EVALUATION OF CONSUMER BEHAVIORAL RESEARCH

Final Report

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EXECUTIVE SUMMARY

This report summarizes research conducted for the Northwest Energy Efficiency Alliance (NEEA) at the direction of the Northwest Energy Efficiency Taskforce (NEET) Work Group 4 Energy Efficiency Regional Marketing Coordinating Council (hereafter "the Council"). The research involved a comprehensive review of the existing research on effective behavior change strategies employed in the energy and utility industry as well as other industries. This is the first stage of the Council's three-stage proposed approach to develop a regional marketing effort to make energy efficiency behaviors as commonplace as recycling in the Northwest. The second and third stages will involve primary research and the development and deployment of the regional marketing effort, respectively. The overall goal of the research is to help the Council document the insights from existing behavior change research and to identify research gaps to support the Council's efforts to explore regional marketing efforts related to the reduction of energy consumption in the Northwest. The specific objectives of this first stage research study are to:

1. Identify and review relevant current research, evaluations, and behavior change initiatives.
2. Catalog and summarize insights from the studies identified in reviewed literature.
3. Identify gaps in existing research and knowledge to effectively inform the Council's planning for future primary research efforts.
4. Provide recommendations for next steps as the Council continues to develop a regional marketing strategy for reducing consumers' energy use, including best practices identified in the secondary research and recommendations for future primary research to be conducted in the second stage of the Council's three-stage approach.

The project team conducted informational interviews with academic experts and program implementers who are actively involved in behavior change initiatives and a thorough review of existing evaluations, papers, and reports related to the topic. A list of more than 100 studies was identified, which was then narrowed down based on a set of criteria reviewed with members of the Council. The focus was on identifying behavior change initiatives that are relevant to what the Council hopes to accomplish in the Northwest, have been recently implemented, and ideally have been evaluated to quantify energy savings; however, true impact evaluations of behavior change initiatives in the energy field are quite rare, particularly for media- and community-based efforts. The project team grouped the reviewed studies into four broad categories:

- Mass media and multi-media campaigns (see Section 2)
- Community-based social marketing (see Section 3)
- Feedback mechanisms (see Section 4)
- Competitions (see Section 5)

Recent segmentation research on Northwest attitudes and behaviors is also summarized in this report (see Section 6).

Key Findings

Behavior change initiatives work best if appropriately targeted and delivered in a sustained and coordinated fashion. The following summary highlights the common elements shared by many of the most successful behavior change initiatives reviewed in this research.

- **Element #1: Targeted messaging informed by segmentation and barriers research.** Examples of campaigns that have done this particularly well include NYSERDA (Section 2.1.1) and the EX smoking cessation campaign (Section 2.4). Specifically, the effectiveness of media messages and program communications can be maximized through the following best practices:

    - **Identify and prioritize target segments.** Understanding and segmenting the market into distinct groups based on their shared characteristics, needs, and preferences allows for customization of messaging. Segments are typically prioritized based on both a hypothesis about the capacity to change specific behaviors *and* the potential impacts of those behavior changes.

    - **Conduct segment-specific barriers research.** The research shows that targeted messaging that speaks to the specific barriers a segment of the population experiences in behavior change improves yield over one-size-fits-all messaging.

    - **Pre-test messaging prior to program roll-out.** Qualitative research such as focus groups with members of the target segment can help avoid costly "false starts" by identifying messaging that will or will not resonate with the target segment.

    - **Employ advanced micro-targeting capabilities.** Highly targeted and even household-specific messages can be delivered through strategic tools such as social media and online advertising. The database-driven capabilities of enhanced billing feedback and community-based social marketing programs also enable the delivery of targeted and customized messaging, as well as data collection for evaluation purposes.

- **Element #2: Trustworthy messengers and empowering change agents.** The "voice" of the campaign should be trustworthy and inspiring; consumers need to both believe the information provided and feel empowered to take action. Examples of campaigns that have done this particularly well include Project Porchlight (Section 3.1) and community energy challenges (Section 5.1). The most successful campaigns employ the following practices:

    - **Use trusted sources of information.** Marketers have long known that using trusted and credible sources of information improves message traction. However, recent research suggests that to move consumers from "believing" information to actually taking action, a campaign needs to move beyond invoking a trusted brand or information source and actively engage consumers through local change agents.

    - **Empower local agents of change.** Behavior change initiatives often extend their reach by developing partnerships with local entities such as non-profits, community groups, churches, schools, governments, and contractor networks. By empowering local community leaders to act as champions of the cause, programs can tap into social networks and often generate local media interest, further amplifying the program's message. Non-profit organizations are perceived as particularly credible messengers, as they typically have no hidden financial agenda. Consumers often have trouble understanding why their utility, which profits off higher consumption, would encourage them to conserve energy.

    - **Enable peer-to-peer communication.** The most effective marketing channel is often word-of-mouth communication with friends and family. Social media and community-based social marketing approaches enable peer-to-peer communication and the sharing of ideas through user-generated content. These approaches also enable two-way communication between the program and its target segment, which can provide valuable insights into what messages and

strategies are resonating and which may need to be rethought. See Section 2.3 for a description of how ConEd's Power of Green campaign has benefited from the interactivity of social media to gain new ideas about how communicate with their audience.

- **Element #3: Social marketing tools.** All types of behavior change initiatives, even mass media-based campaigns, can successfully employ the tools of social marketing, which include social norms, goals/commitments, feedback, prompts, and community-based one-on-one interactions. Behavior change initiatives can particularly benefit from implementing the following social marketing best practices:

    - **Capitalize on the power of social norms.** Most programs benefit from creating a perception that "everyone is doing it" rather than describing efficiency as extreme or something only the "tree huggers" do. Community-based efforts show efficiency as normative by using peer-to-peer networks; advertising invokes norms by showing "normal people" choosing efficiency. Feedback mechanisms such as OPOWER (Section 4.2) help people understand their energy consumption relative to their peers. When invoking norms, avoid portraying extreme behaviors as normative, to retain believability with the target audience.

    - **Do not neglect other social marketing tools.** The use of norms in marketing has gained popularity in recent years, but other tools work well too, particularly those developed for community-based social marketing efforts. Commitment, goal setting, prompts, and behavior-specific barrier research strategies have also been demonstrated to increase behavior change effectiveness.

- **Element #4: Pilots and evaluation planning.** Active behavior change initiatives at utilities are attracting a variety of disciplines (social psychology, behavioral economics, consumer psychology, sociology, and marketing effectiveness). Each is advancing the collective science of behavior change by conducting pilots and testing program effectiveness. See Appendix C for more information on proper experimental design and evaluation techniques. Specifically, behavior science-based efforts utilize the following practices:

    - **Conduct pilots using proper experimental design approaches.** Launching campaigns in pilot phase and establishing baseline measurements and control groups from the outset allow campaign messages and strategies to be fine-tuned prior to full scale roll-out and enable robust evaluations of the campaign's impacts.

    - **Monitor for persistence and rebound or take-back effects.** A campaign's effectiveness can be undermined if the behavioral impacts do not persist, or its participants exhibit rebound or take-back behaviors, e.g., "it's ok to leave my lights on; they're CFLs." Careful monitoring is necessary to understand how best to reduce potentially negative effects.

    - **Identify and build on the efforts of others**. A campaign such as that contemplated in the Northwest will not operate in a vacuum; there are entities promoting energy conservation at the local, statewide, regional, national, and global levels. What potential opportunities for collaboration and cross-promotion might exist between all interested parties? Early and regular reviews of program logic and monitoring of implementation efforts can identify and build on the efforts of potential program partners.

- **Element #5: Utilize multiple intervention strategies in combination**. Behavior change can be promoted across a variety of channels. Table 1 is a summary of the key strengths, weaknesses, and potential applicability of the dominant strategies employed today, which have been classified into

four categories: mass media and multi-media campaigns; community-based social marketing; feedback mechanisms; and competitions. Note that historically, campaigns have focused on one of these strategies; if coordination and support exists, a more holistic campaign may yield improved traction.

Table 1. Categories of Behavior Change Strategies

Strategy	Tactics	Strengths	Weaknesses	Potential NW Impact
Mass Media and Multi-Media Campaigns (Section 2)	Social modeling, awareness building, branding. Social media is sometimes used in support of media campaigns. Many existing state and utility campaigns are in the process of integrating other elements such as community-based social marketing and outreach events with traditional media approaches.	Media has the power to reach a large geographic region and variety of households. Industry is comfortable with this medium and television affords the ability to visualize rather than simply describe desired actions. Social media can be very cost-effective and provide opportunities to learn from customers' experiences.	Mass media is expensive and impacts can be difficult to attribute to a specific campaign. New brands and programs can take significant time and money to gain traction, especially in those markets with competing brands and messages.	Regional data from Avista Utilities' Every Little Bit campaign indicate media can be effective support of program enrollment when closely tied to utility programming. Recent trends indicate that traditional media may be most effective in combination with other strategies.
Community-Based Social Marketing (Section 3)	Uses direct engagement (e.g., door to door canvassing) and tools of reciprocity, commitments, prompts, norms, peer-to-peer communication, etc.	Personal touch provides opportunities to address household-specific barriers. Customizable for utility program support. Strong earned media when run at scale. New GIS tools support data-mining.	Requires experience to scale. If reciprocity strategies are employed (e.g., a free light bulb or power-strip) some utility subsidy may be required to support costs.	Significant driver of utility specific program participation with potential to create "movement" mindset. Community strategy permits diversification of message from east side to west side utilities and provides data collection opportunity.
Feedback (Section 4)	Information provisioning in the form of reports, online audits, or in-home display. Can also utilize norm strategies.	Feedback can be timely and personalized to user, depending on method. Research in California reveals a strong customer desire for quantification of impacts.	In-home displays can be expensive, complex, and difficult to install. Participation in utility programming not yet correlated with feedback.	Funding of in-home devices likely prohibitive. Paper feedback may need to remain with utilities as data mining is needed for strong execution. Energy savings 1-3 percent.
Competitions (Section 5)	Pit one town (or school) against another for conservation "status," or encourage households to compete against each other, perhaps to win a home energy makeover.	Often used to jumpstart a campaign by garnering attention and earned media.	May display actions as "extreme" rather than everyday and normative; needs integration into forward-looking campaign to avoid this perception.	Possibility of a sustained NW pride message if competitions designed to increase number of Energy Star homes, rather than "extreme homes."

Recommendations for Primary Research

The following summarizes the key research areas that the Council could pursue, based on the identified gaps in the research. See Section 7.1 for more discussion of these recommendations.

- **Benchmark current energy attitudes and behaviors.** A baseline study on current behaviors in the region should be conducted with an emphasis on correlating specific behaviors with each

major customer segment. This research could be appended to a study on existing building stock in the region, as it would involve significant quantitative (survey) research (building on the existing segmentation research recently conducted in the region), followed by more qualitative research (e.g., focus groups, ethnographic in-home research) to better understand the attitudes and behaviors predominant in the region and identify specific barriers to behavior changes within prioritized customer segments.

- **Assess existing brands' equity.** The Council should consider conducting an assessment of the current brand equity of various regional conservation efforts to determine if there is a campaign/brand with enough traction that it might be adapted for the entire region. The state of California has recently undergone a similar effort for recent campaigns, and the research approach was well documented and could be adapted for the Northwest region.

- **Analyze the synergistic effects of multiple strategies.** There is much to be learned regarding the synergistic effects of different approaches. For example: feedback mechanisms combined with dynamic pricing, social marketing combined with financial incentives, etc. Experimental design approaches that define control groups and measureable metrics can separate the impacts of individual strategies from those that occur only from the use of combined strategies.

- **Identify the best strategies for specific segments.** While considerable work has been done on segmenting customer classes, distinguishing the effects of various behavioral initiatives among different demographic groups will allow for the effective development of targeted strategies. For example, a pilot program might seek to test the impacts of feedback mechanisms compared to competitions in gaining the highest participation levels among single-family homeowners for reducing consumption.

- **Quantify the extent of social desirability bias in consumer research.** Research on quantifying the effect of the social desirability bias (i.e., the overstatement of "good" behavior and/or understatement of "bad" behavior in survey responses) would be of great value in evaluating behavioral campaign impacts based on self-reported actions.

- **Analyze the persistence of impacts from different strategies.** Persistence of savings resulting from behavioral initiatives was consistently identified at the recent 2009 ACEEE Behavior, Energy & Climate Change (BECC) Conference as a significant barrier to increased utility program spending in this area. Many behavioral programs and pilots have not been around long enough to study the effects of what happens when the program stops or what follow-on efforts could be employed to migrate households to new behaviors. Follow-up research (maybe two to three years after a program has operated) is needed to determine if the behavior change persisted beyond the program period. NEEA has conducted research on persistence of long-term effects of market transformation programs such as the Building Operator Certification (BOC) training program; a similar approach could be used to analyze the persistence of consumer behavioral initiatives.

Recommendations for Development of a Regional Marketing Effort

The research team identified four broad approaches in review of recent initiatives that could be effectively deployed in the NW:

- **Deploy a multifaceted approach** that can capitalize on the strengths of each strategy and maximize value, such as using the more costly mass media at the campaign's outset to garner attention for a community-based social marketing effort. A well-articulated experimental design

for pilot efforts and early/ongoing evaluation will assist funders in finding the right balance of program elements to achieve specific objectives.

- **Target messaging to address the specific barriers faced by the target segment(s)**; this will dramatically increase the program's yield in comparison to a one-size-fits-all approach. Do not assume that the only barrier to increased action is lack of awareness/knowledge; investigate other possible barriers to the desired behavior changes (e.g., accessibility, affordability, etc.).

- **Deliver messages by trusted sources, ideally within the community.** This is most effective when people from different organizations at the regional and local levels are empowered to act as champions of the program's message. Support, buy-in, and partnerships throughout the region and possibly with national entities will assist in gaining receptivity from the target audience.

- **Utilize the whole range of social marketing tools**, including social norms, commitments, prompts, feedback, and behavior- and community-specific barrier research. These tools can be used in all types of behavior change strategies, not just community-based social marketing; for instance, a mass media campaign can direct viewers to a website where they make a commitment to reduce their energy consumption by a certain percentage by taking specific actions.

Attention must be paid to the context and timing within which the campaign is developed. For example, is the regulatory environment prepared to attribute savings to behavioral campaigns (i.e., are the impacts certain enough that utility commissions will accept them and allow recovery of costs through rates)? In the current economic climate, will utility customers be willing to bear the cost of a regional marketing campaign? Will they be receptive to messaging at this time?

Next Steps

While the recommendations above present a number of options for the Council's consideration, the following steps are likely the highest priorities for near-term action:

1. Gather regional stakeholders and potential national partners to determine the political will for a collaborative regional effort and settle any outstanding questions related to program funding, management, branding, and credit for impacts.

2. Conduct quantitative research on current behaviors by segment, and then conduct qualitative research on the specific barriers faced by prioritized segments in relation to the desired behavior changes.

3. Develop pilot programs using experimental design approaches (i.e., establish baseline metrics and control groups) to test the effectiveness of messages and combinations of strategies before deploying a full-scale campaign.

4. Create an attention-grabbing event or series of events to kick off the regional campaign and garner earned media coverage.

1 INTRODUCTION

The research in this report was funded through the Northwest Energy Efficiency Alliance (NEEA) at the direction of the Northwest Energy Efficiency Taskforce (NEET) Work Group 4 Energy Efficiency Regional Marketing Coordinating Council (hereafter "the Council"). The project involves a comprehensive review of the existing research on effective behavior change strategies employed in the energy and utility industry as well as other industries. Historically, energy efficiency has been promoted with a "widget"-based mentality to produce quantifiable savings impacts; however, the industry is now widely recognizing that to achieve deeper efficiency gains, it is imperative to change end-user behavior and attitudes about energy conservation. This report represents a summary of the behavioral research to date that can inform the development of a region-wide behavior change initiative in the Northwest.

1.1 Research Objectives

This research project is the first stage of the Council's three-stage proposed approach to develop a regional marketing effort to make energy efficiency behaviors as commonplace as recycling in the Northwest. The second and third stages will involve primary research and the development and deployment of the regional marketing effort, respectively. The specific objectives of this first stage research study are to:

1. Identify and review relevant current research, evaluations, and behavior change initiatives.
2. Catalog and summarize insights from the studies identified in Objective #1.
3. Identify gaps in existing research and knowledge to effectively inform the Council's planning for future primary research efforts.
4. Provide recommendations for next steps as the Council continues to develop a regional marketing strategy for reducing consumers' energy use, including best practices identified in the secondary research and recommendations for future primary research to be conducted in the second stage of the Council's three-stage approach.

The goal of this effort is to help the Council document the insights from existing behavior change research and to identify research gaps to support the Council's efforts to explore regional marketing efforts related to the reduction of energy consumption in the Northwest. The programs that are the focus of this research use a variety of strategies and channels to influence energy use decisions in the home. These behaviors can include habitual behaviors (e.g., turning off lights or adjusting HVAC settings), purchasing behaviors (e.g., choosing to purchase CFLs or energy-efficient appliances), maintenance behaviors (e.g., cleaning refrigerator coils or getting yearly furnace tune-ups), and program participation decisions (e.g., participation in a utility home audit program). Effectively supporting changes in these behaviors will vary depending on the type of behavior that is requested. Unlike most traditional utility programs, the efforts reviewed in this report focus primarily on marketing strategies to promote behavior changes.

1.2 Research Methods

The research approach was developed in an iterative process together with the Summit Blue team, NEEA staff, and members of the Council. After establishing a list of interviewees and thought leaders from industry as well as studies of merit, the team began conducting interviews and compiling research. Studies reviewed included relevant current research and evaluations of behavior change initiatives in the

Northwest, nationally, and internationally. The appendices contain a list of interview subjects and studies reviewed.

In total, the Summit Blue team reviewed over 100 studies and spoke with more than 20 experts in informational interviews. Collectively, the team met to identify those initiatives most relevant to the Council's effort so as to capture key findings (progress, successes, barriers, lessons learned, use of established best practices, replicability, and feasibility of applying them in the Northwest). The project team grouped the reviewed studies into four broad categories: mass media and multi-media campaigns, community-based social marketing, feedback, and competitions. Recent segmentation research on Northwest attitudes and behaviors is also summarized in this report. These reviewed studies were then further catalogued and summarized in narrative and tabular format with a goal of identifying gaps in the current research that warrant further investigation as well as best practices that should be kept in mind during the creation of a future regional behavior change campaign. Finally, a list of recommendations was developed for the Council's consideration.

1.3 Layout of the Report

The remainder of this report presents the findings and recommendations. The report is organized into the following major sections:

- **Executive Summary:** Top line findings and overview.
- **Section 1: Introduction** (this section) presents the context for this research, the research objectives, and the methodology.
- **Section 2: Mass Media and Multi-Media Campaigns** presents the research findings on mass media- and multi-media-based behavior change campaigns in the energy field as well as one example from the public health field.
- **Section 3: Community-Based Social Marketing** presents the research findings on community-based social marketing efforts in the energy field as well as examples from other sustainability-related fields.
- **Section 4: Feedback Mechanisms** presents the research findings on the use of feedback mechanisms to promote energy conservation as well as one example related to water conservation.
- **Section 5: Competitions** presents the research findings on the use of competitions to promote energy conservation.
- **Section 6: Current Northwest Attitudinal Segments and Behaviors** presents a review of major segmentation studies conducted in the Pacific Northwest in the last few years as well as other insights into attitudes and behaviors.
- **Section 7: Recommendations** presents the research team's recommendations for primary research and next steps for the Council to consider as they pursue the development of a regional marketing campaign.
- **Appendices** include lists of interviewees and studies reviewed, as well as a section on behavior change program evaluation.

2 MASS MEDIA AND MULTI-MEDIA CAMPAIGNS

This section presents the findings on the first of the four categories of behavior change strategies: mass media and multi-media campaigns. Section 2.1 presents examples of the energy industry's experiences with mass media campaigns. Section 2.2 presents some insights onto media messages and tone from various studies. Section 2.3 discusses the use of social media in the energy industry. Finally, Section2.4 presents an example of a mass media campaign from the public health field.

A mass media strategy in which a campaign seeks to influence attitudes and behaviors by reaching a broad population through television and radio is a comfortable and well understood means of raising awareness of a message. However, these efforts can be costly[1] and difficult to track, and some researchers question whether it is an effective strategy for driving behavior change on its own. Where the campaigns do focus tightly on promoting utility programs, more direct correlation is observed between media spend and program uptake (Avista). Incorporating the use of online advertising and social media can boost a campaign's cost-effectiveness and provide more customizable and interactive learning experiences than the one-way communications of mass media, which may also enhance the campaign's ability to influence actual changes in behavior. Campaigns should keep in mind that consumers have varying preferences in communications channels.

Several of the earliest energy conservation campaigns are being rebranded (California, New York) or are shifting emphasis to a state brand (New Jersey). Each of these rebranding or new branding exercises is also providing significant support for grassroots or higher touch efforts focused on community-based social marketing and/or marketing to communities themselves. This new trend challenges marketers to craft complementary messages that support rather than compete in a crowded space. Historically, media campaigns have tended to focus either on supporting the change of individual behaviors (e.g., turning off lights not in use) or on promotion of beliefs to support utility programs (e.g., every little bit matters). Truly integrated marketing efforts across a large region with multiple utility "buy-in" do not appear to exist yet. This may be a missed opportunity, as the research suggests that exposure to the same message in varying media and access points, such as through partnerships, can improve efficacy.[2] However, the coordination and control issues implicated are appreciable. The following examples document some of the key findings from media-based campaigns.

2.1 Energy Industry Experiences with Mass Media Campaigns

This section summarizes the key lessons learned from energy industry experiences with mass media campaigns in three locations: New York, California, and Avista Utilities' efforts in Washington, Oregon

[1] Some research from the health industry suggests that a significant media endeavor should not be pursued unless sufficient funding is available for "scale," i.e., if it is known that there is insufficient funding for a larger effort, those dollars could better be spent on other interventions. Personal Communication, Lawrence Swiader, Director Digital Media, The National Campaign (a Buffet Foundation funded effort in preventing unplanned pregnancy). Scale and funding can be specific to a region and depend in part on the length and media chosen for an effort. For example, in 2002 BPA developed a mass media effort that spanned roughly 6 months at a cost of $7M (total collaborative/in-kind dollars) and was fast tracked to be ready for primetime Olympics, while California spent roughly $60M over a three year period for mass media focused on promotion of efficiency and about $20M on demand response.

[2] Briggs, Rex, and Greg Stuart. *What Sticks. Why most advertising fails and how to make sure yours succeeds*. 2003. (citing Advertising Research Foundation Study).

and Idaho. Several key themes emerged around message development, channel selection, and the need for regional diversity.

In terms of message development, consumers remain confused what specific actions they can take. As a result, information must be clear and concise throughout all the touchpoints of the campaign (mass media, website, social media presence, printed collateral, etc.). Take advantage of seasonal triggers (e.g., in fall, remind customers to service their furnace; at spring cleaning time, remind customers to replace their AC filter). Customers who believe they are already doing all they can should be challenged to do more. Given the significant costs of mass media and the need to spend significant sums to get good purchased media value, campaigns should take caution against overspending for awareness efforts that don't directly promote specific actions or program participation.

Due to the pressures of delivering a campaign within funding horizons and seasons, it can be tempting to decide on specific messaging too soon. However, fine-tuning messaging after pre-tests will have a better chance of success and avoid potentially costly missteps.

In terms of channel selection, there are several important considerations to be made. Given the numerous energy conservation campaigns delivered by utilities and governments at varying levels, care should be taken to avoid competing messages. One solution is consider marketing in channels that the utilities are less active in or work together to understand how best to support a diverse group of utilities and regional stakeholders. Campaigns should also appreciate that the media choices of younger customers and specific segments may vary; these channel preferences can be explored as part of segmentation research.

A key theme that emerged from the review of mass media campaigns in New York, California, and the Northwest is the importance of understanding regional diversity. There are regional variations in barriers to energy efficiency, and information that is persuasive in one region may not be credible in another. Economic, political, and cultural conditions vary by community, which can have a significant effect on message traction. Regional campaigns need to maintain enough flexibility to tailor messages to sub-regions. Furthermore, a multi-state campaign will need to take into account the differing regulatory treatment of marketing expenses and attribution of behavioral impacts, as that will affect utilities' willingness to providing funding support.

2.1.1 New York State Energy Research and Development Authority (NYSERDA)

Historically, the New York State Energy Research and Development Authority (NYSERDA) has been a dominant force in the energy conservation efforts of New York State, being responsible for over 3,200 GWh in annual electricity savings through demand-side management (DSM) programs.[3] Several years ago, the NYSERDA marketing team made a strategic decision to not overly emphasize the NYSERDA name and brand, focusing instead on leveraging Energy Star in mass media and providing retailer support in point-of-purchase (POP) displays. Recently, however, with the authorization of new funding approaches in the state, utilities have begun to promote DSM (and their own brands and social responsibility) as well. It is against this backdrop of increasing utility marketing efforts that the state entity NYSERDA recently began a rebranding exercise.

NYSERDA adopted several new strategies in their branding and messaging. They began to target and message specific communities and regions in the advertising. The new efforts sought to help consumers

[3] Savings values are from the 2008 NYSERDA Energy $mart Program Evaluation and Status Report, available at http://www.nyserda.org/publications/SBC%20March%202009%20Annual%20Report-Rev%208-09.pdf.

understand the efficiency and conservation opportunities from a "whole house" perspective, without being overwhelming. Understanding that whole house approaches get better traction where there is an intention to stay in the home for more than five years, NYSERDA targeted relatively stable communities using the triggers of seasonal change in the current economic context (e.g., the winter's upcoming heating bills in the wake of an unemployed family member) and working to improve awareness of incentives through improved point-of-purchase displays.

NYSERDA's research found that there was suspicion of green-washing, and this varied by region. Downstate residents were not persuaded by testimonials. Upstate residents found them to be very credible, demonstrating the need for different messages for each region that were complementary. A common trigger they did find across the state was the need to provide clear, concise, specific information on what to do. As a result, the rebranding efforts focus on recommending specific actions rather than awareness. This finding also led NYSERDA to undertake a significant website redesign process.[4] Notably, research showed that the state's own goals in conservation were not motivational. It can be tempting in developing campaigns such as this to use the authority of the state to add validity to an effort; however, in the case of NYSERDA, this was explicitly tested and not found persuasive or motivational to residents. In personal interviews, marketers from NYSERDA also indicated that "a process such as the Northwest is embarking on should take care to appreciate and preserve the cooperative spirit embodied in the Council's effort so as to avoid competing messages (utility versus region) in the market."[5] Managing state-sponsored campaigns in a more competitive environment can be a challenge.

2.1.2 California

California has spent large sums of money on efficiency programs predominantly delivered through utilities (roughly $2B in 2006-08). The state also had a statewide mass media campaign to promote efficiency/demand response (Flex Your Power/Flex Alert). The campaign focuses on TV and radio message vehicles. Expenditures for the 2006-2008 program years were approximately $60M for Flex Your Power and about $20M for the Flex Alert demand response component.

Evaluations of the programs revealed that those that saw the ads increased awareness of conservation and efficiency actions, but after several years, unaided awareness of the brand itself was only 2%. As the state contemplated a shift in the brand strategy, brand equity was questioned. Additional research showed that the channeling effects (i.e., whether the program drove utility program participation) were also modest, contributing perhaps up to 10 % of the CFL sales increase, but this was the only energy impact

[4] Several other states are also devoting significant efforts to improving the quality of their online resources, recognizing that the Internet has become the primary research tool for most people when looking for information about products and services. The Colorado Governor's Energy Office is just starting to embark on a new marketing and information campaign which will center around a website that will serve as a one-stop clearinghouse for information on what energy efficiency steps to take, how to get started, how to find qualified market actors in the state, etc. The state of California also has a comprehensive new energy efficiency website in development, which has dual purposes: (1) to serve as a collaborative tool for energy efficiency providers (in California and around the world) to share ideas and information with each other and (2) to provide consumers with all the best information on energy efficiency. The success of these efforts should be tracked going forward.

[5] Moore, Ryan; Phone Interview, New York State Energy Research and Development Agency. December 10, 2009.

measured.[6] The Flex Alert demand campaign impacts were estimated more specifically at approximately 222 to 282 MW.[7]

The campaign faced several challenges in developing the approaches and creative materials collaboratively, including:

- Should the campaign mention utilities in messaging? On websites? In emails? Local billboards?
- Should the utilities refer to the campaign on their website, and redirect traffic to the state campaign?
- Should there be different messages in different regions to address unique segments and seasons?
- Should ratepayer funding be acknowledged as a tagline in the ads?

As the approach was developed, there were significant dialogues about what messages and tones could be employed, especially related to the use of global warming in state advertising. While it is important to address stakeholder needs, it can be challenging to develop strong creative collateral in a committee where participants may have potentially competing agendas. Ultimately after several years of support, the California Public Utility Commission (CPUC) announced a review of the Flex Your Power campaign as part of its effort to support the ambitious California Strategic Plan for Energy Efficiency.[8] The CPUC and utilities have issued a State Marketing RFP (to select bidders) centered on a "Smart Energy Living" concept. As the RFP wasn't publicly available, participant interviews were used to help understand the direction of the RFP. One participant suggested that "it may be wise to develop channels that are 'where the utilities aren't.'" The reasoning appeared to address two concerns: how to increase touch points to the consumer, as well as simplifying potential attribution questions later.[9] As dialogues on permissible earnings for utilities (for efficiency) have expanded to a preliminary set of discussions on how to measure and credit impacts from behavior, it appears that this may be part of the drive to simplify attribution.

The progression in California is rooted in the history and politics of energy efficiency and demand response in that state. FYP was created rapidly in the midst of the California energy crisis without the benefit of a more deliberate process such as the one the Council is undertaking. The early campaign focused on a peak load reduction and then grew into a significantly larger effort with strong purchasing power and reach. As the state's and utilities' efficiency and demand response portfolios and resource acquisition targets grew, utilities became increasingly interested in marketing their own programs with their respective regional appeals. They were under pressure to reach targets, yet "marketing" was treated as an overhead expense that negatively impacted the cost-effectiveness of the efficiency portfolio. A regional marketing approach in the Northwest will also likely be affected by the regulatory backdrop of crediting impacts from behavior and regulatory treatment of marketing expenses.

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[6] Opinion Dynamics Corporation. *PY2006-2008 Indirect Impact Evaluation of the Statewide Marketing and Outreach Programs, Volume I*. Submitted to the California Public Utilities Commission Energy Division, January 13, 2010 DRAFT.

[7] Summit Blue Consulting. *2008 Flex Alert Campaign Evaluation Report*. Rep. CALMAC Study ID: PGE0270.01, December 10, 2008. http://www.calmac.org/publications/2008_Flex_Alert_Final_Report_12-18-08.pdf.See also Appendix C on evaluation in this report for more details about how surveys and engineering analysis can be used to estimate impacts from self-reported behavior changes.

[8] California Energy Efficiency Strategic Plan (Supplemented Draft) Rulemaking 06-04-010, March 6, 2008, available for download at *www.californiaenergyefficiency.com.*

[9] Personal Communication, Marianne Ellis, Veo Group, supporting the California Public Utility Commission's Marketing and Communications Plan RFP process for the state's "Smart Energy Living" marketing effort.

2.1.3 Avista Utilities' Every Little Bit Campaign

Avista's "Every Little Bit" campaign is an award-winning[10] effort designed to support the utility's DSM programs in three states. The campaign uses traditional advertising channels (television, radio, print) and creative outreach strategies (teen video contests) as well as a strong information portal on a 'microsite' to drive awareness and participation in Avista's DSM programs. Because the campaign was designed to drive interest in a relatively low involvement issue (energy consumption), the creators recognized that an incremental and sustained effort would be needed. A three-year campaign was planned, with the first year's focus on low- and no-cost energy saving actions, the second year's focus on why saving energy is so important, and the third year's focus on the environmental impacts of energy consumption.[11]

The primary approach is to increase customer awareness about Avista's energy efficiency programs and to build context around why energy efficiency matters, as well as to provide general uplift and support to DSM kWh and therm goals, thereby delaying the need for more expensive generation. Like many areas of the world where some DSM work has occurred, there is a common misperception on the part of customers that they are already doing all they can. As Avista developed and tracked its messaging, it has identified that concerns about first cost and specific program awareness remain challenging, as is reaching younger segments (under 45).

Unlike many media-focused efforts, budget for this effort is relatively modest at $700k annually. The context within which Avista is operating is one in which incentives for efficiency are up, energy and environment have been high-profile issues in political campaigns, and the utility has experienced cost of service increases in a time of economic downturn. As a result, there are many factors supporting efficiency program participation.

By maintaining good research practices (pre/post survey monitoring, ongoing focus group research), the company has been able to track the campaign's efficacy. Overall, despite the difficult economy, payouts on efficiency programs are up 40%, correlated closely to the campaign. The campaign demonstrates that directly supporting utility programs can work. Awareness and recall of specific messages is up significantly since advertising began. At outset, 52% surveyed could not name specific messages and actions recommended from the campaign unaided. That number has since dropped to 30% as a result of the campaign. Cost-related reasons for non-participation have also surprisingly decreased despite the economy, suggesting traction on perceived value of efficiency investments.

2.2 Insights into Messages and Tone for Media Campaigns

The review of media-based campaigns and various studies identified several key lessons related to messages and tone that should be kept in mind in the development of media messages and program communications. First and foremost, overly aggressive environmental appeals should be avoided during times of economic downturn, as resistance to environmental messages correlates closely with economic troubles. "Anti-waste" messages rather than "save energy, save money" messages often gain more traction with consumers, and are a way to manage consumers' frequently unrealistic expectations of energy savings from simple behavior changes. Campaigns which promote a few simple behavior changes, rather than a laundry list of dozens of possible actions, are less overwhelming to consumers; these

[10] Utility Communicators Best in Show. Better Communications Competition, 2008. http://www.utilitycommunicators.com/files/public/uci_awards_2008_v5.pdf.

[11] http://www.coateskokes.com/work/case-studies/avista.

narrowly focused campaigns are also easier to evaluate as it's easier to track changes in just a few behaviors over time and to assess the influence of the campaign on those behaviors relative to other influences.

2.2.1 Use of Environmental, Economic, and Anti-Waste Appeals

A basic-to-basics "anti-waste" message may be more broadly appealing than a "save money, save energy, save the environment" message, particularly in times of economic downturn.

Many recent campaign research efforts have discovered that over-reliance on environmental appeal can "turn off" a significant subset of the population.[12] There is evidence that this type of trigger is over-exposed and that concerns about greenwashing[13] may yield unintended consequences.[14] The aversion to environmental appeals typically correlates with downturns in the economy, which underscores the importance of regularly updating segmentation research as household priorities change with changing economic and political conditions. A number of households today simply do not have the luxury of worrying about future environmental repercussions when all of their time, money, and mental bandwidth are devoted to their family's day-to-day survival. This represents an opportunity for a back-to-basics, anti-waste appeal to emphasize how much a household can financially benefit from conservation. At the same time, the environmental appeal can be motivational to a subset of the population, with significant regional clustering, so the appeal cannot be entirely ignored. See Section 6.1 on segmentation for more discussion of targeting messages to specific segments.

Some of the most effective energy efficiency and conservation campaigns have framed their message in terms of "don't waste" energy or money or resources, rather than a "save money, save energy, save the environment" message.[15] It is important to avoid overly vague claims of saving money, because when consumers are told they can expect to save money, but they aren't given an estimate of what they'll save, they mentally "fill in the gaps" in the message and assign a overly high number for their expected savings.[16] When consumers' expectations about cost savings from efficiency upgrades are not met, it can create a negative association with energy efficiency which may seriously hamper future campaign efforts.

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[12] Specialty marketing firm EcoAlign's research indicates that nearly 40 percent of Americans are turned off by such messages. Personal communication with Andrea Fabbri of EcoAlign.

[13] There is a greenwashing watchdog website sponsored by EnviroMedia Social Marketing and the University of Oregon which provides useful descriptions of typical greenwashing errors (i.e., things to avoid in messaging), located at http://www.greenwashingindex.com/criteria.php.

[14] Teisl, Mario F., Noblet, Caroline L. and Rubin, Jonathan (2009) 'Can Environmental Promotion Backfire? Evidence from the Vehicle Market', Social Marketing Quarterly, 15: 3, 2 — 32. Message recipients began to second guess motives rather than appreciating car attributes. Similarly, in California where significant environmental appeals have been made, research indicates that the population is beginning to think of this large global warming problem as "the state's problem" rather than believing in the efficacy and impact of their own actions.

[15] Neuroscientists and social psychologists have found that a "don't waste" message provokes three times as many responses as a "save money" message. http://www.sheltongroupinc.com/blog/?p=849. The human brain processes these two message frames quite differently: the desire to correct deficiencies and avoid waste—particularly relative to a normatively defined group of peers—can be persuasive, provided a non-judgmental tone can be struck.

[16] This result was found was consistently observed in two consecutive years (2008 and 2009) of the Shelton Group's EcoPulse Survey. http://www.sheltongroupinc.com/blog/?p=727. Recent research has found that American consumers expect a $4,000 investment in energy efficiency upgrades to result in approximately 50% savings on their utility bills, which is an unrealistic expectation.

2.2.2 Advantages of a Tight Focus on Specific Behaviors

There are advantages to focusing on one or a few very specific behaviors. The simplicity of the message can rise above the other conservation "noise" in the marketplace, particularly if the behavior targeted is a lesser-known behavior (e.g., unplugging electronics) rather than the common "turn off your lights" or "adjust your thermostat" behaviors. Consumers may also feel overwhelmed if they are presented with a long list of actions to take. Campaigns can start with promoting one or two simple behaviors and then move towards more complex behaviors as they gain consumers' trust; see the description of *Project Porchlight/One Change* in Section 3.1 on community-based social marketing for more details on this strategy of promoting "foot in the door" behaviors.

Another advantage to having a tightly focused campaign is the relative ease of evaluating the campaign's effects. Focusing also makes it easier to collect enough customer data to estimate energy savings, and differentiate the effects of the campaign from other influences in the marketplace. In contrast, a campaign which focuses on a few specific behaviors can collect a great deal of information about those few behaviors through surveys, including enough technical details about those behaviors and the respondents' home to estimate energy impacts[17], as well as assessing the influence of the campaign relative to other possible influences.[18]

Take advantage of the particular strengths of different types of media: use mass media for generating a buzz around a campaign and online/social media or channel partners for delivering more complex, action-oriented information.

A good example of a tightly focused campaign is the "Off. Really off?" campaign in Germany. The campaign raised awareness of the energy wasted by plug loads (i.e., consumer electronics) even when they are "off," and promoted a few specific, related behaviors: unplug electronics when they aren't in use, purchase/use power strips, and take standby power consumption into consideration when making electronics purchases. The appeal of the messaging was the psychological loss of control over one's home environment represented by the (previously unknown) energy waste; a secondary appeal was utility bill savings. The campaign was evaluated extensively, with a baseline survey conducted before the campaign, a survey conducted at the peak of the campaign, and a follow-up survey conducted one year after the campaign, to assess the persistence of these behaviors. After just three months, awareness of the campaign was 33%.[19] Both awareness of the standby power problem and the prevalence of the requested behaviors rose during the campaign and remained elevated over pre-campaign levels one year after the campaign ended. The campaign also selected a nearby region which was unaffected by the campaign and surveyed residents in that region as well, to establish a control group. By focusing on a few specific behaviors, planning ahead for evaluation by establishing a baseline and a control group, and conducting a post-campaign survey to establish long-term effects, the evaluators were able to identify the effects of the campaign on those behaviors and estimate energy savings with far more confidence than

[17] See Appendix E on impact evaluation for more discussion about how a combination of surveying and engineering analysis can be used to estimate energy savings.

[18] Programs which have known participants (e.g., programs which involve home energy audits or energy education workshops) can track many measures/behaviors with relative ease because they know who their participants are; however, the "participants" of a media-based campaign (i.e., those who were influenced by the campaign to change their behavior) are unknown to the campaign until they are identified by surveys, and the campaign is not necessarily the only influence on their behaviors.

[19] Wortmann, Klaus, and Werner Mohring-Huser. "Long term effects of an energy efficiency advertising campaign." *ECEEE 2003 Summer Study - Time to Turn Down Energy Demand.* ECEEE, 2003. 1159-1169.

most other marketing/information-based utility programs. The campaign resulted in 14.7 million kWh of short-term savings (from behavior changes expected to persist for 2 years) and 11.3 million kWh of long-term savings (from energy-efficient purchases with savings expected to persist for 10 years).[20]

The "Off. Really off?" campaign was also an excellent example of how a campaign can take advantage of the particular strengths of different types of media and outreach to maximize the value of each. The campaign used traditional advertising (TV, radio, newspaper) primarily for raising awareness and creating a buzz around the campaign; the mass media advertising used humor and wordplay to catch the audience's attention. Then social media and retailer partners (who received free marketing materials) were used to provide more specific, action-oriented information; these more interactive forms of communication are better suited to conveying complex actions because the consumers can ask questions and seek out information tailored to their specific needs.

2.3 Social Media in the Energy Industry

Social media can be thought of as any online presence which invites user-generated content or peer-to-peer interaction, including social networking sites (e.g., Facebook, mySpace, LinkedIn), media sharing sites (e.g., YouTube, Flickr), blogs, microblogs (e.g., Twitter), text messaging, and message boards, among other applications. The use of social media is evolving rapidly, and many utilities and behavioral campaigns have found unique ways to more effectively interact with consumers through the use of social media.[21] For instance, a number of utilities have found that by tracking the social media "buzz" around their company, they can improve customer relations by responding quickly to complaints, nipping potential PR disasters in the bud, and identifying what messages are resonating with their customers (or not).

Social media encourages peer-to-peer communication and allows consumers to feel personally engaged with a campaign; it also enables two-way communication between the campaign and the consumers, providing real-time feedback on what messages are resonating with the target audience.

Social media can be an inexpensive way to reach a large audience. Contrary to popular belief, the use of social media is not limited to the teenage crowd. A recent survey by the Pew Internet and American Life Project found that the median age of Facebook users is 33 years old, and the median age of Twitter users is 31 years old.[22] The use of social networking sites by adults between the age of 35 and 64 grew 60% from 2008 to 2009.[23] More importantly, social media makes Internet users feel more personally connected with campaigns; another recent Pew survey found that 54% of Internet users who participate in social media agree with the statement "The Internet makes me feel more personally connected to my candidate or campaign of choice," compared to just 28% of all Internet users.[24] While this survey was asking about political campaigns, it stands to reason that social media users would feel more personally engaged with issue-oriented campaigns (e.g., energy conservation) as well.

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[20] The "Off. Really off?" campaign cost 890,000 Euro in 2000-2001. Based on the Euro-dollar exchange rate on January 2, 2001 (the first business day of the year), that is approximately $839,000 in U.S dollars (or 3 cents per kWh). Historical exchange rates obtained at http://www.oanda.com/currency/historical-rates.

[21] There is a social networking site for utilities to share information and ideas related to social media, located at http://socialutilities.ning.com.

[22] http://www.pewinternet.org/Reports/2009/17-Twitter-and-Status-Updating-Fall-2009.aspx.

[23] http://www.nytimes.com/2009/08/26/technology/internet/26twitter.html.

[24] http://www.pewinternet.org/Presentations/2009/RTIP-Social-Media.aspx.

One of the key advantages of social media is the ability of consumers to share items of interest (e.g., videos, articles, etc.) with their peers and to publicly affiliate themselves with various causes. For instance, ConEd has launched a campaign called "the Power of Green," and they have a Facebook page representing this campaign; a ConEd customer can become a "fan" of the campaign, which will then show up on their profile and their friends will see it. Some of those friends may be curious about what the Power of Green is and will click on the link to see what the campaign is all about; if they agree with what the campaign stands for (or if they want to be perceived by their friends as caring), they may become a fan of the campaign also. Periodically, the Power of Green campaign will post content such energy conservation tips, interesting videos, or links to opportunities to participate in ConEd's various programs. Fans then might decide that the content is interesting enough that they should share it with their friends by forwarding it on or reposting it on their own page or blog (or in Twitter parlance, "re-tweeting" the content). This type of peer-to-peer communication is very effective for changing behavior, because it helps to provide evidence for descriptive social norms (i.e., the sentiment of "If my friends think that this is interesting or cool or 'the right thing to do,' then maybe I should too!").[25]

Perhaps equally as valuable as the peer-to-peer communication is the ability for campaign implementers to have direct interactions with their target audience through social media. Unlike traditional advertising, social media is a two-way form of communication which enables consumers to comment on content in real time. Program implementers can evaluate the effectiveness of their messages and content by observing which content receives the most "hits" and assessing the tone of comments.[26] Implementers can also obtain suggestions for additional content (for instance, see Figure 1 – one fan of the Power of Green campaign suggested that the campaign provide a cookbook that is "low energy, high taste, and healthy," in response to a recommendation to use the toaster oven more). Some campaigns seek even more sophisticated "user-generated content"; for instance, the America's Greenest Campus campaign sponsored a contest in which people could submit videos that encourage young adults to save energy. The makers of the winning video (available at http://www.youtube.com/smartpower) won $10,000 for their efforts.

[25] See Schultz, W. P., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The Constructive, Destructive, and Reconstructive Power of Social Norms. Psychological Science, 18, 429-434; and Nolan, J. M., Schultz, W. P., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative Social Influence is Underdetected. Personality and Social Psychology Bulletin, 34, 913-923

[26] There are many analytical tools and services (e.g., FiltrBox, Vocus, others) available to assist in tracking both the quantity and quality of social media interactions. These can be used to identify and track what people are saying about a campaign on all social media websites, not just social media efforts put forth by the campaign. Even if a campaign does not have an active social media presence, it doesn't mean that people aren't talking about it on their social networking sites, blogs, and message boards, and savvy marketers can learn a lot about their customers and the effectiveness of their campaign by studying their social media "buzz."

Figure 1. Example of Content from ConEd's Power of Green Facebook Page

Another advantage of using social media to support a brand or campaign is that providing dynamic, frequently updated content and linking back and forth between the campaign's website, social networking sites, file sharing sites such as YouTube and Flickr, and blogs/microblogs greatly improves the campaign's online presence in terms of search engine optimization.[27] In other words, when people Google "energy conservation," they are more likely to find websites that are actively engaged in the social media realm, rather than static, unchanging websites.

Social media and other online content are increasingly being accessed via mobile devices (e.g., smartphones such as the iPhone or Blackberry), which present additional opportunities for behavioral campaigns to engage consumers in an interactive context. Almost one-third (32%) of Americans have used their mobile phones to access the internet, and one in five use the Internet on their mobile phones on a daily basis.[28] Almost half of Americans (49%) use the SMS (text messaging) feature of their mobile phones.[29] Smoking cessation campaigns have used text messaging to provide reminders and encouragement to people trying to quit smoking; there are services that send you a text in the morning to remind you to take an umbrella with you if there is rain forecast that day. One can envision a number of applications of this technology for prompting energy-efficient behavior in a timely manner; for instance, an iPhone app that pops up a message that says "have you unplugged your charger?" when it senses that the iPhone has been disconnected from the charger, or a text message that asks "did you remember to adjust the thermostat when you left the house today?"[30] Just as there are significant variations in consumers' attitudes and behaviors, there are also varying preferences for communication channels, and consumers are increasingly using their phone as a primary means for accessing information.

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[27] Search engines use complex algorithms (e.g., Google's PageRank algorithm) to assess the order in which websites appear on a search results page, which take into account the implied importance of the website based on the number of links into and out of the website. For more information, see http://en.wikipedia.org/wiki/PageRank.

[28] Pew Internet and American Life survey results, reported at http://news.cnet.com/8301-1035_3-10293283-94.html.

[29] Holmen, Eric (2009) 'TXTING4HEALTH: The Role of the Mobile Channel in the Health Care Industry and in the Sphere of Public Health', *Social Marketing Quarterly*, 15: 1, 30 — 35.

[30] Ecobee smart thermostats can be controlled remotely by an iPhone application. http://www.appstorehq.com/ecobeesmartthermostat-iphone-85397/app.

The power and sheer ubiquity of social media indicates that any marketing campaign without a well-integrated social media presence is missing significant opportunities to engage consumers in a medium in which they are already spending significant amounts of time.

2.4 Experiences in the Public Health Industry: EX Smoking Cessation Campaign

Public health organizations have a long history of implementing social marketing techniques to promote challenging behavior change such as smoking cessation, weight loss, and safe sex. Many of the most carefully planned and well executed social marketing campaigns have been to promote smoking cessation, such as the EX campaign described in this section.

EX is a smoking cessation pilot campaign that relied on television advertising, a telephone helpline, and a website, along with community outreach. A campaign brand was developed in response to recent research that indicates that branded campaigns result in greater response than unbranded media messages, and segmentation was used to target the message to specific audiences. The campaign focused on increasing smokers' sense of self-efficacy and making them feel prepared and hopeful for the process of quitting smoking, as opposed to filled with dread and shame.

Target consumers who want to change their behavior but need assistance in overcoming specific barriers. A peer-to-peer communication style and a "one step at a time" approach can empower people to find solutions to a seemingly insurmountable challenge such as climate change.

The campaign acknowledged that many smokers have repeatedly tried and failed to quit smoking, and most have been repeatedly berated by loved ones (and strangers) about their failures. Typical anti-smoking messages have been delivered by sources such as doctors/health professionals (who smokers feel don't understand the difficulty of quitting), the tobacco companies (who appear to be trying to manipulate the public to improve their image), and the pharmaceutical companies (who stand to profit from smokers' repeated attempts to use the "patch" or other pharmaceutical quitting aids). Thus, it was important to create a branded campaign with a "voice" that was independent of any of these sources who are perceived as being disingenuous or having ulterior motives. The voice of the EX campaign was "smoker-to-smoker", and the campaign's name was aspirational – the target audiences desire to be EX-smokers.

Barriers research found that smokers who want to quit, but have repeatedly failed, have had difficulty "re-learning" to be a non-smoker. The campaign's tagline is "re-learn life without cigarettes", and provides advice on how to get through specific situations without cigarettes. The campaign acknowledges that by removing the cigarette from habitual behaviors (e.g., the first cup of coffee of the day), that changes the smoker's experience of those other behaviors as well, and they have to "re-learn coffee" to mean something different than what it meant when it was always accompanied by a cigarette. The campaign encouraged smokers to adopt a step-by-step mentality, looking at quitting as a series of behaviors that they needed to re-learn, rather than a radical, all-at-once lifestyle change.

The EX pilot was evaluated for awareness and message receptivity. The majority of survey respondents who were aware of the EX campaign thought that the EX brand was a trusted, empathetic brand which provided helpful information. The campaign proved to be broadly appealing across many demographic subgroups, particularly among people who actively desired to quit smoking (the intended audience). The evaluation took place too soon after the campaign to assess whether long-term behavior changes resulted.

The EX campaign has a number of relevant lessons for energy conservation. For starters, a campaign focused on empowering people to take small, manageable steps to increase their sense of self-efficacy over a seemingly insurmountable challenge would resonate with environmentally conscious consumers who feel overwhelmed by the issue of climate change. The campaign targeted people who desired to change their behavior, but needed specific assistance in overcoming barriers. The EX campaign specifically avoided any sense of shaming or authoritative lecturing, and cultivated a "peer-to-peer" style of communication (i.e., "smoker-to-smoker"). For an issue as deeply personal as how people behave in their own home, a peer-to-peer message may be better received than a message coming from an "authority figure." The campaign chose to use a branded campaign rather than risk the perception that the campaign sponsors have ulterior motives; consumers sometimes have difficulty understanding why their utility is encouraging them to use less energy when they profit by selling energy.

3 COMMUNITY-BASED SOCIAL MARKETING

This section discusses the use of community-based social marketing techniques in the promotion of energy conservation (Sections 3.1 through 3.3) as well as some non-energy examples (in Section 3.4). While both social marketing and community-based social marketing (CBSM) market behaviors and ideas rather than products, CBSM focuses directly at addressing the specific barriers and benefits perceived within a given community. The approach exploits what psychologists and sociologists know about energy: it can be deeply personal and rooted in community context.[31] By focusing on specific, local barriers to efficiency and conservation behaviors, this approach can yield significant impacts as discussed below.[32]

Historically, community-based efforts have been "grassroots," homespun efforts typically run by a variety of non-profits with little control on message or regional cohesion. These efforts are beginning to come of age in many regards as larger campaigns integrate the principles of community-based social marketing into multi-faceted programs. First, as the New Jersey Clean Energy Task Force learned in their Project Porchlight effort, the use of non-profits as partners gives utilities and state entities access to communities through credible messengers in that they have no commercial gain from participation. Non-profits can also say and do things that utilities sometimes cannot, for instance, taking a more light-hearted, nimble, and fun tone in their communications.[33] Community-based social marketing campaigns are also starting to leverage new technologies such as geographic information system (GIS) enhanced online databases and mobile technologies (e.g., iPhone applications) to greatly enhance volunteers' ability to canvass neighborhoods, track their efforts, and collect evaluation-grade data. Community-based social marketing efforts require discipline and often techno-savvy to scale well, but have been demonstrated to deliver cost-effective energy savings when implemented properly.

3.1 Door-to-Door Canvassing: One Change/Project Porchlight

One of the challenges of community-based social marketing strategies is that they can be difficult to scale. If each community has specific and potentially different barriers to change, can one size fit all? One example that addresses this scalability concern is One Change/Project Porchlight (a United Nations Environment Programme Partner), a community-based social marketing non-profit that has run direct engagement energy efficiency campaigns in 900 communities across North America. Their fun and upbeat campaigns are typically sponsored by states and/or utilities to mobilize volunteer resources in their own communities. One Change harnesses the power of person-to-person communication by training volunteers to create a moment of reciprocity that leads to broad public participation in energy efficiency programs. Volunteers from existing community groups deliver a CFL bulb or other low cost efficiency gift (other efforts use a tire gauge or water savings device) door to door and at community events. The gift

[31] For a review of how energy decisions are rooted in community and lifecycle, see for example the work of sociologist Loren Lutzenhiser. Loren Lutzenhiser and Sylvia Bender. 2008. "Social Structure and Differences in Household Energy Use and Carbon Emissions." Proceedings, American Council for an Energy Efficient Economy. Washington, DC: ACEEE Press 7:191-204; and Loren Lutzenhiser and Susan Lutzenhiser. 2006. "Looking at Lifestyle: The Impacts of American Ways of Life on Energy/Resource Demands and Pollution Patterns." Proceedings, American Council for an Energy Efficient Economy. Washington, DC: ACEEE Press 7:163-176.

[32] For a review of community-based social marketing principles, see the website and books of Douglas McKenzie-Mohr, at http://www.cbsm.com.

[33] Personal Communication, Chris Granda, Gasteau Associates, Advisor to the New Jersey Clean Energy Program residential program planning team.

attracts attention and enables a conversation, neighbor to neighbor, to empower people to make smart choices about how they use energy. The bulb is bundled with other utility or state energy efficiency program info. Because the contact is made by someone the person at the door recognizes as a credible source (a friend or neighbor or community leader), the message sticks.

When comparing bulb recipients to those who were not reached through this door-to-door strategy:

- Significantly more bulb recipients signed up for other utility programs. In New Jersey, a single county in which One Change volunteers brought information about refrigerator recycling while at the door accounted for 25% of the state's refrigerator recycling program.
- Puget Sound Energy (PSE) customers in Washington state who received a Project Porchlight bulb were significantly more likely than before the campaign to purchase CFLs the next time a bulb burned out (77% vs. 65%). Those who did not receive a bulb became less likely to purchase CFLs over the same period.
- New Jersey residents who received a bulb were significantly more likely than before the campaign (50% vs. 23%) to say they have purchased a CFL bulb as a way to reduce energy consumption.
- In the BC Hydro sponsored campaign, 41% of those that received a bulb rated BC Hydro Power Smart program "very favorable," while just 27% of those that did not receive a bulb gave the same rating.

One Change has developed a set of sophisticated web-based program planning, reporting, and evaluation tools to manage their campaigns and volunteer resources. This helps consistency and provides verification for sponsors. They use a Google Maps-enabled GIS tool that can incorporate multiple sources of data, including customer energy use and demographic data increase the effectiveness of street-by-street outreach. An iPhone app and other GIS tools make lead generation for other energy efficiency programs possible, and facilitate quick follow-up opportunities specific to the local host utility programs and household. One Change's award-winning Project Porchlight is the number one not-for-profit pledge driver for the Energy Star Change a Light program, and Porchlight is credited with making PSE's Rock the Bulb retail campaign a broad-based community success that reached new customers for PSE's programming. Without any purchased media, One Change brought out over 1,000 volunteers to over 172,000 households in the PSE service territory. Communities were strategically chosen to support local Rock the Bulb events, and 25% of those that attended a Rock the Bulb event heard about it from Project Porchlight.[34]

Volunteer-based community efforts extend the reach of traditional energy efficiency programs by mobilizing "the converted" to bring the efficiency message to their peers via neighborly conversations.

One Change campaigns extend the reach of traditional energy efficiency programs by mobilizing those customers who have already participated in past energy efficiency programs to reach out to those who have not yet been engaged by traditional programs. Volunteers report that the sense of community, connection, and contribution are extremely motivational. "People are excited to be part of an action-oriented campaign," says Christopher Kelly[35] of One Change, "in fact we find that volunteers are clamoring for more opportunities to participate in future initiatives." Almost all (94%) surveyed say they

[34] Personal Communication, Stuart Hickox, Executive Director, One Change.

[35] Personal Communication, Christopher Kelly, Development Director, One Change.

would participate in another campaign with One Change. Participants seem to love the bright green clothing and branding, it makes them feel connected to a "collective identity or movement."

One Change's experience shows that mobilizing existing community networks can speed up market transformation by converting awareness to action at the local level. Volunteers reported that they talk to their friends and family more about energy conservation since volunteering (59%) and many report that the ability to be involved in their own local community was why they participated (65%). Sponsors benefit from strong brand association with positive local action (tracked by post campaign surveys) and an earned media value that is typically three times the media buy. Total costs for the program in simple form are about 1-2 cents per kWh depending on scale. Now that One Change has registered and trained 12,000 volunteers for Project Porchlight, it is experimenting with other program options to improve return on investment (ROI) beyond the bulb, e.g., by being able to re-engage Porchlight volunteers to revisit homes to support appliance switch-outs or home energy audits. The group uses the phrase, "using light bulbs to change people," citing the number of volunteers and those touched by the program that go on to have energy conversations with neighbors.[36]

In the Northwest, an approach like the One Change community-based strategy and campaign toolset could support an existing region-wide branded campaign as well as distinct utility-by-utility messages. By making it possible for people of all backgrounds to take a simple first step, the foundation can be laid for behavioral change and broad brand recognition for supporting utility identity and program collateral.

3.2 Community Organizing: Pickens Plan

The Pickens Plan Community Organizing Campaign utilized a strategic combination of cutting-edge social media and well tested community organizing techniques using both online and offline engagement opportunities.[37] Brett Horvath of Re-Vision Labs was hired by T. Boone Pickens to develop and organize a persistent and engaged online and offline nationwide community motivated and trained to lobby Congress and the President in the first 100 days of the new administration in support of the "Pickens Plan." In particular, the community of active participants was encouraged to write letters to Congress and form local chapters. A robust "Activist Tool Kit" (template Power Point presentations, business cards, and informational leave–behinds) and a variety of different communication channels (email, social networking websites, texting, house parties, and public events) allowed individuals to participate in ways most comfortable and convenient to them. This combination of elements creates what Re-Vision Labs refers to as an intentional "architecture of participation"

Developing a multi-faceted "tool box" for activists, including various marketing collateral and guidelines for developing events, allows individuals to participate in ways most comfortable and convenient to them.

The campaign has shown significant measurable results. Key outcomes include: recruited 100k members in first month and 1 million in 4 months; led to 10k real world, face-to-face meet-ups and events, 150 local chapters, 6.8 million letters to Congress in a week, and adoption by scores of politicians. Unanticipated outcomes include organic formation of several dozen cooperative investment groups for alternative energy and over 200 groups that shared information on local utility incentives (participants used tools developed by Brett Horvath and Re-Vision Labs).

[36] In a review of the State of New Jersey efforts, 79% of volunteers reported having learned about energy conservation as a result of volunteering for Project Porchlight.

[37] http://www.pickensplan.com/act/.

A central organizing premise of these campaign designs is that person-to-person interaction among trusted peers leads to greater adoption of desired behavior than other forms of intervention. Combining this idea with social media technologies allow for virtual community and continuation of engagement (both virtual and real). A North American Technographics Media and Marketing Online Survey supports this idea; according to the October 2008 survey, the most trusted form of online communication is "e mail from people you know" with a 77% rating.

For the number of people that participated in taking actions and the activity generated, the staff was fairly small (a paid staff of seven was responsible for team growth, management, and mobilization of the "army" of participants). Even with this expense, the cost is significantly less than the $56 million spent on TV advertising for the Pickens Plan. Mr. Horvath posits that for less than $5 million and, utilizing the right technical platforms[38] along with solid on- and offline community organizing, a national (or regional) movement can be created.

While the primary goals of the Pickens Plan may differ from those of the Council, one can see that by creating a similar "architecture of participation," as well as a community organizing strategy built around person-to-person (peer) relationships, behavior change could be increased and/or reinforced.

3.3 Barnraisings and "Bible" Study Groups

There are a number of innovative ways in which community groups and social networks have been enlisted to educate peers and promote behavior change. A non-profit in Cambridge, Massachusetts called the Home Energy Efficiency Team (HEET) repurposes the traditional New England "barnraising party" for home weatherization, in which trained staff assist a homeowner in assessing their weatherization needs and recruiting a small army of friends, family, and community members to provide free manual labor (the homeowner pays for supplies).[39] The staff and a few skilled volunteers teach the unskilled volunteers everything they need to know about weatherizing a home, along with other possible energy efficiency upgrades. The program operates with very low overhead and provides a hands-on energy efficiency education to a large group of volunteers, 40% of whom go on to make weatherization and efficiency upgrades in their own homes.[40]

Directly engaging community groups (such as churches, book clubs, sports teams, workplaces, etc.) can be a powerful means of inspiring behavior change because participants are changing their behavior to better align with a set of moral values shared by their peers.

Another intriguing community-based effort is the use of bible study-type groups to study and discuss ways in which participants can lead more sustainable lives. Many parishes of the Unitarian Universalist Church have implemented these types of study groups which use the "Low Carbon Diet" workbook as the "bible."[41] The groups, often called "Carbon Rings," provide emotional and practical support and an opportunity for sharing ideas/solutions for members who are committed to changing their lifestyles to reduce their carbon footprint. Each "Carbon Ring" begins with a carbon

38 According to Mr. Horvath, while a cost saving was realized through the use of free on-line technical platforms, doing so actually created barriers to participation. For subsequent programs Re-Vision Labs recommends a technical review process in order to choose the appropriate platform.

[39] More information can be found at http://www.heetma.com/, including a manual on implementing home energy efficiency/weatherization barnraisings.

[40] Personal communication with HEET staff.

[41] This and other similar workbooks are compiled by the Northwest Earth Institute. http://www.nwei.org.

footprint audit, and goals for reduction are set. In California, results are reported to the state coordinator to encourage friendly competition between churches. While the Unitarian Universalist Church's use of this approach is the most documented, these types of study/discussion guides are used by book clubs, workplaces, and other types of community organizations across the country as well. These community-based groups are particularly powerful in that participants are changing their behavior to better align with a set of moral values shared by their peers.

These types of community-based efforts have the potential to be part of a toolbox of possible approaches which partners of a regional campaign could implement on a community level. A regional campaign could develop guidelines and marketing/educational collateral for different types of community-based activities (see also the discussion of community energy challenges in Section 5), allowing local leaders/partners to decide what works best for their individual communities.

3.4 Experiences in Non-Energy Campaigns: IndiMark

Community-based social marketing techniques have been effectively by organizations seeking to promote other sustainability measures such as water conservation and environmentally-friendly modes of transportation. Individualized Marketing or "IndiMark" is a process developed by Socialdata America that has proven very successful at encouraging adoption of environmentally favorable modes of travel (EFMs). The methodology has been piloted and evaluated more than 100 times and in several countries and US states, most notably for the purposes of this study in Bend, Eugene, Salem-Keizer, and Portland, OR.[42] Results in these cities demonstrate substantial and lasting travel behavior changes.

In general, the IndiMark methodology is about establishing a dialogue through an individualized, direct approach via a detailed step-by-step procedure. The IndiMark process involves several stages, each based on personal contact with the target households. This dialogue motivates people to consider and review their travel behavior in the context of their own life situations. People who are interested in changing their travel behavior are supported and encouraged, but the choice is always left to the individual.

Customizing one-on-one interactions to an individual's specific needs and barriers can motivate substantial behavior change.

The key elements of the IndiMark process are to:

- Personally contact all target households,
- Motivate them to think about their travel behavior, and
- Inform them about alternatives in their travel mode choice.

IndiMark pilot projects in three Oregon communities (Bend, Eugene, and Salem-Keizer) show substantial increases in environmentally friendly modes of travel (EFMs) following the IndiMark campaign (i.e., walking, bicycling, and public transportation modes of travel). The use of these modes increased by 31% for the project as a whole. EFMs also increased significantly in each project area – 35% in Bend, 18% in Eugene, and 52% in Salem-Keizer. In addition, car-as-driver trips decreased by 9% for the project as a whole. Car-as-driver trips decreased by 10% in Bend, three percent in Eugene, and 11% in Salem-Keizer. Over 1.3 million vehicle miles were reduced as a result of the project, representing a 9% VMT (vehicle miles traveled) reduction. Physical activities also increased substantially due to the marketing efforts.

[42] A SmartTrips program has also been launched in Bellingham, WA, though results have not been included in this study.

Similar results were achieved in the Portland SmartTrips and TravelSmart programs. Portland SmartTrips projects have yielded a reduction of 9 to 13 percent in drive-alone car trips by all area residents with a corresponding increase in walking, bicycling, and transit mode shares in the SmartTrips areas. These results were collected through random telephone surveys of 300 to 600 households in each SmartTrips area with a corresponding control group.

The program costs $10 per person in the SmartTrips area. A typical 20,000-household program costs $570,000. This cost includes 4.35 FT staff and most materials and services. Staff overhead is included in this number, but computers, general overhead, and printing bicycle maps and transit schedules are not.

The IndiMark approach has also been successfully applied to promote other sustainability measures, including household water conservation and whole-house sustainability efforts in Australia. The Water Smart program was implemented in three communities in Australia, and included a program element of feedback on water consumption (see Section 4.2 in this report to read more about indirect feedback mechanisms) as well as the type of individual dialogue-based coaching described in the beginning of this section. The Water Smart campaign resulted in water consumption reductions of 7-12%.[43] The Living Smart Homes program, also implemented in Australia, engaged homeowners with sustainability practices through face-to-face workshops, an interactive website with action-learning modules, and a recognition scheme (a sign displayed in front of participants' homes indicating that they had completed modules). Public recognition for sustainability achievements can be a powerful motivator and is also often an element of energy conservation competitions (see Section 5 of this report for more discussion of the use of competitions to promote energy conservation).

[43] http://www.garnautreview.org.au/CA25734E0016A131/WebObj/D0844475ResponsetoIssuePaper5-WADepartmentofPlanningandInfrastructure/$File/D08 44475 Response to Issue Paper 5 - WA Department of Planning and Infrastructure.pdf.

4 FEEDBACK MECHANISMS

This section presents the use of various feedback mechanisms to promote energy conservation. "Feedback" refers to any intervention or strategy in which an entity is provided information on their energy usage habits with the goal of reducing energy consumption or shifting consumption to non-peak times. As with the use of mass media, providing information alone increases knowledge, but does not necessarily decrease energy use. However, the combination of energy consumption feedback with other behavior change strategies can be a powerful tool for reducing energy consumption.[44] Feedback is an increasingly popular intervention, which is being incorporated into many utilities' efficiency and demand response efforts in various ways, including technology-enabled (direct) feedback, billing analysis-based (indirect) feedback, and the simple provision of quantitative estimates of various efficiency and conservation actions in utility communications materials.

While technology-enabled or billing analysis-based approaches may not be feasible for a regional marketing campaign, there are several important concepts related to feedback which should inform the development of a marketing campaign. Many researchers believe it is important to provide people with information regarding the impacts of their own actions *and* which savings options are going to be most effective for them. Research suggests that when one can see or feel the results of their actions—preferably on an immediate and continuous basis—that individual is more likely to maintain the behavior over time. For example, research into efficient driving habits shows that drivers welcome feedback devices in their vehicles and that they drive more efficiently as a result.[45] Similarly, energy consumption feedback has been shown in numerous studies to be an effective means of achieving energy savings. A number of studies indicate feedback is most effective in the following circumstances:[46]

- It is provided frequently, as soon after the consumption behavior as possible.
- It is clearly and simply presented.
- It is customized to the household's specific circumstances.
- It is provided relative to a meaningful standard of comparison.
- It is provided over an extended period of time.
- It includes appliance-specific consumption breakdown (some studies).
- It is interactive (some studies).
- It is provided in combination with actionable suggestions for conservation.

There are two types of feedback commonly being employed in residential energy efficiency today: direct feedback (typically in-home energy use monitors) and indirect feedback (typically enhanced or

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[44] Abrahamse, Wokje. *Energy conservation through behavioral change: Examining the effectiveness of a tailor-made approach*, 2007

[45] Barkenbus, Jack. "Eco-driving: an overlooked climate change initiative." *Elsevier Energy Policy Journal*, www.elsevier.com/locate/enpol October, 2009

[46] Neenan, B, *Residential Electricity Use Feedback: A Research Synthesis and Economic Framework*. Feb, 2009, for EPRI; Darby S. *Making it obvious: designing feedback into energy consumption*. Proceedings, 2nd International Conference on Energy Efficiency in Household Appliances and Lighting. Italian Association of Energy Economists/ EC-SAVE programme; Fischer, Corinna. "Feedback on household electricity consumption: a tool for saving energy?" *Energy Efficiency*. Springer. December, 2007; Abrahamse, W., Steg, L., Vlek, C., & Rothenger, T. (2005). "A review of intervention studies aimed at household energy conservation." Journal of Environmental Psychology, 25, 273-291

comparative billing practices). Closely related to feedback is the use of online carbon calculators, which are less accurate than direct and indirect feedback mechanisms, but are cost-effective ways to integrate the concept of feedback into a marketing-based campaign.

4.1 Direct Feedback: In-Home Energy Use Monitors

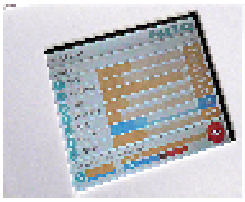
Direct feedback, in which consumption information is provided as the consumption occurs, typically comes in the form of in-home energy use monitors. Direct feedback mechanisms can be likened to the speedometer in the car, providing consumers with instantaneous feedback on how quickly they are using energy. Numerous studies report savings from home energy use monitors in the range of 5 to 15%.[47] Figure 2 displays images of the wide range of in-home energy use monitors available.

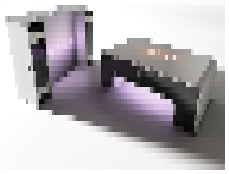
Figure 2. In-Home Energy Use Monitors

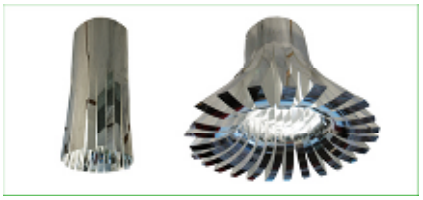

The Home Joule

Yahoo's green screen


Google PowerMeter

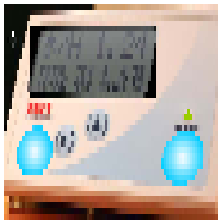

MorePower Multi


Wattson


blooming flower (grows with low use)


Energy Orb


Power Cost Monitor and Kill-A-Watt EZ


TED

While direct feedback has documented energy savings in the range of 5 to 15% (although more research remains to be done on the persistence of savings), the technologies are expensive and most likely impractical to deploy as part of a regional marketing effort. Thus, the remainder of this section focused on feedback mechanisms that could be more closely integrated into a marketing-based campaign.

4.2 Indirect Feedback: Enhanced Billing

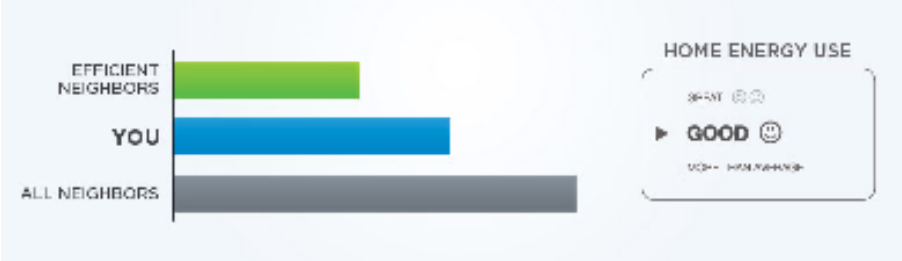
Indirect feedback is feedback that has been processed in some way before reaching the energy user[48] and is provided after the consumption occurs. The typical application for this has been "enhanced billing"

[47] Franklin Energy, for Minnesota Department of Commerce, *Residential Energy Use Behavior Change Pilot.* April 20, 2009; Neenan, B, *Residential Electricity Use Feedback: A Research Synthesis and Economic Framework*. Feb, 2009, for EPRI. See section 6-A of this report for a full list of feedback studies and their associated savings.

[48] Darby, Sarah. *The Effectiveness of Feedback on Energy Consumption: A Review for DEFRA of the Literature on Metering, Billing and Direct Displays*, 2006

such as that from OPOWER (formerly Positive Energy) in which information is provided regarding a customer's energy use in comparison to neighboring customers with similar homes (see Figure 3 for an example of this comparison). This invocation of social normative pressure is frequently cited in behavioral literature as being particularly effective. Several evaluations of OPOWER's pilots show average savings of ~2% from peer feedback reports as a part of a monthly utility bill. [49]

Figure 3. Home Energy Report



While savings per customer are typically smaller with indirect feedback, these programs are usually deployed as "opt-out" programs. Direct feedback pilots have typically been "opt-in," meaning the customer has to choose to participate. Opt-out programs enjoy significantly greater participation than opt-in programs as only small percentages (2% in the case of the Sacramento Municipal Utility District OPOWER pilot[50]) of customers actually opt out. While the opt-in home energy use monitor programs produce greater savings per participant, they are also much more expensive to deploy on a $/kWh basis. Energy use monitor programs that are opt-in typically have only single digit participation[51] (e.g., the NSTAR pilot[52]). As a result of their broad participation, opt-out programs may have more than four times the savings opportunities of opt-in programs.[53] Information on persistence of savings is ambiguous at this point. Most of these programs are relatively new and more research needs to be done to better quantify persistence of savings of these approaches over time.

4.3 Integrating Feedback with Other Strategies

As with many forms of behavioral interventions, the effects of feedback can be enhanced when used in conjunction with other approaches:

- Antecedent strategies such as commitments, prompts, goal setting/targets.
- Consequence strategies, i.e., rewards/incentives.
- Dynamic pricing regimes, i.e., consumption information and pricing information provided concurrently through the same interface.

[49] Ayers, Ian, *Evidence from Two Large Field Experiments that Peer Comparison Feedback Can Reduce Residential Energy Usage*. 2009 http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1434950

[50] Summit Blue Consulting. *Impact Evaluation of Positive Energy SMUD Pilot Study*. May 26, 2009.

[51] After a successful 500-customer pilot showing savings of up to 15%, Hydro One is deploying 30,000 free power cost monitors. At the writing of this report, an evaluation of that program was not yet available.

[52] MacLellan, David. "NSTAR Power Cost Monitor Pilot." *ACEEE Behavior, Energy, and Climate Change Conference.* November 19, 2008.

[53] Franklin Energy, 2009.

One way that energy use feedback has been integrated into broader campaigns is carbon footprint evaluation. Many organizations have put together online "carbon calculators" which allow individuals to enter in details about their household energy using equipment and typical energy bills, along with other behaviors that impact total resource use such as transportation and purchasing habits. After entering in these details, the calculators estimate the individual's carbon footprint and typically provide suggestions on how to reduce that footprint. Some websites ask individuals to commit through pledges to taking certain actions to reduce their footprint, and may provide them a means to publicly track their progress (e.g., by posting a widget on a Facebook page); some provide comparative data on the carbon footprint of people with similar lifestyles. There are issues of accuracy and lack of customization with these tools that leave room for improvement[54]; however, these calculators offer a low-cost way to quantify and visualize one's actions and impacts.[55] The key objective is to provide consumers with information that helps them prioritize actions based on relative expected savings; achieving precise calculations of consumers' carbon footprints and potential energy savings from various actions is less important.[56]

Feedback can incorporate elements of social marketing such as commitments/goal-setting and public recognition (for instance, a Facebook application that displays progress towards goals).

Below are some examples of organizations that provide online carbon calculators:

www.fightglobalwarming.com/carboncalculator.cfm
www.climatecrisis.net/takeaction/carboncalculator
www.nature.org/initiatives/climatechange/calculator
www.climatecare.org
www.carbonneutral.com
www.earthday.net
www.safeclimate.net
www.bp.com
www.travelmatters.org
www.conservation.org
www.carbonfootprint.com
www.epa.gov
green.msn.com
www.earthlab.com
www.treeswaterpeople.org

4.4 New Technologies

There are several new technologies under development in this space; for example, Internet-based feedback such as the Google Power Meter which provides energy use and cost information (Figure 4), comparison of energy use with friends and community, and the ability to measure home energy efficiency improvements through the use of a web portal.[57] Shaspa's kits[58] due out in 2010 track not only overall

[54] Padgett, J. Paul. *A comparison of carbon calculators*. Elsevier Science Direct. 2007. www.elsevier.com/locate/eiar; Bottrill, Catherine. *Internet-based tools for behaviour change*. Paper presented at European Council for Energy Efficient Economies (ECEEE) Summer Study 2007 Dynamics of Consumption Session 9, paper 211, 2007.

[55] Summit Blue's focus group research for the California Flex Alert campaign found a strong desire among participants for quantification of their impacts (both at an individual and statewide level). They want a sense (even if it's a rough estimate) of how much their actions matter. Recent ethnographic research conducted in California by ODC found a similar desire to see measurable impacts.

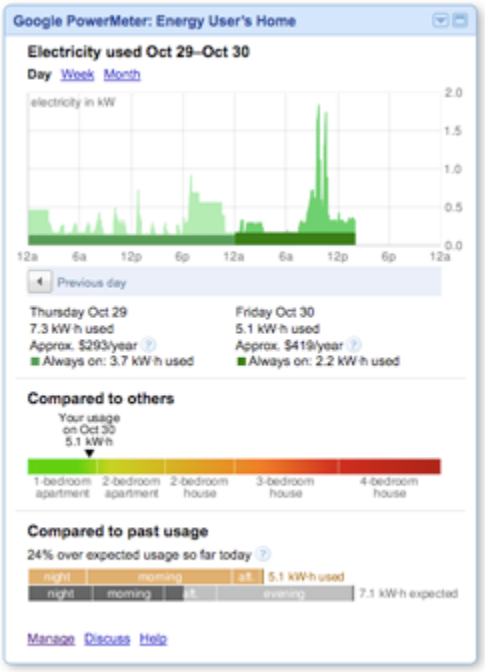
[56] Consider the use of the bathroom scale in weight loss; the measurement accuracy of the scale is less important than the ability to track progress relative to the original weight.

[57] Several utilities are already conducting pilots using Google Power Meter, including San Diego Gas & Electric. More information on SDG&E's collaboration with Google can be found here: http://www.sdge.com/smartmeter/googlePilot.shtml

[58] http://www.shaspa.com.

energy use, but they can also turn off individual outlets remotely. The system can also send stats to Twitter and Facebook to encourage friendly competition. Advanced kits even include 3-D software that lets you access them from virtual worlds like Second Life, letting you lower the thermostat with a favorite avatar.[59] Online feedback approaches could be one of many tools in a toolbox offered to participants in a regional marketing campaign.

Figure 4. Example of Google Power Meter User Interface

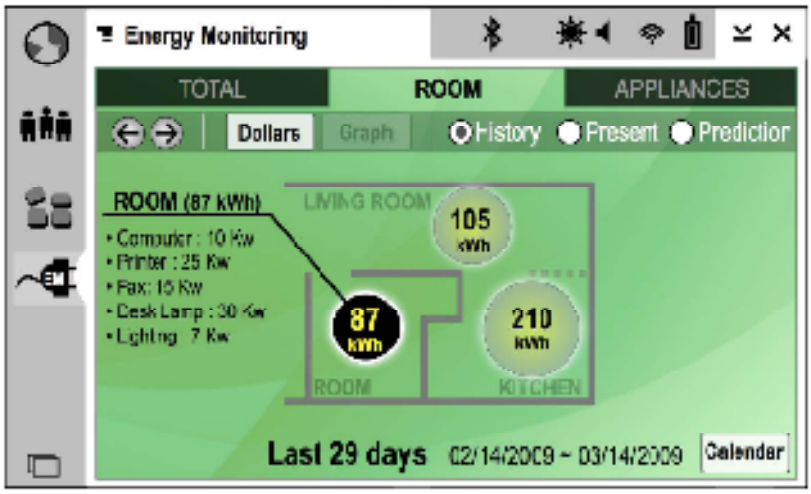


The Northwest is leading the way in the deployment of smart meters and other smart grid infrastructure with plans to install thousands of meters.[60] This is ushering in an era where more detailed information on energy use will become ubiquitous and will provide tremendous opportunity for enhanced feedback approaches. Figure 5 displays another example of an experimental user interface being developed at the University of Washington.

[59] *Popular Science*, January 2010, pg 24.

[60] The Pacific Northwest Smart Grid Demonstration Project is deploying smart meters throughout the Northwest.

Figure 5. New kinds of consumption feedback models which provide per fixture or per room consumption[61]



Imagine if you went to the supermarket and bought all of your food, but didn't pay at check out, and instead received one bill at the end of the month which simply said "food, $500." That would make it very difficult to make smart decisions about your grocery purchases. Similarly, consumers often struggle to make smart decisions about their energy use because they don't have a high level of understanding of what uses how much energy in their home. The findings above indicate that if homeowners are provided with tools to better understand and manage their electricity use, they are likely to use it more efficiently. Pilot projects and research indicate that feedback can be an effective tool in encouraging implementation of efficient behaviors. Feedback assists in the more efficient use of existing appliances, and it may also inform future appliance purchasing decisions. Enhanced billing and Internet-based feedback also have the advantage of being able to convey tips to achieve greater energy efficiency and provide targeted utility program information.

Increased knowledge of how their homes use energy can assist consumers in making smarter energy choices.

4.5 Experiences in the Water Conservation Field: Melbourne, Australia

Australian authorities have tested a variety of different social marketing interventions to reduce water consumption in the last decade. There is some evidence for the efficacy of consumption feedback; media; and use of prompts or "attunement labels." One study on feedback showed that while attitudes were a poor predictor of water consumption providing feedback on consumption and the dissonance between attitudes and actions did yield conservation. However the experiment was short lived (6 weeks) and some snapback occurred when feedback was halted. This suggests that feedback should either be ongoing or should last long enough to provide for more deeply engrained habit formation.[62]

[61] From presentation by Jon Froehlich, PhD candidate, University of Washington, at the ACEEE Behavior, Energy, and Climate Change Conference, November 2009.

[62] Aitken, C.K., McMahon T.A., Wearing A.J., Finlayson B.L., *Residential Water Use: Predicting and Reducing Consumption.* Journal of Applied Social Psychology, 1994, 24, 2, pp. 136-158

A longer-lived effort explored the impact of education through both schools and a more general media campaign. Researchers identified baseline behaviors of households and then tracked their response to exposure to media and education for their school aged children on water conservation. Three years later, volunteers from the baseline survey were surveyed to determine what behaviors had changed and to what the respondents attributed the changes. Respondents showed positive attitudinal shifts and reported improved conservation behaviors which were attributed in significant part to the television public service announcements. However, as the media exposure was not tested independent of the education efforts, it is difficult to know which in fact was more influential.[63] More recently, field experimentation research has yielded additional insights. Researchers have had promising success using labels to attune residents to the impact of home appliances. One experiment yielded 23% reduction in water consumption from labeling after 6 months, while norm-based messaging did not yield conservation effects.[64]

[63] Moore S., Murphy M., Watson R., *A Longitudinal Study of Domestic Water Conservation Behavior*. Population and Environment, Volume 16, Number 2, November 1994, pp. 175-189.

[64] Kurz, T., Donaghue, N., Walker, I, "*Utilizing a Social-Ecological Framework to Promote Water and Energy Conservation: Field Experiment,*" Journal of Social Psychology, 2005, Vol. 35, Number 6; pp. 1281-1300.

5 COMPETITIONS

This section discusses the use of competitions to promote energy conservation. Competitions can be an effective means to stimulate action and generate excitement and publicity around an energy conservation campaign, and they can also be a powerful force in transforming the market towards energy efficiency. As stated by Karen Ehrhardt-Martinez of the American Council for an Energy Efficient Economy, competitions can be very effective in inspiring changes because "social incentives are often more effective than economic incentives in spurring people to change their behavior."[65] The social incentives in an energy conservation competition are typically public recognition of "winners" and increased "team" or community pride (i.e., a sense of being a part of something bigger than yourself). Psychological research indicates that people are more likely to make green choices if they think others are too; competitions provide an opportunity to establish these social norms by providing recognition to residents and businesses that are modeling "good behavior."

Competitions have been demonstrated to leverage multiple resources by engaging disparate organizations such as municipalities, non-profits, and utilities in a collaborative effort. Competitions can attain significant savings at low cost and could be an integral part of a regional campaign. Tools, promotional materials, and examples could be made available for communities, schools, and utilities who want to bring the regional campaign to the local level. It should be noted that competitions run the risk of being event-based, and can yield a perception that the behavior promoted is "extreme" or for a defined period of time, rather than long-term persistent change; however, close integration into a forward-looking campaign should avert those risks. Below are some examples of competitions which are being deployed throughout the U.S. and around the world.

5.1 Community Energy Challenges

There are a growing number of examples of communities implementing public engagement campaigns related to energy efficiency and putting into practice cost-effective efficiency measures in homes, municipal buildings, fleets, street lighting, water treatment, etc. Local governments have been and will likely continue to be leaders in innovative solutions to climate change.[66] One way that communities have led the way in progressive sustainable policies is through community energy challenges. These take many forms, including challenges for constituents to reduce their carbon and energy footprints and communities competing against each other for the greatest savings, but most of them involve:

- Pledges or commitments.
- Use of local "celebrities" and influential community members as spokespeople.
- Energy assessments, usually online audit tools or carbon footprint calculators, or Energy Star Portfolio Manager for commercial buildings, to measure progress towards goals.
- Rewards, incentives, prizes, recognition.
- Project Porchlight[67] or similar grassroots outreach approaches.

[65] Interview with Karen Ehrhardt-Martinez, 2009.

[66] World leaders recently gathered in Copenhagen at the 15th United Nations Climate Change Conference (COP15); in addition to national leaders, local government leaders had a strong presence at the negotiations, led by ICLEI-Local Governments for Sustainability.

[67] See Section 3.1 for discussion of the One Change/Project Porchlight program.

- Partnerships with local, regional, and national entities. For example, EPA is currently running a community energy challenge for municipalities across New England.[68]

The Bellingham/Whatcom County Community Energy Challenge is targeting comprehensive efficiency improvements at both commercial and residential facilities, by actively working to reduce the barriers to implementing energy efficiency including financing and an adequate qualified workforce and raising awareness of opportunities to conserve energy through community-based social marketing, establishing community goals, and friendly competition. Regional partnerships were formed involving local/regional governments, utilities, businesses, educational institutions, and non-profits.[69] A reality TV show called the Greenest House has been developed with two families in the region competing to reduce their carbon footprint, with the help of "coaches."[70] Efficiency targets over the 18 months of the Challenge are 100 Whatcom County businesses saving (at least) 5-15% of their energy use, and 1000 residential housing units saving 5-30% of their energy use.

No independent evaluations of community energy challenges were found in publicly available sources at the writing of this report. However, Summit Blue recently commenced an impact and process evaluation of the ComEd Community Energy Challenge[71] in which ten local municipalities within the ComEd service territory competed to design and implement the best plan to meet energy and sustainability requirements including reducing municipal building energy consumption, reducing community energy consumption, and conducting community education on energy efficiency and sustainability. Results of the evaluation will be made available to the Council upon completion; in the mean time, Shaw Environmental, the implementation contractor, supplied the following preliminary assessment:

- 10 Plans submitted
- Estimated kWh Savings 43,601,384
- Estimated Avoided MTCO2e Emissions 31,312
- Over $4M of utility and state incentives and grants pledged to support implementation

Another example of a community energy challenge is Ireland's Power of One Street, which was one element of a multi-faceted campaign (called the Power of One) to reduce residential energy consumption. The concept of Power of One Street is that a variety of consumers (12 households, two businesses, and one school) became the stars of case studies (via reality-style television[72] and web) and faced a series of

[68] http://www.epa.gov/region1/eco/energy/energy-challenge.html. Other regional and national partners include: ENERGY STAR, NSTAR, KeySpan, National Grid, Jordan Institute, ICLEI, CT Clean Energy, CT Energy Efficiency Fund, Northeast Energy Efficiency Partnership, Massachusetts Technology Collaborative, the U.S. Conference of Mayors, Alliance for Climate Action, Clean Air Cool Planet, and Cool Monadnock.

[69] www.sustainableconnections.org/energy/energychallenge. Partners in this effort include: Sustainable Connections, the Opportunity Council (through the Building Performance Center), Bellingham Technical College, Puget Sound Energy (PSE), Cascade Natural Gas (CNG), the City of Bellingham, Whatcom County, Energy Efficiency Finance Corporation, RE Sources for Sustainable Communities, Western Washington University, and the Bellingham/Whatcom County Housing Authority.

[70] http://www.thegreenesthouse.com/.

[71] http://www.comed.com/sites/newsroom/News%20Room/newsroomreleases_11102008.aspx.

[72] The use of reality-style TV shows both in the Bellingham/Whatcom County Community Energy Challenge and the Power of One Street campaign is very powerful because it provides a means of moving actions which typically happen in the privacy of one's home (e.g., programming one's thermostat, upgrading insulation, etc.) out into the public realm. The contestants have the motivation of knowing that the public is watching their successes and failures, and viewers are able to see exactly what "good behavior" looks like, which makes energy efficiency more tangible and also establishes social norms (i.e., the sense that "ordinary people like me do this stuff").

challenges to reduce their energy consumption. Each month, the challenges focused on different end uses: space heating, lighting, domestic hot water, small power (i.e., plug loads), cooking, and an eco-driving challenge. Feedback also played a significant role in this challenge, as the participants had both energy consumption feedback and also energy "coaches" who were available to help them interpret the data and brainstorm methods of reducing consumption. The participants' energy savings were in the range of 13% to 27%, and the competition generated a high level of media interest.

The Energy Smackdown™ is a highly publicized energy reduction contest which has been run for two years in a few communities in the Boston region.[73] The contest is organized into two broad challenges: a household challenge and a team challenge. There was considerable local, regional, and national media participation in the second year's competition, such as publishing/broadcasting a total of 22 stories (12 newspaper, seven Web, and three television) about the Energy Smackdown. A 7-part video documentary is in post-production and will be distributed via community access television as well as on the Web.

Competitions generate publicity and earned media for a campaign, and help define social norms by publicly rewarding those people who are displaying "good behavior."

In the Energy Smackdown competition, household challenge participants are evaluated based on their percent reduction in per-person CO_2 emissions. Reductions are measured in five areas: electricity, heating fuel (home heating, hot water, cooking and dryer if applicable), travel (car and non-business plane travel), waste, and consumption of meat. In the team challenge, members of a community or organization work together to expand their impact. Points are awarded based on the total "nuggets" (energy efficiency actions) the team members have collected. As part of the Team Challenge, special challenge events are organized to highlight key issues related to energy consumption and to increase awareness in the community. Points earned in challenge events are added to the team score. In Season 2 of the Energy Smackdown, three urban communities (Arlington, Cambridge, and Medford) formed teams of 10 households each and competed over a 12-month, 4-season cycle to reduce energy use and CO_2 emissions.

Energy Smackdown participants took a variety of actions to reduce their energy consumption. Over three-quarters (77%) of Energy Smackdown participants reduced their hot water temperature, 69% replaced incandescent bulbs with CFLs, 54% air sealed and/or insulated their home, 46% installed low-flow aerators, 38% purchased green power, 38% replaced at least one major appliance with an Energy Star model, and 27% line-dried laundry. National Grid sponsored a reduction in heating fuel prize. The winners, the Koenig family of Arlington, reduced their energy use by 66%. The average contestant reduced their energy consumption by 17%.

A key theme running through these competitions is partnership: a regional campaign will need to successfully recruit partners like those mentioned throughout this section: utilities, community organizations, schools, municipal governments, and home energy efficiency contractors, to take an ownership interest in the campaign and to provide logistical and financial support. Strong partnerships with trusted organizations (as well as community leaders) lend local credibility to these competitions.

5.2 School Energy Challenges

As focal points of the community, getting schools involved in a regional energy efficiency campaign is a highly effective way to gain access to communities. Students engage in energy efficiency learning and

[73] Information available at: www.energysmackdown.com.

activities at school, and take the messages home to friends and family. Similarly, the school can be an access point for getting other municipal facilities involved and engaging local politicians and community leaders. There are numerous examples of successful school energy efficiency programs including one prominent example from western Washington called the Cool School Challenge.

The Cool School Challenge program was developed in collaboration with Redmond High School environmental science teacher Mike Town, the Puget Sound Clean Air Agency, and Puget Sound Energy's Powerful Choices for the Environment program.[74] Conceptually modeled after the U.S. Mayor's Climate Protection Agreement, the Cool School Challenge aims to motivate students, teachers, and school districts to reduce carbon dioxide and other greenhouse gas emissions throughout the school and at home. At the heart of the Cool School Challenge is the philosophy that big changes start with small steps, and that taken together, simple individual actions create a world of difference. Table 2 summarizes the results of schools participating in the Cool School Challenge.

School competitions provide an excellent opportunity for teaching future generations about energy efficiency and placing efficiency in its proper context as a feasible means of addressing climate change.

Table 2. Examples of Participating Schools and Associated Savings

School	CO_2 Reductions
Lincoln High School	2,958 lbs
Juanita High School	3,700 lbs
Jefferson Middle School	3,788 lbs
Lake Stevens High School	15,500 lbs
Ridgeline Middle School	24,520 lbs
Anacortes High School	30,000 lbs
Ingraham High School	39,650 lbs
American School of Dubai	71,889 lbs[75]

The Cool School Challenge provides teachers with free, downloadable lesson plans that engage students in activities such as performing an energy audit of their classroom and the school. Students are also given the tools and training to perform a home energy audit. Students receive classroom instruction, exercises, quizzes, and homework assignments, which expose them to all major concepts of energy efficiency and place it in its context as a feasible means of addressing climate change.

5.3 Home Energy Makeovers

Home energy makeover contests are designed to reach the existing homes market, which has significant savings potential yet has historically proven difficult to access. These contests demonstrate the value of a "home performance" approach to energy savings and educate homeowners about the benefits of energy efficiency retrofits by capitalizing on the popularity of home renovation and home makeover shows, and

[74] www.coolschoolchallenge.org

[75] Savings claims are self reported and not third party verified

help build demand for energy efficiency retrofits in existing homes. As with other forms of competition, these contests can generate media interest and garner a lot of free publicity for the sponsors, who typically include local contractors and suppliers as well as utilities and local governments. Contest promotions also often make use of local celebrities, athletes, and community leaders to help spread the word.

The contest takes a building-science approach to the selection of a home that best demonstrates the potential for whole house energy savings. Winning homes are selected based on energy usage per square foot and potential to demonstrate whole-house energy savings through existing home energy efficiency programs such as Home Performance with ENERGY STAR (HPwES). The winning home receives a makeover using energy-saving products and services donated by local suppliers. Entrants who don't win become leads for the sponsoring efficiency program and are provided information on how to participate in the program.

Home energy makeovers demonstrate the benefits of a whole-house approach to energy efficiency upgrades and help generate publicity and leads for aualified local contractors.

All contest entrants (i.e., contest losers) and other community members are invited to tour the newly-improved home and learn how to conduct their own energy makeover at their own expense using the local suppliers. Winners typically demonstrate energy savings of 50% or more. The winning homeowners also make a compelling case to the home visitors and media for the non-energy benefits that the improvements achieve in comfort, health, safety, and more.

Home energy makeovers are a great means of driving participation in existing homes energy efficiency programs like HPwES. HPwES continues to build momentum across the country as a very effective program in accessing the existing homes market. HPwES programs are designed to overcome several of the key barriers in the residential existing homes market: lack of information about how the home uses energy, uncertainty about which actions will save the most energy and money, and access to a base of reliable, knowledgeable, and trustworthy contractors. The Energy Trust of Oregon launched their HPwES program using a Home Energy Makeover Contest to help spread the word.[76] More than 6,000 homeowners entered the contest. The contest and its prizes were paid for by sponsors and supporters in return for the media attention they received.

[76] Information available at: www.homeenergymakeoveroregon.org.

6 CURRENT NORTHWEST ATTITUDINAL SEGMENTS AND BEHAVIORS

This section presents a summary of the existing research on attitudes and behaviors related to energy efficiency and conservation in the Northwest, including the results of seven recent segmentation studies in the region. A thorough understanding of the variations in consumers' attitudes and behaviors is critical to prioritizing target segments and tailoring messages to address the segments' specific mindsets and barriers that they are facing with regard to the desired behavior change.

6.1 Segmentation

Understanding and segmenting the market into distinct groups based on their shared characteristics, needs and preferences allows for customization of messaging. Seven utilities and energy agencies on the west coast have conducted segmentation studies within the past five years: the Energy Trust of Oregon (ETO), Bonneville Power Administration (BPA), Puget Sound Energy (PSE), Snohomish PUD (SnoPUD), Tacoma Power, BC Hydro, and Sacramento Municipal Utility District (SMUD). The Energy Trust of Oregon recently engaged Dethman & Associates to conduct a meta-analysis of these seven segmentation studies. The resulting report, *Comparison of Segmentation Plans for Residential Energy Consumer*, provides an excellent overview of each segmentation study's intentions, results, and implementation. The authors also stress that the real value of a segmentation study is the commitment to an ongoing process of better understanding the variation in consumers' attitudes and behaviors and abandoning the "one-size-fits-all" mentality, not the achievement of a "perfect" segmentation scheme. In other words, segmentation has little value if the utility does not commit to tailoring messaging and program offerings to the segments identified, and continually testing and refining the usefulness of their segmentation strategies.

The real value of segmentation is the commitment to an ongoing process of understanding the variation in consumers' attitudes and behaviors as opposed to approaching the residential market with a one-size-fits-all message.

Using the results of the seven studies, Dethman & Associates identified 10 broad customer segments in the Northwest, which are enumerated in Table 3, and prioritized the segments by their interest in conserving energy and their ability to reduce their energy usage. Note that the segment names and definitions vary by each segmentation study (although the BPA, SnoPUD, PSE, and Tacoma used a common survey instrument and similar segment names), and not all segments appear in each study, but these ten segments represent the broad categories of residential energy consumers in the Northwest. The three high priority segments described below (the Usual Suspects, the Average, and the Well-Intentioned) represent three distinct customer segments with significant potential for energy savings.

Table 3. Broad Segments Identified Across Northwest Segmentation Studies

Priority	Segment	Demographics	Attitudes	Potential to Save Energy	Prevalence in Segmentation Studies
High	The Usual Suspects	Stable, affluent homeowners	High level of green concerns	Some energy saving steps taken, but high usage means they can do more	ETO (24%); BPA/SnoPUD/PSE/Tacoma (18-24%); SMUD (6%)
	The Average	Stable, less affluent homeowners	Little concern for green issues; interested in saving money	Few energy savings steps taken, most could reduce usage	ETO (19%); BPA/SnoPUD/PSE/Tacoma (15-25%)
	The Well-Intentioned	Stable, mid-income homeowners	High level of green concerns	Energy saving actions taken do not match their level of concern for green issues	BPA/SnoPUD/PSE/Tacoma (10-25%); BC Hydro (20%)
Medium	The Too-Busy	Stable, low-to-mid-income homeowners with families	Some green concerns; no time to do anything more than what they've already got on their plates		ETO (18%); SMUD (21%)
	The Value-Driven	A mix of older stable homeowners of different income levels	Values drive them towards energy efficiency	Energy usage is already low	BC Hydro (26%); SMUD (16%)
	The Comfort-Driven	Stable, affluent homeowners	Interested in home improvement and comfort, but not efficiency or being green		BPA/SnoPUD/PSE/Tacoma (9-12%); BC Hydro (9%); SMUD (4%)
Low-Medium	The Cost-Driven	Often stable homeowners	Driven by cost savings	Energy usage is already low	BC Hydro (22%); SMUD (20%)
	Tomorrow's Suspects	Younger, lower-income renters	Strong green concerns	Not able to take most energy efficiency actions	ETO (15%); SMUD (21%)
Low	The Young and Clueless	Younger, lower-income renters	Low green concerns	Not able to take most energy efficiency actions	ETO (13%); BPA/SnoPUD/PSE/Tacoma (18-24%)
	The Disinterested	Mix of stable homeowners and mid-aged to older renters	Do not care about energy efficiency or being green	Potential to save energy, but no desire to do so	ETO (11%); BPA/SnoPUD/PSE/Tacoma (7-8%); BC Hydro (22%); SMUD (12%)

Source: Dethman & Associates. *Comparison of Segmentation Plans for Residential Energy Consumers.* Submitted to the Energy Trust of Oregon. Draft, November 2009.

A significant finding of the Dethman & Associates report is that the level of concern for green issues does not necessarily correspond with energy usage. The lowest energy users include young renters who strongly desire to be green, young renters who are completely disengaged from green/efficiency concerns, and true energy efficiency devotees. This serves as an important reminder that program design cannot rely solely on targeting the highest energy users or the "greenest" customers; segmentation must take both customers' receptiveness to a "green" message and their potential for energy savings into account when selecting a target audience and tailoring messages for that audience.

Of particular relevance to the Council's anticipated effort in building a regional marketing effort is the finding that there is less regional variation in the segments than BPA initially expected, when they compared their own results to the similarly structured segmentation studies done by PSE, Tacoma, and SnoPUD. They found that although there is some variation in the relative size of each segment and some segments were not found in all geographic areas, overall the proportions of the segments within each geographic area roughly mirror the proportions of the region as a whole. They did find that a "tree hugger" message likely wouldn't resonate well in some eastern parts of the region, but that a "we're all in this together and you can help your community" message would likely work well across the region.

6.2 Attitudes and Behaviors

Each of the seven segmentation studies conducted in the Northwest explored consumers' attitudes and behaviors related to energy efficiency, conservation, renewable energy, environmental issues, and participation in utility programs. These studies provide a wealth of information for each utility territory. The segmentation studies conducted for BPA, SnoPUD, PSE, and Tacoma are particularly useful for gaining a broad regional perspective on attitudes and behaviors, because they used nearly identical survey instruments and similar methodologies, and the results of those four studies are conveniently presented in a report by Momentum Market Intelligence.[77] The report breaks out responses into two regions: Puget Sound and non-Puget Sound BPA territory (which covers much of the Pacific Northwest region). Note that the non-Puget Sound BPA territory respondents do not include customers of investor-owned utilities, and thus excludes some of the more populous cities in the region (including Portland and Spokane). However, the BPA/Puget Sound survey responses are estimated to cover roughly three-quarters of the region's population, and thus provide a good overview of prevalent attitudes and behaviors.[78]

The findings indicate that energy efficiency purchases are widespread among residents of these regions:

- Over 70% of respondents have purchased CFLs (71% non-Puget Sound, 77% Puget Sound)[79]
- Over 75% of respondents who purchased any large appliances in the past 12 months chose energy-efficient models (79% non-Puget Sound, 75% Puget Sound)

[77] Momentum Market Intelligence. *Bonneville Power Administration Residential Segmentation Research Detailed Findings*. March 2009. Available at: http://www.bpa.gov/energy/N/segmentation/BPA_Detailed_Findings_3-11-09.pdf .

[78] According to their websites, the major electric investor-owned utilities which are excluded from the BPA study (Portland General Electric, Pacific Power/Rocky Mountain Power, Avista, Idaho Power, and Northwestern Energy) combined serve approximately 3.24 million customers, or approximately 26% of the Pacific Northwest region's total population (as defined by BPA to be 12.26 million people). The three Puget Sound region utilities (PSE, Tacoma, and SnoPUD) combined account for approximately 1.46 million customers, or approximately 12% of the region's population. Therefore, the combined BPA/PSE/Tacoma/SnoPUD survey results are estimated to cover about 74% of the region's population.

[79] Seattle City Light Research has found that while CFLs have "penetrated" 7 of 8 homes, saturation is still quite low, approximately 7 out of 33 sockets per home. Bob Balzar presentation to AESP on CFL markets, September 24, 2009.

However, the majority of respondents have been unable to notice savings from the energy efficiency actions that they've taken (44% non-Puget Sound, 33% Puget Sound). This is a potential red flag for campaigns promoting energy efficiency; if consumers are disappointed with past energy-efficient purchases not achieving noticeable energy savings, it may cause reluctance to pursue additional energy efficiency opportunities down the road.

Responses related to energy and environmental attitudes indicate that reducing energy costs is a top concern for about half of the respondents; protecting the environment is less of a concern, but a significant portion of respondents do believe in the long-term threat of global warming.

- Over half of respondents strongly agree with the statement "It's very important to find new ways to control energy costs." (53% non-Puget Sound, 54% Puget Sound)
- One-third of respondents strongly agree with the statement "Very concerned about environmental effects of electricity-generating plants." (33% non-Puget Sound, 32% Puget Sound)
- Non-Puget Sound residents are more likely to strongly agree that "it is socially responsible to limit use of electricity" (49% compared to 28% in Puget Sound), whereas Puget Sound residents are more likely to believe that "the long-term threat from global warming and climate change is real and potentially catastrophic (47% compared to 38% in non-Puget Sound regions).

The fact that agreement with most of these pro-conservation statements hovers in the range of roughly one-third to one-half of the population further underscores the fact that a one-size-fits-all message is unlikely to result in transformational changes in behaviors across a region. A successful campaign will make use of the segmentation research that has already been conducted, prioritize segments based on their ability and hypothesized likelihood to adopt the desired behavior(s), tailor the messaging to the segments' unique mindsets, and test their hypotheses.

Any discussion of the region's environmental/energy-related attitudes and behaviors must include the efforts that the King County (Washington) government has taken to develop the Environmental Behavior Index.[80] The county developed a comprehensive index of environmental behaviors in 2005, which has been updated several times since then. For each behavior in the list, respondents are asked:

1. What do you do?
2. How often do you do it that way?
3. Have you ever considered it doing it differently?

These questions are used to track the prevalence of certain behaviors and people's expected willingness to change those behaviors. Results are broken down by socioeconomic and geographic characteristics to identify segments/regions which are either far above or below the norm in terms of environmentally friendly behaviors; these results are used to adjust program delivery. The behaviors tracked do not include energy-efficient behaviors (the focus is on waste reduction behaviors such as recycling, composting, and proper disposal of hazardous materials), but the methodology used to prioritize behaviors to target through behavior change programs holds promise for energy behaviors as well.

The Energy Trust of Oregon segmentation study report[81] also included some useful findings about the prevalence of certain energy-efficient behaviors and products in Oregon. One of the more intriguing

[80] Jull, Pamela. "Environmental Behavior Index Survey." *Proceedings of 2009 International Energy Program Evaluation Conference (IEPEC),* Portland, OR. 2009.

[81] Research into Action. *2009 Oregon Residential Awareness and Perception Study.* Funded by Energy Trust of Oregon. November 17, 2009.

findings was that 40% of households have programmable thermostats, and just 66% of those are actually programmed, meaning that only 26% of households have programmable thermostats which are being used as intended.[82]

[82] However, it is important to note that there is considerable skepticism within the energy evaluation community as to the attribution of savings to this measure, because it is thought that the majority of people who are willing to buy and install a programmable thermostat would have simply turned down the manual thermostat anyway.

7 RECOMMENDATIONS

The research conducted for this study indicates there are many reasons a Northwest regional campaign aimed at changing attitudes and behaviors toward energy efficiency can be successful and should continue to be explored. Summit Blue recommends the Council move forward with primary research efforts to refine the approach. Specific recommendations for primary research are described in Section 7.1. Specific recommendations for a Northwest regional campaign are presented in Section 7.2.

7.1 Recommendations for Future Primary Research Efforts

This section highlights research areas noted in the studies as in need of further exploration, experimentation, or piloting. Primary research which addresses the research gaps outlined below will be most helpful in identifying and creating strategies to overcome barriers to widespread implementation of behavioral initiatives. Below are some suggestions for potentially fruitful avenues of research.

7.1.1 Current Behaviors

While the segmentation studies discussed in Section 6 have collected a great deal of information about attitudes, there is relatively little information (at least in the publicly available reports) about the prevalence of specific energy conservation behaviors. The BPA/SnoPUD/PSE/Tacoma segmentation studies[83] collected some data about CFL and appliance purchasing behaviors, and the ETO segmentation study[84] asked about CFLs, use of programmable thermostats, use of power strips, and a few other energy saving behaviors, but a comprehensive assessment of what energy efficient behaviors people are currently taking across the region would assist in establishing a baseline as well as prioritizing behaviors to promote. Linking the behavior baseline data to existing segmentation schemes would further assist in targeting messages. In-home research on current behaviors could be fruitful, as it would potentially help address social desirability response biases as well as provide a deeper understanding of the barriers faced by households related to specific behavior changes.

In determining which behaviors to promote in a regional campaign, care should be taken to avoid promoting already prevalent behaviors, and also to appreciate any east/west variations or gas/electric variations that could affect the likelihood that the region as a whole would see impacts and support the effort. Thus, the impacts of potential behaviors to promote should be assessed, similar to the work conducted for BC Hydro, and informed by the plasticity (or likelihood of adoption) research by Dietz.[85]

7.1.2 Brand Equity

The Council should consider conducting an assessment of the current brand equity of various regional utility conservation efforts to determine if there is a campaign/brand with enough traction that it might be

[83] Momentum Market Intelligence. *Bonneville Power Administration Residential Segmentation Research Detailed Findings*. March 2009. Available at: http://www.bpa.gov/energy/N/segmentation/BPA_Detailed_Findings_3-11-09.pdf.

[84] Research into Action. *2009 Oregon Residential Awareness and Perception Study.* Funded by Energy Trust of Oregon. November 17, 2009.

[85] See BC Hydro conservation potential assessment, by Marbek. See also Dietz cited infra.

adapted for the entire region.[86] In California, a similar assessment was made to determine whether the Flex Your Power campaign should be continued[87] or a new statewide brand (possibly in partnership with Energy Star or another well-known national brand) should be developed (or whether a statewide brand was unnecessary).[88]

7.1.3 Persistence

Persistence has been consistently identified as the primary barrier to utility spending on behavior based initiatives. This is an important topic, as our industries' regulators and program managers are used to planning in terms of measures and "measure life" so that they can judge that investments are worthwhile. More data needs to be gathered on the after-effects of the behavioral initiatives which have been deployed to date. Since many behavioral programs are funded as one-off pilots, there is little data on the persistence of program effects. The EPRI research on feedback cited earlier does suggest some persistence, though results vary and much of the research is from work done outside the U.S. However, recent presentations and dialogues with presenters at the ACEEE Behavior, Energy, and Climate Change (BECC) Conference suggest that persistence may be very specific to the nature of the behavior change pursued. For example, turning off lights not in use is a habitual behavior, once acquired the behavior may be more likely to persist than a maintenance behavior, like remembering to have your HVAC system tuned each year. Moreover, with the implementation of more efficient lights and appliances, the impact of our habitual behavior is diminished. Persistence of a "behavior" as described above and persistence of energy savings are potentially two distinct questions.

Follow-up research regularly in the 2-3 years after a program has operated is needed to determine if the behavior change persisted beyond the program period. NEEA has conducted research on persistence of long-term effects of programs such as the Building Operator Certification (BOC) training program; a similar approach could be used to analyze the persistence of behavioral initiatives.

Specifically related to feedback mechanisms, results from ongoing research indicates that a large percentage of households stop using their in-home energy use display devices after a relatively short period of time. This information needs to be reconciled against past study results that suggest

[86] There is some indication that this may happen in Maryland, where one utility has developed a strong campaign which may be adopted by the statewide energy efficiency program and used as the umbrella campaign brand.

[87] The brand equity research found that while aided awareness of the Flex Your Power campaign was high (66%), the majority (also 66%) of those aware had heard the name only, or knew very little about it, and unaided awareness (when asked to name programs/campaigns/brands/logos related to "smart energy use") was just 2%. This means that while the campaign was well known, people did not have strong, top-of-mind associations of the brand with its intended meaning. Thus, it was determined that it would be more cost-effective to create a new brand than to attempt to change people's associations with a brand with which they are familiar but not mentally engaged. The CPUC Marketing and Outreach Workshop which occurred in December 2009 outlined a methodical approach to assessing brand equity which could serve as a useful model for the Council's research, if this research is pursued in the Northwest.

[88] Partnership with Energy Star or another national brand was ruled out because California wanted to maintain more control over the brand than that type of partnership would afford, and it was determined that a statewide brand was preferable over allowing the utilities to be the primary marketers of energy efficiency in the state because it is believed that a utility-driven approach is fragmented and leads to lost opportunities. Thus, a new statewide brand is in development and should be implemented in 2010.

conservation effect persistence, e.g., some of the research fails to include the reduction in impact from the group as a whole, but rather focuses on those that actively used (and installed) the devices.[89]

7.1.4 Rebound, Snapback, or Take-Back Effect

Closely related to persistence, rebound, snapback, or take-back phenomena can occur with behavioral changes just as with other efficiency or renewable measures. For example, if a home adds insulation and storm windows, but then adjusts the thermostat higher, while there have been gains in efficiency, there may be no reductions in consumption. In renewable energy, researchers have heard residential adopters of solar power explain, "I have paid for PV so now I can run my AC when I want." More research needs to be done to determine if by using less energy through one strategy (or participating in a program), there is a tendency to use more energy somewhere else. This can be difficult to evaluate, particularly as it relates to demand response behaviors. For instance, if a poorly insulated home reduces AC usage on a hot day early in the day, they may actually be delivering less impact than a similar counterpart that reduces usage at precisely the time the system requires relief.[90]

7.1.5 Spillover and Synergistic Behaviors

A number of authors argue that drastic changes can lead to snapback phenomena (see Section 7.1.4), but few have actively explored the synergy of how the marketing and program effects interact, e.g., if a customer exposed to a community-based marketing program is more likely to discuss energy conservation options with a neighbor, what is the value of that? Based on a review of existing efforts in this space, it is likely that our persistence results are affected significantly by the lack of portfolio approaches/mindsets in our marketing research. Consider, how often do we track our ability to migrate a customer from a CFL install to a home audit program and then to a high efficiency furnace? What other modulators exist that can increase retention along that pathway of smart energy choices?

7.1.6 Social Desirability Bias

Research on quantifying the effect of the social desirability bias (i.e., the overstatement of "good" behavior and/or understatement of "bad" behavior) would be of great value in evaluating behavioral campaign impacts based on self-reported actions. Studies of this nature would begin with surveys and then use on-site inspections or review of metering data (e.g., interval load data where available) to verify. For example, an appliance saturation survey might be administered to estimate the presence of high-efficiency appliances. Later, participants could be incented to participate in a home energy audit in which the appliance types were noted. Another example would be to survey residential customers with interval load meters (or perhaps even monthly billing data) about their energy consumption behavior and then review their load data (perhaps in conjunction with a home energy audit) to validate their claims.

[89] In one study, over 20 percent of households that paid for a feedback monitor failed to install it. Norton, B. (2008). *Final Report for PowerCost Monitor Pilot Program Evaluation.* Prepared for National Grid, NSTAR Electric, Western Massachusetts Electric Company. Opinion Dynamics Corporation, Waltham, MA.

[90] See generally the impact results of the 2008 Flex Alert evaluation, available at www.calmac.org. In the impact analysis, significant discussion and analysis is devoted to the evaluation of timing components in demand impacts.

7.2 Recommendations for Development of a Regional Marketing Effort

The research findings indicate a comprehensive approach employing elements of many of the approaches outlined is worthy of additional investigation, provided that the regulatory environment (funding and cost recovery) support behavior related efforts.

- **Deploy a multifaceted approach** that can capitalize on the strengths of each strategy, such as using expensive mass media at the outset to garner attention for a low-cost community-based social marketing effort.

    - Energy decision-making can be much more strongly influenced a by a variety of moderators than we may have previously realized. The Northwest has a unique opportunity to test how a regional campaign interacts with other moderators such as community engagement, feedback, or other utility offers, or some combination. By using experimental design techniques (use of control groups, establishment of a baseline, evaluating progress), the region can support the discovery of what combinations work best to accelerate the adoption of behavior change.

    - Take advantage of cutting-edge social media tools and strategies. In particular, the integration (rather than ad hoc addition) of social media with well-tested community organizing techniques has the potential of building active communities of change.

    - Consider the use of competitions as a way to generate publicity for a campaign and demonstrate the value of energy efficiency in a public setting (see Section 5).

- **Utilize the whole range of social marketing tools**, including social norms, commitments, prompts, feedback, and behavior- and community-specific barrier research.

    - These tools can be used in all types of behavior change strategies, not just community-based social marketing; for instance, a mass media campaign can direct viewers to a website where they make a commitment to reduce their energy consumption by a certain percentage by taking specific actions.

    - Adapt messaging and behavioral initiatives to take advantage of the triggers of social normative behavior. Research supports the power of social norms; the more we see others behaving in a certain way or making particular decisions, the more we feel obliged to follow suit.

- **Target messaging to address the specific barriers faced by the target segment(s)**; this will dramatically increase the program's yield in comparison to a one-size-fits-all approach. See Section 6.1 on segmentation.

    - Segmentation must take both customers' receptiveness to a "green" message and their potential for energy savings into account when selecting a target audience and tailoring messages for that audience.

    - Do not assume that the only barrier to increased action is lack of awareness/knowledge; investigate all possible barriers to the desired behavior changes.

- Take advantage of segmentation research that has been done in the region to target messages to specific psychographic/attitudinal segments.

- In the current economic climate, there is an opportunity for a back-to-basics, anti-waste appeal which resonates with a broader constituency than the "save the environment" message.

- Consider using positive, can-do messaging – many studies have found that the American public is increasingly overwhelmed by negative media, dire predictions of climate collapse, and fear-based tactics to induce behavior change. Framing issues, materials, and media in more positive, solution-focused terms has proven to be successful in helping to overcome disengagement, leading to positive action.

- Provide clear, concise, specific, and actionable information on what to do. Focusing on a few simple requested behavior changes may improve message traction and evaluability. Consumers can feel overwhelmed if they are presented with a long list of actions to take.

- Allow for micro-targeting of the campaign based on local population segments.

- **Deliver messages by trusted sources, ideally within the community.** This is most effective when people from different organizations at the regional and local levels are empowered to act as champions of the program's message.

    - Support, buy-in, and partnerships throughout the region and possibly with national entities will assist in gaining receptivity from the largest audience.

    - Explore partnerships and synergistic marketing messages. Leverage existing local and national brands. The use of nonprofit partners gives utilities and state entities access to communities through local change agents that are credible messengers.

    - Consider developing a "toolbox" of offerings that could be deployed by partners such as local governments, utilities, non-profits, and community groups, which would enable partners to participate in the campaign in a way that makes sense for their community. For instance, the Council might provide guidelines on how to develop a community energy challenge along with publicity/marketing collateral (see Section 5.1) or something similar to the "Carbon Ring" study group guides used by the Unitarian Universalist Church (see Section 3.3). This would provide value to the region by preventing these smaller organizations from reinventing the wheel.

7.3 Evaluation of Behavior Change Campaigns

This section presents a brief overview of evaluation techniques for behavior change campaigns and the importance of proper evaluation planning and execution. See Appendix C for a more thorough discussion of this topic.

Most utilities operate in a state-regulated environment. Regulators require accountability for all expenditures of ratepayer funds. In order to receive regulatory approval, and therefore funding, energy efficiency programs must measure and verify electric energy and demand savings. All work and analysis methodologies used to determine these savings must be documented and will likely need to comply with the rigor level criteria found in various evaluation protocols that states are developing. Behavior programs

are no exception. In order for these new, innovative, and potentially impactful programs to get funded, pilots and other early efforts must show results. Marketing and other behavioral changes approaches *can be* impactful, however, quantifying the outcomes and impacts of behavioral programs may require innovation in evaluation methodologies. More quantitative analytic methods need to be applied in the design of these programs in order to verify savings for utilities and their regulators.

Evaluation is the qualitative and quantitative assessment of program impacts and processes. Quantitative outcomes of behavior change programs include measurable changes in perception, attitude, and behavior. It is these behavior changes that ultimately lead to energy savings (i.e., impacts). Impacts are the energy and non-energy consequences of program-induced behavior change. In the best cases, energy impacts are directly measurable through metering, billing, and load research data. Excellent examples of using metering to quantify impacts of a behavioral program are the evaluations of Positive Energy/OPOWER's Home Energy Report programs (see Section 4.2).

In addition to usage monitoring, identifying and quantifying program outcomes is typically done by asking the target audience about their behavior change through surveys and interviews. Determining a baseline and use of control groups must be considered in the design of the program to facilitate quantification of outcomes. The use of experimental and control groups in survey research before, during, and after the program period gives the researchers a clear view of baseline and experimental group trends over time.

Two of the primary barriers to quantifying outcomes of behavior initiatives are attribution and persistence of savings.

- **Attribution**: It can be difficult to attribute impacts to one specific campaign when there are so many active influences in the marketplace, which underscores the necessity of creating a unique voice and promoting a few specific actions rather than a generic "save energy" message.

- **Persistence**: Impact quantifications of behavioral energy programs are relatively scarce, and much of it has been done only in the last few years without sufficient control groups. This has not provided enough time to study how behavior changes persist. Pilots must be designed appropriately to facilitate quantification of outcomes.

News media and social media offer the evaluator new approaches for measuring involvement, interest, and ultimately impact. Assessing both the frequency and context in which the behavioral topic at hand is discussed in the news media as well as through social media channels (e.g., social networking sites, blogs, online message boards) gives valuable insights into the effectiveness of a campaign at generating "buzz" around an issue, as well as opportunities to correct misperceptions or misunderstandings.

The relative lack of robust, independent evaluations of residential energy behavior change programs is a continual deterrent to the implementation of these types of programs. The Council has an opportunity to break this deadlock by implementing solid evaluation planning from the outset for its regional marketing campaign.

See Appendix C for a continued discussion of this topic.

7.4 Context for a Regional Campaign

There are several unique contextual markers that would likely be part of any SWOT analysis the Council will undertake going forward. The following key market drivers are relevant to place past historical research in context of future likelihood of success.

- **Northwest context.** The Northwest region will likely be undergoing several significant changes in how energy managed in the near future.

    - Historically, the region has had lower cost energy supply resources without significant demand constraints. This is changing for a variety of reasons: peak growth is outstripping demand growth, at the same time that more variable resources such as wind are scheduled to be integrated into the system.

    - Demand management techniques to improve renewable energy penetration will be enabled by Smart Grid investments. These techniques will rely on technology adoption and shifting pricing conventions (e.g., critical peak pricing, etc.), which usually require marketing or an incentive or both.[91]

    - The technology will likely enable dynamic pricing. This increase in price (even if only at certain times of the day or on critical days) will be rolling out to the public at a time of unprecedented financial strain in the residential economy.

    - Smart Grid investments and roll-outs are not without public skeptics. The recent class action lawsuit in California on smart meters is a key signpost illustrating the risks in moving a population through a rapid technological advancement without proper outreach and marketing.

    - There are several researchers that have expressed concern about the entrenchment of some groups. We should be mindful that this stranded minority may not be without political voice and may need a targeted message.

    - One opportunity that is presented by the foregoing is a chance to test the efficacy of marketing on early Smart Grid neighborhoods. Significant analytical advances in modeling marketing efficacy are currently being explored by several entities. For example, some utilities are prioritizing their first Smart Grid neighborhoods for energy efficiency initiatives to help them better understand the effect of their promotions and other business opportunities.

- **National and international context.** At the same time the Northwest is navigating these regional changes, the national and international stage is struggling with similar issues and will likely make cost-effectiveness issues part of the smart meter/behavior dialogue going forward.

    - How much is too much (in terms of cost increases to support the changes we must make as a society) and who should pay will increasingly be the focus of debate, as evidenced by the Copenhagen dialogues.

    - In the next national election there will be an accounting requested by Republican leadership that will ask, what did we get for our ARRA funding? This will yield a reference frame that focuses extensively on cost-effectiveness.

[91] The PNW Smart Grid Demo is scheduled to span five states and affecting more than 60,000 consumers to demonstrate and validate new Smart Grid technologies and inform business cases; provide two-way communication between distributed generation, storage, and demand assets and the existing grid infrastructure; quantify Smart Grid costs and benefits; and advance interoperability standards and cyber security approaches. http://www.energy.gov/news2009/8305.htm/. The total deployment of smart meters in the Northwest is expected to be significantly more extensive than this estimate.

- **Ongoing regulatory dialogue.** Just across the border, the BC regulatory authorities have authorized BC Hydro's long term procurement plan which includes a significant component of behavior change in the residential sector.[92] In terms of regulatory dialogue, exploring what types of behavioral impacts are "counted" toward goals (funded or otherwise incentivized) represents a significant step forward for the industry. Note, however, that even in this ground breaking decision, that behavior is only credited with a persistence of one year. This could change as behavioral initiatives mature and more evaluations conclude.

    - Other states are also pursuing behavior change regulatory dialogues. In a request for comments, California recently asked stakeholders about the best way to measure behavior change. It is widely thought that this dialogue represents the opening for the "counting" or incentivizing of behavior change with earnings credits. [93]

    - Other states are beginning dialogues on which activities are "resource acquisition" and which are "merely marketing" activities that should not be subject to recovery as they are more focused on "supporting the utility brand."

    - If dialogues in the Northwest states move to support behavior change programs, this could make a significant difference in the support for an initiative such as the Council is considering.

[92]BC Hydro filed an annual Long Term Procurement Plan (LTAP) for 2008 which included a behavioral program as well as outreach and engagement to support behavior change. The behavior program itself is somewhat loosely defined as a mechanism to engage, motivate, measure, and reward consumer efforts in conservation behavior adoption. Estimates of impact in the LTAP in the residential sector are stated at 88GWh/year with one year persistence. The BC Commission authorized without approving the programs by decision dated July 27, 2009. Available at http://www.bcuc.com/Documents/Proceedings/2009/DOC_22471_LTAP_Decision_WEB.pdf. The programs themselves are described in Appendix K to the LTAP at http://www.bcuc.com/Documents/Proceedings/2008/BCH_LTAP_B-1-1_APPENDICES/Appendix%20K.pdf. Additional insights on the jurisdiction's support for behavior can be found in their acceptance of the residential inclined block rate. This decision cites conservation behavior as likely impacting rate impacts. The decision is available at http://www.bcuc.com/Documents/Decisions/2008/DOC_19755_BCH-RIB-Decision-WEB.pdf.

[93] In California, a recent ruling by Administrative Law Judge (ALJ) Gamson released on March 9, 2010 stated that the state will adopt a policy to estimate, measure, and count savings from comparative usage programs (i.e., OPOWER-style enhanced billing feedback), and that further efforts to create a regulatory environment that encourages behavior change and conservation were necessary. The current position is that only ex post savings during the 2010-2012 program cycle will be counted, but the onus is on the program implementers to prove that projected ex ante savings will materialize. The ALJ ruling can be found at http://docs.cpuc.ca.gov/efile/PD/114662.pdf.

APPENDICES

Appendix A: Final List of Interviewees

Name	Affiliation
Andrea Fabbri	EcoAlign
Dan Ariely	Duke University
Dana Anderson	Avista
Dilip Soman	University of Toronto
Donald Kelly	The Brainshift Foundation (Energy Smackdown)
Ed Thomas	Utility Exchange
Hannah Carmalt	Energy Market Innovations
Jessica Geenan	Puget Sound Energy
Jon Froehlich	University of Washington
Karen Ehrhardt-Martinez	ACEEE
Kathy Gumbleton	Southern California Edison
Lawrence Swiader	National Campaign to Prevent Teen and Unplanned Pregnancy
Loren Lutzenhiser	Portland State University
Marianne Ellis	VEO Group
Nick Hall	Tec Market Works
Pamela Jull	Applied Research Northwest
Rafael Friedmann	Pacific Gas & Electric
Rhys Roth	Climate Solutions
Ryan Moore	NYSERDA
Sue Kaplan	Massachusetts Department of Energy Resources
(multiple)	One Thing (Connecticut)

Appendix B: Matrix Summary of Key Initiatives

The following table displays a summary of each initiative and study that received in-depth analysis by the research team.

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
Statewide Umbrella Mass Media Campaign for Efficiency and Demand Response. Flex Your Power (FYP) and Flex Your Power Now (FYPN) are funded by California IOUs under CPUC approval. Primarily TV and radio, though other significant outreach does occur (events, awards etc.) [94]	FYP: Save Energy; Energy Efficiency Education, support IOU programs through increasing awareness. FYPN: reduce energy consumption on a few key days at peak hours by changing AC settings, turning off lights and shifting appliance use.	Lack of information; apathy; considering efficiency when making appliance purchases Prior years used California pride messages (this Californian can't purchase an efficient appliance but you can); most recent years used global warming, call to action.	Use of complex structural equation modeling techniques to estimate "feeder effects" with existing programming. Surveying to understand brand equity and support; Use of engineering models to estimate demand impacts. (Eval due out before final report is due)	It's likely that the brand is too CA centric for export, though regional pride elements may be a useful trigger to explore. Costs were also significant: 2004 through 2008, approximately $111M For 2004-05:$30M For 2006-2008: Flex Your Power 61M and FYPN $20M. Future efforts are planned to generate stronger experimental evidence, e.g., what synergies with CA utility programming uptake does community-based marketing yield?	Branding review indicated that it would be cheaper to create a new brand than to improve the equity in the existing FYP/FYPN brand. Current unaided awareness estimated at 2%. FYP was created rapidly in the midst of the CA energy crisis. As the states' and utilities marketing sophistication grew it became difficult to deploy more regionally targeted messages. Purchased media given large buy was delivered at excellent value. Subsequent ethnographic research indicates need for more
Every Little Bit – Avista Utilities	Increase customer awareness about Avista's energy efficiency programs; build context around why energy efficiency matters; Provide general uplift and support to DSM kWh and therm goals; delay need for more expensive generation	Customers often believe they are doing all they can. A common barrier in many research efforts. Concerns about pricing (first cost), and specific program awareness remain challenging. Avista's market has experienced many triggers that drive improved visibility on energy issues. Incentives for efficiency are up, energy and environment have been high profile campaign issues, the utility has experienced cost of service increases in a time of economic down-turn.	Good because of strong pre/post survey monitoring: baseline research in April 2007 and updated in November 2008. Despite difficult economy payouts on efficiency programs are up 40%. Consistent tracking of message traction planned for future as well (surveys, focus groups).	High – current successful initiative in the region. Campaign is working to fine tune deployment and identify additional outreach channels particularly for the under 45 segment. Unlike many media focused efforts, budget for this effort is relatively modest at $0.7M.	Make sure to measure awareness/attitudes /knowledge of specific programs, prior to launch and regularly thereafter. Media campaigns that directly support utility programs can work. Here awareness of specific messages is up significantly since advertising began. At outset, 52% surveyed could not name specific messages unaided. That number has dropped to 30%. Cost related reasons for failure to participate have surprisingly decreased despite the economy suggesting traction on perceived value of efficiency investments.

[94] http://californiaenergyefficiency.com/docs/market_ed_outreach/Meeting05262009.doc;

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
NYSERDA[95]	Intention to target communities and migrate households through a series of steps designed to help them understand the efficiency and conservation opportunities from a "whole house" perspective, without being overwhelming.	Triggers: Receipt of bill and planning for seasonal changes (e.g., a winter heating budget in the face of an unemployed family member. The biggest barrier to doing bigger things is cost of the bigger ticket items. Other barriers cited by participants included lack of awareness of incentives /rebates, need for information on payback and lack of a credible, reliable source of information /assistance. E.g., who do I call for insulation? Can I trust the contractor's recommendation?	Targeting older homes where occupants likely to remain for 5 years or more yields better savings. Tracking appliance sales as one efficacy tool. Significant pre-testing on messaging. Revised campaign is relatively young with little current evaluation: however retailers (Sears, Best Buy) appear interested participating in POP support.	Similarities: state has had strong association with Energy Star as leveragable starting point. State also has significant regional variation in what tones/messages work. Use of governmental (entity that does not profit) seen as credible to deliver messaging. Interview subjects cited conversion of free-onsite audit (offered by Energy Trust of Oregon) to action. E.g., NYSERDA appears to be learning from the Northwest.	Significant regional variations in message perception. Upstate found testimonials persuasive upstate but edgier communications style tested better downstate. Statewide, the state's own goals (15% reduction) were not motivational and the Energy Star logo appears to be associated with a selling frame of mind, rather than information provisioning. Consistent with CA research: any effort must be supported by easy to use website where consumers can go to get unbiased information. Key finding: It's important to maintain a cooperative structure to avoid competing messages in the market
What's On: PEPCO and Delmarva's advertising campaign, designed by EcoAlign as part of the EmPOWER Maryland effort.	Set thermostat to 68 degrees or lower in winter. Unplug TVs, game consoles, and laptops when not in use. Turn off lights when not in use. Participate in utility programs.	"What's on?" Get people thinking about what's wasting energy in their home, whether it's plug loads or unneeded lights or inefficient appliances.	Campaign was only launched in late summer 2009; too early to evaluate impacts, but focus groups indicate positive responses to the messaging. Other utilities within Maryland looking to adopt "what's on?" catchphrase.	Highly collaborative, multi-stakeholder regional effort.	Significant, long-term funding provides better opportunity to be heard amidst all the noise in the marketplace. The "What's on?" phrase is flexible enough to work for a wide variety of requested actions – it'll still work in 5 or 10 years.
Aus. Wirklich aus? (Off. Really off?): German regional advertising campaign to reduce standby power consumption.	Turning electronics fully off; purchasing/using power strips & power savers; considering standby power consumption when making electronics purchases.	Lack of awareness. Loss of psychological control over household equipment; saving money. No ecological messages. Humorous tone with wordplay.	An extensive evaluation was conducted, with three surveys of consumers and retailers: pre-campaign, at the campaign's peak, and one year later. Significant long-term changes in awareness and behavior observed, and kWh and CO_2 impacts were calculated.	Example of a successful regionally implemented, information-only campaign with measurable impacts.	Engaging retailers was critical. The mass media conveyed humor and fun and raised general awareness, whereas social media and retailers provided more factual information. Narrow focus of campaign enables more effective impact evaluation.

[95] NYSERDA Brand Communications Research, Acadia Consulting Group, December 4, 2008. Personal communication Ryan Mark Michalski, Associate Project Manager.

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
One Change/Project Porchlight[96]	Mobilizing significant low cost volunteer resources to help people undertake simple gateway actions. Use of gateway actions to encourage people to get on a path to considering other smart energy choices. .	Addresses lack of knowledge, mis-information, belief that their own actions matter. Helps people find community, connection and contribution in the face of an overwhelming problem. Reciprocity: Using light bulbs to change people; Also emphasis on trust: because of non-profit status, community-based action yields additional validity and participants (e.g., my neighbor is volunteering, what can I do?): Perception of organic grassroots change.	Participation in other energy saving programs has been relatively higher (and in some cases markedly higher) in Porchlight communities In one regional effort, 25% of refrigerators recycled came from communities where Porchlight was active. Porchlight also uses GIS applications and iPhone apps to collect key information at the household level to provide evaluation level documentation and to identify additional opportunities for utility partners.	Demonstrated portability and ready infrastructure makes it easy to participate. In over 900 communities in North America. 92% from latest NJ campaign said they'd volunteer again. PSE has used Porchlight to drive attendance to Rock the Bulb. 1000 volunteers reached 172,000 households in the area.	Focus on making participation "fun" and an event. People are excited to be part of an action oriented campaign. "Volunteers are clamoring for more opportunities to participate in future initiatives." 94% say they would participate in another Porchlight campaign. Using the community-based efforts and non-profit component to get the most traction, and ready force of volunteers. Total costs range from 1-2 cents per KWH depending on scale. Earned media is typically 3x paid media.
Pickens Plan (led by Brett Horvath of Re-Vision Labs)	Engaged and persistent online and offline community motivated and trained to lobby congress and the President in the 1st 100 days of the new administration in support of the Pickens Plan.	The technical platforms utilized by the organizers were free. For subsequent programs Re-Vision Labs recommends a technical review process in order to choose the appropriate platform. Person-to-person interaction among trusted peers leads to greater adoption of desired behavior than other forms of intervention. Social marketing techniques allow for virtual community and continuation of engagement.	Combination of cutting-edge social media and tested community organizing techniques using both on-line and off-line engagement opportunities. A robust "Activist Tool Kit" supported ready communication in ways most comfortable and convenient to them.		Key outcomes included: recruited 100k members in first month and 1 million in 4 months; led to 10k real world, face-to-face meet-ups and events, 150 local chapters, 6.8 million letters to congress in a week, and adoption by scores of politicians. Unanticipated outcomes include organic formation of: several dozen cooperative investment groups for alternative energy; over 200 groups that shared information on local utility incentives (participants used tools developed by Brett Horvath and Re-Vision Labs). .

[96] Review of October 2009 NJ Clean Energy Program Partner Activities. Sponsored by NJ Board of Public Utilities. 94% of surveyed New Jersey volunteers would do so again for Project Porchlight or other One Change campaign; 79% reported having learned about energy conservation as a result of volunteering for Project Porchlight; 59% of volunteers reported that they talk to their friends and family more about energy conservation since volunteering. 65% of volunteers participated because they wanted to be involved in their community.

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
Unitarian Universalists Low Carbon Challenge "Carbon Rings" (Study/Action Groups)	A wide variety of energy and environmental behaviors; each week focuses on a new chapter and new behavior or set of behaviors.	A methodical, step-by-step approach helps participants overcome the overwhelming sense of "I want to do something, but where do I start?" Study group setting allows peers to brainstorm ideas and share solutions, rather than be told what to do. Empowering people to take action to reduce their environmental impact, and fostering a sense of community and "we're all in this together." Leveraging the strong sense of environmental stewardship found in the Unitarian Universalist Church; strategy has been used in other types of community groups as well.	Given that the groups generally have known memberships and meet regularly, participants could easily be recruited to participate in a series of surveys to track changes in attitudes and behaviors. With a strong group leader who's integrated into a regional campaign, each meeting could be a mini focus group where new insights into energy behaviors and attitudes could be learned.	Could be part of a toolkit of community-based strategies for community groups such as churches, book clubs, etc.	Provides social support for people who are deeply committed to reducing their carbon footprint, but need assistance in taking the next step. Encourages others who might not be as committed to learn more about what their peers are doing. Each group needs a motivated leader who can interact with the campaign to receive materials and to report back on lessons learned. Groups often uncover barriers that were previously unknown to utilities/campaigns, e.g., a mother who felt a social stigma about taking her children to the park on the bus; felt strength in numbers when another mother from the group agreed to join them.
Home Energy Efficiency Team – Barn-raising Model for Home Weatherization	Home weatherization	Lack of knowledge and skills; time required to complete upgrades. Free technical assistance; aid in recruiting volunteers to help complete work quickly.	Organization conducts follow-up surveys with both the homeowners and volunteers; 40% of volunteers go on to make efficiency upgrades themselves.	Could be part of a toolkit of community-based strategies for municipalities, non-profits, community groups, etc. HEET has already put together a guide to implementing weatherization "barnraising" parties.	Non-profit organization with low overhead. Homeowner pays for the materials, but gets all the labor for free. Only one home gets weatherized at a time, but it provides a teaching opportunity to educate 30-40 volunteers about energy efficiency actions they can take in their own home.
Residential Energy Use Behavior Change Pilot, April, 2009, by Franklin Energy,	Understand the nature of how their actions relate to their energy consumption	Inadequate information, habits, ingrained beliefs Providing information on use. Direct real time feedback is most effective	Evaluation of numerous published studies on energy use behavior change interventions	A decision making support report for the state of Minnesota. Useful for planning feedback pilots with insights on planning, logistics, sample sizing etc.	There are 3 broad categories 1. In home energy use devices 2. Customized regular feedback to customers, often in combination with comparison to neighbors and 3. Dynamic pricing

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
Residential Electricity Use Feedback: A Research Synthesis and Economic Framework, Feb, 2009, B. Neenan for EPRI. ** It should be noted that the pioneering work of Darby and Fischer is cited in all of these works	Increased awareness of household-specific electricity consumption information	Households are typically not provided with tools that improve their ability to manage their resources Several studies have suggested that household-specific electricity consumption feedback information can be an effective tool in encouraging conservation	This report provides a synthesis of research relating to household electricity consumption suggesting areas for further evaluation. Impacts however range significantly, even when similar tools are used in different regions.	Feedback in this schema can be device-based or indirect, e.g., enhanced billing. Widespread distribution of devices doesn't appear the intent of this committee.	Feedback is more effective if provided frequently, clearly and simply presented and customized to the household's specific circumstances. In addition it should be relative to a meaningful standard of comparison, provided over an extended period of time, and includes appliance-specific consumption breakdown (some studies).
Promoting Energy Efficient Behaviors in the Home through Feedback: The Role of Human-Computer Interaction – Froehlich, UW	Awareness of energy use	Information on consumption is only provided in aggregate on monthly bill When people become aware of their energy use, they can manage it. The greater the granularity (e.g., appliance level), the greater the ability to mange	Introduces ten design dimensions of feedback technology with which to build and evaluate future systems.	More of theory piece to keep misconceptions and other potential confounds in mind.	Establishes the potential of feedback to change energy consumption behavior, by 10-15% on average, with significant decreases linked to more frequent feedback and higher data granularity (e.g., specific
The Cool School Challenge	Get kids to bring home the message of how to implement energy efficiency	Free downloadable lesson plans online that engage students in activities such as performing an energy audit of their classroom and the school. Students are also given the tools and training to perform a home energy audit. Students are given exercises, quizzes and home work assignments, as well as classroom instruction, which exposes them to all major concepts of energy efficiency and places it in its context as a can do means of addressing global warming	Evaluation of energy impacts of educating children can be difficult. Access to kids requires parental permission. Research on parents that have children in the program, as compared to control groups, would add insight.	Applicability will depend on traction with existing education initiatives in	A number of education programs around the US indicate that cost effective savings can be generated through these programs.

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
Oregon Home Energy Makeover	Existing home efficiency improvement	Lack of information about how the home uses energy, the actions that will save the most energy and money and access to a base of reliable, knowledgeable and trustworthy contractors Works to leverage the popularity of home renovation and home makeover shows with big publicity contest.	While significant PR accrues to the event, and the homeowners "make a compelling case to the visitors and media it can be difficult to attribute the "impacts" of the program to those who have seen the program. Interviews with local suppliers of efficient equipment would be interviewed about program's effects. But it would be difficult to attribute program effects from other efforts in region.	Already implemented in numerous locations including Portland Oregon. Interesting new strategy to access a traditionally difficult segment: existing homes.	Winners typically demonstrate savings of 50% or more. No data yet on indirect effects (suppliers and others that tour home or watch program). The winning home receives a makeover using energy-saving products and services donated by local suppliers. All contest entrants (i.e., contest losers) and other community members are invited to tour the newly-improved, winning home and learn how to conduct their own energy makeover at their own expense using the local suppliers. In all cases, the winning home owners make a compelling case to the home visitors and media for the non-energy benefits that the improvements achieve in comfort, health and safety
The Energy Smackdown	Existing home efficiency improvement	lack of information about how the home uses energy, the actions that will save the most energy and money and access to a base of reliable, knowledgeable and trustworthy contractors Leverage the popularity of reality TV shows with big publicity contest.	Evaluation would require good "comparables" and persistence after "competition" ends. Competition mentality may yield perception that behavior is extreme or event-based.	The contest accesses the media in a number of ways, but at its core is a docuseries on how these people learned about and implemented energy efficiency in their homes. Interest would likely vary by region and segment.	The competitive spirit is alive and well! Broadcasting this as a reality TV show reached an audience not typically aware of energy use or ways to improve it.

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
Bellingham Community Energy Challenge	Community wide involvement in energy efficient behavior	Many communities set carbon reduction targets but lack information and access to examples of how to structure community wide energy efficiency or carbon reduction programs Social normative behavior, civic mindedness, competition	Several evaluations under way. Care needs to be taken not to double count savings and to attribute savings appropriately to the initiative or to other efforts or utility programs	Marketing and participation by municipal leadership and local celebrities to promote community wide energy reductions. Municipal buildings, schools, homes and businesses all can participate	Elements of successful campaigns include: Pledges or commitments; Use of local star power; Energy assessments, usually online audit tools or carbon footprint calculators, or Energy Star Portfolio Manager for commercial buildings, to measure progress; Rewards, incentives, prizes, recognition ; "Change a light" or similar grassroots outreach approaches; Partnerships with local, regional and national entities.
"Eco Driving: An Overlooked Climate Change Initiative – Barkenbus, 2009	More efficient driving habits	Lack of knowledge of how driving habits impact fuel use Education and feedback on driving style impacts	Can test education and use of feedback devices. However program also uses combination of fiscal incentives and social norm reinforcement. Each element likely contributes.	High	A sophisticated, multidimensional campaign involving education, regulation, fiscal incentives, and social norm reinforcement is what will be successful

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
ODOT Individualized Transportation Options Pilot Project and Portland SmartTrips program, using the Individualized Marketing (IndiMark) methodology developed by Socialdata America	- reduce drive alone trips - reduce vehicle miles driven by residents and employees - increase awareness and raising acceptability of all travel modes - increase walking, biking, transit, carpooling and car sharing trips - increase neighborhood mobility and livability	Necessary to find people that are already interested in changing behavior. Grow relationship with participants/households who require more time and effort than simply sending out an information packet. Lots of subjective or learned behaviors – hard to overcome. Dialogue through an individualized, direct approach via a detailed step-by-step procedure that involves. - Personally contact all target households, - Motivate them to think about their travel behavior, and - Inform them about alternatives in their travel mode choice. The approach reinforces changes in travel behavior brought about through "hard polities" such as provision of transportation services and infrastructure, pricing and longer-term land use policies.	The IndiMark process involves several stages, each based on personal contact with the target households. This dialogue motivates people to consider and review their travel behavior in the context of their own life situations. People who are interested in changing their travel behavior are supported and encouraged, but the choice is always left to the individual. Context and other confounds (other interactions, price etc.) may make evaluation challenging.	Already active in Northwest	Substantial increases in environmentally friendly modes of travel (EFMs) (i.e., walking, bicycling, and public transit, etc.) increased by 31 percent for the project as a whole. EFMs also increased significantly in each project area -- 35 percent in Bend, 18 percent in Eugene, and 52 percent in Salem-Keizer. Car-as-driver trips decreased by nine percent for the project as a whole. Car-as-driver trips decreased by 10 percent in Bend, three percent in Eugene, and 11 percent in Salem-Keizer.
WaterSmart program, using the Individualized Marketing (IndiMark) methodology developed by Socialdata America (see directly above)	Encourages water conserving behaviors	Similar to the above Similar to the above	Involves monthly utility reports of water usage increases or decreases for individual households and as compared to neighbors as well as "self-reading" of meters to elicit conserving behaviors. The program couples the provision of water usage data with Individualized Marketing (IndiMark) techniques such as personal contacts, targeted education and information, and coaching (see above).	.	Meter readings show reductions of 7-12 percent in water consumption

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
Ehrhardt-Martinez, Karen, John A. Laitner, and Kenneth M. Keating *Pursuing Energy-Efficient Behavior in a Regulatory Environment: Motivating Policymakers, Program Administrators, and Program Implementers*. Berkeley, CA: California Institute for Energy and Environment, 2009.				Concern over reproducibility and persistence and lack of precision in measurement hamper investment. Clear rules rewarding investment are needed. No silver bullet – need multiple paths to achieve the estimated potential savings of 25% of current residential energy consumption.	
Dietz et al, Household actions can provide a behavioral wedge, National Academy of Sciences. Released 10-27-09	Analyzed 17 household behaviors to reduce energy consumption using available technology. Important classification scheme: Behaviors vary in type (purchasing, maintenance, habitual, weatherization etc.)	Behaviors vary in adoptability (plasticity). E.g., carpooling is hard to get high adoption on, but with right approaches, maintenance of HVAC (a once yearly participation) may be more likely. Uses best practices for each behavior promoted to identify (optimistic) potential reductions that explicitly consider plasticity.	"The most effective interventions typically (i) combine several policy tools (e.g., information, persuasive appeals, and incentives) to address multiple barriers to behavior change; (ii) use strong social marketing, often featuring a combination of mass media appeals and participatory, community-based approaches that rely on social networks and can alter community social norms; and (iii) address multiple targets (e.g., individuals, communities.	Single policy tools have been notably ineffective in reducing household energy consumption. However there are few good research efforts on portfolio approaches to behavioral interventions.	Household behavior change (low or zero cost) can account for 7% reduction in GHGs in the US. Key lesson: indicates that responsiveness to price can vary by a factor of 10, depending on nonfinancial aspects of policy implementation
"Nudge" Thaler & Sunstein	Noted professors review how choice architecture can "nudge" us to more beneficial choices. Argues that policy makers should consider these affects when designing interventions.	Emphasis on decision processing biases. E.g., we are conditioned to respond to default/opt-in settings and discount future gain. Financial sector lessons may have applicability to energy. E.g., commitments to "save more tomorrow" are easier to obtain. Appreciates that many policy makers are concerned about restricting freedom of choice. Introduces concept of libertarian paternalism where path of least resistance is more beneficial.	Emphasis on experimental design as in most behavioral economics research.	May be more of a policy level tool, and thus out of scope for this project. Emphasis on preserving choice a useful construct for the active engagement of Northwestern stakeholder groups.	Small details matter much more than we may appreciate. Example – locating healthy food at eye level yields improved choices without promotion or other dialog in cafeteria line.

Initiative	Desired Behavior(s)	Barriers & Triggers	Evaluability	Applicability to Northwest	Key Lessons Learned
"Predictably Irrational" Dan Ariely	Encourages promoters of socially desirable behavior to understand the predicable ways in which human decision making is biased or "irrational" and to exploit those biases for social good.	People have built in cognitive biases that discount steeply future gains (personally and globally). Moreover energy efficiency is a low involvement behavior (e.g., not compelling). "Couldn't design a harder problem [than global warming] if we tried."[97] Creating opportunities to sign up now, or realize gain now and pay later can address this barrier, and has worked in other fields.	Typically the research uses experimental design to test strategies before wide spread role out. Opt out strategies are favored over opt in. Prompts for small incremental actions are preferred over complex choice option sets.[98]	Northwest - in launching a new regional effort is potentially poised to identify significant insights using similar experiments. E.g., before locking in on an approach, has the luxury of experimenting to identify which strategies have most potential for synergy with existing marketing efforts in region.	Goes beyond choice architecture and behavioral economics to also include elements from psychology, such as norms, social contracts, arousal and procrastination.
"Fostering Sustainable Behavior" – McKenzie-Mohr[99]	Emphasis on community level appreciation of context and barriers for participation in environmentally sound actions. Perspective of environmental psychologist.	Barriers to action can be community specific. Community-based social marketing should emphasize (market) benefits and reduce barriers (real and perceived) to action. Several tools are contemplate, particular emphasis on use of Commitments, improved convenience, Norms, Prompts and Social Diffusion tools.	Strongly supports pilots and experimental design to prove effort is appropriately designed.	Very	Hero-type behaviors (high impact/low adoption rate) are a poor starting point. Easier to adopt behaviors are better starting point. Information provisioning is insufficient and yields poor results.

[97] Paraphrase from ACEEE, Behavior Conference keynote address, November 2009.

[98] Personal communication Dan Ariely. December 2009.

[99] http://www.cbsm.com/pages/guide/preface

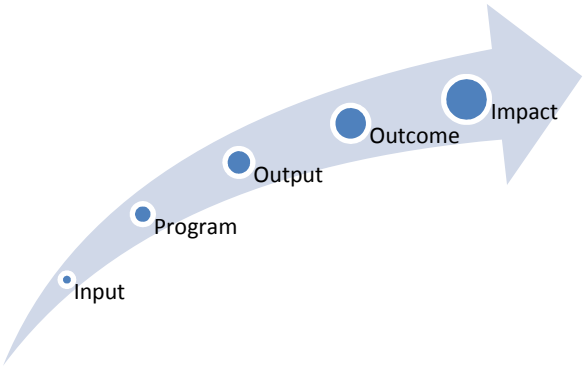
7.5 Appendix C: Methods Used to Evaluate Success of Behavioral Initiatives

A thorough evaluation of a traditional resource acquisition energy efficiency program not only quantifies the amount of energy saved (i.e., impact evaluation), but also assesses the means through which the program influenced the target audience to save energy (i.e., process evaluation). Behavioral energy initiatives are no different: it is just as important to understand the *means* as the *end*. In fact, the process evaluation might be even more important for behavioral initiatives because of the open-ended nature of program design and the complex, psychologically- and sociologically-driven reactions of participants. However, in the current atmosphere of regulatory interest/insistence on cost-effectiveness and the natural inclination towards quantification in the energy field, the methods used to develop sound estimates of program impacts are also of keen interest.

7.5.1 Program Logic Models and Process Evaluations

Articulating the process through which initial ideas and motivations translate into programs that ultimately deliver impacts is a necessary first step in developing an evaluation approach. Figure 6 illustrates this process, which can be thought of as a simplified program logic model: initial inputs such as internal motivations, external mandates and pressures, and knowledge of prior programs come together to form a program design. This design is then implemented as a program that produces outputs. The audience responds to these outputs by changing their behavior or adopting new attitudes; these responses are the outcomes. Ultimately, the outcomes results in impacts. Evaluation, then, is the qualitative and quantitative examination of the activities involved in each of these steps and of the linkages from step to step.

Figure 6. How an Idea Becomes an Impact



Process evaluation is largely the same for behavioral programs as it for traditional resource acquisition programs, and as such, is not the focus of this report. A starting point for a process evaluation is often the review (and perhaps revision) of a logic model developed by the implementer, or the development of a logic model if none exists. As with resource acquisition programs, the process evaluation typically involves an assessment of the strength of the program design and logic model, interviews with program implementers to determine whether the program has been implemented as designed, and qualitative and quantitative evaluation of the program's outputs (e.g., focus groups to assess program concepts and marketing materials, review of media buy to ensure that reach and frequency targets are met, etc.). The remainder of this section on evaluation is devoted to quantifying the outcomes and impacts of behavioral programs.

7.5.2 Impact Evaluation Methods

Evaluating the impacts of energy behavioral or information-only programs can be much more challenging than traditional resource acquisition energy programs.[100] Differences between the two types of programs that lead to this challenge include:

- **Identification**: In a behavioral program, the "action-takers" may be a small subset of the audience, often without a clear signal to identify them. In contrast, in a resource acquisition program, identifying participants with certainty is often only a matter of data tracking.

- **Actions taken**: Even a simple behavioral program may encourage conservation across many different end-uses (e.g., residential lighting, heating/cooling, equipment with standby modes); resource acquisition programs have a much more narrowly defined scope, and again, identifying the actions taken with certainty is only a matter of data tracking.

- **Impact per participant**: The expected impact per action-taker is often much lower for a behavior program than for a resource acquisition program. This makes measuring the impact per person much more difficult to assess with certainty on an individual basis. To counter this, behavior programs tend to have larger audiences than resource acquisition programs, allowing for adequate aggregate impact estimates.

- **Attribution:** Behavioral programs tend to have less concentrated and more diverse impacts than their resource acquisition counterparts, and they might be only one of a complex set of influences driving behavior change. For instance, consumers may be hearing energy efficiency-related messages from many entities: utilities, local companies such as contractors and retailers, national companies promoting a "green" message, local and state governments, and national leaders such as President Obama. It can be difficult to attribute impacts to one specific campaign when there are so many active influences in the marketplace, which underscores the necessity of creating a unique voice and promoting a few specific actions rather than a generic "save energy" message.

Despite these challenges, evaluation is important to most entities implementing behavioral programs, and with careful evaluation planning, the program's outcomes and impacts can be assessed and quantified.

To properly assess the impacts of behavioral programs, the evaluation team must first have a thorough understanding of each element of the program's intended logic: inputs, implementation strategy, outputs, outcomes, and impacts. The first three elements are typically evaluated in the process evaluation, as discussed in the previous subsection. The final two elements, outcomes and impacts, are the province of impact evaluation. The term "outcomes" is used here to describe the changes in attitude, perception, and behavior resulting from the program; "impacts" is used to describe the energy and non-energy consequences of behavior change outcomes.

Evaluating Outcomes

Quantitative outcomes of behavior change programs include measurable changes in perception, attitude, and behavior. It is these behavior changes that ultimately lead to energy savings (i.e., impacts).

[100] Some behavioral/information-only programs explicitly aim to funnel participants into traditional resource acquisition programs; evaluation of this type of behavior (i.e., the decision to participate in a utility program) is markedly simpler, as long as the resource acquisition program tracks how participants learned of the program.

The impacts of targeted behavior changes can be categorized as "durable" or "non-durable": "durable" impacts being those that outlast the initial action (e.g., replacing an appliance with a high efficiency appliance, air sealing a home), and "non-durable" impacts being those that last only as long as the behavior change (e.g., turning lights off when not in rooms).

The techniques used to quantifying behavior change depend heavily on the details of the program and the availability of data regarding this behavior. Often, this aspect of evaluation requires a degree of creativity to identify data sources and collection techniques that provide unbiased, statistically significant results that properly account for external influences. Identifying and quantifying program outcomes is typically done by asking the target audience about their behavior change through surveys and interviews. Additional techniques for observing outcomes include review of traditional and social media coverage (i.e., the "buzz" around a campaign or idea) and more advanced qualitative research methods such as participant journaling. Behavior change outcomes may also be observable through existing data sources such as sales data, transportation data, and photo/video records.

Asking the Audience

The most common approach to understanding the qualitative response of the audience is through surveys, interviews, and focus groups. Subjects are first asked about their beliefs, attitudes, and behaviors regarding the program topic without the evaluator referencing the program. This type of information, if collected before, during, and after the program, can be used to track changes in the audience and also to establish a dynamic baseline through the use of a control group.

For example, the evaluation of the "Aus. Wirklich aus?" ("Off. Really, off?") campaign in Germany (Wortmann and Möhring-Hüser 2003) surveyed four groups of people: 1,000 people over the age of 14 in the state of Schleswig-Holstein, where the campaign was conducted, 1,000 people over the age of 14 in Nieder-sachsen, which was not subjected to the campaign, and 100 retailers in both of these states. Three rounds of surveys were conducted: one before the campaign, one during the campaign, and one after the campaign. This use of experimental (Schleswig-Holstein) and control (Nieder-sachsen) groups and before/during/after surveys gave the researchers a clear view of baseline and experimental group trends over time; the impact of the program could then be taken as the difference between the two trends.

At all stages of these activities, the evaluators should be keenly aware of sociological and psychological phenomenon at play. One common example of this is social desirability bias or response bias, i.e., the over-statement of good behavior, which can play out in both *who* chooses to report[101] (i.e., non-response bias) and *what* they choose to report. [102]

The technique of participant journaling has been demonstrated to minimize response-bias. One example of this is an evaluation of a transportation options pilot program (Socialdata America Ltd. 2007), in which participants were asked to keep a travel diary and then mail the diary back to the program.

[101] An impact evaluation of the Indiana Energy Assistance Program Energy Education Pilot observed reduced measure installation rates as the incentives for completing the survey were increased (from $10 to $25). This implies that those most willing to report, i.e., those not requiring a large incentive to participate in the survey, are most likely to have taken action. This also implies that large incentives can minimize this type of bias.

[102] For example, a study of re-use and recycling behavior in Mexico showed poor correlation between self-reported and observed behaviors, another study observed that people tripled their estimated willingness to purchase CFLs when asked in person by a utility home auditor, after having been asked on paper in a screening survey.

Using News Media and Social Media to Observe the Audience

News media and social media offer the evaluator an opportunity to observe the audience absent of the influence of the observer. Assessing both the frequency and context in which the behavioral topic at hand is discussed in the news media as well as through social media channels (e.g., social networking sites, blogs, online message boards) gives valuable insights into the effectiveness of a campaign at generating "buzz" around an issue, as well as opportunities to correct misperceptions or misunderstandings. For instance, Summit Blue's evaluation of California's Flex Alert demand response media campaign utilized a media monitoring service which monitored TV and radio news channels for specific keywords; through this observation, the evaluation team noticed errors in terminology and requested actions and gave the program implementers specific suggestions to work with news media on improved message accuracy. The evaluation also utilized a social media monitoring service, which found that there was very little social media "buzz" occurring spontaneously about the Flex Alert campaign, which highlighted the need for the campaign to engage those channels as well as a general lack of prescience of the issue despite a large advertising budget.[103]

Use of Existing Data Sources

Existing data sources may be available to support an evaluation; the availability of such data will be highly dependent on the targeted behavior, audience, and location. Durable changes, such as purchasing new energy-efficient equipment, may be observed through sales data or appliance saturation surveys. Non-durable changes may be observable through load data. Evaluators should discuss the availability of data, such as load research samples, billing data, sales data, rebate invoices, and transportation statistics, with relevant authorities.

7.5.3 Evaluating Impacts

Impacts are the energy and non-energy consequences of program-induced behavior change. In the best cases, energy impacts are directly measurable through metering, billing, and load research data. Where this information is not available, or expected impacts are too small to observe with statistical certainty for a given sample size, surveys and interviews can be used to capture the frequency and details of behavior change; this information can then be used to estimate impact from.

Metering and Billing Data

Non-durable changes, such as the frequency and duration of use of energy-consuming equipment, might be observed through whole-building or end-use metering. Where interval whole-building data is available, signatures of specific end-use consumption may be observable, i.e., evaluators may be able to tease out the activities of a particular end-use from whole-building data based on the magnitude and duration of changes in the data.

Metering is useful when the group of behavior changers is well known (i.e., you know who is changing their behavior) and the number of end-uses to observe are relatively small. Where this group is not well known, installing enough meters to capture a statistically significant sample of positive responders could be cost-prohibitive. Furthermore, the knowledge of being observed may influence the behavior of the observed.

[103] There are a number of services available for monitoring media coverage, e.g., Vocus (which covers all forms of news media, including print and broadcast, as well as social media) and FiltrBox (which is focused on social media).

In some cases, metering data may be available retrospectively, e.g., monthly billing data collected by the utility. It may be feasible to first conduct a survey to identify action-takers, in which the respondents are asked for permission to access their utility billing records. Then, the billing data for the identified action-takers can be analyzed. This effectively concentrates action-takers in the pool of respondents being analyzed and can improve the savings per action-taker evaluability considerably. As AMI and residential smart metering devices are deployed, a much richer dataset than monthly billing totals will be available for enhanced analysis.

Excellent examples of using metering to quantify impacts of a behavioral program are the evaluations of Positive Energy/OPOWER's Home Energy Report programs[104]. Billing data was used for the evaluation, which meant that there was no added intrusion on the part of the evaluator to collect the data. The target audience was known exactly: experimental and control groups were selected and subjects either did or did not receive a series of personalized mailing. These evaluations contained tens of thousands of subjects in both the experimental and control groups, allowing for statistically significant observations of impact in the range of 1% to 2% of whole-house monthly and daily consumption.

Surveys and Interviews

Surveys and interviews are often the best source of data available, especially when metering is not an option (e.g., due to cost, sample size, or the risk of influencing participants). As discussed in the *Asking the Audience* section above, surveys can be used to capture what people did (and how many people did it), and then follow-up interviews can then be conducted that focus on quantifying the impact of what people did, for example asking if they have gas or electric (or other fuel) water-heating, or how long their showers are (pre and post).

Surveys (typically phone or internet) are a tool for provided standardized data collection; everyone surveyed is exposed to the same questions, and their responses are captured in the same manner. However, for complicated behavior change, it may be infeasible to design a survey capable of capturing all possible, significant actions and enough follow up detail to be able to quantify savings. Another challenge with surveys is crafting the wording of the surveys in a universally understandable way.

In cases like these, interviews conducted by those well-versed in the end-use technologies and behaviors may be more effective at capturing the right details, minimizing the misinterpretation of questions, and requesting clarification where open-ended responses are unclear.

As discussed earlier, social desirability bias is a major concern with surveys and interviews. Quantifying this effect for energy behavioral programs is an important and underexplored area of research. Studies that can match self-reported information (e.g., end-use hours of usage) to verifiable information (e.g., metered end-use hours of usage) would be of great value to the energy behavioral community as a starting point for: 1) how to design surveys and interviews to minimize this phenomenon and 2) how to calibrate results of surveys based on these findings.[105] See Section 7.1 on recommendations for future primary research for more discussions.

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[104] Summit Blue Consulting, Impact Evaluation of OPOWER SMUD Pilot Study - UPDATE - September 24, 2009

[105] Refer to footnote [102]. As another example, in an evaluation of state-wide demand response media campaign, self-reported residential demand response behavioral impact were estimated from surveys, then statewide residential load research data was examined to confirm the order of magnitude of impact estimated in the surveys. Summit Blue Consulting. *2008 Flex Alert Campaign Evaluation Report*. Rep. CALMAC Study ID: PGE0270.01, December 10, 2008. http://www.calmac.org/publications/2008_Flex_Alert_Final_Report_12-18-08.pdf.

Summit Blue has recently been involved in several behavior program impact evaluations that used surveys and interviews to estimate impacts and has developed the following recommendations for survey and interview design:

- **Start with a proposed impact estimate methodology**. Engineers who will conduct the analysis should identify all data sources that will be used for assumptions and for default assumptions where respondents do not provide a usable answer to a question (e.g., size of home, heating fuel type). Based on the magnitude of uncertainty, engineers should also identify what missing information would justify excluding a respondent from the analysis (i.e., what is the most important data in order to be able to estimate impacts, without which impact estimates would be impossible?).

- **Get engineers to assist in designing surveys and interview guides**. Once the methodology is determined, the engineers should work with the survey and interview guide writers to ensure that the inputs they need for their analysis are captured, and that inputs are in the formats convenient to their analyses. For example, if using deemed-savings values, the same building type descriptions, building vintages, and HVAC options present in the deemed-savings database should be used in the survey's multiple choice questions. This will likely be a balancing act between collecting the desired amount of information and keeping the survey/interview to a reasonable length, especially when behaviors regarding multiple end-uses are influenced by the program.

- **Test surveys and interview guides, then refine**. Testing ensures that questions and wording are understood by most respondents and gives an glimpse of what types of information respondents will be able to provide (e.g., will homeowners know how large their AC system is?). Surveys and guides should then be refined to reflect what was learned during testing.

- **Where possible, use follow-up interviews to capture details for impact quantification** - Follow-up interviews conducted with an expert can yield more accurate results that surveys in getting the details of actions that are necessary to conduct engineering analyses to estimate impact. Interviewers should have good communication skills and be comfortable talking to the target audience in their parlance (e.g., knowing how a homeowner might refer to components of their home HVAC system, or how a contractor might, depending on the interviewee). This can be expensive: each complete interview may take several hours when you account for reviewing screening data, multiple attempted contacts, not completing interviews with many in the sample (typically about half), conducting the interview, and cleaning interview notes or recordings for analysis.

Where budget does not allow for interviews of all members of the sample, interviews can be done for a sample of action-takers identified in the screening survey; the results of the interviews can then be used to calibrate estimates for the entire surveyed sample.

7.5.4 Attribution

A behavior program is typically one of many influences on the target behavior; overlapping influences include other behavioral campaigns, corporate green messaging, weather conditions, and economic conditions. Attributing outcomes and impacts across these influences is challenging; this issue is complicated further if some of the target behavior change includes funneling the audience towards resource acquisition programs.

The most convenient way to isolate the outcomes and impacts of a program from other influences is through the use of a control group (see the discussion in the section **Program Design for Evaluation** below); here the experimental group and a control group (not exposed to the program) are both randomly selected from the same population. Differences in outcomes and impacts between the two groups are then taken as the outcome and impact of the program. Where a control group is not an option (e.g., a region-wide marketing campaign), the program designers should identify the most reasonable *comparison* group or groups; these are groups that are comparable but separate from the target audience (for example similar demographic groups in nearby regions that do not have a regional behavior program). Outcome and impact estimates developed using a comparison group may not be as rigorous as those developed using a control group, but they will suffice to provide reasonable estimates.

To support or substitute for a control or comparison group, surveys can be used to ask the audience how significantly the program influence reported outcomes. Survey content for this can range from a simple battery of questions asking participants how significant that program was in changing their perception/attitude/behavior, to complex statistical modeling that can be used to refine and validate logic models and rate the relative strength of proposed linkages.

An example of the latter is an evaluation of a California's Flex Your Power social marketing campaign (Dougherty, Randazzo and Wellner 2009), where a control group was not available, due to the state-wide nature of the campaign made the use of a control group.

7.5.5 Persistence

The long-term, accumulated impact of a program is dependent on the persistence of the changed behavior. This a particularly difficult piece of the impact puzzle. Impact quantifications of behavioral energy programs are relatively scarce, and much of it has been done only in the last few years without sufficient control groups. This has not provided enough time to study how behavior changes persist – either in the presence or absence of the program.

Short-term persistence (i.e., over the span of months) can be measured through repeated studies over time. The German "Off. Really off?" campaign (Wortmann and Möhring-Hüser 2003) evaluated behavior change (relative to pre-campaign behavior) both during the campaign and almost a year later and saw relatively stable (increasing in some cases) levels of behavioral change. Early results of the Positive Energy/OPOWER pilots suggest good persistence (Ayres, Raseman and Shih 2009) after seven and 12 months (separate pilots).

However, longer term persistence (i.e., years) has yet to be adequately explored. Evaluators must not only identify how long the behavior change lasts, but how likely (and when) it would have changed in the absence of the program; in other words, the baseline cannot be assumed to remain static over time. For example, impact from speeding the adoption of energy efficiency technologies (such as CFLs) can be seen as the difference in energy implications of adoption rates with and without the program. Overlapping influences such as new behavior programs must also be accounted for.

7.5.6 Program Design for Evaluation

Proper evaluation planning upfront can ensure the most precise outcome and impact results in the end. Determining what kind of evaluation to plan for (e.g., evaluation activities, level of rigor) will depend on the objectives of the evaluation: is an "order of magnitude" estimate needed? A rough estimate of program cost-effectiveness? A precise impact value for DSM credits or planning? This section discusses elements of experimental design that are useful for program designers to keep in mind. In many cases, it

may not be feasible to follow these guidelines due to timing or the nature of the program; in these cases, evaluators can fill in information gaps with the best available data and reasonable assumption. Results will not be as precise as when these guidelines can be followed, but they can still provide a reasonable estimate of the program's outcomes and impacts that can be used to gauge cost-effectiveness or other standards.

Useful aspects of experimental design include:

- **Baseline/pre-program conditions:** It is impossible to say how behavior has changed if the baseline behavior is not known. This may require a pre-program period of data collection such as interviews, surveys, and end-use metering. In some cases, existing surveys and studies may suffice; billing data might also be used and is already being collected by utilities.

- **Control groups:** Behavioral programs are typically one of many influences on an individual's behaviors. A control group is randomly selected from the same population that the experimental group is also randomly selected from. Where a control group is not possible (e.g., impossible to expose some members of the audience to a program and not others), comparison groups of comparable demographics and other energy-influencing characteristics can be used. Without a comparable control group, the evaluator's ability to distinguish between outcome and impacts between the program and external conditions is greatly handicapped. Random sampling should be used to select the experimental and control groups.

- **Population size:** Proper sample design techniques should be used to ensure that experimental and control groups within the target audience (and the observed samples of these groups) are large enough to provide the statistical precision desired for the expected magnitude of outcomes and impacts.

The use of control groups may limit initial program deployment to only a sample of the target audience. However, an initial pilot evaluation provides program implementers with a scientifically rigorous method of estimating impact, as well as potentially avoiding a costly full-scale implementation of a campaign that will not produce significant impacts. The complexity of sociological and psychological response to influences on behavior change typically warrants experimenting and program refinement before a full scale program can be deployed with confidence of its effectiveness.

7.5.7 Statistical Significance of Impact Estimates

Determining what size sample will be needed to obtain desired levels of confidence and precision in outcome and impact estimates is an exercise that should be conducted during the program design phase. This may affect the scope of the project (e.g., if the expected impact per person is small, you will need a large sample size to be confident of results). Figure 7 and Figure 8 illustrate the sample size needed given a desired confidence level, margin of error,[106] and expected standard deviation of results. Figure 7 shows these results when estimating the population of a binary variable (e.g., those who take action vs. those who don't); Figure 8 shows these results for continuous variables (e.g., kWh of impact).

[106] Here, the margin of error is represented in percentage points, not percent. For example, a margin of error of 2% and an estimate of 3% would imply a confidence range of 1% to 5%.

Figure 7. Sample Size for Binary (Yes/No) Variables

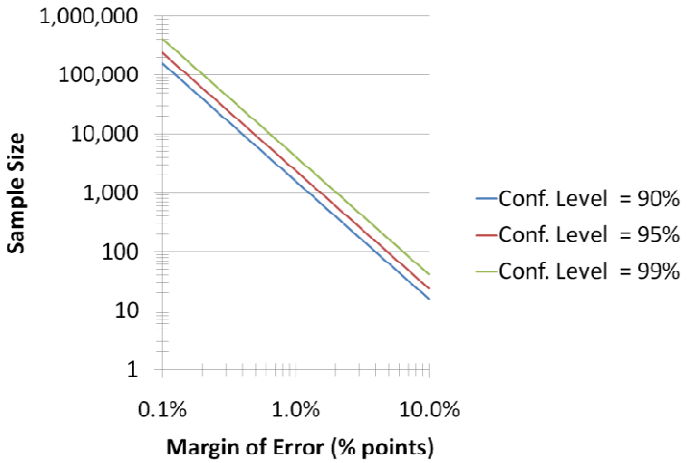
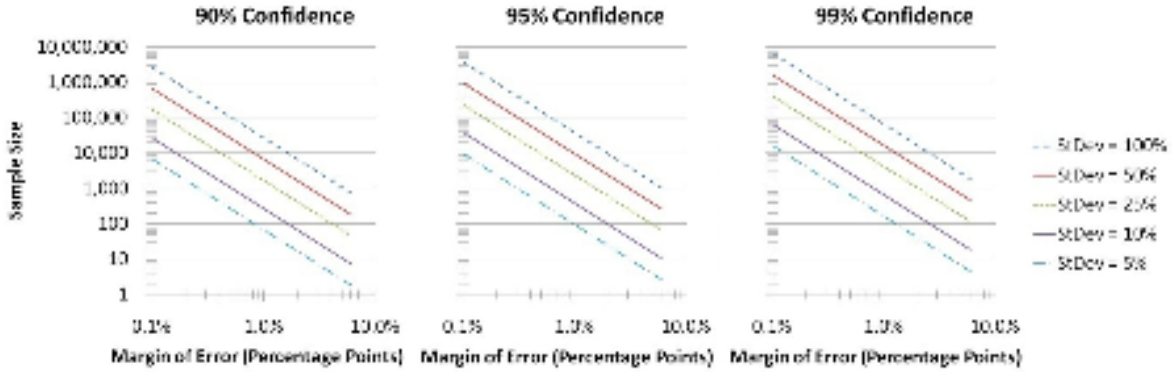


Figure 8. Sample Size Required for Precision of Estimates, Continuous Variables



For example, if one were reviewing billing data from a control and experimental group and wanted to estimate savings with 90%/20% confidence/precision. Furthermore, one would expect the impact per person in the experimental group to be approximately 3% of the baseline consumption, and a standard deviation of 25% in the population of baseline consumptions would be observed:

- 20% precision would imply a savings estimate of 3% +/- 0.6%.
- Use the left-most graph in Figure 8, which is for the 90% confidence level.
- Use the center green dashed line, which represents a 25% standard deviation.
- On this line, an x-axis value of 0.6% has a y-axis value of approximately 5,000: a sample size of 5,000 is needed for this level of precision.