

Preaching to the Choir: Are Repeat Participants Free Riders?

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ABSTRACT

Mature, long term energy efficiency programs can see customers coming back year after year for assistance and incentives. In some cases customers are changing behaviors based on the first project influence, and implementing these measures in similar projects. Repeated exposure to a message can make that message stick much longer than a single exposure. As a result, repeated participation can make for effective and efficient programs and can help produce lasting effects on the market. Programs need to be designed in a way to make maximum use of their resources. At some point, it will be more cost-effective to pull in new participants than to continue to provide services to a repeat participant. Regulators may push this issue by using free ridership rates to penalize programs and excluding distant past program activities from the definition of program support used to identify free riders. How can program managers and evaluators accurately distinguish between repeat participants who would implement the target actions now without program assistance and those that genuinely need program assistance? How should the savings generated by repeat participants be counted? How much attribution should be given to prior program efforts and how should that be determined?

This paper will discuss how two different utilities struggled with those critical questions. The paper will discuss methods for quantifying the influence of prior program experience, and for determining how to classify the savings attributable to the current and past program activities. The paper will discuss how regulators struggle with the concepts and what conclusions they reached.

Introduction

Consider this situation: A company receives financial incentives from a utility energy efficiency program in the current year because they implemented an energy efficiency measure. The program has been in operation for a long time. The participant has had interaction with the program over the years, perhaps receiving incentives, perhaps information and technical assistance. In a free ridership study, the participant says that they probably would have implemented the measure even if they had not received the most recent incentive. They say that they were convinced through interaction with the program *in prior years* that it was in their best interest to implement the measure. When evaluation staff come calling, should this participant be counted as a complete free rider? Should they be counted as a partial free rider? Should a spillover adjustment be made? In this paper, we will examine how two utilities and their regulators dealt with that question.

Why is Repeated Exposure Common? Why does it Signal Effective Program Implementation?

Good program design calls for repeated exposure to a message to 1) make sure it sinks in with the current customer staff, and 2) convince new staff of the benefits. Just because a

company was once convinced energy efficiency was worth investing in, does not mean it stays convinced.

Staff turnover can create a problem for maintaining gains in the market achieved by an energy efficiency program. If the program has changed the attitudes and procedures of, say, plant engineers so that they always specify energy efficient equipment, what happens when the plant engineer retires or moves to a different company in a different utility territory? Does the company maintain the procedures or does the new plant engineer start from scratch? Does the new plant engineer just copy what was done in the past assuming that it is company practice? On the other hand, if the program has changed institutional policies and won over those at the top of the organization, staff changes lower down may not undo the gains made. If an energy efficiency program is primarily targeting plant engineers, it may need to stay in the market for the long term to guard against backsliding.

Some projects take years from conception to completed implementation. A program may be involved at all stages. It may be particularly involved in the early conception stages to ensure that energy efficiency is taken into consideration. If program influences succeed in changing the early stages of a project, it stands to reason that the program should be credited with helping to achieve the energy efficiency gains. At the opposite extreme, programs that come in at the last minute to offer incentives for measures that have already been specified and planned can rightly be criticized for throwing money around to no effect (other than good will perhaps).

While these points make a good argument for the information and technical assistance aspects of programs, they do not necessarily make a good argument for providing financial incentives. If the main impacts of a program are to help customers see that energy efficiency is a good policy and then provide technical help to put energy efficiency thoughts into action, then what is the justification for providing rebates? (Providing financial assistance to support technical studies would fit within this logic.) In some cases, the prospect of receiving incentives can make the program's offer of technical assistance and information seem more appealing. It can open doors.

So What is the Problem?

Program managers, regulators, and evaluators all hope that a program is spending its money to good effect. They want to see that the funds are producing real energy savings. Providing rebates can be good for customer relationships and public relations, but if the official purpose of the money is to achieve energy efficiency, then programs should be held accountable for the efficiency achieved by their spending. If the majority of the impacts of a program are created by the technical assistance but the majority of the funding goes to rebates, how should the cost-effectiveness of the program be calculated? If the program technical assistance and education changes procedures and purchasing patterns at the beginning of the project design phase, and the financial incentives are delivered one or two years later at the end of installation, what credit should be given to current program year efforts? If the goal of DSM is not to hand out incentives, but to transform markets, should the issue be looked at differently and free ridership defined in some other manner?

Under the historical methodology, evaluations are tasked with measuring the net impacts of the current program year. Those net impacts are compared to current program year expenditures to calculate program cost effectiveness. If evaluators find that spending in the current year had little effect on projects that have been in the works for years, the impact of

current year spending can appear to be small – producing a low net-to-gross ratio and unattractive cost-effectiveness. This presents obvious challenges to evaluators and regulators who set the rules of the game. How should program impacts be calculated? There are three main options for treating repeat participants:

1. The only thing that should be counted are the impacts of current year spending on current year behavior.
2. Count as impacts the same as option #1 and label them direct impacts. Also count the energy impacts in the current year of past program efforts but label them as spillover impacts. Compute the net-to-gross ratio as $(\text{Direct impacts} + \text{spillover impacts}) / (\text{Gross reported impacts})$.
3. Take prior year program involvement and market transformation effects into account when calculating direct impacts (rather than labeling the effects of past efforts as spillover).

Option #1 enables simple program impact calculations and extrapolation to the future. Option #2 gives programs credit for helping customers over time, but some may be bothered by the distinction between direct and spillover effects. Option #3 simplifies the measurement issue but complicates extrapolation – evaluators have to guard against double-counting impacts. Option #3 has the added advantage of treating the program as a whole and not trying to calculate based on a distinction that may not be clear in the participant’s mind – the difference between actions that were inspired by the technical assistance and those inspired by the financial incentive.

Many utilities and program designers and managers struggle with this issue. Below we will discuss how two different utilities addressed the problem.

Case Study #1: Slice and Dice the Data

Utility #1 has been offering an energy efficiency program to its large commercial and industrial customers for many years. It provides education, technical assistance, and cost sharing for the energy efficiency measures. Projects tend to be large and take some time to go from idea to implementation. Utility account executives work with their customers throughout the process to help them identify and capture energy efficiency opportunities. With the urging of their public utility commission, the utility commissioned a study of free ridership and spillover. The commission wanted the study to focus on the effects of program activity in a given year, but they were willing to grant that prior year efforts would have an effect on current year behavior and accepted a research plan designed to tease out the effects of current and past interactions on participant behavior. While it was anticipated that spillover effects would partially offset the negative affect of free ridership on program claimed savings, the commission and utility agreed that the study results would be used to improve the program, not to justify ignoring the issue of free ridership.

The free ridership and spillover study was based on a telephone survey with participants with questions on the effect of current and past program involvement on the decision to implement energy efficiency measures. Senior analytic staff from a third party consulting firm implemented the survey so that they could ad-lib to ask probing questions when appropriate. The sample was based on participants whose projects were completed in a specific year (2005). For

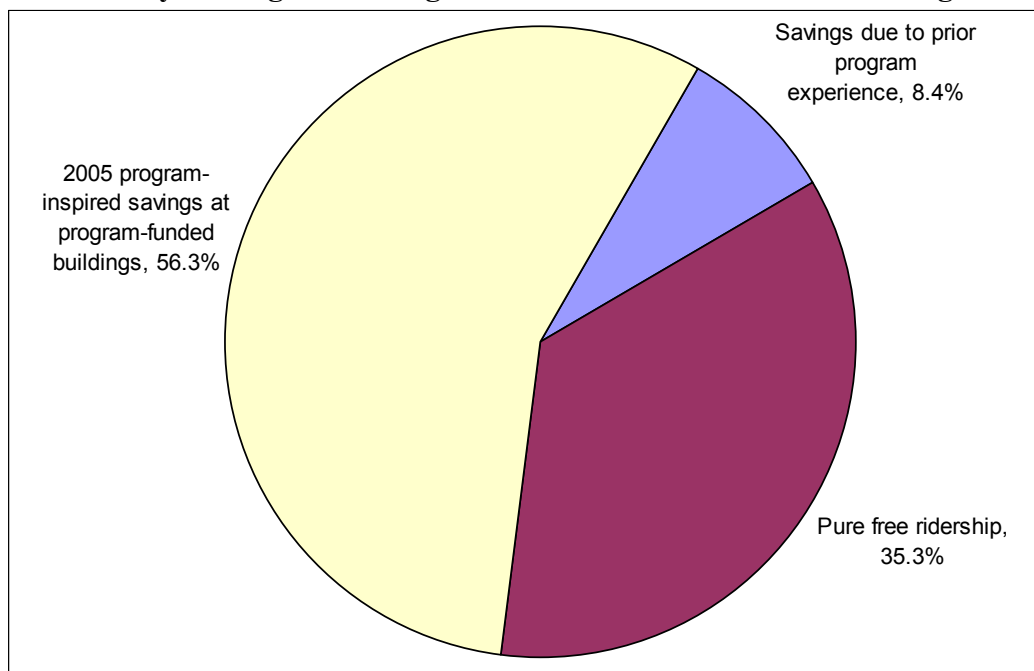
most questions respondents were instructed to think of their program interaction in that year when answering questions. To capture the effects of prior years, repeat participants were asked “How important was your prior participation in the program relative to the assistance that you received from participating in 2005 in your decision to install the energy efficiency equipment that you did? Answer on a scale of 1 to 5 where 1 means that your prior participation was much more important, 3 means it was equally as important as the assistance in 2005, and 5 means the assistance in 2005 was much more important.” Respondents were also asked an open-ended question about the influence of past program experience which the interviewer scored on a 1-5 scale.

Sixty-three percent of 2005 program participants received financial and/or technical assistance from the program for other projects in the past. Twenty-eight percent of the respondents indicated that their prior experience with the program had a great influence (1 or 2 on the five-point scale) on their plans to install high-efficiency equipment through the program in 2005. The influence of prior program experience is underscored by the fact that 28% of respondents reported that their prior program experience was actually *more* influential in their decision to install high efficiency equipment during 2005 than their 2005 program experience. This respondent feedback highlights the importance of long-term program implementation and provides evidence that the market transformation is underway.

Prior to taking the impacts of prior program years into account, the free ridership survey results indicated that free ridership was 43.7%. However, since responses to both the open-ended and scale question were quite consistent, it is reasonable to attribute a portion of the total free ridership estimate for the program to the cumulative program impacts resulting from participants’ prior experiences with the program. Dividing the free ridership energy savings into ‘prior program induced’ and ‘pure free rider’ buckets indicated that 8.4% of the total program savings were induced by prior programs, reducing the effective ‘pure’ free ridership to 35.3% (Figure 1).

The analysis presented so far divides program-reported savings into the three buckets shown in the graph above. However, including savings from prior program years in the calculation only presents part of the story. The utility and its public service commission also agreed to examine spillover, which represents energy savings that are due to the program but not counted in program records. For example, a participating building owner or engineer might observe the benefits of installing efficiency measures at a program site and, based on this experience, install the same or similar measures at the same site (participant inside spillover) or other sites (participant outside spillover) without formally participating in the program. The term “spillover” is often used because it reflects savings that extend beyond the bounds of the program records. Spillover adds to a program’s measured savings by incorporating indirect (e.g., non-incentivized) savings and effects that the program has had on the market above and beyond the directly incentivized or directly induced program measures. Within the participant survey, questions were asked to examine:

Figure 1. Summary of Program Savings Attributable to 2005 and Prior Program Activities



Note: Participant spillover is not represented in this graph due to the fact that the pie represents savings at program-funded buildings only.

Source: Summit Blue analysis of telephone interviews with 51 program participants.

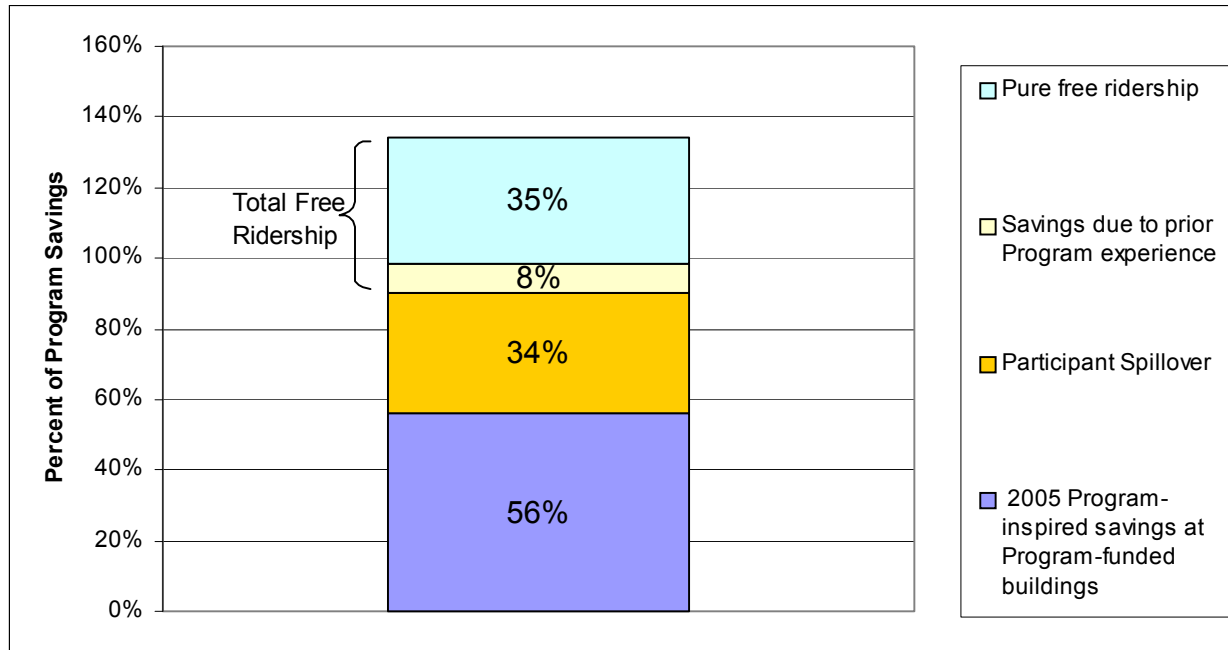
- Whether spillover exists at all. These were yes/no questions that asked, for example, whether the respondent installed energy efficiency equipment that was not recorded in program records. Questions related to extra measures installed at the project site (participant inside spillover) and measures installed in non-project sites (participant outside spillover).
- The extent of the spillover in terms of the size of the market to which it applies. These questions requested information on the number of projects/facilities into which additional measures or technologies were installed. (These questions were not asked for inside spillover because the value applies only to the one project on which the interviewee focuses.)
- The amount of savings per spillover project. These questions asked respondents to estimate the energy savings associated with the non-recorded measures relative to the savings from the program project itself.
- The share of those savings that could be attributed to the influence of the program.

Adding spillover to program-reported savings gives a view of the total savings achieved by participants, which is 134% of program-reported savings (Figure 2). Dividing program savings net of all free ridership by program reported savings produces a net-to-gross ratio of 56%. Adding in spillover and program-reported savings attributable to prior program experience brings the net-to-gross ratio to 91%.

The advantage of this approach is that it clearly distinguishes between the types of energy savings achieved in the market. It also correctly recognizes that a program's influence cannot be neatly confined to program activities within a specific time frame. The disadvantage of this

approach is that participants must be asked to differentiate between program impacts from different time periods. To the extent that they have difficulty doing that, the results are subject to error. However, the error is probably more on where the line is dividing current and past program effects, not the line dividing pure free ridership and savings due to prior program experience.

Figure 2. Summary of Program Savings Attributable to 2005 and Prior Program Activities



Source: Summit Blue analysis of telephone interviews with 51 program participants.

Case Study #2: Make no Distinction between Program Years – the Monolithic Approach

Utility #2 has also been offering a custom energy efficiency program to its large commercial and industrial customers for many years. Utility account executives provide education and technical assistance to help their customers identify, design, and implement energy efficiency measures. Program promotion and services are provided both through utility account executives and through trade allies. Free walk-through audits are offered, where appropriate, as well as financial assistance with comprehensive facility audits. Various levels of financial incentives are offered, depending on the market sector and the efficiency measures selected. Each project is assessed individually for participation in the program. As with Utility #1, the projects that get implemented through the program tend to be large and take some time to go from idea to implementation.

The DSM plans approved by the public service commission included free ridership research. The free ridership study included a spillover component, examining both participant and nonparticipant spillover. As with Utility #1, this study relied on participant self-reports for free ridership and spillover data. The commission DSM decision also directed the utility to establish an independent committee composed of stakeholders with standing in the utilities' rate case proceedings and ask that committee to provide advice and guidance regarding evaluation research.

Early in the discussions on the evaluation design, it was expected that an approach similar to Utility #1 would be taken in examining the effects of earlier program involvement on current project savings. However, there was much concern that respondents would not be able to accurately distinguish between program involvement in the target year with program involvement in prior years. Program managers felt strongly that long-term support was a crucial component of the program and that trying to distinguish between short-term support (e.g., financial incentives) and long term support (e.g., the technical assistance, audits, and feasibility studies) would be artificial and not truly represent the program experience. As a result, it was agreed that, for the most part, in the survey participants would not be asked to differentiate between target year involvement and prior year involvement. In fact, the only question that addressed timing asked whether the participant had plans to install the equipment “prior to your first contact with Utility staff regarding this project”. The survey also included questions specifically designed to address the historical relationship of the customer with the utility, for example:

“How important were each of the following aspects of your experience with Utility #2 in your decision to install energy efficient equipment at your facility. ... Your ongoing relationship with the utility?”

The utility’s goal was thus to treat the entirety of the participants’ interactions with the utility over time as the program intervention. Repeat participants were to be asked about their interaction with the utility over time, not just current program year interaction.

The advantages and disadvantages of this approach are mirror images of the approach for Utility #1. Utility #2’s approach does not ask participants to differentiate between program impacts from different time periods. In that way it allows participants to consider the entire scope of their interaction with the utility and it’s trade allies when considering the actions it took. The disadvantage is that we cannot distinguish between savings produced by near term activities (like the financial incentives) and those that have taken place over time (primarily the technical assistance). By eliminating most references to timing in the survey, the evaluation could not perform the same type of analysis shown for Utility #1, separating current impacts from past impacts.

While Utility #2 did not want to distinguish between current and past interaction in the survey, it did want to use historical data to help understand the survey results and dig deeper into the free ridership calculation. The utility funded feasibility studies and energy audits that preceded measure installation for some customers. Of course, the program management’s hope is that the audit or study had an influence on the decision to install the measure, whether it identified the measure in the first place or provided support for the decision to install the measure. It is also possible that the respondent failed to understand the full impact of the audit or study when responding to the free ridership questions. Some audits were two to three years before project implementation, which allows plenty of time for the lessons of the audit to be internalized (leading to “of course I would have done this anyway” answers to survey questions). This also leaves plenty of time for staff turnover to erode corporate memories. To examine the magnitude of the issue, the evaluation separated free ridership savings into two buckets – savings from measures that were preceded by an audit or study and those that were not. Over half of the free ridership savings went into the audit/study bucket. In other words, a substantial fraction of those who had audits or studies prior to project implementation looked like free riders. This

raises two questions – Did some of the audits and studies provide little influence on the ultimate measure installed? Or is it asking too much of a self-report based study of free ridership to accurately measure the influence of such a long and complex relationship? As of this writing, the utility and its regulators have yet to come together to discuss those questions.

What Are Others Doing?

Several utilities serving customers in Massachusetts have annually measured free ridership from their nonresidential programs for years and in 2003 developed a standard protocol for measuring free ridership. (Rathbun) That protocol explicitly takes past program experience into account and reduces current project-specific free ridership if past program experience was positive and had an effect on current measure installation decisions. The protocol does not directly call for quantifying the effect of past participation but the survey design provides the data to enable that analysis.

California recently released guidelines for a methodology for calculating nonresidential net-to-gross ratios and included a draft survey with the guidelines. The guidelines do not address prior program participation and the draft survey offers no instructions for considering or not the impact of prior participation. However, the California Master Evaluation Contractor Team has instructed the evaluators to specifically exclude questions that address prior program influence from the calculation of free ridership. This means that if the respondent is consistent and states that prior experience, not recent experience with the program, was the driving factor, then they will be classified a free rider *as the only thing that matters is recent experience*. As of this writing, the survey being implemented for nonresidential programs asks about the influence of prior program experience but does not use the answer in the calculation of free ridership. Rather it uses the answer as a consistency check against other answers. If past program experience was a driving factor in the decision, then it is logical to assume that the current program interaction (say current incentives) will have had relatively low influence. If the responses do not follow that logic, the interviewer is to loop back to earlier questions and ask the respondent to resolve the contradiction. (Fagan and Ridge)

Conclusion

If simplicity of approach and interpretation is paramount, the second case study certainly presents an appealing approach – make no distinction between program impacts created by activities in the target year versus those that were inspired and incubated in previous years. This approach does not force survey respondents to try to untangle the various influences they have had from their interaction with program staff over time. Also, because it treats the program as a monolithic whole, it does not force program managers to contemplate choices between providing technical and financial assistance.

However, the approach used in the first case study provides more evidence to suggest which activity is the most important in achieving energy savings – whether it is the earlier technical assistance and information or the later financial assistance. It provides information to help program managers think about how to balance their funding and attention between technical and financial support. It also provides more information to assist in deciding whether markets are mature and can be left to their own devices.

Program designers and managers can look to other programs to study the effectiveness of information and assistance-only programs. But there is a limit to how appropriate it is to apply the lessons of a different program to the specific nature of their own market and methods of interacting with the market. It will surely be better to study their own programs more thoroughly to provide clear data on how their participants come to make the decisions that they do.

The total influence of all utility activities in the market combined with the temporal effect of these activities make it difficult for survey respondents to fully assess the impact of a utility program on their actions. However, utilities, regulators, and evaluators are striving to refine approaches to more accurately measure free ridership. At the same time they are also debating whether it would be more productive to focus on metrics that address other aspects of program implementation and are easier to measure. This might enable program managers to focus more effort on those things that they feel they have more control over and reduce the anxiety and arguments that come from measuring something as difficult as free ridership.

However, free ridership will probably remain an important issue as no one wants to see money intended for one purpose being spent on something else. While the debate over substituting other metrics for free ridership works itself out, evaluations will provide a clearer picture of the program's effects if they attempt to differentiate between current and past program influences than if they pretend such an differentiation is impossible.

References

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