing the campaign?

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