

# **From Programs to Products: Evaluation's Contribution And Future Direction in a Deregulated Energy Market**

*Roberta W. Walsh, Florida Gulf Coast University, Ft. Myers, FL*

## **ABSTRACT**

This paper explores the potential of the energy industry to more successfully adapt to a competitive environment as a result of the emphasis it has placed on program evaluation over the past 20 years of its history. Using conference proceedings since 1995 when deregulation began to enter the energy program evaluation scene, evaluation papers were examined for their contribution to a competitive environment. Five areas emerged as having relevance to the transition: evaluation principles, marketing research enhancements to evaluation, identifying and overcoming methodological challenges, evaluation as a profession, and the effects on low-income energy consumers. Notwithstanding the significant potential contribution of evaluation to the transition, energy markets will not be immune from the pitfalls of deregulation that affected other industries. By instituting self-regulatory customer satisfaction measures and integrating their adoption with evaluation principles, the energy industry can minimize the likelihood of re-regulation over the long term.

## **Introduction**

The formal evaluation of energy programs over the past two decades has occurred in a context that has been as multi-faceted as the programs themselves. The issues that energy program evaluation has addressed have been driven by program elements such as different types of end-users, a wide range of building structures and equipment, multiple fuel types, and associated psychological and economic behaviors of various end users. Additionally, energy program evaluation has applied a wealth of methodological approaches, encompassing both quantitative and qualitative, and developed techniques unique to its own field, in the pursuit of best practices to achieving desired program goals.

Another contextual dimension has been the political and economic environment in which energy programs have been implemented in the past 20 years. Initially prompted by calls for accountability of government expenditure when federal funds supported programs such as the Residential Conservation Service and Low-income Weatherization, energy program evaluation as a field of endeavor has adapted to the vagaries and dynamics of public policy. It played an integral role in state efforts to promote least-cost utility planning, demand-side management (DSM) and integrated resource planning (IRP). These later developments, now all but abandoned, eased evaluation into the realm of the private sector where it had previously remained almost exclusively in the public domain.

With the onset of the 21<sup>st</sup> Century, the majority of energy programs increasingly will become privatized and affected by the forces of competition, as the electricity industry becomes one of the last of the regulated industries to be deregulated. In this new and defining context of energy program implementation, programs become *products* that are marketed in the same manner as in other deregulated service industries such as telecommunications and finance.

Energy services are distinguished from these other industries by a rich, contemporary history of program evaluation that has become an interdisciplinary and highly specialized field, ever changing to maintain the state-of-the-art. This situation poses at least two questions:

- Are the many years' of evaluation experience that had been superimposed in the earlier but relatively recent regulatory climate, transferable to the deregulated environment? If so, what aspects are especially useful?
- Does this experience point to a more successful transition of energy programs (products) for the industry than its earlier deregulated counterparts?

## Overview

This paper addresses these and related questions by drawing directly from energy program evaluations reported in (1) Proceedings from earlier International Energy Program Evaluation Conferences (IEPEC) and (2) evaluation papers from Proceedings of the American Council for an Energy-Efficient Economy (ACEEE) Summer Study on Energy Efficiency in Buildings. The conference proceedings were selected as appropriate sources for this analysis for two reasons. First, they have consistently tracked developments in energy programs since the early 1980's. Second, they are recognized among energy program specialists as the premier sources on the state-of-the art in their respective, yet related, niches in energy program evaluation and efficiency in buildings.

Using these sources, this paper identifies and classifies the theoretical and practical issues that have characterized energy program evaluation in recent years, focusing attention to those that are particularly relevant and significant in a competitive energy environment. It assesses the relative advantage of these issues in the transition to a competitive market as compared to other deregulated industries where evaluation had not played as dominant a role.

The paper concludes with recommendations for enhancing the tools of evaluation to energy products in a competitive environment, including where principles from other fields such as marketing or management may be incorporated in energy evaluation strategies.

## Approach

The implications for energy programs of retail competition in the electric industry became a prevalent topic for discussion in the aforementioned conference proceedings beginning in 1995. The approach to the present examination of the role of evaluation in the transition was to identify and analyze those papers that focused attention to the broad range of issues affecting energy programs offered as products in the residential sector of the privatized market. In all, some 70 of 230 (30%) papers fit this description in IEPEC Proceedings of 1995 and 1997, and relevant ACEEE Proceedings<sup>1</sup> of 1996 and 1998. The topics covered in the papers that were examined embrace the following general areas of interest to this discussion, and each is described more fully in the following section:

- Evaluation Principles
- Marketing Research Enhancements to Evaluation
- Identifying and Overcoming Methodological Challenges
- Evaluation as a Profession in a Competitive Climate
- Effect of Deregulation on Low-Income Energy Consumers

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<sup>1</sup> Includes only those panel sessions for the respective ACEEE *Proceedings* that specifically addressed evaluation.

This paper goes on to discuss the advantages and limitations of an evaluation history as energy products and services enter the competitive era. Finally, it sets forth conclusions and recommendations based on the analysis.

## **Evaluation Issues Affecting the Transition to Competition**

The complexity of transitioning as all pervasive and historically entrenched an industry as electric utilities into a competitive environment suggests that any enumeration of relevant evaluation issues would be a laborious exercise. Of course, the task is simplified in this paper by limiting the source of information to the conference proceedings identified in the preceding section. Accordingly, although this analysis is not intended as the type of comprehensive treatment that would be derived from a more thorough search of the literature, the following classification is representative of the scope of issues that evaluation encompasses in examining its implications for deregulation. As well, the specific issues that are addressed serve as examples rather than an exhaustive discussion.

## **Evaluation Principles**

Principles inherent in the field of evaluation research appear in various forms in the papers reviewed. Some applications of these principles serve to expand the topics addressed into new marketing territory, while others reveal a concern for compromise of basic evaluation principles in a deregulated environment. Many papers dealing with market transformation issues addressed the importance of understanding the varied and complex market interactions for energy products. This holistic approach has long been recognized in conducting evaluations of large-scale programs in which a thorough knowledge of the relationships of key players is critical to isolating program effects. It represents a significant departure from energy program evaluation's earlier work that focused more narrowly on programs having a limited sphere of influence in the market.

Herman, *et al.* (1997) recognized the need for the broader approach in measuring market effects of residential new construction (RNC) programs implemented by two California utilities. Their analysis pointed to two preliminary steps in the process: (1) identifying the full scope of stakeholders (over 20 in all) in the RNC market that may interact with the homebuyer and (2) appropriately linking market interventions—such as training for real estate salespersons—with a specific market barrier, such as information needs of that stakeholder group. An analysis by Feldman, *et al.* (1997) of the market for compact fluorescent lamps (CFLs) represents another expansion in the perspective of the market. This study applied the concept of *exchange functions* surrounding these products—from physical possession to product promotion to payment—to illustrate the fact that a given function is not associated with any single market actor. This situation further illustrates the complexity of markets for energy products under a new paradigm and the associated challenge to evaluators.

Many other authors contributed to energy program evaluation in a competitive environment applying traditional evaluation principles. In one such example, Erickson and Reed (1996) addressed effective program design and delivery of programs in attributing failures of some community-based programs in Wisconsin. Traditional program evaluation in non-energy settings has emphasized the need to distinguish between program planning and implementation while at the same time recognizing that one process is dependent upon the other. In another example, Uhlaner and Fletcher (1995) concluded that DSM evaluation can effectively transition into a competitive environment if it focuses attention to future program performance and supports overall marketing and planning objectives. Their point is founded in the long-held principle in program evaluation that when evaluations are

conducted with a view toward the organization's mission, their results can have a more lasting effect than when focused on a specific program alone.

Among the concerns expressed about the potential for compromising evaluation principles, Kushler (1997) questioned whether true evaluation approaches were being employed in the context of policy formulation surrounding electric utility restructuring at the state and federal levels. In a critical assessment of the process, he took issue with the assumption that the policy shift serves the public interest with limited input of the affected consuming public, concluding that [t]he electric industry...is *leaving behind* an era in which the evaluation profession performed a significant role" (emphasis added) (p. 598).

Another recent concern among evaluators has been the prospect of change in policies that support public disclosure of evaluation studies to treatment of this information as confidential. The threat of a shift of this nature stems from the utilities' desire for competitive advantage in the market. Peters (1995) explored the ethical conflicts inherent in this debate from the perspectives of the consumer, researcher, company, and society. Vine (1997) discussed the negative impacts of information availability in the utility industry becoming inhibited, stifling public access to data, and the need for disclosure requirements as a part of continuing regulatory oversight at the state level. These evaluators articulate a concern for what would constitute a major departure from energy program evaluation as it developed prior to the deregulation era. Indeed, as the IEFEC and ACEEE conference proceedings attest, information sharing and the fraternity among evaluators are largely responsible for advancing the field to the level that it enjoys today.

## **Marketing Research Enhancements to Evaluation**

The transition from programs to products requires energy evaluation to draw from other fields, including operations research, and total quality management (Merchant, 1995), as well as marketing research. Yet marketing, with its emphasis on understanding customer behavior, appears as the area of choice for special emphasis, as evidenced by the subject matter addressed by authors in the volumes examined for this paper. Reference to these emphases as *enhancements* underscores the refinement of evaluation techniques to meet the challenges posed by competition rather than departing from them as if they were no longer relevant.

Whereas energy savings was the *raison d'être* of evaluation in the period characterized by DSM, the competitive era requires utilities to expand their focus to include interpretations of *customer value*. Using the Tennessee Valley Authority (TVA) as an example, Herman and Birch (1995) identified two added dimensions of evaluation requirements in this context:

- Acknowledging that precision is not always possible in measuring customer value, making estimates based on the best information an acceptable substitute for no information
- Shifting evaluation resources to areas of customer value that had been shortchanged in the DSM evaluation framework (e.g., customer perceptions and expectations; immediate and long-term rate impacts; and hidden or market barrier costs to product acceptance).

The targeting of the particular energy efficiency products that best lend themselves to a deregulated market was the focus of several papers. Bogenrieder and Davis (1996) used marketing case studies of electric heat pumps and lighting to conclude that by using the appropriate evaluation techniques "...efficiency can be profitable and attractive to consumers and that competition...can enhance...efficiency" (p. 3.22). (These authors were also representative of other efforts to counter the perception when deregulation was first proposed, that competition would mean the end of efficiency as a marketing objective.) Another type of energy product illustrative of the potential breadth of market

offerings based on research is *building commissioning*. As described by York and Sumi (1997), because it is a service that begins in the design phase and lasts at least one year after construction, commissioning incorporates a process that assures customers' (owners and occupants) satisfaction with the building. It is also attractive as a product because it enhances customer contact and the potential for repeat business.

Gilman, *et al.* (1996) were among those to recognize the payoff of market research as a pre-market strategy vs. post-market as had been applied in the DSM environment. In a program sponsored by the Electric Power Research Institute (EPRI) to assess the market potential of efficient clothes washers, a combination of market and evaluation research techniques was integrated into a comprehensive design. The research design elements included customer research tools such as focus groups and surveys as well as an impact study and laboratory test data. The authors emphasized the benefit of the combined approach to fulfilling basic information needs of ongoing market research.

### **Identifying and Overcoming Methodological Challenges**

As energy program evaluation evolved as a field over the last two decades, the conference proceedings reveal increasing sophistication and rigor in the methodological techniques applied to the more complex situations encountered by the researchers reporting their results. These challenges range from data collection and statistical techniques to interpretation and implications of findings. Indeed, the proceedings exhibit extensive cross-referencing to methodological issues addressed in earlier conference papers, setting forth "lessons learned" with an honest desire to share insights and advance the integrity of the field.

Many of the issues addressed emerged with the advent of market transformation as a program objective. For example, Meadows, *et al.* (1995) reported on a program in Wisconsin that aimed to transform the market for electric motors to models that exceeded the 1997 standard through a rebate incentive. In the data collection phase, they encountered so many unanticipated difficulties, including lack of cooperation among manufacturers and technical constraints among distributors in obtaining sales data, that they recommended by-passing these sources and concentrating on end user sales only. Based on this conclusion, they suggested that market transformation is best assessed using relative vs. absolute terms. In their paper they also describe external factors such as program maturity and economic growth that should be accounted for in analyses of perceived market transformation.

The sound methodological approaches that had become "tried and true" in earlier energy conservation and even DSM programs slowly gave way as the reality of a more competitive market began to set in. Measurement techniques developed and applied to more traditional consumer product lines were now being utilized for energy products and services. Merchant and Dufford (1995) are representative of the type of contribution to methodology that began to appear in the evaluation of energy as a product vs. a program. Drawing from the experience of the telecommunications industry, they illustrated the variety of measurement scales available to estimate customers' quality of service perceptions, emphasizing that the particular combination employed will depend upon the type of product being marketed, its target customers, and the company's information needs, among other factors. As such, this type of methodology represents a significant departure from the more prescriptive approaches undertaken in energy programs (audits and incentives) that had become almost standard in the earlier era.

Another methodological innovation is represented in Peters and Tannenbaum's (1997) report on market simulation for estimating the market potential of solar domestic water heaters by testing differences in market acceptance among various delivery agents, including utilities and local

heating/plumbing contractors. They addressed a number of research concerns dealing with use of utilities' customer data bases, the extent to which simulations approximate real market conditions, and lack of consumer knowledge about the product. Based on their experience, they concluded that conducting market simulations could in fact contribute to a company's understanding about product acceptance better than not conducting them. However, researchers engaging in market simulation studies should pay special attention to sampling issues and administer surveys at a period in time when respondents have some familiarity with the product in question.

Willingness-to-pay (WTP) as a research question raises another example of a methodological challenge that enters the picture in a competitive market. Herman, *et al.* (1997) addressed the issue of contingent valuation with respect to measuring indirect costs and benefits of energy products from the consumer's point of view. They pointed out that unlike other applications of this type of analysis where people are asked to value public goods, estimates of WTP for energy products are likely to be more accurate rather than overstated. This situation holds promise for designing energy product marketing to reduce large indirect costs and emphasize large indirect benefits.

### **Evaluation as a Profession in a Competitive Climate**

Not surprisingly, when policy pronouncements leaning toward deregulation threatened the DSM and other programs that had been put in place under regulatory mandate, energy program evaluation professionals expressed concern for their place in the new environment. This concern is not as self-serving as it might first appear. Much of it was based on the prospect that the expertise they had developed and fine-tuned over the years could be dismissed out of hand by utility executives as no longer relevant or otherwise lost in the shuffle of institutional reorganization. By and large, evaluators believed they not only had much to offer in the competitive arena, but also, they were committed to broadening their perspective and making a positive contribution to the transition and beyond.

Stewart (1995) discussed his personal experience as an evaluator in a utility company setting where DSM was beginning to be de-emphasized. In a candid and forthright presentation, he noted a shift in his role from the climate of "rigorous, all-encompassing, time-consuming and costly regulatory-driven DSM" (p. 487) where the evaluator is often isolated, to being able to work more closely with program planners and sales staff in an integrated fashion. His advice to other evaluation professionals was to not wait to be asked to participate more broadly in planning activities, but rather to work to establish themselves among their corporate colleagues as equal players in contributing to the "bottom line."

This observation has implications for the dilemma that often confounds evaluators in other program areas—i.e., to what extent should the evaluator interact with planning and program staff, except as an external party in the process, and what should be the nature of that interaction? The potential for losing expertise that can lead to better program design or product development and marketing makes a strong case for a departure from the strict, third-party relationship between evaluators and planners/implementers.

### **Effects of Deregulation on Low-Income Energy Consumers**

Programs initiated in the public sector aimed at promoting energy efficiency for low-income households represent another category that emerges as an area of concern as competition unfolds. Evaluators who had conducted process and impact evaluations of the federal Low-Income Weatherization Assistance Program and other state-level programs targeted to assist low and moderate

income consumers also began and continue to advocate for protections from market dysfunctions that could further jeopardize the economic position of this group.

The evaluation of a program targeted toward payment-troubled customers of a Pittsburgh gas utility formed the basis for Peach, *et al.* (1997) to make some observations about the need for evaluators to devote special attention to issues affecting low-income consumers in a competitive environment. The authors pointed out the “high stakes” climate for this group resulting from not only deregulation but also globalization of the economy and welfare reform. They stressed the fact that if evaluators do not adapt their approaches to examining low-income programs, the programs can appear to be cost ineffective to decision-makers considering the fate of or whether to adopt such programs. Their paper describes situational factors in evaluating a low-income customer assistance program that affected the evaluation design and analytic techniques that were applied. As a result of making modifications in the evaluation, the program was deemed successful for the low-income clientele and increased payments to the utility.

Hall, *et al.* (1997) treated low-income utility customers as a market segment requiring sub-segmentation and identification of customer needs in the same manner as any other customer group as a basis for energy product development. Classifying the “working poor” at 150 per cent of the poverty level, the authors noted that serving this population in a given service area (market) can increase a utility’s market share. Using market segmentation and choice analysis techniques, they suggested, utilities can better understand this group’s energy use behavior, attitudes toward program participation and bill payment, barriers to implementing energy efficiency and opinions about energy in general.

Addressing the many facets of low-income energy affordability, Hamilton, *et al.* (1998) set forth an approach to energy products that tackles the specific problems of this consumer segment head-on, by incorporating three program objectives:

- Lowering the household’s energy burden in terms of both consumption and price paid
- Increasing predictability of energy bills to account for often erratic income patterns of low-income households
- Incorporating a remediation mechanism for indebtedness when it occurs.

The authors’ integrated approach for a New Jersey utility’s low-income customer program consisted of extensive efficiency measures, an education program in which customers participated as partners in achieving energy efficiency, and an affordable payment plan.

Other authors described approaches to address needs of low-income consumers in a competitive energy environment through avenues outside the utilities themselves. Lord and Snell (1998) examined the prospects for pooling low-income customers as a single energy purchaser in markets as a means of increasing market power. Among specific policy recommendations, Tannenbaum and Kuntz (1998) endorsed moratoria on energy cutoffs during seasons when heating and cooling needs are essential for health, and bans on charging discriminatory rates to low-income customers.

## **Advantages and Limitations of an Evaluation History in Entering the Competitive Era**

In his text, *Utilization-Focused Evaluation*, Michael Quinn Patton (1996) draws from the field of marketing to illustrate the importance of useful evaluation designs. The case in point involved a new product line that a corporate board chairperson rejected because he did not believe the projections for its sales were based on a valid interview survey sample, even though the sample was carefully selected to closely approximate the population of the target customers. When a rival company

successfully marketed the same product the following year, the marketing director realized (after consulting Patton) that the potential for applying evaluation results increases when the user accepts—at the outset—the rationale underlying the research design. Patton uses the example to underscore the need for *face validity* of evaluation design so that “stakeholders can look at the items and understand what is being measured (p. 253)”. This is an element of research design that many energy program evaluators have come to appreciate. Yet the example, like others in this paper, goes further to suggest at least two points

- Market researchers may not have the same insights that come from a program evaluator’s experience
- As the newly competitive energy market develops and offers products that had their foundation in programs, it may benefit in ways that were unavailable to other industries undergoing deregulation.

The deregulated energy market may develop with some of the same characteristics of energy programs that are rooted in their public sector origin and their emphasis on evaluation. The most obvious of these is the need to address impacts on low-income energy consumers, an issue that will be addressed either by continued regulation in certain elements of the market, through self-regulatory mechanisms, or some combination of both approaches. While much of the detail remains to be seen as deregulation takes form at the state level, it appears from this analysis that the energy evaluation community is adapting its expertise in ways that can only aid in the effective transition of the market to a more competitive environment.

Notwithstanding the potential benefits of an evaluation history, it will be self-defeating to assume that the historical context by itself gives this emerging market an assurance that mistakes of other deregulated industries will not be repeated. In the aftermath of deregulation of other industries, the unleashing of competitive forces, over time, has resulted in a backlash of consumer dissatisfaction with specific industry practices. Widely reported areas of complaint in the airline industry suggest a weakened concern for customer satisfaction. Problems include mishandling of baggage, lack of information from personnel about delays in arrival and departure times, and failure to meet expectations of frequent flyer programs. In the financial services industry, branch closings and imposition of fees for transaction services, among other changes in the way customers relate to financial institutions, has been the outcome of deregulation of interstate banking. Telecommunications deregulation resulted in increased complaints of telemarketing abuses to state attorneys-general and Better Business Bureaus.

The absence of oversight by industry-specific, independent regulatory agency forces the public to turn to state or federal legislative processes or consumer protection agencies for redress. Prompted by reports of market abuses, elected officials often begin to call for new legislation targeted at the specific practices at issue. In the case of telecommunications, the practice of “slamming” by long distance carriers became an area for re-regulation under the aegis of oversight functions that did remain following the breakup of AT&T.

## **Conclusions and Recommendations**

What conclusions can be drawn from the foregoing discussion? In reviewing the five areas where energy program evaluation is responding to the deregulatory climate, it appears that the



potential exists for evaluation to make a significant contribution to the successful transition of the energy market to retail competition. Of particular importance will be adherence to principles emanating from traditional program evaluation, as the field looks more and more to market research as a source for methodologies and techniques. The convergence of the two fields shows promise for minimizing the down side of deregulation as witnessed in other industries.

Marketing and marketing management texts are not without their caveats in their approaches to the issues discussed in this paper. Many encourage pro-active efforts and a self-regulatory stance to forestall marketplace difficulties that may find remedies in re-regulation. Assael's (1992) *Consumer Behavior and Marketing Action* offers a set of guidelines in this context, presented here with linkages to energy program evaluation and the competitive environment:

- *Reduce barriers to communication with customers, including encouraging complaining behaviors.* Conduct research to identify customer preferences for establishing effective communication channels, seeking out opportunities for responsiveness to and reaction to new products and services.
- *Assure systematic internal communication mechanisms based on analysis of complaints.* Analyze customer communication and complaints for patterns and identification of source of the problem, directing results to appropriate product managers for incorporation in revised marketing strategies.
- *Conduct strategic customer satisfaction surveys as a supplemental source of product acceptance.* Prepare survey design and implementation plans during the product development stage, identifying other stakeholders to include, as appropriate.
- *Ensure redress of complaints.* For this purpose, establish an in-house unit that acts as an integral component of the marketing function rather than a separate entity operating in isolation.
- *Institutionalize a mechanism for mediation/arbitration of complaints.* Utilize one of many independent bodies such as the American Arbitration Association or Council of Better Business Bureaus for establishing procedures and identifying and training volunteer mediators and arbitrators.

In the final analysis and in the long term, it will be the integration of advances in energy program evaluation with marketing research and the right mix of regulation, deregulation and self-regulation that will determine the success of retail competition. Future conference proceedings of the type reviewed here will no doubt reveal the successes and failures along the way in the same manner as they have been doing in recent years.

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