

# I Can Do It!

## The Role of Self-Efficacy in Motivating Changes in Attitudes and Behavior Relating to Energy Efficiency and Renewables

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### ABSTRACT

There have been very few effective messages to motivate consumers and businesses to invest in renewable energy and energy efficiency. Following on focus group research regarding willingness to participate in a green energy program, the authors began to investigate self-efficacy as a possible predictor of response to green energy programs. The results of these first studies suggest that a message that addresses self-efficacy, the perception by an individual that he or she has control over performing a behavior effectively, may be a means to reach consumers and businesses for both energy efficiency and renewable energy.

### Introduction<sup>1</sup>

As more and more interventions on behalf of energy efficiency and renewables attempt to use market forces and marketing methods, utilities, regional consortia (such as the Northwest Energy Efficiency Alliance), and other agencies interested in market transformation (such as the Wisconsin Department of Administration), have turned to advertising to convey their message. To date, the results of these advertising efforts have been somewhat disappointing. In part, this is because of the limited funds available to reach customers and break through the “clutter” of other messages and, in part, because sponsors have relatively little experience with what mass media messages are effective in social marketing.

Several theoretical approaches drawn from the fields of psychology and mass communications offer insights as to themes that may be effective and cause viewers or listeners to attend to, process and consider the sponsors’ messages. This paper explores one factor in particular: *self-efficacy* (Bandura 1977). This is the perception of an individual that he or she has control over performing a behavior effectively (e.g., can readily use renewable energy or energy efficiency in the home or can do something to increase the use of renewable energy or energy efficiency by others).

Together with *response efficacy* (the perception that the behavior will have predictable and desirable outcomes), Ajzen’s *The Theory of Planned Behavior* (1988) suggests self-efficacy predicts adoption of the promoted behavior (such as embracing renewables or energy-conserving behaviors). Thus, advertising that evokes and reinforces the perception that customers can carry out the recommended behaviors should be among the more effective messages about energy efficiency and renewables.

This paper reports three sets of studies that demonstrate the importance of self-efficacy as a determinant of customer response to advertising for support of energy efficiency and renewables. A

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series of focus groups in California first illuminated this issue as a potential motivational driver for green power purchasers. Subsequent survey research for Tennessee Valley Authority (TVA) confirmed that self-efficacy motivations are strong for green power purchasers. A series of surveys conducted to evaluate advertising on behalf of the Wisconsin Focus on Energy program provides additional evidence of the relationship. In particular, a detailed regression analysis indicated that attitudinal measures of self-efficacy are among the few—and strongest—predictors of respondent recall of advertising on behalf of renewables.

## The California Focus Groups

In 1998, one of the authors (Peters) facilitated a series of focus groups with residential and commercial customers of the Sacramento Municipal Utility District (SMUD) for the Environmental Protection Agency (EPA). The purpose of the focus groups was to explore consumer reaction to a new green power energy source: landfill gas. We conducted six focus groups: three with residential consumers; two with small business consumers; and one with current participants in SMUD's Greenergy<sup>SM</sup> program, a green energy marketing program with about 10,000 participants.

Other than the participants in the Greenergy<sup>SM</sup> program, the focus group participants were recruited primarily from panels maintained by the focus group facility. The panel members were screened to ensure they were SMUD customers and met specific demographic criteria. The criteria for residential consumers were that they own their own home, have children in the home, and were between the ages of 30 and 55. For commercial customers, the criteria were that the firm was responsible for its own electric bill and had daily face-to-face, walk-in contact with customers.

The groups discussed their response to questions about renewable energy, landfill gas as a green energy source, and whether they would be willing to purchase green energy products at a higher cost than standard products. As these discussions proceeded, it became apparent that Greenergy<sup>SM</sup> participants had turned up in two nonparticipant sessions. It was also apparent that the Greenergy<sup>SM</sup> program participants were making slightly different statements about whether they would participate in such a program than most of those who were not participants. During the Greenergy<sup>SM</sup> participant focus group discussion, group participants offered similar statements.

The statements made by the Greenergy<sup>SM</sup> purchasers were: *"If I don't do it, who will?"* and *"It seems important to take the first step."* In contrast, the focus group respondents as a whole were more likely to say: *"Why should I do it if everyone else isn't?"* or *"I think it should be the same for everyone."*

These statements by program participants were unexpected. They did not directly pertain to the purpose of the focus group research but did seem to suggest some motivation behind these peoples' willingness to pay for green power. On reflection, they suggested to us that there was some underlying sense of purpose motivating these particular utility customers to make the investment in green power. This motivation was not altruism, but seemed to fit within the theory of self-efficacy and a sense of personal control.

## Self-Efficacy

Bandura first formalized the Theory of Self-Efficacy in 1977. Self-efficacy refers to individuals' perceptions of their own capability. It is the notion of *can do* as versus *will do*. Pajares (1996) notes that, "Self-efficacy is concerned with individuals' perceived capability to produce results and to attain designated types of performance."

Self-efficacy research has concentrated on motivations to learn and to change behavior (Pajares 1997). Yet, efforts have also focused on ways to increase individuals' intrinsic interest in tasks and activities by increasing their self-efficacy with regard to that task or activity. For instance, telling

students to work harder when they do not have the skills to do the work does not motivate. Rather, focusing on the acquisition of the sub-skills needed, and building mastery of the skills and a sense those skills can be acquired increases self-efficacy and improves performance (Bandura 1997).

Self-efficacy is a perception of self that individuals possess that will affect their approach to implementing tasks and activities. It can be changed through experiences of mastery and through modeling. It has also been demonstrated to be predictive of task and activity performance.

Intention, “what one will do,” has also been found to be a reliable predictor of behavior. Intention has been studied, primarily as a predictor of behavior in models of attitudes and behavior (e.g., Fishbein & Ajzen 1975). Building on Bandura’s suggestion that self-efficacy (“what one can do”) is a major determinant of intention, but a unique construct, Ajzen explored the role of efficacy and intention in predicting behavior in his *The Theory of Planned Behavior* (1988).

In this volume, Ajzen (1988) revised the earlier theory of reasoned action to incorporate perceived behavioral control into the model. Ajzen drew upon Bandura’s work and theorized that for behaviors the individual can decide to perform or not perform, performance of the behavior “depends at least to some degree on such non-motivational factors as availability of requisite opportunities and resources (e.g., time, money, skills, cooperation of others). Collectively, these factors represent people’s actual control over the behavior” (Ajzen 1988, 182).

Thus, he argues, if people believe that they have the ability, the skills, the knowledge and the experience to perform a behavior, they are more likely to follow through on their intentions to perform it. The approach to perceived behavioral control, as implemented in the theory of planned behavior, also includes response efficacy measures, which is a perception of whether performance of the action will actually have an impact. Both perceptions, self-efficacy and response efficacy, appear to be important for behavioral control.

## **Interest in Green Power and Energy Efficiency**

The results of the focus groups had raised an interesting issue about the motivations of green power program participants as compared to those who did not participate in the Greenergy<sup>SM</sup> program. Reviewing opinion polls about renewable energy and energy-efficiency behavior, it is also striking the degree to which the public is concerned about these two issues, yet this interest is not supported by their actions (Farhar 1993, 1999).

In the case of green power, Farhar (1999) documents high levels of willingness to pay for green power across a range of local and national market studies. She found an average of 70% of residential customers, across twelve utility service territories, willing to pay at least \$5 per month more for electricity from renewable sources. Yet, Farhar warns, these figures “should not be construed as the proportion of residential customers who will actually sign up for a green power product offering at its inception” (Farhar 1999, 3).

Actual program experience has shown much less uptake than would be expected, based on responses to willingness-to-pay surveys. In California, between October 1998 and July 2000, about 2% of the eligible residential consumers signed up for green power. A similar trend is observed across all green power programs surveyed by the National Renewable Energy Laboratory (Swezey & Bird 2000); participation rates rarely exceed 2%. Even for SMUD’s successful Greenergy<sup>SM</sup> program, the purchase rate is only 1.4% of customers.

In a few communities participation has exceeded 2%. For instance Madison Gas and Electric has over 4% participation. In this utility program, the utility company owns the energy facility and, while located in another county, it could be considered by customers to actually be providing power to them. The question we raised thinking about the results of the focus group research and the willingness-to-pay studies, was whether it is important that people feel their efforts make a difference. Following from this,

we wondered if the lack or presence of this feeling could explain the rate of uptake in green power programs and in energy efficiency behaviors. Thus we began to look to self-efficacy to see if it could be an effective predictor of green power or energy efficiency decisions.

## The First TVA Research

The Tennessee Valley Authority implemented the Green Power Switch<sup>SM</sup> pilot program on Earth Day 2000. The pilot program offers customers of twelve TVA power distribution companies the opportunity to purchase blocks of certified green power from solar, wind and landfill gas.<sup>2</sup> As part of an evaluation of this program, a survey was conducted with those who signed up in the first three months. This sign-up survey included a variety of questions as to why people had signed up for the program, as well as two questions to assess their feelings of personal responsibility, to test whether self-efficacy might help explain participation (Jackson 2000). The questions are shown in Table 1, along with the responses from the 241 participants who were surveyed.

**Table 1. Personal Responsibility Questions**

<b>Each of us has to be responsible; what I do can make a difference.</b>	
Strongly Agree	72%
Agree	27%
Disagree	1%
Strongly Disagree	0%
Don't know/refused	1%
<b>What the individual does only makes a difference if others do it too.</b>	
Strongly Agree	11%
Agree	30%
Disagree	37%
Strongly Disagree	20%
Don't know/refused	2%

The two questions focus on whether the individual perceives that their actions can make a difference. The responses revealed that over 90% of the Green Power Switch<sup>SM</sup> participants agreed or strongly agreed with the statement that their actions can make a difference. On the other hand, only 41%

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<sup>2</sup> The Green Power Switch<sup>SM</sup> renewable energy sources are certified through a process developed by Green Power Switch<sup>SM</sup> stakeholders following guidelines from the Center for Resource Solutions. Will most people know who this Center is? Their sponsorship? Where they are located?

agreed with the second statement that the individual cannot make a difference without others also contributing.

This overwhelming response in the expected direction was encouraging. However, to assess the value of this perspective more reliably, we needed to test it with both participants and nonparticipants.

## **Wisconsin Focus on Energy Research**

Components of the Wisconsin Focus on Energy Program have been piloted in northeastern Wisconsin since the end of 1998. An advertising campaign was conducted in Fall 1999 and Spring 2000 to help prepare the market for a renewable energy component by increasing public/consumer awareness of relevant technologies and opportunities for implementation. (See Appendix for self-efficacy questions.)

The ongoing evaluation of the Focus on Energy Program includes a specific effort to track the effects of the renewables advertising campaign. As part of this effort, RDD telephone surveys were conducted with a random sample of 300 residential customers in November 1999, and 400 additional customers in May 2000. The surveys included questions based on the Theory of Planned Behavior model as one basis for analysis. Thus questions on perceived behavior control, attitudes toward relevant behavior, subjective norms, and intentions to use renewable energy were coupled with questions about awareness of the advertising campaign and renewable energy.

The planned behavior questions for the baseline study primarily focused on response efficacy. However, the revised advertising campaign for the spring emphasized what individuals can do around the home to employ renewable energy. Thus, for the follow-up survey (also following the authors' discussions about the California focus group research), additional questions to expand on both self-efficacy and response efficacy were included.

The results of the study showed a statistically significant increase in awareness of renewable energy, from 46.2% in November 1999 to 55.2% in May 2000 ( $\chi^2=4.45$ ,  $p<.05$ ). A regression analysis, however, showed that despite an increase in awareness of the Focus on Energy advertising campaign from 16.6% to 28.1%, the increase in renewables awareness could not be fully explained by recall of the Spring 2000 campaign. However, recall of the ad themes was associated with the efficacy measures, particularly self-efficacy in regard to home renewables energy use; and the ads did increase awareness of the Focus on Energy Program in the pilot area.

The efficacy measures proved to be very important for explaining consumer response to the ads. A sense of self-efficacy about adopting renewable energy measures in the homes appears to lead to a motivation to seek information from such sources as advertisements and contractors, and for then thinking about how to apply this information. Table 2 shows these relationships.

## **Further Research**

The effort to investigate the role of self-efficacy in green power purchases is continuing both at the TVA and in Wisconsin. A survey will be conducted in Summer 2001 with participants and nonparticipants in the Green Power Switch<sup>SM</sup> pilot program. The survey will include questions used in the previous TVA and Wisconsin Focus on Energy studies. Similarly, assessments of advertising effectiveness in motivating use of the Focus on Energy website ([www.wifocusonenergy.com](http://www.wifocusonenergy.com)) are also investigating linkages to perceived ability to use the web for information searches.

**Table 2.** Relationship of Renewables Advertising Recall to Renewables Energy Efficacy and Information Seeking/Processing (T2)

Independent Variable	Renewables Energy Efficacy				Energy Information Seeking and Processing			
	Self Efficacy		Response Efficacy		Seeking		Processing	
	Home	Environ-ment	Environ-ment	Home	Index	Con-tractors	Heur-istic	System-atic
Age	-.16		-.24	-.16				
Education			.18					
Salience	.19		.19			.14		
Informational Subjective Norms	.14	.13			.28	.13	-.13	.19
N Real Ad Themes Recalled	.16							.14
Self Efficacy (Home)					.18	.25		.19
Self Efficacy (Environment)					.20			
Response Efficacy (Home)					.14		-.13	
Multiple R	.34	.27	.41	.23NS	.58	.50	.37	.45
Adjusted R2	.08	.04	.14	.01	.30	.21	.09	.16
N	304	323	325	320	281	280	281	281

Multiple regression statistically significant beta coefficients  $p \leq .05$

Intercept = 0

NS = Not significant

No significant relationships were found for bogus ads recalled, sex of respondent, income, tenure, N of inhabitants indwelling, response-efficacy (environment), or sensitization to ads.

## Implications

Among the problems facing attempts to increase customer awareness, understanding, and use of information regarding energy efficiency and renewables has been the sheer disinterest of the public. Advertising campaigns in the Pacific Northwest and Wisconsin have not been particularly effective at changing awareness, let alone behaviors. While limited media reach and frequency (as well as specific issues associated with those campaigns) contribute to the low awareness of the program advertising

itself, there is little evidence that such advertising has gained a thoughtful hearing among customers, even when received. Thus, it is crucial that proponents of advertising programs find, understand and use themes that can break through the clutter and cause customers to process the relevant information at a level that will lead to behavior change.

Several studies have suggested that the key motivators of energy-efficient behaviors for residential customers are either cost savings or non-energy benefits. Accordingly, much of the advertising touts opportunities for such benefits. The effort in Wisconsin focused on cost savings, while the effort in the Pacific Northwest focused on non-energy benefits. In both cases, there was limited response (Griffen & Feldman 2000; Gordon, Peters & Dethman 2001).

If annual savings and non-energy benefits are in fact relatively small (and difficult to discern in bundled energy bills), one unintended message may be that people will *not* be able to realize the benefits of what is promoted, and certainly not at the scale the promotion implies. Thus, a focus on cost savings or non-energy benefits may be counterproductive and may be helping to limit customer attention to current messages.

The findings of the three studies summarized in this paper suggest strongly the need for revisiting current advertising directions and embrace themes more likely to engage and motivate customers. If the message does not enhance individuals' perceptions of efficacy regarding their ability to solve the problem and to reap the benefits, the message may be the problem.

As Farhar (1993) has shown, there is an overwhelming preference for energy conservation and renewable energy among the population at large. Our suggestion is to focus more on the "I can" perception and to focus on the things that individuals can do to build the sense of self-efficacy around energy efficiency and renewable energy. This can arise from perceiving that actions taken do in fact make a difference and from building the skills of individuals to take those actions.

Clearly, there are opportunities for moving in this direction, both in the content of the advertising used and in the customers targeted by those messages. Marketing messages can be tailored to stress the sense of self-efficacy that can come from doing something concrete and knowing that you have made a difference. Similarly, those market segments where self-efficacy is high can be targeted and addressed in terms of concrete actions, while the building of self-efficacy can be stressed in other segments.

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## **Appendix: Self-Efficacy Questions Used in Wisconsin Focus on Energy Evaluation**

a. Scale: 1 Disagree strongly; 2 Disagree somewhat; 3 Disagree slightly; 4 Agree slightly; 5 Agree somewhat; 6 Agree strongly.

b. Scale: 6 Disagree strongly; 5 Disagree somewhat; 4 Disagree slightly; 3 Agree slightly; 2 Agree somewhat; 1 Agree strongly.

### **Self-Efficacy**

There's not much I can do to increase the use of renewable energy sources in this area of the country. (a)

I'm confident that it would be simple to include the use of renewable energy, if I were to remodel or build a new home. (b)

There are some easy, common sense ways to include renewable energy measures in most homes these days. (b)

### **Response Efficacy**

Whether or not I use renewable energy makes little difference to the environment. (a)

I don't believe using renewable energy sources does very much to reduce pollution. (b)

The use of renewable resources can provide a reliable source of energy for my home. (b)