SERI/TP-251-2648
UC Category: 58
DE85002937

Program Redesign Based on Reality

T. Potter

February 1985

To be presented at the
Second National Utility Energy
Efficiency Conference
Oakland, California
May 21 - 23, 1985

Prepared under Task No. 1389.10
FTP No. 413

Solar Energy Research Institute
A Division of Midwest Research Institute

1617 Cole Boulevard
Golden, Colorado 80401

Prepared for the
U.S. Department of Energy
Contract No. DE-AC02-83CH10093

Printed in the United States of America
Available from:
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161

Price: Microfiche A01
Printed Copy A02

Codes are used for pricing all publications. The code is determined by the number of pages in the publication. Information pertaining to the pricing codes can be found in the current issue of the following publications, which are generally available in most libraries: *Energy Research Abstracts, (ERA); Government Reports Announcements* and Index (*GRA* and I); *Scientific and Technical Abstract Reports (STAR);* and publication, NTIS-PR-360 available from NTIS at the above address.

PROGRAM REDESIGN BASED ON REALITY

Thomas F. Potter

INTRODUCTION

From the perspectives of my previous position as a utility program developer/trainer and several later years of observation as a program resource person at a federal lab, I'd like to present some quick sketches of the development of an early home energy audit program. Then I'll draw the lessons that I think can be learned from this experience into a few suggestions for the design or redesign of current programs. I use the corporate "we" in this paper with no offense intended to my audit program colleagues, who could remind me that I was more unrealistically optimistic than most.

SOME EARLY-PROGRAM ASSUMPTIONS

We embarked on the program design and implementation at the utility with several unstated assumptions about the task at hand.

First, we didn't discuss much the difficulty of achieving our general building conservation objectives. While the word "easy" was not used, the sense was very clearly that we could field this program as well as anyone; scattered reports of failure by corporate peers were easily shrugged off as inept or public relations efforts by people who weren't really interested in results.

Both our enthusiasm and our recently developed information on conservation would spread, almost infectiously, through our service territory. Our main problem would be logistics: how could we schedule enough reps into the field to accomplish the job within a reasonable period of time. We could add up the contact numbers and watch the consumption figures fall.

Second, we assumed rationality in consumer decision-making. The less said about this the better, but it did seem to follow that if significant savings were available at little or no expense, people would rush to learn about it. Having learned what to do, they would then do it.

Field implementation of this program was not easy. Information on retrofit measures was scattered, contradictory and not especially credible. (It wasn't even credible to our field reps. Two years after a negative comparison of storm doors with many other conservation options, we found reps still recommending them as the top retrofit priority.) The infiltration estimates we were given seemed strange, the heat-loss calculation procedures were unreasonably difficult for the reps, and any solar audit information got blank looks from the reps and the customers. Trying to tie it all into a coherent and credible program was anything but easy.

Before long we could see that evaluation was not a simple thing to accomplish either. Most embarassing was the tendency for customers to take immediate action after the audit--by promptly filing the information we had given them on retrofit opportunities. This is not to say that there was no impact of the in-house visit, nor should the ripple effect in the neighborhood or the media be completely discounted. Savings did appear to be somehow linked to the program but we couldn't link them as closely as we'd thought we could to the home visits.

The apparent irrationality of customers' retrofit choices, when action was taken, surprised us. Storm doors, north-facing sunspaces, R-20 on top of R-20; these and other retrofits appeared after the audit instead of the carefully calculated and prioritized retrofit projects we had suggested. This early experience also ran counter to the national program assumption that cost and savings information should together be enough to result in a wise retrofit choice.

Finally, we found what we thought then was a remarkable resistance to flexibility on the part of the institutions that were involved in the program. Recognizing now that in the first few years everybody was feeling their way, we can see that it made sense for manufacturers to disbelieve that a significant market opportunity existed with the audit program; for upper utility management to disbelieve that consumption could and would drop dramatically; and for regulators to disbelieve that a team of committed people could, and would in good faith, strongly influence the more efficient use of energy in the region's homes. This suspension of belief resulted in only grudging and partial commitment to our plans; this meant delays in startup and full implementation.

CURRENT STATUS

This conference itself is the real show-case for communication of state-of-the-art in conservation programs. I think that the presentations here will show that the expensive early lessons have paid off in

- a movement toward institutional flexibility;
- an agreement that the customer/occupant-behavior variable is an important one;
- an understanding that neither the implementation nor the evaluation of a major program is an easy task;
- a recognition that the quality and durability of measures plays an important part in performance and economics;
- the knowledge that we don't know it all.

The conservation field is no longer seen as only a minor annoyance to energy business-as-usual, because, surprisingly, the energy savings that started out so slowly then have continued to compound (and confound) over time. In Colorado, for example, the weather-normalized average annual use of natural gas in a residence has dropped in the last 10 years from 185 to 130 MCF. Explanations for this drop in energy use are numerous, and a major increase in price in this example certainly was a factor, but I believe that rising consumer consciousness of household energy as a conservable expense is now playing, and will continue to play, an important part.

The revenue loss associated with these savings, however, is a disturbing utility reality that is seldom mentioned in relation to the programs. Nor have there been studies published that identify in a comprehensive way the off setting benefits that can accrue to especially gas utilities that reduce building energy consumption. Utilities are significant stake-holders and major participants in current national programs; these studies should be done to clarify the effects of the revenue loss. It is possible that they will also identify sufficient reason for programs to continue that the quiet withdrawal of a major force in conservation will be averted.

I hope that that is the case, as there should be no dilution of our efforts now on either the new or existing program fronts in the continuing drive for increased energy efficiency. I don't accept the broadly held belief that "the easiest savings are gone". Take a look around your own home or work-place and I think you'll agree that gross energy waste still abounds. Admittedly, we may have to be

a little more clever in order to pry it out of our personal and business operations. But the challenge is still there; the cleverness should come from lessons learned.

FUTURES

For starters, let's examine the institutional resistance issue. Can't we do better at collaborating with others who may have a significant interest in the outcome? For the impatient, it often appears that to get results you are forced to do an end-run, yet the surprises that result will be unpleasant more often than you would like. The development of a consensus is very tedious, but the results tend to last, nobody is unpleasantly surprised, and during the project a flexibility emerges that serves all.

Next, what more can we do to identify and address the interface with unique customer/ occupant characteristics that we know finally makes or breaks an energy conservation project? Renters, ethnics, rugged individualists, disadvantaged, and late adopters would all benefit from an approach that recognized them, in total, as the majority, and, singly, as important contributors to a program's success. But we hesitate. Maybe throwing our hands up at the difficulty of the problem is an appropriate first step, but the second is to find out who knows what about the sector of interest. There is a lot of good work going on now, and I'm pleased to see that social science researchers are being called back in to help in this area.

An aspect of the "rationality" issue that should be addressed concerns the broader marketing question of what is rational consumer behavior. Not a professional in that field myself, I can still see that many things other than "simple payback" strongly affect a buying decision. Monetary factors such as available cash or credit limit may be much more powerful. If so, that should encourage the design of innovative field approaches that offer, for example, the best package of cost vs. savings for under $300. Or $900.

Non-monetary factors such as comfort, appearance or status should also be addressed. Since even basic sales courses train a person to identify buyer motivation and resistance, it seems reasonable that such a flexibility of approach could be used in "selling" conservation much more effectively than we're doing it now. A program design or redesign should include a careful examination of the corporate and individual motivation for carrying out the program. If the objective really is conservation, let's get serious about the skills that are

brought to bear. Program redesign that calls for fielding a team of players with different or enhanced skills may be a way to do it.

I think that program designs should place more emphasis on measures that exhibit longer lasting performance without the need for occupant attention. We don't have to wait for the new generation of super windows or vacuum insulation to design programs that reflect occupant reality. Fool-proof, fail-safe and durable measure options that don't need tending constitute the appropriate response to field observation that energy, for most building occupants, is expected to be a "given", requiring no more than occasional thought or action. This will also help assure the stream of conservation savings that may otherwise be affected by changing perceptions of "the energy crisis", fuel availability, price trends or personal commitment.

The experiences related here and elsewhere of measured savings at great variance with the audit estimates are disturbing. On closer examination, we've found that some of the field audits were using early versions of savings calculations that have since been revised. We also found an example of consistent overprediction that was caused by a division sign that had blurred into an addition sign after the third copy of a copy of a copy. A reality consideration for program redesign must be the examination of the calculation methodology to assure ourselves that it is current and accurate. Beyond that, and more important in the long view, I think that it is important for us to continue the investigation of energy use in buildings, how that energy use changes with retrofit, and how retrofit savings change over time. Continuing update of programs with the resulting data is critical to the establishment of credibility.

Program implementation and evaluation are being made easier. Listening to the complaints of "insufficient data" you may hear at this conference may itself lead to better program and evaluation design. But it's never going to be really easy, and you can save yourself some grief later by building slack into your program for mishap, and by following the evaluation planning guidelines prepared by Eric Hirst and others. It may also help to explain to your program sponsor the human scope of your venture. This encourages a perception of the work by you and your management that will allow you more creative freedom in a very complicated area, as well as the flexibility to absorb the occasional setbacks that can be guaranteed.

Finally, some encouragement should be given to innovative design. Earlier programs, working under mandate or threat of mandate, stressed very much the "necessary" aspect of the project, as opposed to the "desirable" or "possible". The relaxation of many regulations should result in a broad wave of programs that emphasize the desirable and possible.

For example, it should be possible to field programs that more effectively address local or regional electric demand concerns. They could and should benefit from the public contact experience of earlier programs, but concentrate on customers or energy uses that have disproportionate demand impacts. The 300 small commercial buildings visited in the joint-lab Commercial and Apartment Conservation Service (CACS) survey averaged between 10 and 15 kW at the time of the local utility system peak. Yet these establishments used, by CACS definition, fewer than 4000 kWh per month. The potential is certainly there for selective peak shaving.

Similarly, the eagerness of industry to develop markets can be put to use in programs that are designed to offer "package" solutions to joint program/customer problems. One of the most successful retrofit contractors in Denver attributes much of his success to the fact that he can very nearly "do it all". He has simplified the choices for a potential customer, making the "package" an easy thing to buy. This is a potential that should be explored in your program design.

The options for successful program design or redesign have never been greater, the skill and experience in organizing programs is growing, and the payoff is still very definitely there. I hope that these brief thoughts can help you collect on that promise.