Using Continuous Improvement to Assess a Multi-Faceted Behavior Change Initiative for Businesses

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Abstract

Pacific Gas & Electric Company's Step Up and Power Down (SUPD) commercial campaign is a pioneering behavior change pilot that relies on non-financial rewards, such as employee engagement campaigns and public recognition, to encourage owners and employees of downtown businesses in two major California cities to join a movement to reduce energy waste. SUPD began its design phase in September of 2014, launched in mid-2015, and is planned to wind down in the first quarter of 2017. If successful, SUPD will be replicated in other communities.

The initial sections of this paper describe the key elements of SUPD and explain the continuous improvement evaluation approach that the research team has used to assess and help guide it. In this role, we are providing diverse services across the whole arc of the project, from the campaign's inception until the end of the pilot. As part of a broader team of sponsors and implementers, our first tasks were to provide key inputs to the campaign design, such as creating a "living" logic model and behavioral "briefs" for creating employee campaigns, conducting market intelligence and baseline research, and helping to steer an advisory committee of behavioral experts. After program launch we suggested, guided, and assessed a randomized control trial that is testing an enhanced outreach approach for small and medium businesses; conducted an early process evaluation; and advised on how to accomplish a rigorous impact evaluation. Follow up to these activities, and more, are planned.

The concluding section of this paper discusses the lessons learned so far in employing continuous improvement strategies with SUPD. On balance, while take a continuous improvement approach presents challenges in terms of uncertain scopes of work and needed budget, rapid response, and maintaining objectivity, we have found this approach valuable in meeting the multiple assessment goals of complex behavior change initiatives, from changing energy viewpoints and behaviors to achieving energy savings.

Introduction

The purpose of this paper is to demonstrate how continuous improvement (CI) strategies have been a powerful framework for evaluating Pacific Gas and Electric's (PG&E) pioneering behavior change effort with businesses – the Step Up and Power Down (SUPD) campaign. We first explore the "cradle to grave" CI approach the research team (Team) is using to assess and provide ongoing feedback for and assessment of the campaign. As part of this discussion, we describe SUPD, its goals, its design, and our involvement in the design and start up process. We then explore the concepts underlying CI strategies, and our use of the CI model to assess campaign progress over time. We also analyze how CI differs from standard practice evaluation approaches more commonly used for efficiency programs in the United States. In conclusion, we discuss the lessons we have learned from being the CI evaluators for SUPD.

Description of the Step Up and Power Down Campaign

SUPD is a multi-faceted marketing campaign targeted to changing energy use awareness and behaviors among business owners, employees, facility managers, and visitors to businesses in downtown San Francisco and San Jose.[1] This pilot campaign offers a variety of resources, including:

- An online library of easy ways to reduce energy waste
- Training and education to facility managers and others who influence energy use, such as green team members and internal sustainability leaders
- Creative, turn-key engagement campaigns, such as "Adopt a Light" that uses stickers and prompts to encourage employees and guests to take ownership of their lighting use access to co-branded marketing tools and templates
- Public recognition for actions taken to cut energy waste
- Tracking tools for businesses to chart their progress
- Monthly business energy reports with tips and feedback
- In-person and online energy assessments, from do-it-yourself guides to in-depth technical audits
- Outreach and support to small and medium-sized businesses (SMBs) from Energy Watch staff in both cities
- Outreach and support to large businesses from SUPD staff, which includes help with implementing behavior change campaigns and tracking employee engagement
- Business Energy Reports (BERs) to most SMBs, except those in a control group for a randomized control trial to test an enhanced marketing approach

While the campaign actively encourages businesses to participate in PG&E's existing portfolio of energy efficiency programs, many of which offer incentives and rebates to install highly efficient technologies, SUPD relies on the non-financial benefits described above to attract and involve businesses in the program.

SUPD intends to meet three goals:

- Increase customer awareness of the utility's current efficiency programs
- Drive businesses to participate at increased levels in existing energy efficiency programs
- Achieve a measureable decline in energy use through operational, behavioral, and equipment changes

PG&E also designed the campaign to address larger utility goals, including increasing participation in its existing energy efficiency programs and creating stronger relationships with community businesses, both customers and indirect recipients of its services.

PG&E partnered with a large and complex team, including implementation, marketing, and evaluation contractors, and the two cities where the campaign is being piloted, San Francisco and San Jose to design, deliver, and assess the campaign, as shown in Figure 1. The Team is part of the evaluation and implementation activities, and although not responsible for making final design decisions, the Team was heavily involved in providing crucial advice about the market, customers, behavioral interventions, and ensuring that campaign tracking, metrics, and evaluability needs were met.

[1] SUPD has a parallel behavior change campaign targeted to household that is not discussed in this paper.

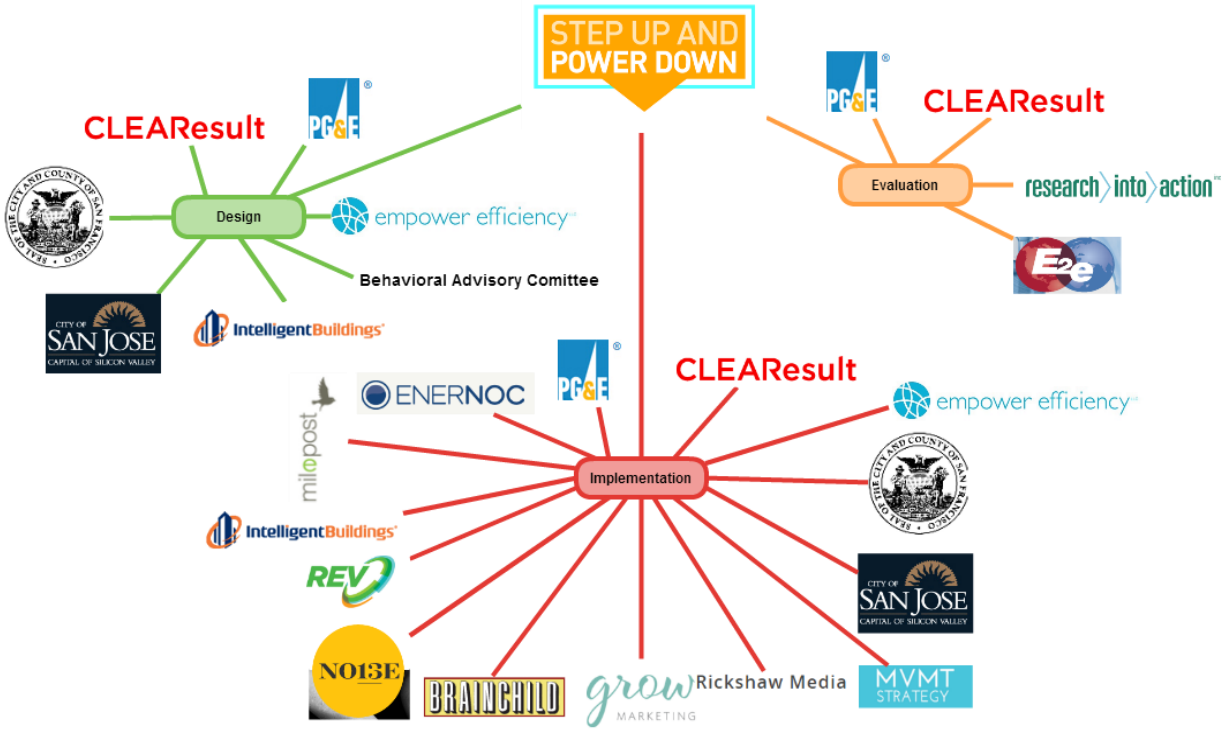

Figure 1. Step Up and Power Down – Campaign Actors

During the campaign's design phase, the Team ensured that evaluation interests were represented in the various work streams listed below. For instance, they helped define marketing and public relations (PR) metrics and provided a data gathering tool to collect early customer feedback with potential large customer participants. In addition to creating an overall work plan and setting the timeline, the work streams for SUPD included:

- **City/Key Player Outreach.** Members of this work stream decided on external collaborators, conducted outreach and co-branding for "flagship" participants, and developed the value propositions.
- **Marketing and PR.** Members of this work stream dealt with managing external marketing/PR agencies, naming and branding, and scopes and timelines for marketing and PR.
- **Technology Infrastructure.** Members of this work stream determined system users and developed the data system architecture, storyboards to chart and integrate the flow of data among program elements, and website requirements.
- **Early Customer/Participant Outreach.** Members of this work stream developed and refined a large customer/participant target list and created strategies to reach and attract them to participate.
- **Training.** Members of this work stream developed operations and maintenance training for facility managers. They also developed "sustainability circle" training, a comprehensive six- month peer-learning program that empowers businesses to embed sustainable practices in their organizations. This training was targeted to key sustainability influencers within businesses, such as green team leaders. We helped the training team develop metrics for these efforts.
- **Program and Strategy Design**. As part of this work stream, we created causal and logic models; characterized and segmented target markets for SMBs as well as large businesses; gathered market intelligence through interviews, surveys and focus groups; reviewed campaign marketing and outreach elements; identified social science theory and evidence that could be used to create effective behavioral interventions for target audiences (such as

those that would work best for offices and hotels); mapped the customer journey for SMBs and large businesses; documented all data sources and how they would be used; and set campaign metrics. The SUPD campaign's target audiences are summarized in

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- Figure **2** below.

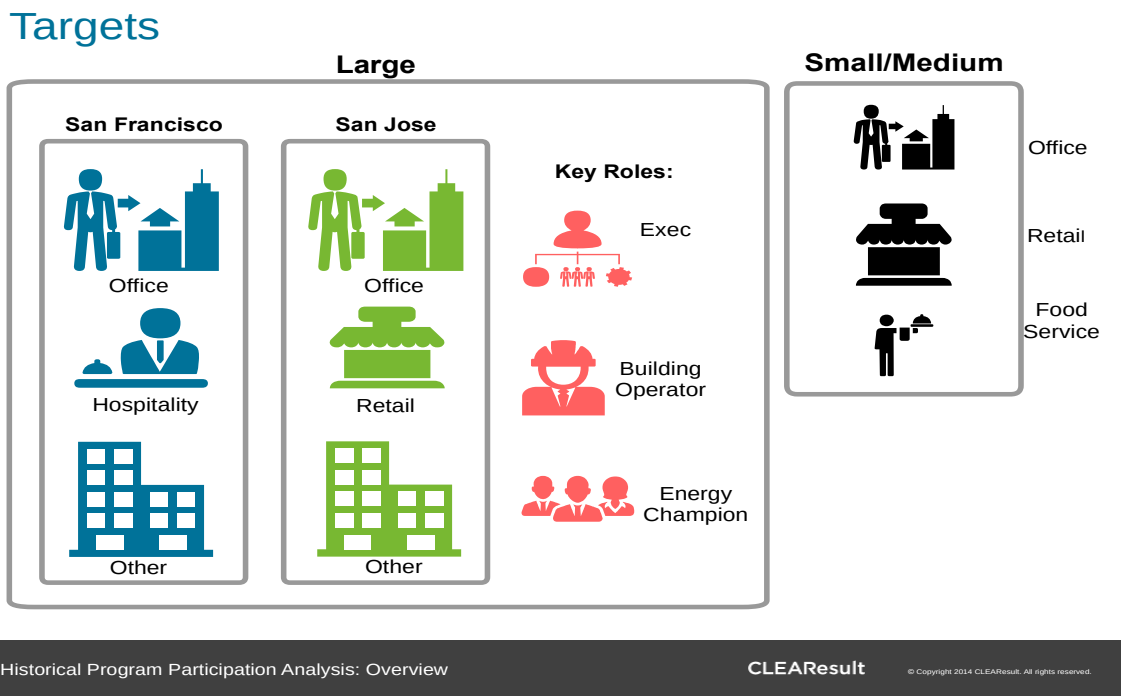

Figure 2. SUPD Campaign Targets

As the campaign was designed, launched and implemented, the Team conducted ongoing research that influenced the campaigns design and operation. For instance, we conducted focus groups with office, retail, and food service SMBs to explore what type of messaging and non-financial incentives would attract this hard to reach audience to participate in SUPD. Among other insights, we found that SMBs most value the opportunity to leverage marketing opportunities with PG&E and to receive public recognition in their local neighborhoods. We also found the SMBs do not view sustainability as a "green" concept but as activities that make them more sustainable as a business. Finally, we discovered the great attachment that SMBs have to their immediate neighborhoods and their willingness to support neighborhood causes. The marketing and outreach team relied on these insights to craft their strategies.

Other activities during design and start up included establishing awareness and participation baselines for the large customers and SMBs; testing value propositions, services, website visuals, and intervention ideas with businesses; conducting an interim process evaluation to document the initiative's history and design, needed improvements, and lessons learned to date; ensuring necessary data were collected to track progress; and creating and assessing a randomized control trial (RCT) to test specific behavioral interventions and their effect on signups and attitudinal and behavioral changes among SMBs. The CI team suggested this approach – unusual in United States energy efficiency efforts – after the campaign's launch. The evolution and results of this RCT will be discussed further in subsequent sections of this paper.

At the time of this paper, with the end of the pilot about a year away, the campaign has a new PG&E manager who has simplified some aspects of SUPD. This has resulted in shifting more of our evaluation work to an end-of-campaign focus where we will collect indicators of campaign progress and non-energy impacts, gather in-depth insights from large business decision-makers and their employees, and analyze the potential to replicate and scale-up the campaign in other urban areas. In

addition, PG&E plans to hire an impact evaluation firm and wishes to integrate our CI results with impact results to create a full picture of SUPD's activities and results.

Although this shift means we may have less continuous contact with campaign decision-makers, the trusted advisor relationship that we have established with them has fostered ongoing communication, so that they call on us for ad-hoc guidance and we have good access to campaign decision-makers. Future evaluation plans include follow-ups to the baseline research, the process evaluation, the RCT analysis, primary research with large customers, and integration of all key findings and conclusions into a single process and impact evaluation report.

Using Continuous Improvement to Evaluate Energy Efficiency Programs

The philosophy of CI emanates from the business management world, most notably from Japan's Kaizen (Kai – do, change, Zen – well). "The phrase 'CI' is associated with a variety of organizational improvement approaches that are intrinsically evaluative. These approaches include the adoption of lean manufacturing techniques, total quality management (TQM), employee involvement programs, customer service initiatives, and waste reduction campaigns" (Singh and Singh, 2013).

CI embraces practices that create an active, self-examining culture that fosters regular assessments that result in mostly incremental, but sometimes radical, innovations and improvements in organizations, or, in this case, an energy efficiency campaign. The impetus for CI emerges from the desire to conduct ongoing and useful evaluations of complex, innovative, and evolving social programs. For example, the work we are doing with SUPD has resulted in many small improvements, including:

- Ongoing and persistent attention to evaluation needs
- Increased efforts to solicit and integrate customer feedback into campaign elements
- Better definition of roles and responsibilities across the SUPD team
- Changes to marketing messages that better address customer priorities
- Increased communication and coordination among team members
- Conscious incorporation of social science-based behavior change interventions
- Improvements in data collection and tracking of campaign metrics
- Documentation of the campaign's evolutions
- Integration of process and impact assessments

Other changes have been more radical. For example, as mentioned, the Team suggested an "embedded" RCT to test the power of an enhanced marketing and involvement approach for SMBs. The RCT design hypothesized that using the following two mechanisms, cited in the behavior change literature (Ignelzi et al., 2013), would produce significantly more sign-ups and active campaign participation in the treatment group than in the control group.

- **Reciprocity:** Research shows (Cialdini, 2009) that when individuals receive a gift or favor, they are motivated to reciprocate or "return the favor." In SUPD, free BERs serve as the gift intended to elicit feelings of reciprocity. We expect that when SMB customers are offered and then receive the BERs, they will reciprocate through signing up and becoming active participants in SUPD.
- **Prompts:** Research also shows that prompts, or reminders, are an effective strategy to encourage behavior change over time (Neff and Fry, 2009). The reminder letter served as an initial prompt, and the SUPD-branded BERs served as a monthly reminder to SMBs to sign up for and participate in the campaign. We expect these prompts will increase the likelihood that SMBs who are interested in SUPD but do not initially join the campaign will sign up later. In addition, we expect that the BERs may prompt more active participation among customers who sign up for the campaign.

In this research we also explored how two other factors influenced SMB participation in the campaign: the campaign's use of a third behavior change mechanism, personal contact,[2] to encourage participation, and the city where the SMB is located (San Francisco or San Jose).

To implement the RCT, we randomly assigned SMBs to a treatment or control group. SMBs in the treatment group received an invitation to join SUPD that emphasized the campaign's benefits, including the opportunity to receive 12 free, monthly BERs that provide tailored feedback about their energy use.[3] The treatment group also received a reminder letter about the SUPD opportunity, and their first BER. SMBs in the control group received none of this enhanced outreach. The final overall sample size for the RCT was 7,617 SMBs, with 5,503 SMBs in the treatment group, and 2,564 SMBs in the control group

Overall, the interim data showed that sign-ups for the SUPD campaign across the entire sample of SMBs was about 2%. Consistent with much research (Ignelzi et al., 2013), results show that personal contact strongly influenced sign-ups; SMBs that were visited or called were significantly (seventeen times) more likely to sign up for the campaign than those not contacted. Results also show that reciprocity and prompts increased sign-ups; SMBs in the treatment group were significantly (two times) more likely to sign up for SUPD than those in the control group.

Despite its benefits, we are working in an environment where CI is not a familiar or well-accepted evaluation approach for energy efficiency programs. Standard practice tends to favor less formative and more formalized evaluation strategies. These strategies often distance evaluators from the program and their decision-makers, involve evaluators later (often after a program has been underway for a year or more or even concluded), are less real-time, may be repeated but are not continuous, and do not allow multiple points for suggesting improvements. The differences between standard practice evaluation and CI evaluation are discussed further in the next section.

How Continuous Improvement Compares to Typical Energy Efficiency Program Evaluations

Clearly, CI and standard practice evaluations both have merit, depending upon the type of program being run and the purpose and needs of the evaluation. For established and documented rebate and incentive programs standard evaluation approaches to assess processes and outcomes still make sense. However, energy efficiency programs are changing in response to the energy industry's goals for greater (yet cost-effective) energy savings, stronger climate mitigation, and more engaged customers. For these new and innovative efforts such as SUPD, a CI approach can be more responsive and help program designers and implementers gain insights and traction more quickly. In particular, two types of programs have been on the upswing in an attempt to meet these goals:

- **Pilot programs,** like SUPD, that test emerging technologies or innovative behavioral mechanisms to influence energy use. Sponsors hope these shorter-term initiatives (typically one to three years) lead to scalable, replicable, and cost-effective programs. Pilots benefit from working with evaluators upfront to conduct market research and to make sure the pilot can be evaluated. Once launched, Pilots benefit from the rapid feedback that evaluators can provide and their insights about a Pilot's full-scale potential, often before all results are in.
- **Market Transformation (MT) programs** that intend to change, over a longer time frame (typically five to 20 years) "the structure or functioning of a market or the behavior of participants in a market" (The TechMarket Works Team, 2006). Sponsors hope these long-term investments result in widespread adoption of higher efficiency equipment and habits. For MT programs, evaluators conduct upfront and ongoing market research. Once underway, these programs need to have regular and cumulative assessments to measure progress and to convince funders to stay the course.

To ensure pilots and MT programs succeed, the energy industry is increasingly looking to new design frameworks. Energy program designers are starting to apply principles similar to the "lean

[2] SMBs in both the treatment and control groups could receive such calls or visits.
[3] Approximately 9% of customers in the treatment group did not receive the first BER due to inadequate data.

launchpad" approach many business schools now advocate to reduce the risk of start-up companies that typically experience a 75% failure rate. Instead of heavy up-front investments in start-ups, a lean design "favors experimentation over elaborate planning, customer feedback over intuition, and iterative design over traditional 'big design up front' development" (Blank, 2013). The idea is to construct a new venture that shows its weaknesses quickly, to learn from those mistakes, and to pivot to a better design.

Similar to start-ups, pilot programs often fail to perform well or to inform their sponsors about needed adjustments, in part because evaluation activities come too late. A CI approach that values in-depth feedback from the market, and employs a test, measure, adjust – then repeat – philosophy, fits well with a "lean pilot" paradigm.

In terms of early and ongoing involvement, process evaluations protocols in our industry tend to allow more formative approaches than impact evaluations that usually focus on end-of-year or program cycle energy impacts. Still, even for process evaluations, sponsors can be concerned about the cost of involving evaluators early and the potential for conflict of interest if evaluators become advisors on program design elements or establish strong relationships with program sponsors. Thus, in many cases, sponsors exclude evaluators from working with programs early on to ensure evaluability, establish logic models, and provide continuous improvement feedback that would allow for easier pivots under the lean launchpad model.Table **1** presents a set of questions and answers that frame key points of comparison between a CI approach and standard practice evaluation approaches that we more often use in the United States. The answers for standard practice evaluations apply most consistently to impact evaluations (although some changes are occurring here with the availability of ongoing big data). Still, many process evaluations are retrospective assessments of program performance and do not provide real-time assessments.

Table 1. Comparing Continuous Improvement with Standard Practice Evaluation Approaches

Questions	Continuous Improvement	Standard Practice Evaluations
What is the evaluation purpose?	To assess program performance on an ongoing basis and to make needed program adjustments as soon as possible while a program is being delivered. The goal is to incorporate nimble processes that collect frequent data and insights that program sponsors and evaluators review together.	To inform the program at set cycles, and often not initiated during program design, even for process evaluations. Evaluations tend to be retrospective but are intended to inform revisions in program design.
When do evaluators get involved?	Early and ongoing, to conduct research to inform program design and evolution and to have deep program understanding. CI designs often include evaluability assessments, program logic modeling, process mapping, customer journeys, and market assessments before program launch.	Usually after design, to reduce process evaluation costs and ensure evaluators remain objective. Evaluators may be asked to review relevant evaluation literature and are charged with framing the key questions once evaluation activities commence.
What methods are used?	Multiple methods, but choices focus on producing timely feedback. Research plans are intended to be flexible. Market research, such as focused surveys, and qualitative methods such as focus groups or small sample interviews are frequently used. Evaluators may also help with analyzing existing data to establish	Multiple methods but usually a more limited set is used and they are defined in advance. Research plans tend to be more static. Evaluators may provide market intelligence but contributions to design are less frequent due to conflict of interest concerns and a

Questions	Continuous Improvement	Standard Practice Evaluations
	baselines and assess data collection and tracking approaches that program sponsors will implement.	later involvement with the program.
How are results delivered and used?	Focus on fast feedback channels (memos, summaries, presentations, meetings) at intervals tied to programs making key decisions or investigating issues of interest.	Focus on in-depth reports and presentations to inform changes for the next program cycle and meet regulatory requirements.
What level of rigor can be expected?	While systematic and rigorous, data are in smaller chunks and affects depth of analysis, and insights. Results, however, are closer to real time.	More data analyzed over a longer time produces greater hindsight and rigor.
How involved are program sponsors?	Sponsors need to actively interact with evaluators to voice research goals, needs, questions, implications, and strategies. They are also involved in selecting methods and resources to enable robust research and providing quick response to evaluation inputs.	Sponsors help define the goals and research questions for the evaluation, and often the budget. They may also be involved in selecting methods and resources to enable robust research. They also respond to requests and review reports.
How do costs compare?	With more touch points and greater responsiveness to key decisions, costs are less predictable and need to be monitored and mapped out as the program progresses.	Activities are defined at the beginning and follow a more predictable path and budget.

Lessons Learned from Using Continuous Improvement for SUPD

This section explores key lessons that we have gained from acting as CI evaluators for SUPD.

CI Still Requires Systematic Thinking and Planning

Despite its lean and nimble approach, CI evaluations still need to embrace the tenets of thoughtful, systematic research. This means that evaluators using these strategies need to follow best practices in designing and conducting research. They just need to be quicker, more responsive, and more flexible, as do program decision-makers, in identifying ongoing research needs and in adjusting plans and making budgets available on short notice. This type of flexible approach, especially for contracting, is not necessarily easy within many United States utilities that are more comfortable with a defined request-for-proposals (RFP) approach.

The correct framing for CI also is critical. CI needs to frame itself as a useful approach to ensuring evaluability through ongoing research and feedback that produces incremental and sometimes radical campaign changes. In addition to its research obligations, CI teams need to create stronger and more trusting partnerships between program decision-makers and evaluators, and between evaluation results and their application. In the SUPD campaign, for instance, it took some time to clarify if the CI team were really evaluators. And once established as evaluators, it took time to quell the usual trepidation about evaluation being a judgmental and forbidding process rather than a constructive learning and evolution process. We worked through these confusions and barriers by having regular meetings, supplying needed information quickly, and by convincing program sponsors to have a few all-team gatherings so that coordination could be improved.

Finally, helping campaigns use social science theory and evidence, and experimental and quasi-experimental designs, to inform behavior change interventions is critical work if we are going to understand what mechanisms best influence customer engagement and behavior changes that reduce

energy use. CI teams are in a good position to suggest and help ensure rigorous research approaches when they work in partnership with program sponsors, as shown by our RCT experience within SUPD. CI team members were not only able to offer specific interventions for behavior change, they helped define target markets, create causal and logic models, and create visual maps to chart customer journeys through the program steps. These maps remind sponsors and evaluators alike of the effort and commitment that we ask customers to make as they progress through energy efficiency programs.

Being Nimble is a Learning Process for Evaluators

For CI to work, evaluators and decision-makers need to agree to be nimble, to accept that research conditions may be challenging or imperfect (for instance, dealing with small sample sizes and very tight turnaround times), and to recognize getting more and regular feedback may require unexpected changes to program trajectories.

These behaviors are not always familiar to, or comfortable for either group, and resistance is to be expected. We found that once CI services have clearly resulted in insights and useful improvements, all parties start to relax and embrace the obligations of CI. For instance, for SUPD, mutual appreciation began to happen when we completed focus groups and a baseline survey with SMBs about SUPD concepts and marketing. That research revealed some surprising windows into SMB thinking, including that SMBs were very dependent on community support, generally thought of sustainability as the need to sustain their own business and not in the context of environmental concerns, and saw significant value in having PG&E as a marketing partner.

Retaining Objectivity is Crucial but Challenging

While evaluators and program implementers need to form trusted relationships to ensure they can openly discuss problems and solutions, their roles are very different. Evaluators provide essential data, analysis, and advice to campaign decision-makers; those decision-makers make and implement the final decisions. However, as seasoned evaluators, we have been surprised at how our greater-than-usual involvement in SUPD's design, our increased familiarity with campaign operations, and our closer relationships with campaign decision-makers, have forced us to more consciously revisit our roles and responsibilities and to confront in ourselves if our greater campaign involvement could affect our objectivity.

Over the course of almost 18 months of our work with SUPD, we have worked hard to make the delineation between our role and those implementing the campaign clearer. We have felt the pull of wanting to make program design decisions (others than those for evaluation) and to be program implementers and have pulled back from those responsibilities. We have analyzed our role in creating the RCT and have, after some initial design responsibilities, left subsequent RCT design and implementation decisions to others. Overall, we feel our greater involvement and stronger ties to the program are positive. We have developed a deep understanding of the campaign and how it has evolved (in fact, in some instances, we have become the campaign "historians"). In addition, on occasion, we have been able to be a trusted and valued advisor for our clients, a position that we cherish but which is rare for evaluators. Finally, being CI evaluators is energizing, it keeps us on our toes and forces us to find the most constructive and helpful ways to improve SUPD.

Maintaining Discipline for Experimental Design is Challenging

As behavioral scientists and researchers, we think all the time about how behavior change theories and customer research should be central in decisions about how to run behavior change efforts like SUPD. Unfortunately, this is usually not the mindset of marketers, decision-makers, and implementers, who bring different beliefs and experiences to the table.

These many viewpoints, along with a limited exposure to behavior change theory and evidence, can result in a kitchen-sink or stacked approaches to behavioral change that incorporate multiple interventions, just in case one theory of change does not work. Unfortunately, a stacked design makes it more difficult to detect what is and is not working to produce change, even within a structured experimental design.

Although the RCT within SUPD has encouraging results, we also found challenges in maintaining discipline in its design and implementation. The decision to have a control group was not in the spirit of SUPD's desire to involve all businesses in the downtown neighborhoods. In fact, businesses in the control group could be touched through other outreach mechanisms, such as in-person visits. Fortunately, we were able to identify which businesses received in-person visits and factor this into our analysis so that we could see the 'lift' due to the enhanced BER marketing.

Marketers and the CI team also had some different ideas about translating the reciprocity and feedback theories into compelling copy for outreach materials. Finally, despite our initial agreement to limit ourselves to operationalizing the reciprocity and feedback interventions, a number of other priorities crept in, such as emphasizing how simple it is to change behaviors around energy use, and how small changes contribute to the good of everyone. These additions created the stacked design described above.

Continuous Improvement is a Rich and Rewarding Evaluation Strategy

With all of its challenges, our team agrees that employing a CI approach to evaluating SUPD has been a very rich experience for us as evaluators. We have enjoyed being with the campaign from the ground up, to contribute to its self-corrections, and to see how it turns out over the course of almost three years. We are glad to be in the role of trusted advisors and not, for the most part, having to justify our expense and value.

From the perspective of decision-makers, we also have been told that this approach has added value to their endeavors. They have said it is good to be reminded from the beginning about evaluation needs; to have a customer-centric viewpoint be reinforced; to have us document the evolution of the campaign as it has changed over time; and to bring evidence of the need to make both evolutionary and revolutionary changes to the campaign.

Finally, at the end of SUPD, many decisions will need to be made about whether or not it can be scaled up and replicated elsewhere. We believe that having evaluators available who have lived through the process of the campaign, and who can supply rich insights about its progress and impacts will be a valuable resource for our clients and other program sponsors as they chart the future for these types of complex behavior change efforts.

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