Learning from Public Health: Embedded Evaluation and its Applications to Energy Efficiency

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Abstract

Now is a pivotal moment in the field of energy program evaluation. With movement toward standardized methods and evaluator certification, it is clear that we are working to solidify our profession and its role in demand side management. However, much of this conversation leaves out critical considerations of process and what is best for program innovation and advancement. Other evaluation practices have moved toward standardization while also maintaining an eye toward program development, growth, and potential. As energy programs move away from rebates to more sophisticated market and behavior-change models—often requiring more real-time evaluation approaches—we would do well to look to other evaluation fields for guidance. By drawing on the strategies and lessons learned in similarly rigorous evaluation fields, we can enrich our industry.

Public health, in particular, made a clear move toward integrated evaluation in the mid-1990s. At the time, emerging efforts, including those led by the Centers for Disease Control (CDC), highlighted the importance of identifying and defining evaluation frameworks and standards. Chief among these standards were new approaches that emphasized combining evaluation with program planning and management. Today, public health evaluation efforts focus on evaluation designs and methodologies that are applied, feasible, realistic, and timely. Instead of waiting until a program has been in the field, public health programs are now rolling out evaluations at the time of program implementation. Trends toward participatory approaches have also aided in engaging appropriate stakeholders, ensuring the ease of implementation, and use of evaluation data. The result is that evaluation becomes embedded within programs, leading to continual assessment and improvement of those programs and enhanced outcomes for program participants. This paper argues that best practices for embedded evaluation from public health should be applied to energy evaluation, particularly for process evaluation.

The paper begins by presenting an overview of evaluation theories, frameworks, and best practices from public health. Next, we provide specific evaluation examples and associated lessons learned. Examples include innovative process, outcome, and impact evaluations, in addition to recent efforts in participatory and empowerment evaluation approaches. In the last section, the paper discusses potential applications of these models to energy programs. As the energy industry moves toward standardized evaluation approaches, it is critically important to explore alternative models of evaluation that may help us usher in new program models and theories. To date, most evaluations of energy programs require, and prefer, the evaluator to keep an arms length from program implementation. We should question whether these are the approaches we want to set in stone, and examine whether we can benefit from real-time embedded evaluation approaches to better support our programs, such as those used widely in public health. Drawing on the lessons learned for embedded evaluation in public health provides a lens with which to view our own approaches, and to examine ways we might improve the practice of energy program evaluation at this critical moment in time.

Introduction

As the field of energy program evaluation moves toward standardized models of evaluation, it is critical that we also keep an eye toward program development, growth, and potential. In this paper, we describe the history of evaluation approaches in public health, and how the field has moved toward standardization while also fostering participatory and empowerment evaluation models. These two approaches touch on all stages of evaluation work, from planning to collaboration to data collection and evidence gathering, in order to increase stakeholder buy-in and to gain quicker feedback about program processes and effectiveness.

Evaluations in the utility industry have been trying to move this direction for years. However, there are policy, attitudinal, and other factors that tend to thwart such efforts. In this paper, we do not argue for the abandonment of standardized evaluation approaches for the field of energy efficiency. Instead, we highlight the importance of participatory approaches to expand the purpose and means by which evaluations within our industry are conducted.

We begin by presenting an overview of public health evaluation history, including evaluation theories, frameworks, and best practices. We discuss the development of a standardized model of evaluation in the early 1990's, and the growth of participatory and empowerment evaluation approaches. Next, we describe benefits to these types of approaches, with specific examples drawn from the field of public health. We then describe the potential applications to, and benefits of, these models to energy efficiency programs. We conclude with a proposed model for using participatory evaluation approaches in energy efficiency.

Findings

Brief History of Evaluation Approaches in Public Health

Program evaluation is essential to the field of public health. In the 1990's, the field of public health coalesced around a recognition that evaluation was not consistently practiced, nor embedded within the day-to-day mangement of many public health programs. Growing recognition of its importance led the Centers for Disease Control and Prevention to develop a framework for evaluation in public health (figure 1). That framework described a systematic way to assess the strengths and weaknesses of programs, policies, and organizations to improve their effectiveness.

Figure 1. CDC Framework for Public Health Program Evaluation*
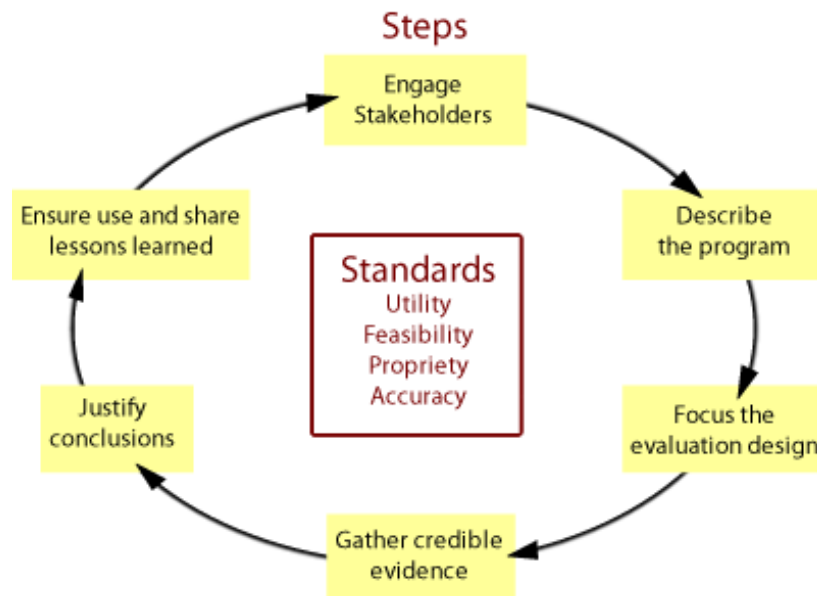
* Figure from US Department of Health and Human Services, Centers for Disease Control and Prevention, 2011.

The cycle begins by engaging all relevant key stakeholders. In the public health context, key stakeholders include, but are not limited to, program leaders, implementation staff, funders, and the individuals or commumnities directly affected by a program and its evaluation activities (Linnan and Steckler, 2002). The first step is critical. Without engaging all stakeholders, important evaluation questions might not be asked, or evaluation findings may be criticized or resisted if the stakeholders' concerns were not addressed during the evaluation.

In the energy context, the stakeholder engagement process can be dramatically improved by simply integrating evalutors and program teams. Recent work by this article's authors sought to evaluate an innovative, community-based program implemented in seven diverse communities. Having detailed conversations between the evaluation team and the utility partner regarding what was being uncovered throughout the evaluation process led to a more nuanced and deeper understanding of the program, its processes, and impact results.

However, just integrating evaluation and program implementation teams would not fully capture the intent of participatory evaluation. The most notable difference in the public health approach, compared to energy efficiency, is the engagment of the target community, or as we woul define them, "participants." While energy efficiency typically refers to "funders" or "intervenors" as stakeholders, the public health context recognizes that the definition of "stakeholders" extends to the end users or benficiaries of the program. This more widely cast definition of "stakeholders" produces a more diverse group of individuals in terms of evaluation knowledge and experience, background, education, occupation, and most importantly,

investment in the programs' success. By including end users in the participatory model along side funders, program teams, and intervenors, more agenda-focused stakholders' may be tempered by the voices of particpants.

At first blush, the inclusion of participants as stakeholders may appear complicated, however evaluation practices in public health have demonstrated that diverse groups of stakeholders can be brought together. In doing so, evaluation quality is improved. For example, extending the "stakeholder" definition to include participants and end users, evaluators are better able to identify, and subsequently quantify, a wide range of potential program benefits beyond savings alone.

An example from public health will help illustrate this point: an after-school program seeks to decrease school abseentism and reduce alcohol use among its students. Evaluators employ a pre-post design and use survey methods to capture data related to school abseentism and alcohol use. At the conclusion of the evaluation, evaluators determine that there are little effects of the program on these outcomes and present these results to stakeholders. Stakeholders are frustrated that the evaluation did not capture other benefits that they believe are important effects of the program: for example, that the program provides a safe space for their children and keeps them off the streets after school. If evaluators had employed participatory approaches, this may have been avoided. Instead, evaluators would have worked with all program stakeholders to describe the program and design an evaluation that would capture relevant data. Qualitative methodologies may have been particularly important to employ in this context, and are often an important methodological consideration for moving beyond traditional, survey-based evaluations.

In short, it is critical that a diverse group of stakeholders are engaged and given a "seat at the table." Applying this process to energy efficiency would require that, instead of having independent third-party evaluators deliver evaluation results at the conclusion of a program, evalators design a participatory model at the onset of program planning so as to enagage stakeholders (including participants themselves) in the evaluation design.

Once integrated into the process, stakeholders and evaluators work together to describe the program to be evaluated, including the public health need that the program seeks to address (or in the energy case, the market or resource acquisition need), the context in which the program operates, and program outcomes, outputs, activities, and resources. This approach is not unlike program theory and logic model (PTLM) development where evaluators work to gain consensus around the goals and objectives of the program.

Next, evaluators facilitate stakeholder engagement to formulate the purpose of the evaluation and to focus the evaluation on issues of the greatest interest or concern to all stakeholders. In this stage, it is important for stakeholders to reach consensus on how evaluation results will be used, bearing in mind the utility and feasibility of work. This process of consensus-building also provides stakeholders with the opportunity to ask questions and have their evaluation perspectives and issuess addressed. If and when consensus cannot be reached, this process promotes a common understanding of the program and the evaluation among its stakeholders.

Next, evaluators begin the process of gaterhing evidence. Note this is the typical "start" of an evaluation in the energy efficiency context. In the field of public health, this may require a randomized controlled trial or quasi-experimental design. At other times, qualitative methodologies used without a comparison group might be most appropriate. Credible evidence allows for the development of justified recommendations to improve program activities or

performance. Conclusions should be developed based upon the data and evidence that was collected, and should align with the agreed-upon values of the stakeholders. Finally, the evaluation results must be conveyed to all stakeholders, and used in decisions or changes to improve program effectiveness.

Clearly, the utility industry differs from health – particularly when considering evaluations to test the effectiveness of new drugs or medical devices. In such a scenario, the repercurssions of designing and conducting a poor evaluation can be severe – even life or death for those involved in evaluative work of drug testing. In the utility industry, the stakes may not be as high. However, ever-diminishing funding and lack of adequate time to determine the effectiveness of energy efficiency programs requires that our evaluations are focused and adequately meet the needs of its stakeholders. Currently, many utilities are required to complete annual and program cycle impact evaluations in order to justify ongoing program funding. If the utility industry and its policymakers and evaluators are to supplement current evaluation methodologies with those proposed herein, it will be necessary to more deeply engage stakeholders, push for utiltities to become more active participants, or at least partners, in evaluative work of their programs, and be willing to integrate an on-going stakeholder process into planning and reporting cycles.

Notably, this framework highlighted the importance of integrating evaluation appproaches with routine program operations. Instead of relying on independent, third-party evaluation experts and evaluations *after* a program had concluded, this newer public health paradigm shifted evaluations toward ongoing, embedded research that involve all program stakeholders. These embedded evalaution approaches allow for continual feedback of program operations and practices, leading to ongoing learning and program improvement. Such embedded evaluation designs necessitate a degree of planning and coordination during the program design and data collection phases. Instead of implementing a program, and then trying to develop an evauation plan, these approaches meld planning for programs and evaluation together, with all stakeholders involved during these processes. When programs are rolled out, evaluation work can commence in tandem with the programs' implementation.

Empowerment Evaluation

Public health has coined a term for this type of evalution, called "empowerment" evaluation. While this definition has evolved from its inception, the latest framework for empowerment evaluation, according to Wandersman et al (2005), defines empowerment evaluation as "an approach that aims to increase the probability of achieving program success by (1) providing program stakeholders with tools for assessing the planning, implementation, and self-evaluation of their program; and (2) mainstreaming evaluation as part of the planning and management of the program/organization" (Wandersman, et al, 2005, p. 28). In 2007, Fetterman and Wandersman laid out 10 principles of empowerment evaluation (table 2) (Fetterman and Wandersman, 2007).

Table 2. 10 Principles of Empowerment Evaluation.*

Principles of Empowerment Evaluation	Definition
1. Improvement	Improve program performance.
2. Community Ownership	Value and facilitate community control.
3. Inclusion	Invite involvement, participation, and diversity.

4. Democratic Participation	Open participation and fair decision-making.
5. Social Justice	Address social inequities in society.
6. Community Knowledge	Respect and value community knowledge.
7. Evidence-Based Strategies	Respect and use both scholarly and community knowledge.
8. Capacity Building	Enhance stakeholder ability to evaluate and improve program planning and implementation.
9. Organizational Learning	Apply data to evaluate and implement practices and inform decision-making.
10. Accountability	Emphasize outcomes and accountability.

Definitions adapted from Fetterman and Wandersman, 2004.

Benefits to Embedded and Empowerment Evaluation Approaches

Embedded and empowerment evaluation approaches enable evaluators to capture information that is relevant to stakeholders, increase community knowledge and skills, aid in reaching marginalized populations, and help distinguish and measure unanticipated outcomes. This form of evaluation also has a number of additional outcomes:

- **Promote more timely feedback and information on what is working within a program, how it is working, and why.** Given that a primary goal of program evaluation is to inform and improve programs, such approaches help to do so prior to significant resources being spent on programs that may, in fact, be ineffective.
- **Increase community knowledge, skills, and capacity.** By engaging stakeholders throughout the evaluation process, individuals and communities become more invested in the achievement of positive outcomes. In addition, communities become primed for future intervention efforts.
- **Aid in reaching marginalized populations, including low-income populations (which may be of particular relevance to energy efficiency), youth, and highly mobile populations.** In their 1992 article, Dorfman et al (Dorfman, Derish, and Cohen, 1992) provide a wonderful example of using qualitative methods in both a process and outcomes[1] evaluation to provide a more comprehensive assessment of how to reach a marginalized population. Instead of relying solely on quantitative approaches, evaluators conducted open-ended interviews with participants to explore motivation for participation in the intervention. Ultimately, this research led evaluators to determine appropriate messaging strategies for reaching this marginalized population with future program efforts.
- **Highlight the ability to evaluate benefits that may not be key intervention outcomes or impacts.** By engaging with stakeholders to describe the program, evaluators have the opportunity to learn about all perceived benefits of a particular program. This allows evaluators and stakeholders to creatively plan evaluations to capture outcomes that demonstrate other types of benefits of a given program (often called non-energy benefits in the field of energy efficiency).

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[1] In public health, outcome evaluation includes the measurement of events or conditions that signify program effectiveness. These often include short, intermediate, and long-term outcomes, such as changes in participants' knowledge, awareness, beliefs, and behaviors.

Table 3 below compares and contrasts traditional evaluation approaches to empowerment approaches.

Table 3. Comparing and Contrasting Traditional Approaches to Empowerment Approaches for Energy Efficiency

Traditional Approaches	Empowerment Approaches
Evaluation planning begins after program implementation	Evaluation planning begins during program design to ensure metrics and program elements are evaluable
Stakeholders are engaged in single purpose-driven conversations (i.e., Program Manager interviews)	Stakeholders (including evaluators, program staff, others) communicate regularly as a team
Evaluation is not integrated into program-specific meetings. Evaluators are not included in these meetings due to concerns of independence of evaluators.	Evaluation is integrated into program-specific meetings. Evaluators are included in these meetings. Integration of evaluators does not inherently imply lack of independence.
Data collection focuses on metrics that evaluators believe are relevant; data collection may miss key outcomes.	Data collection focuses on capturing metrics that are relevant to all stakeholders; data collection is more likely to capture outcomes that are relevant to stakeholders.
Evaluation methodologies rely heavily on engineering modeling and surveys.	Evaluation methodologies rely on qualitative methodologies (i.e., ethnographic research) to gather insights.

Barriers to the Adoption of Empowerment Approaches in Energy Efficiency

Similar to the transformation of evaluation within public health, evaluation within energy efficiency is quickly changing. The applications and benefits of embedded evaluation approaches from public health are well-suited to the field of energy efficiency, particularly for the growing field of behavioral research. Within the field, there has already been recognition that evaluations must move beyond traditional evaluation approaches. Indeed, many evaluations and evaluators are already doing this. Instead of focusing on traditional customer satisfaction, pre-post, and tracking surveys, evaluations are now employing qualitative methodologies and seeking to determine program benefits beyond energy savings. Despite this, there are particular policy, attitudinal, and program issues that can thwart the application of such approaches within energy efficiency:

- **Planning and Reporting Cycle**: Many utility efficiency programs have prescribed timelines with stringent reporting cycles, which may have financial implications. Additionally, the issues to be addressed may be controversial and difficult to measure (e.g., free ridership and spillover). These cycles prohibit "outside the box" planning and evaluations and force program administrators and evaluators to use standard evaluation techniques to meet requirements. Longer-term evaluation cycles and flexibility on reporting would be valuable and allow more embedded research – assuming that it is well thought out and strategically planned from the beginning. Evaluation structure and regular touch-points are critical to

ensure the evaluation is moving forward as intended.

- **Evaluation Funding:** Some would argue that a lot of money goes into evaluation, and in some cases from the gross dollar value, that is true. However, this tends to be a function of the growth of programs, when in fact evaluators are being asked to do more for less at the program-level. Funding for experimental or pilot programs are especially limited as measurement and verification studies tend to reserve evaluation funds for the largest saving or riskiest programs. Energy efficiency would benefit from putting more funding into pilot programs evaluations so that the market can be driven forward using best practices. If our industry does not do this, we will be limited in our ability to move beyond current technologies and the "low-hanging fruit" of energy savings.

- **Stakeholder engagement:** In the health field, individuals tend to have a strongly vested interest in a project, particularly when it comes to programs that have the potential to significantly improve our health or well-being. In the energy industry, there is less of a vested interest. Utility staff, especially those that have been in the industry a long time, tend to be transplanted into efficiency from different departments, and have a different level of interest than those in the health industry. Utility executives themselves are not always on board with efficiency unless it has a financial benefit through incentive mechanisms. The question then becomes how we position benefits of programs and evaluations to these stakeholders. Instead of relying on the traditional mantra of, "installing X will get me Y savings," our industry should be transitioning to a perspective that focuses on the social goods and benefits of doing X.

- **Data collection:** In public health, embedded evaluation approaches often employ qualitative, participatory methodologies. In the energy industry, data collection has largely emphasized engineering studies to capture energy savings and quantitative surveys to capture impacts. These methodologies still have an important role to play, but could be supplemented by methodologies used in embedded approaches.

- **Reporting:** In public health, reporting and dissemination of results often occurs among all stakeholders, including those individuals who are receiving the intervention. This is not typical in energy. However, dissemination of results presents an opportunity to once again engage stakeholders, and to prime audiences for future interventions. Such processes also have the potential to gain customer buy-in to energy efficiency programs and interventions.

Applications of, and Benefits to, Public Health Evaluation Approaches in Energy Efficiency

Despite such challenges, there are many benefits to using these approaches within energy efficiency. Such approaches afford real-time engagement with customers, allow for the identification and measurement of non-energy benefits, and may be particularly useful for engaging hard-to-reach populations. Each of these benefits is described in more detail, below.

- **First, adopting a participatory evaluation model affords real-time engagement with customers. Programs will be better positioned to make improvements when customer communication occurs more frequently.** For example, if energy program evaluators are engaged in on-going in-depth interviewing with program participants, it is possible to develop more real-time insight into customers' perceptions of program processes and benefits. Take, for instance, a standard direct install program for small business customers. If embedded evaluation approaches were employed, program teams would be able to pair

install work with follow-up in-depth interviews to provide quick and timely feedback to the program team while also collecting important intelligence on the small business market. These real-time interviews would shed light on program processes, outreach and communication tactics, and participant satisfaction overall. Ideally, these insights would be interested into a continuous improvement process that has the potential to increase cost-effectiveness through reduced acquisition and field costs while improving customer experience.

- **Second, participatory models help identify ancillary, non-energy benefits to programs and interventions.** As an example, recent work by this study's authors measured increases in participation and savings attributable to a unique community-based program implemented within seven diverse communities. In addition to employing survey research, we conducted in-depth interviews with community leaders to determine the strategies that worked best within each community, how these strategies were implemented, and non-energy benefits to community participation in the program. We found that community leaders highly valued the partnership that they had developed with their utility company through participation in the program. In addition, community leaders described high levels of satisfaction with the program and the utility company, and some participants expressed a desire to continue working with their utility. This is a wonderful example of how high-touch programs can positively benefit customer satisfaction. By using qualitative evaluation approaches and methods in real-time, we were able to identify unique characteristics of the program and dimensions of program satisfaction that would not have been captured by traditional survey research or the measurement of energy impacts alone. Other research has similarly found that those individuals involved with participatory evaluations express higher levels of personal satisfaction (Sabo, 2008). Similarly, this research has the potential to identify additional societal benefits and non-energy benefits that may ultimately be quantified and integrated into cost-effectiveness tests and other measures of a program's value. For example, benefits of comfort may be of interest for general population research, decreased fuel poverty among low-income customers, and increases in investment capital due to reduced fuel costs among business and commercial customers. In most cases, these potential benefits are largely unexplored and underreported. With embedded research approaches, particularly qualitative methods, learnings of this variety can emerge, offering new insight into potentially quantifiable non-energy benefits that may be of value to utilities, regulators, interveners, and public interest groups.

- **Third, as with public health, these approaches may be useful for engaging hard-to-reach populations, particularly for low-income customers.** By using participatory evaluation models, the approach becomes a customer engagement method in and of itself. Customers that may not traditionally participate in programs, or for whom more barriers to participation exist, may be more motivated to participate when engaged more deeply in evaluation work. As an example, training and enlisting community-based programs to engage and collect data on their constituents not only builds capacity of the organizations for self-evaluation, but also creates stronger community networks and outreach channels for subsequent program activities. By engaging local program administrators, as well as participants in research and evaluation activities, programs can build capacity for greater engagement around energy topics.

- **Fourth, public health evaluation approaches may be particularly useful for empowering customers and local organizations and governments with the knowledge and**

information that they need to make better decisions around their energy use. As an example, in the state of Iowa, utilities currently conduct tours for their customers and stakeholders as a means by which to share information. Similarly, in California, public workshops are held. Such forums serve as a platform to effectively create increased knowledge and awareness among multiple stakeholders. Relatedly, by empowering customers with knowledge and information, both about specific types of programs, and energy and resource management in general, customers will be more receptive to future program efforts. In addition, such approaches may have benefits related to increased customer satisfaction with their relationship with utility companies.

These benefits are not without their difficulties or drawbacks. Embedded evaluation approaches can be costly, time-consuming, require on-going collaboration, and have the potential to generate tremendous amounts of data. Regarding the latter, who is responsible for collecting and managing that data can vary widely across the industry. For example, in an evaluation led by one of this author's students, data collection tools were developed with youth working with an organization. The youth were attuned to what they believed the program was doing, and how it was benefiting youth participants. Using an empowerment approach, students worked with youth and the community-based organization to develop data collection techniques and tools that would capture relevant outcomes, and that would also be appropriate to administer to youth (i.e., correct reading level, use of terms employed by youth, etc.) This approach increased knowledge and capacity of youth, and also ensured that data collection and, ultimately, the final evaluation, would be relevant to all stakeholders (youth, community organization, etc.) However, processes for data collection and data management in this type of approach need to be discussed thoroughly, and the benefits and risks of those approaches managed. For example, if youth are to collect data, what are their obligations to maintaining respondent privacy and confidentiality? Should the community-based organization be the "owner" of the data, and if so, how should the organization manage the data? Clearly, embedded approaches raise additional questions that must be considered in the face of any evaluation context, whether in public health or energy efficiency.

Proposed Model for Energy Efficiency

Given the many applications and benefits of using public health evaluation approaches in energy efficiency, we now outline a proposed model for how this type of work might best be applied within the energy industry. We propose the following approaches to developing a participatory model in energy efficiency.

1. **Initiate evaluation planning alongside program design and planning.** Too often, energy program evaluations are designed and implemented long after programs are in field. Under the best circumstances, this results in evaluations that lack timeliness. Under the worst circumstances, programs are implemented that cannot be effectively evaluated due to design challenges. For participatory models to work in energy efficiency programs, the evaluation must begin alongside the program. This is likely the greatest challenge to our existing evaluation framework.
2. **Expand the definition of stakeholders within energy efficiency evaluation**. Currently, "stakeholders" in energy efficiency are narrowly defined as funders and interveners. However, stakeholders may include regulators, utilities, program administrators and

implementers, regional and local stakeholders, such as community-based organizations and government, end users, and even other evaluators.

3. **Engage stakeholders throughout each stage of the evaluation, with an emphasis on upfront evaluation planning and design.** At the beginning of an evaluation, stakeholders should be engaged in building consensus on research questions and program benefits through workshops in which the evaluator facilitates the session. The primary goal of these workshops are to enumerate energy and non-energy benefits, gain consensus on program goals, and engage program participants and local entities in the evaluation process. The secondary goal of these workshops are to give all vested parties a "voice" in the evaluation and to ensure that the evaluation maintains the interest of the public good in its measurement approaches, both process and impact. This involves ensuring that the evaluation plan and methodologies reflect the interests and concerns of all stakeholders, and that information gathered during the course of the evaluation will be used to improve program processes.

4. **Train program administrators and stakeholders on evaluation approaches and measurement techniques.** While this may not be necessary for every program evaluation depending on the breadth of activities in a region, trainings are invaluable for new programs, new stakeholders, and for controversial or newly applied research approaches in the energy space. This involves providing education on data collection, and creating channels and mechanisms for these stakeholders to provide feedback to improve program processes.

5. **Empower program teams and/or communities with the tools to assess their own outcomes on an on-going basis in support of evaluation.** Embedded evaluation data collection is critical for gaining real-time and ongoing insight into how programs work, and why. Once embedded in the program implementation process, on-going feedback can help identify program constraints and barriers to program participation. In an ideal world, such data collection would be facilitated, if not implemented, by a third party evaluation team. However, this is often not feasible due to budget constraints. Instead, third-party evaluators can set up tools and provide techniques to program teams and/or communities to collect valuable data that can later be verified and validated by a third party. Upon conclusion of embedded evaluation data collection, these findings should be used to inform the development of quantifiable metrics for use in survey research.

6. **Evaluation feedback must be provided to all key stakeholders in order to share evaluation results and inform recommendations for future program efforts.** Throughout the process, the evaluation team should communicate its findings to stakeholders. This provides an opportunity to educate and inform stakeholders on the program challenges and successes while also ensuring that the important learnings from the evaluation can be integrated into the program design as it is being implemented.

Such participatory design approaches are most appropriate and applicable to new and emerging program models and/or to those program models where savings may be more difficult to quantify using typical evaluation methods. For example, midstream program models necessetate participatory approaches. First, these approaches require that evaluation is initiated at the onset of the program because market effects are expected to occur relatively quickly if large retailers participate, and are successful in, changing their buying and stocking practices. For this reason, evaluators are engaged early to document and track the program effects in real time. Secondly, all parties can benefit from the stakholder engagement process, including the participants (retailers), the implementers and utilties, and the funders, regulators, and intervenors. Stakeholder workshops would ensure that all parties understand the necessity of evaluation activites, the data requirements and standards throughout, and the percieved risks associated with the program. Finally, because the data collection process is on-going and the market effects are expected to occur more swiftly than most evaluation cycles, evaluation training and continuous stakeholder feedback can help to ensure that the program effects are documented, communicated, and that all percieved risks are accounted for in the data collection process.

Conclusions

The field of public health has undergone a transformation of its evaluation approaches during the past two decades. The CDC framework for public health evaluation highlights the importance of engaging multiple key stakeholders throughout the evaluation cycle, beginning with describing programs and interventions, through the dissemination of evaluation findings. Participatory and empowerment evaluation approaches further expanded the field to more deeply engage stakeholders and develop evaluations that were relevant, meaningful, and useful to improving programs. These models engage evaluators and stakeholders alongside programs to elevate the role of evaluation from that of verification (did we save or not) to that of design partner (did we save, how can we save more, and what else are we achieving?).

Evaluations within the utility industry have been trying to move in this direction for years. However, key barriers prevent us from moving toward true embedded approaches. Such barriers include policy, attitudinal, and program issues related to program reporting, evaluation funding, and a lack of, or contentious, stakeholder engagement, among others. Despite these barriers, public health embedded approaches have direct applicability, and potentially tremendous benefit, if applied to the field of energy efficiency. Embedded approaches can be used as a method of customer engagement, thus affording real-time communication with customers and continuous process improvement. These approaches can help identify non-energy benefits which may be linked to increased customer satisfaction. In addition, these benefits may be of value to utilities, regulators, interveners, and public interest groups when calculating cost-effectiveness of programs. Embedded approaches can increase customer and community capacity by increasing knowledge and awareness and by providing communities with the tools that they need to make their own self-assessments about energy use. Increased knowledge and awareness can also help prime customers for future program efforts. Lastly, participatory approaches may be particularly useful in engaging marginalized populations.

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