NEW DIRECTIONS FOR CONSERVATION PROGRAMS

Virginia Kreitler, Synergic Resources Corporation
Sarah Kirchen, U.S. Department of Energy

ABSTRACT

Thirteen residential conservation programs were selected to serve as case studies in an evaluation of alternatives to the RCS (Residential Conservation Service) program. The findings from that study provided the basis for the discussion in this conference paper.

This paper reviews selected program planning approaches currently in use, comparing their benefits and suggesting that there is a need for greater formalization of the planning process. In addition, the need for better understanding of customer acceptance factors is discussed. Some new efforts in the areas of program planning and market research are identified. The discussion concludes with a recommendation that the government and trade associations need to address further program planning and evaluations issues while utilities individually need to adopt a more proactive stance toward their programs and the conservation marketplace.

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INTRODUCTION

Early in 1985, a number of conservation program managers around the country were interviewed as part of a study undertaken for the U.S. Department of Energy. The intent of the study was to examine, on a case study basis, some of the many conservation programs undertaken by utilities and municipal governments independent of the federally mandated RCS program. Thirteen programs were examined, twelve administered by electric, gas, or combination utilities, and one by a city agency. The findings from this effort are summarized in the resulting report, Alternative Utility Conservation Program Designs: An Evaluation Based On Case Study Program Experience.[1]

The case study programs included a variety of conservation strategies, including various types of audits, rebates, low interest loans, free installation, and a marketing strategy which promoted the benefits of conservation measures in new homes. The programs targeted low cost weatherization measures, more expensive measures such as ceiling insulation, high efficiency air conditioners, and heat pumps. Each program demonstrated the successes of one or another approach to promoting conservation to residential customers. A summary of the programs, their features, and their results appears in Table 1. As this table shows, the parameters used to describe program achievements can be as varied as the programs themselves.

The conclusions drawn from this study suggest that many viable options exist for conservation program design and implementation. A variety of program designs have been proven effective in inducing customers to adopt targeted conservation technologies. This variety of successful program strategies should be utilized more fully and, in particular, the methods used by the case study program managers should be studied by program administrators elsewhere. It is surely no accident that these successful programs typically were the result of thoughtful planning processes which gave a great deal of consideration to the unique attributes of the specific markets being served. The rest of this paper will explore in greater depth these two topics -program planning and addressing the conservation marketplace - for these represent significant areas of opportunity for new conservation program efforts.

[1]Kreitler, Virginia, Synergic Resources Corporation, Alternative Utility Conservation Program Designs: An Evaluation Based on Case Study Program Experience, performed under contract to Oak Ridge National Laboratory for the U.S. Department of Energy, 1986.

Table I. Alternative Program Descriptions and Results

Utility	Program Name	Program Features	Selected Results
City of Austin	Appliance Efficiency Program	Rebates awarded for purchase of high efficiency air conditioners. Rebate amount varies with size and efficiency level.	Average efficiency levels increased 1.60 points in 2½ years. Participant energy consumption decreased, on average, 15%.
Florida Power Corportion	Home Energy Fixup	Rebates up to $50 for contractor installation of low cost conservation measures. Walk-through audit used to qualify measures.	Participants are demographically more representative of the local population than are participants in RCS. Elderly customers are more likley to participate than others.
Florida Power and Light	Home Energy Loss Prevention Program	Rebates of up to $75 for contractor-installed weatherization measures. Audit required to qualify measures.	Roughly one-third of the customers receiving an audit had measures installed through HELP program.
Gulf Power	Centsable Energy Check	Free computerized audit coupons offering discounts on conservation services and products.	Gulf Power reports much lower costs than RCS audit with similar energy saving results.
Gulf Power	Good Cents Home	Utility certifies new and existing homes as energy efficient. Cooperative advertising is provided to	Five years after program inception, 95% of all new homes were being built to program standards.
Lincoln Electric System	Audit 2	Modified RCS audits delivered through direct mail, door-to-door canvassing, and neighborhood associations.	Door-to-door canvassing generated a 43% participation rate.
Lincoln Electric System	Home Energy Savings Program	Rebates and bill credits for installation of heat pump, solar, or controllable water heaters and space heaters.	Research indicated that heat pump purchasers are better educated and have above average income levels.
Michigan Consolidated Gas	Interest-Free Conservation Loan	Zero interest loan for flue dampers and ceiling insulation. Repayments billed with fuel bill.	Contractors are supportive of program. Close to half of the customers participating first participated in RCS.
Oklahoma Gas and Electric	AWARD Program	Rebates for installation of weatherization measures and high efficiency air conditioners.	Programs seems to have generated spillovers effects which further increased the efficiency of air conditioners sold in the area.
Pacific Gas and Electric	Zero Interest Program	Up to $3,500 available for weatherization. A set of six measures was promoted most heavily.	Rental market addressed by attracting participation from landlords.
San Diego Gas and Electric	Direct Weatherization Assistance	Free weatherization services for low income customers. Community-based organizations used for service.	Elderly customers responded especially well to this program.
San Diego Gas and Electric	Energraf Audit	Computerized audit of appliance energy consumption.	Cost of audit only one-third that of RCS audit.
City of Santa Monica	Energy Fitness Program	Audits including free installation of three low-cost measures. Door-to-door canvassing used.	Participation rate of 33%. Participants were demographically similar to city population as a whole.

FRAMEWORKS FOR PROGRAM PLANNING

Discussions with managers of the case study programs suggests that the process of planning individual conservation programs is increasingly becoming integrated into larger planning frameworks. Rarely were the programs designed without consideration of a context which addresses issues broader than those specific to implementing a single conservation program. Application of these types of broader frameworks benefits the planning process by enabling more sophisticated decisions to be made in selecting the specific programs and services to be offered to the community.

Several frameworks are currently being applied to program planning; the most common of these consider prior program experiences, current program offerings, and the supply-side alternatives to conservation programs. The benefits of these three frameworks are briefly described below.

A Historical Framework

The most widely used planning framework evaluates proposed programs in light of the results and experiences gained with past programs. Evaluating program options within the context of a historical framework reduces the uncertainties associated with planning demand-side programs. By utilizing proven, field-tested findings, program managers can better estimate the likely impacts of future program efforts. The risks of devoting resources to unsuccessful approaches can be moderated by utilizing the working knowledge gained through prior implementation experiences.

The value of using historical approach is evident from the successes of programs which were planned using this sort of framework. For example, the City of Santa Monica benefited by incorporating findings from previous programs into their planning process. In this case, the city was not relying on its own implementation experiences, but those of other organizations. The information served the city well, as its Energy Fitness program successfully overcame the specific problems that had been targeted on the basis of these earlier findings (i.e., attracting participants from such difficult-to-reach groups as the elderly and renters). Analysis of earlier program experiences allowed planners to pinpoint areas of program weakness and to develop corrective strategies proactively. This is the greatest benefit of a historical program evaluation framework - the ability to refine program designs, based on actual market-tested results, before program inception.

A Program Portfolio Framework

In contrast to the historical perspective which assesses a stream of program experiences which have accrued over time, a portfolio framework looks at the total mix of programs offered in an area at one point in time. This planning framework evaluates the individual program in the context of other programs being offered simultaneously by the utility (or other organization). The entire portfolio of programs is evaluated in terms of how well it serves the

utility's demand-side goals and the needs of local customers. In turn, the individual program is assessed as to how well it serves as a component of the overall portfolio in addressing these goals and needs.

Assessing groups of conservation programs as a total package provides a clearer understanding of where more (or less) program activity is desirable. When many programs are offered simultaneously, it has been found that some programs will be competing for the same customers. This creates inefficiencies which may result in greater expenditures per program participant. This is especially true of promotional expenditures. Evaluating program offerings as a whole provides a framework for identifying this type of resource misallocation. Conversely, a portfolio framework may demonstrate that important voids in conservation services exist. For example, Florida Power and Light made the decision to implement its Home Energy Loss Prevention Program - a promotion of contractor-installed low cost measure - after reviewing the range of conservation programs being offered at the time. Reviewing its residential conservation activities as a whole enabled the Company to identify an area of need that was not being addressed through other programs.

Another advantage of evaluating individual conservation programs in light of the total mix of demand-side programs is that this viewpoint promotes flexibility in program planning. A utility is less likely to overcommit itself to a single program if the overall planning approach emphasizes the mix of program options, rather than the single program. In addition, a portfolio framework is also conducive to better evaluations of program performance. In order to compare programs, emphasis must be shifted away from artificial, program-specific measures of conservation activity (such as the number of audits performed) to standards applicable to all conservation programs. This forces evaluations to remain focused on fundamental measures of performance such as energy and demand savings. This effect of a portfolio framework focusing evaluations on the most essential of program impacts, suggests the importance of thoughtful planning on the feasibility of effective evaluations. The foundations for evaluation are laid in the planning process.

An Integrated Supply and Demand Framework

A third planning framework coming into increasing use evaluates conservation and other demand-side programs against supply-side options available for meeting anticipated customer demand. This framework recognizes the interrelationships between supply and demand concerns, and seeks to optimize the allocation of resources between these different strategies. Only an approach which integrates supply-side and demand-side alternatives provides the necessary analytical basis for identifying the least cost options for meeting regional energy needs.

An integrated supply and demand framework resembles a portfolio framework in that it also forces evaluations to focus on the most essential of program impacts. Again, the focus is riveted on estimates of energy and demand savings rather than on secondary measures of program performance. Again, this has the

effect of formalizing evaluation processes at the same time that planning processes are being made more rigorous. This formalization is essential if reliable comparisons are to be made between disparate planning options.

The City of Austin has adopted an integrated planning approach in serving the electricity needs of its customers. In 1982, the City set a goal for displacing 553 MW of peak demand in 15 years using a mix of load management and conservation programs along with conventional and alternative forms of generation. The options developed by the city are selected primarily on the basis of minimizing long term costs to the ratepayer costs. Financial risks are balanced against the risks of inadequate future energy supplies as well, and the appropriate mix of supply side and demand-side options is defined on the basis of this total picture.

Formalizing the Planning Process

As indicated above, these various planning frameworks each offer a distinct set of benefits. The three frameworks also differ significantly in their degree of methodologic formality, with the historic framework being the least formal and the integrated supply and demand method being the most formal. Often, utility planning and evaluation rely primarily upon the less formal techniques. While these techniques are undeniably valuable, greater benefit would be gained by increased utilization of the more formal methods. Utility planning decisions affect great numbers of people and can bear large investment costs and risks. Planning alternatives should, therefore, be subjected to rigorous review procedures which evaluate a diverse range of energy efficiency options.

PROGRAM MARKETING - SELLING CONSERVATION

Suiting Conservation Programs To Local Markets

Increasingly, conservation program managers are perceiving a need to adopt a proactive marketing approach when bringing conservation programs to their customers. Designing a program which offers worthwhile services is not a sufficient strategy if target customer groups do not participate. Program planning should incorporate, from the earliest stages, consideration of local customer attitudes to ensure that program offerings will be well-accepted by the intended recipients.

A number of issues come into play when evaluating how best to position a program, a few of these are discussed below.

Participation Barriers and Customer Preferences

A great deal of program evaluation effort has been devoted to assessing what factors deterred participation in conservation programs. Such studies provide useful insights into the causes underlying the observed patterns of customer participation, or, more correctly, nonparticipation. For example, walk-through audits were often instituted in response to findings that significant numbers of residential customers refused class A audits because of the

amount of time which they required. Walk-through audits enabled utilities to utilize their resources more effectively, by focusing program efforts in areas most likely to yield tangible conservation results.

Program evaluations based on participation barriers thus do clearly provide useful and valuable insights into appropriate program design. However, analyses limited to identifying participation barriers illuminate only half the issue of customer acceptance of programs. Evaluations must also address the benefits wich customers perceive in different program options. Program planning should give equal, if not greater, weight to customer preferences thanto barriers for it will be the assets of a program which will drive participation. Identifying barriers makes it possible to eliminate less successful approaches, but without assessing customer preferences there is no systematic method for homing in on the most promising program options.

An orientation toward customer preferences is thus a more actionable orientation than one focused on barriers, for it guides program planners toward appropriate program designs more directly. A customer preference orientation gives better definition to appropriate program activities. Often, it will also encourage more innovative approaches to program design, leading to new types of programs that would not have been developed by focusing on barriers to conservation. For example, by responding to customer requests for more information on appliance use, San Diego Gas and Electric developed a home audit service which was completely distinct from the weatherization audits it had been offering. Its new "Energraf" audit focused on energy end uses not addressed by SDG&E's other residential audits (i.e., appliances), providing customers information on which end uses consumed the most energy. SDG&E's decision to respond to customer preferences thus led to the development of a program which would not have been a logical result of responding to barriers to home weatherization. As a result, SDG&E is now capturing conservation potential that would have remained untapped if program planning had focused solely on barriers rather than on customer preferences.

This result is key to the success of future conservation activities: new advnaces in conservation programs will often depend on understanding the marketplace. Market research addressing what technologies to promote, what incentives to use, and what customer groups to target will be a necessary component for planning market-based programs. The importance of a customer-focused viewpoint will increase as the easy markets for existing programs approach saturation. Conservation planning will be forced to evaluate new program options in terms of probable market acceptance in order to minimize the risks associated with initiating new, untested programs.

Program Delivery and Channeling

Gaining an understanding of the local market is useful not only for selecting the technologies to promote or the incentives to offer, it is also useful for determining how to best deliver the program to customers. The selec-

tion of effective advertising media, and the choice of what trade allies or outside agencies to work with, should also be planned in light of information specific to the marketplace.

In some cases, a readjustment in promotional strategy can yield significant improvement in program results. For example, Pacific Gas and Electric found that its Zero Interest Loan Program initially was not effective in penetrating the rental housing market. By shifting its focus from the dwelling occupants to landlords or building owners, PGandE was able to increase penetration in a difficult segment of the market. Building owners proved to be a better target market because the low interest loan incentive better fit their needs than those of building occupants. Loans require a modest planning horizon of at least a few years. Many renters would not reap the benefits of a loan program because they would expect to move (and thus have to pay off the loan) before the investment would provide a payback. Building owners, on the other hand, may view the low interest loan as a valuable opportunity to reduce the costs associated with building maintenance. This benefit is multiplied severalfold for property owners weatherizing numerous dwelling units, making the interest subsidy a greater incentive to persons who own many properties.

Recognizing that the benefits of participation varied across market segments enabled PGandE program administrators to develop more effective channeling strategies. The example of the ZIP program is not an isolated one, appropriate program delivery channels are important in all conservation markets. For example, strategies which rely on the cooperation of third parties often provide marketing leverage which boosts participation. The value of working cooperatively with trade allies has been demonstrated most convincingly by the Good Cents Home program developed by Gulf Power. Through the efforts of the utility, builders were influenced to upgrade the efficiency of almost all new housing in the Company's service territory. In a similar fashion, cooperative efforts with service agencies can also prove most effective. The Direct Weatherization Program offered by San Diego Gas and Electric to low income customers chosen to work with agencies already providing services to the poor. This decision, and the utility's follow up efforts, enabled SDG&E to tap into an effective delivery channel which was actively utilized by its target audience.

Designing a program delivery mechanism in which the utility works with the existing dynamics of the marketplace, instead of as an independent agent, can boost promotional effectiveness dramatically. However, choosing a program delivery strategy which relies heavily on the cooperation of trade allies, community groups, or other outside parties will necessitate developing an understanding of their preferences as well. Market research activities should not overlook these important groups by focusing solely on the end user.

NEW DEVELOPMENTS IN IMPROVING PROGRAM PLANNING AND UNDERSTANDING CONSERVATION MARKETS

Needed Directions For Activity

The findings from the programs examined in this study demonstrate that substantial benefits are gained by careful program planning and an intimate knowledge of the marketplace. The results also suggest that findings from one program are often transferable to other programs. However, it would be overly facile to simply recommend here that program managers should familiarize themselves with relevant program experiences before embarking on a new program initiative. Evaluating program options in light of previous program results - a natural and obvious step - is often hampered by the lack of available data or the lack of awareness of relevant reports. Research findings from programs at one utility are often unknown to program managers at other utilities. This is unfortunate for much of the information generated in local program assessments would be of value to planners elsewhere. Much greater activity in information sharing is needed, both through direct contacts between program administrators, and through more formalized networks of information exchange. Facilitation of informational exchange is an appropriate undertaking for bodies such as the U.S. Department of Energy, state regulators, and trade associations.

One limitation to this is the fact that different frameworks are relied upon by planners around the country, with the result that program planning at different utilities emphasizes different factors. Unfortunately, the evaluation methodologies used may diverge so much that the transferability of program findings becomes suspect. Better transferability of lessons of experience thus also depends on the development of more consistent evaluation methodologies. Again, there is an important role to be played in this endeavor by national trade associations and government agencies.

Several recent developments suggest that there is widespread interest in refining planning techniques, standardizing evaluation methodologies, improving the understanding of relevant customer acceptance issues, and improving information transfer between program managers. The actors involved in these developments range from the federal government through individual utilities. As an example, the impetus for revising RCS and repealing CACS stems in part from a desire to encourage greater flexibility in conservation program planning. In place of prescriptive mandates, the U.S. DOE sees a need for utilities to assess their own options and make their own program decisions with the support of greater information sharing and the development of better planning and evaluation tools. Toward these ends, DOE, as one of its initiatives, has investigated the usefulness of existing information services and established an network to facilitate information transfer across organizational lines.

DOE has also established a Least Cost Utility Planning initiative to facilitate the adoption by PUC's and utilities of planning strategies that integrate supply and demand-side options, including conservation. However, for least cost planning strategies to work, program impacts must be accurately

assessed and accounted for in a utility's overall strategy. In this regard, DOE has conducted a series of utility program evaluations. These cost-shared projects have provided an opportunity for utility program managers and government planners to assess specific program impacts and expand their evaluation capabilities as well. Strategies for developing better evaluation skills among program managers are currently being identified.

EPRI is also acting to promote the transfer of information and to develop better planning tools. A number of these projects will improve the accessibility of information on program experiences. An upcoming series of monographs on program implementation will distill relevant lessons of experience into a practical "how to" form. New databases on customer acceptance of conservation programs will provide the data needed to more accurately project program results, and a new model for projecting participation will make such data more useful and reliable. Moreover, EPRI is establishing a demand-side information center to meet the growing interest in demand side issues raised by electric utilities and others.

There are related efforts by state utility commissions. For example, the New York Public Service Commission is requiring all investor-owned utilities under its jurisdiction to earmark a percentage of their revenues for the development of pilot conservation and load management programs. The purpose of this requirement is not to reduce the need for capacity now, but to prepare for a future time when demand-side management programs will be needed in order to postpone powerplant construction or balance regional power needs. The Texas Public Utility Commission is in the third year of implementing a state legislative requirement that makes utility conservation and cogeneration activities a prerequisite for PUC approval of new powerplant construction. These and other PUC activities demonstrate the extent to which more careful utility planning is becoming a focus of public attention.

In related developments individual utilities - on their own initiative - are institutionalizing planning processes geared to meeting customer needs competitively, and more effectively meeting anticipated state regulatory requirements for justifying new construction and/or rate increases. Evaluation issues are also being addressed more thoroughly. In addition, there is much new activity in the area of program marketing, with attempts being made to define what features influence customer acceptance of programs. Some important areas for future work are described here briefly.

INTEGRATING PLANNING AND EVALUATION

The need for formalizing the planning process and the need for improved marketing of programs are related issues. Too often, new programs are planned without benefit of any systematic investigation of customer needs and preferences. Yet, such attitudinal factors obviously will influence program successes. The need to integrate program planning with market assessments can be addressed effectively by using methods proven useful by utilities and other business concerns. Especially promising in this regard are the opportunities offered by test marketing of programs and market segmentation research.

Test Marketing Conservation Programs

The need for better program planning and the need for better marketing of conservation programs both point to the value of initiating pilot programs designed to provide information on how to most effectively implement new program ideas. Test marketing of conservation programs enables a utility to test the effectiveness of a program concept in the local market without commiting the degree of resources normally devoted to a full scale program. The smaller scale effort provides the company with administrative expertise much in the same way as a full scale program, yet allows an opportunity for refining or, if necessary, discarding a program concept before going full scale. The New York Public Service Commission has endorsed pilot program efforts for these reasons, hoping to determine what types of conservation programs operate most effectively in the state while prompting the utilities in the area to refine their program implementation skills.

Another benefit which can sometimes be gained from pilot program efforts is the ability to carefully test different variations on a single type of program design. For example, New York State Electric and Gas has set up a pilot program promoting high efficiency refrigerators in such a way that it will be able to compare the effectiveness of varying rebate levels on the consumer's purchase decision. This research design will enable NYSEG to evaluate not only whether or not a rebate program influences the market, but which rebate level seems to be most cost-effective. Slight variations in advertising strategy are also being tested to identify effective approaches. This information will be used to adjust program design before offering the program throughout the service territory.

Market Segmentation Research

Most of the program evaluation research done to date, and even that being accomplished through pilot program studies, is developed to assess how well specific programs operate in their marketplaces. Such research is highly valuable and worth pursuing more vigorously in the future. However, the orientation of all such research starts with the program offerings rather than with the marketplace itself. There is still much to be learned about energy consumer markets which cannot be addressed through research which focuses on existing programs. Market segmentation research can fill some of the void by providing information which characterizes the market as a whole.

This type of research is most useful because it does not depend on a priori assumptions about what factors define distinct customer groups in the marketplace. Instead this type of market research evaluates customer characteristics without bias to determine which demographic or attitudinal factors truly differentiate customer groups. Promotional strategies are likely to be more effective and more cost-effective when based on such an unbiased foundation than when based on assumptions which do not fit the market as accurately or fully.

Jersey Central Power and Light is one utility which has undertaken market segmentation studies of its customers. In the residential sector, the findings have suggested directions for increased program activity as well as directions to be avoided. The findings also provide information on the likely market size for different types of program activity. This information will prove useful both for selecting the programs to be offered and the promotional strategies appropriate for each.

CONCLUSIONS

To recapitulate, careful program planning offers a number of valuable benefits which include the following:

- transferance of lessons of experience
- increased proactivity of administrative viewpoint
- improved resource allocation
- improved foundation for effective evaluation.

To ensure that the benefits of program planning are maximized, the planning process must become increasingly formalized. This formalization will, per force, involve the simultaneous formalization of program evaluation procedures. A more rigorous approach to both planning and evaluation is necessary to ensure prudent allocation of resources and to reduce the risks attendant to demand-side programs.

In contrast, flexibility of approach will be key to program future implementation efforts. Utility administrators should not only be willing to adjust their program plans to suit their marketplace, they should actively seek ways of doing so. Customer acceptance factors may shift over time as population demographics or economic factors change. Ongoing market monitoring efforts and a willingness to test innovative program ideas will be necessary for much future conservation work.

In sum, then, there is a great deal of information available on implementation experiences with various programs. Much of this information is transferable to other utility settings and is thus of value to program administrators nationwide. Unfortunately, access to this information is hindered at present by the difficulty of locating documents on specific topics. The usefulness of the information is also limited by the use of numerous evaluation methodologies. Greater efforts are needed in making this information more accessible and more uniform in methodology.

Such efforts will require the involvement of major organizations such as utility trade groups or the Department of Energy. However, utility management should not overlook their own opportunities for advancing the state of program

planning and evaluation. More local market research should be undertaken to improve the understanding of customer behaviors and to "recalibrate" national findings to the regional market. Most importantly, utility management should adopt a proactive approach to all elements of program planning and implementation. An aggressive attitude toward identifying program opportunities and influencing customer acceptance will make the difference between conservation efforts that are merely functional and those which are unusually successful in achieving their objectives.