

Toward a Methodology for Evaluating Market Transformation Programs

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ABSTRACT

As more market transformation programs are implemented, evaluation of these efforts becomes critical. As one of the first organizations to implement a wide menu of market transformation programs, the Northwest Energy Efficiency Alliance is actively engaging this issue. The author discusses current efforts in evaluating market transformation programs, and proposes a general paradigm for assessing program progress. Among the issues discussed are definitions of market transformation, market characterization and market progress reports and the most critical component: measuring progress toward an exit strategy. A brief review of the tools that are available to conduct market transformation evaluation is presented, and areas for future development are suggested.

Introduction

The Northwest Energy Efficiency Alliance (The Alliance) is sponsoring over two dozen programs directed at transforming the market for energy efficient products and services. The funding for these projects is an amalgam of public and private utility contributions, and, the funders, regulators, non-utility Board members, and other stakeholders want to know how effectively this money was spent. Evaluation has been an integral function of the Alliance since its inception – evaluations of all projects and of the Alliance as a whole was written into the Memorandum of Agreement that established the funding of the Alliance. Evaluation effort and budget are integrated into the program planning and implementation process in an iterative sequence we call “adaptive management.”

While we all agree that evaluation plays an important, if not pivotal role in market transformation programs, we are still not in agreement as to what constitutes a complete, or comprehensive evaluation, and how it differs from what we now call “traditional” DSM evaluation. This paper presents an effort to put the various MT evaluation efforts under one overall approach. First, we present a “top down” approach toward MT evaluation. Second, we examine issues of timing and level of effort, and finally some real world experience and issues in the conduct of these evaluations.

Overview

To start out the discussion, we would like to touch briefly on the prior DSM evaluation paradigm, and present a MT evaluation model. The evaluation community has a great deal of experience in evaluating DSM programs. These programs essentially were evaluated using a pre-post participant/nonparticipant research design. The analytic tools ranged from econometric modeling to engineering simulation. The data for these models came from billing histories, customer surveys, metering and on-site inspections. The unit of analysis was the building, or an end-use within a building type. Attribution of effects is essential to the concept of program evaluation, and was

particularly important in situations where shareholder incentives were tied to net energy savings. Controlling for the effects of free riders became an important activity from the regulators' perspective, while accounting for "spillover" became a utility priority. However, spillover stopped at the border of the utility's service territory; the societal benefits of efficiency gains outside the service territory were ignored. Process evaluations generally focused on program implementation issues, improvements in program operation (reduction of overhead) and adherence to the approved delivery mechanism. Impact evaluations were undertaken usually in the second or third year of program implementation, so that at least nine months to a year of post-installation or post-intervention billing history was available.

Evaluation of market transformation programs, on the other hand, has a short track record. We do understand certain things about MT programs. First, MT looks different from traditional DSM, it's measured differently and the traditional DSM evaluation questions don't necessarily apply. Traditional DSM programs and their evaluations were focused on participants. Market transformation and its evaluations must focus on the whole market, of which "participants" contacted directly by the venture are only a fraction of the market. MT looks different from DSM in that the focus is on markets, market penetration and sustainable market effects. It's different in that a wider variety of data and information are required. Finally, it's different in that there is an "exit strategy" leading to a modification, reduction, or cessation of the market intervention, hopefully resulting in a self-sustaining market position for the targeted technology or practice. For a full discussion of these terms readers are directed to Eto et al.(1996), Keating et al. (1998) and Nadel and Latham (1998).

These differences are highlighted in the different metrics for measuring MT program success. Much of the data is qualitative, relying on market intelligence and discussions with market actors. Rapid feedback to program managers is a requirement, rather than a preference; markets move too fast for annual or biannual process evaluations. Energy impacts of market transformation programs are not limited to program participants or to utility service territories. Evidence of a transformed market – program success – must be measured at the appropriate level. Because of the nature of markets, some of these impacts can only be roughly estimated, and attribution to the program, or venture, is more indirect and anecdotal, rather than statistical. Table 1 below, compares some different attributes of traditional DSM and MT program evaluations.

Table 1. Comparison of DSM and MT Evaluation Issues

Demand-Side Management	Market Transformation
Process evaluation of implementation	Adaptive management; market intelligence
Program Net Savings	Total market effects
Utility attribution	Market attribution
Program year analysis	Cumulative effects/ self sustainability
Control for free riders	Macro-level market activity
Participant focus	Market focus
Utility data	Market data
Comparison groups/models	Indirect attribution

Some important conceptual work has been done to set up the MT evaluation framework. Eto, (1996) presented a list of characteristics of market barriers presenting inertia against transformation. Feldman (1996) took a deductive approach in asking the question: how can we tell that a market has been (or is being) transformed. Along with the traditional variables of market penetration and market

share and attitudes, Feldman added changes in the conventional way of doing things (process), new entrants (suppliers) and new products. The last two variables are of particular interests of energy MT, because of the programmatic aspect of our efforts.

When starting to evaluate a MT program, the first step is to define the primary questions. Eto et al. (1996) suggest a useful three-fold hierarchy focusing on market changes (observed differences), market effects (attributable to the venture), and market transformation (structural, permanent effects). The approach we have taken at the Alliance is to develop a baseline of information, track changes and attribute effects, where possible, and to test progress toward an explicit end-state to determine whether market transformation has taken place.

The basic parameters for measuring market effects have been developed by Feldman (1995), who suggests the indicators that follow in Table 2:

Table 2. Indicators of Market Effects

- | |
|---|
| <ul style="list-style-type: none">• Attitudes and information• New Actors• Competing products• New Rules• Market Share• Market Penetration |
|---|

These indicators that something is happening in the market are measurable, using conventional tools of DSM evaluation and market research. Yet, if we agree that market transformation is a dynamic process, the indicators listed above are only a snapshot of the process. Studies undertaken in New England and in California - market effects studies examining the structural or behavioral impacts of resource acquisition programs - provide field tests of potential MT evaluation methodologies. The true test of market transformation evaluation is in the long-term behavior of the market in the absence of a MT program, or rather in the integration of programs into private sector practices.

The fact that there are market effects does not mean that there has been market transformation. Perhaps the most succinct definition of market transformation has been put into practice by the Northwest Energy Efficiency Alliance. Market transformation is a term of art used to describe a process whereby energy efficiency becomes a competitive and widely available alternative to conventional energy technology and practice. This process is achieved by identifying and addressing market barriers and leveraging opportunities to develop self-sustaining ventures. The concept of leveraging opportunities has a benefit-cost basis. In traditional DSM programs, the target was usually the individual end user. While many programs were cost-effective using this paradigm, incentivizing the customer directly may be the least cost-effective way of influencing energy efficiency markets. Figure 1 presents a diagram of market transformation cost effective leveraging opportunities. As can be seen, the “leverage opportunities increase, along with cost effectiveness, the “deeper’ into the market process a venture is developed.”¹

¹ Jeff Harris, of the Northwest Power Planning Council and the Alliance, suggested this model as represented in Figure 1.

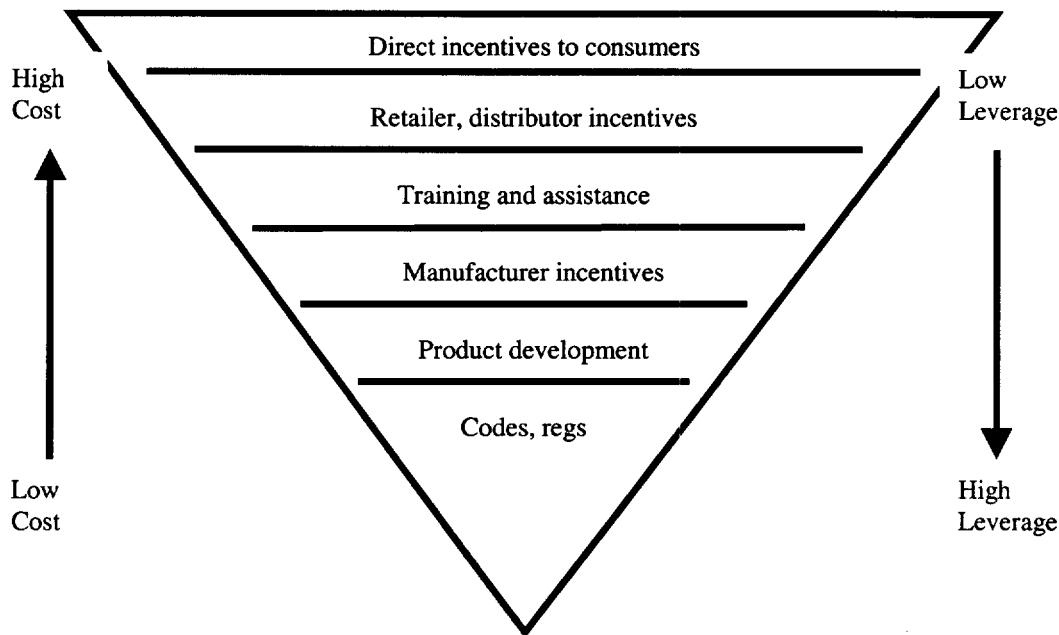


Figure 1. Opportunities for Leveraging Market Transformation Programs

The term “exit strategy” is used to describe a point in the process when ventures are determined to be on the path toward self-sustainability, and thus require no further market intervention. In its extreme form, the goal of market transformation is to make inefficiency “unprofitable, unavailable, or illegal.”²

Given that there is some consensus around a common understanding of the goal of market transformation (Keating et al., 1998), how are we to evaluate the effectiveness of MT programs? First, let’s agree on a common understanding of evaluation. To paraphrase Trochim (1997), evaluation is the systematic acquisition and assessment of information providing empirically driven feedback for decision making. This definition captures the dynamic aspect of evaluation that is one of the keys of MT evaluation: systematic, ongoing feedback. It’s not sufficient to wait a year or two as we did in conservation resource acquisition programs.

The Story

Evaluation of a Market Transformation program begins with the “story” (Herman et al., 1997) of the venture. The project should have a well thought-out hypothesis of the anticipated maturation of the project, ending with the exit strategy. Without this “story,” we cannot develop indicators of progress, market intelligence, focus on barriers or identify opportunities. In short, the “story” is the framework upon which we can develop the evaluation strategy. As new information is produced by the evaluation, the “story” may change; however, it still remains the central thread of the process.

² This phrase is attributed to Tom Eckman of the Northwest Power Planning Council and the Alliance

The “story” is part of the Alliance’s requirement for supporting ventures and the evaluation tracks the progress of the “story.” The completion of the “story” is related to our “exit strategy”, which is point at which our support is no longer necessary to ensure the success of the venture.

Baseline

The baseline is the market research that describes the initial state of the market where the venture takes place. It begins with a market characterization describing the structure of the market and the main players in the market. It should characterize the process by which a product is produced, sold and installed, and the various actors who participate in the process. The market characterization may include manufacturers, distributors, designers and specifiers, service providers and consumers. The research required at this phase may also identify opportunities for further leveraging the program. For example, it may be found that certain manufacturers are poised for expansion. Or, that consolidation is taking place in an industry. Each of these scenarios offers opportunities to leverage market transformation resources more effectively. On the other hand, the market characterization may show program design flaws, such as assumptions about the importance of a market actor such as distributors. Typically, the characterization is expressed as a flow diagram. Finally, the market characterization should describe the variety of products competing against the venture product, and their market niche, and an estimate of the market potential if the venture is successful.

Market segmentation, where possible, is part of the venture plan, but may also be part of the baseline market characterization. These market segments are not the same as the market segments examined in DSM evaluations. Market segments are not building types. They are not utility rate codes. Rather they are the targets of venture marketing effort. Some market segments targeted by the Alliance include purchasing agents, specifiers and property management firms. These segments cut across traditional building-type market segments. Rosenberg, et al.(1998), for example, have used non-traditional market segments to assess the effects commercial lighting programs in California.

The baseline should contain a description of the initial hypothesized market barriers the venture is designed to overcome as well as the status of the targeted product or service in the marketplace. In theory, these barriers should have been made explicit in the design of the venture. In practice, however, many programs are designed and implemented without the basic information necessary to establish a baseline and the onus of gathering the information falls on the evaluation staff.

Where applicable, the baseline should contain an assessment of the attitudes, awareness and purchasing behavior of the affected publics and consumers in general. Affected publics may be regulators, implementers or other market actors.

Finally, the baseline should make explicit the data required for updating the baseline and generating future reports.

The key role of the baseline assessment makes any market transformation evaluation a “front-loaded” activity. Whereas, for DSM evaluations, the bulk of resources were expended at the impact evaluation stage – 2-3 years after a program was initiated – MT evaluations are most resource intensive at the beginning. In most cases, the baseline cannot be re-created, it is more cost effective to gather the data at the beginning of the program, rather than leave data gaps at the end.

Since markets are dynamic and subject to other forces than the venture itself, it is important to develop some leading indicators of market effects so that programs can respond to these changes. In addition, market effects will may, in all probability, be manifested a year or two into the venture. Waiting for sales data will not be sufficient to assess the progress of the program. Leading indicators

can be as simple as attitudes and awareness. Still, a baseline for these indicators needs to be established so that future comparisons will be meaningful.

Market Progress Evaluation³

Following the Baseline reporting, the next regular products of MT evaluations take the form of Market Progress Evaluation Reports (MPER). The MPER's are status reports focusing on changes in the market, compared to the baseline. The focus is on barriers addressed and new barriers identified, on market penetration and market share and opportunities for further leverage. Program progress, implementation statistics milestones and financial information should also be reported.

The purpose of the MPER's is to monitor program progress, evaluate the success of the program in addressing program barriers, identify new barriers and opportunities, and to maintain a consistent record of the transformation process. Critical to this process is the documentation of the "story," or the market hypotheses. This documentation is necessary so that progress toward the exit strategy can be monitored.

MPER's should be frequent enough to be able to identify significant market changes. These changes can be due to the venture, or they can be due to other events occurring in the market, such as consolidation, changes in distribution practices or shifts in manufacturing process. These external changes can occur quickly and quietly, and only frequent monitoring of the process can identify the change quickly enough to react appropriately. At the Alliance, we schedule MPER's every six months. Each of the Reports may not contain a full update of all the statistics and issues. Some triage is necessary so that resources are wisely allocated. Some effects are not expected to be seen for a year, and do not need to be measured in the interim, but keeping a finger on the pulse non-program market changes is still important. MPER's also should build on each other, referring to previous trends and recommendations. Thus an ongoing record of the process is maintained. This in turn will lay the foundation for attribution.

The focus on the progress of the market suggests that periodically looking at the market as a whole is required. This means thinking "outside the box" of demand side management and conservation resource acquisition: it's markets, not participants. The focus on the market as a whole means thinking outside utility service territories, thinking about competing, or new products, new market entrants and market impacts in addition to the success of the specific venture in distributing "widgets."

Market changes can be subtle, but significant. In the Pacific Northwest new products have emerged that compete directly against venture products. Retailers, in a sense, are selling "against" the program. However, these are important impacts because they raise the level of efficiency in the market segment as a whole. In discussing these changes with the appropriate market actors, it is possible to attribute these effects directly to the venture – effects above and beyond the penetration of the venture technology. Another subtle indicator of market transformation success is the entry of new actors into the market. This indicates that the market is vibrant, growing and profitable. It falls on the evaluation to track and monitor these impacts, which must be compared against a baseline to be meaningful.

³ The term "Market Progress Report" was originally coined by Ken Keating of the Bonneville Power Administration

Discussion

Evaluating market transformation programs is a developing field, which is being invented as we go along. Some important definitional and theoretical work has already been done. The challenge now is to translate these ideas into standard practice. The Northwest Energy Efficiency Alliance has taken a major step toward this goal. We have integrated evaluation into our market transformation efforts through a process we call “adaptive management.” We have established a standard process for developing program baselines, and following the ventures through biannual market progress evaluation reporting. Finally, we have integrated “the story” in to program evaluation and implementation so that we have a map of where programs are going, and how progress toward market transformation will impact the need for further Alliance support (our exit strategy). But much work needs to be done, particularly in the area of attribution of effects. It’s an exciting time for the evaluation community.

References

- Eto, J., Prael, R., and Schlegel, J. 1996. *A Scoping Study on Energy Efficiency Market Transformation by California Utility DSM Programs*. Berkeley, CA: Lawrence Berkeley National Laboratory.
- Feldman, S. 1994. “Market Transformation: Hot Topic or Hot Air?” *Proceedings of the 1994 ACEEE Summer Study*, pp. 8.37-8.48.
- Feldman, S. 1995. “How do We Measure the Invisible Hand?” *Proceedings of the 1995 International Energy Program Evaluation Conference*, pp. 3-8.
- Hermann, P., Feldman, S., Samiullah, S., and Munzih, K.S. 1996. “Measuring Market Transformation: First You Need a Story . . .” *Proceedings of the 1997 International Energy Program Evaluation Conference*, pp. 319-326.
- Keating, K.M., Goldstien, D.B., Eckman, and Miller, P. 1998. “Wheat, Chaff and Conflicting Definitions in Market Transformation.” *Proceedings of the 1998 ACEEE Summer Study*, forthcoming.
- Nadel, S., and Latham, L. 1998. *The Role of Market Transformation Strategies in Achieving a More Sustainable Energy Future*. Washington, D.C: American Council for an Energy-Efficient Economy.
- Rosenberg, M., Besa, A., O’Drain, M., and Rufo, M. 1998. “The Market Effects of SDG&E’s and PG&E’s Commercial Lighting Efficiency Programs.” *Proceedings of the 1998 ACEEE Summer Study*, forthcoming.
- Trochim, W.M.K. 1997. The Research Methods Knowledge Base, William M.K. Trochim.