Behavior and Energy White Papers: Use of Papers and Next Steps

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Abstract

In the last two years, the California Institute for Energy and Environment (CIEE) managed nine white papers on behavior and energy that were funded by the California Public Utilities Commission (CPUC). In order to determine what should be done in the future in the area of behavior and energy, CIEE conducted a survey in the Fall of 2009 to assess the value of these papers, see how these papers have been used and are planning to be used, and determine what additional activities should be conducted in the area of behavior and energy (e.g., more white papers or other activities).

Many of the respondents felt that the papers were beneficial and useful. The papers represented an extraordinary resource that could be accessed over time for guidance in designing, implementing, and evaluating policies and programs. The papers also reflected cutting edge research that highlighted big ideas, raised questions regarding existing energy policy and programs, and kept them informed on progress in the areas of behavior and energy efficiency.

Many respondents had already made use of the papers for: general inspiration; training staff; referring to the papers as part of a research study, scientific article, or a proposal; and increasing their understanding of how technology is applied in the market to guide research projects, and of the increasing role of behavioral motivation in energy efficiency. Respondents have also used the papers for: reviewing study methodologies and proposals; supporting recommendations in comments or filings in public proceedings; and making product feature recommendations. Respondents have also used these papers for: designing, developing and evaluating pilots and marketing and outreach strategies; conducting energy savings potential studies; and conducting academic research (e.g., using experimental designs). Finally, many respondents planned to continue their current use of the papers (as noted above) and to explore other opportunities, such as: developing program and speaker ideas; building networks of resources for policy makers and program implementers; and strategic planning.

Most respondents felt that another set of white papers was needed. The list of potential papers was lengthy and diverse. And several respondents provided suggestions for improving the preparation, marketing, presentation, and utilization of the white papers.

Several respondents provided suggestions for conducting other activities, besides preparing more white papers, in the area of behavior and energy. One key activity was presenting the information from the white papers more widely by discussing the topics in workshops, conferences, webinars, and journal articles. Another key activity was conducting research and demonstrations of behavioral motivation principles, especially designing, testing, and evaluating programs using experimental program design, and funding research topics that were identified in these white papers.

In conclusion, the respondents felt that additional white papers, field research, and outreach activities should be supported by the CPUC in ensuring that behavioral issues are integrated in the implementation of energy efficiency programs.

1. Introduction

In the last two years, the California Institute for Energy and Environment (CIEE) managed nine white papers on behavior and energy that were funded by the California Public Utilities Commission (CPUC). The focus of the papers was on describing what had been accomplished in that particular topic and what needed to be done from both a research and policy perspective. All of the papers (Appendix A) are available at CIEE's website: http://uc-ciee.org/energyeff/energyeff.html. In addition to the preparation of the white paper and a two-page summary, each author presented their findings to the CPUC Energy Division staff and at a public workshop. The workshops generally lasted two hours and were held at the CPUC.

In order to determine what should be done in the future, CIEE conducted a survey (Appendix B) in the Fall of 2009 to see how these papers have been used and what further activities should be conducted in the area of behavior and energy (e.g., more white papers or other activities). The notice about the survey was sent out to CIEE's list server and the CPUC's service list; the survey was also announced at one of the public workshops. The survey was completed by 30 people. Since we do not know the size of the population of people who are interested in this topic, we were unable to determine a response rate or assess the representativeness of the sample. Nevertheless, we believe that the responses provide some useful information for determining the next steps in the area of behavior and energy.

2. Respondent Characteristics

As shown in Table 1, the respondents reflect a diverse group of respondents in terms of their affiliation. Due to the research focus of the papers, it is not surprising to see that most people who responded to the survey were affiliated with the university (faculty, students, researchers). Consultants also responded, and, based on their survey responses, it appears that many of them are consulting for utility companies that were implementing energy efficiency programs. Most of the government representatives were associated with California agencies: e.g., California Energy Commission, California Air Resources Board, or the CPUC – and this group was expected, due to the policy recommendations contained in many of these papers. Finally, only two utility people responded to the survey; this was surprising and disappointing since we know that many utility personnel participated (in person or by phone) at the public workshops, and we also know that many utilities are interested in one or more of these topics.

Table 1. Respondents' Affiliation

#	Organization
7	Consulting firm
3	Government – federal, state, or local
0	National laboratory
3	Non-profit organization
2	Public service/utilities commission
9	University
2	Utility – investor owned
0	Utility – municipal or other
4	Other: Smart Grid software vendor; Marketing and outreach firm; third-party quality control and verification service provider; energy research

As shown in Table 2, the respondents reflect a diverse group of respondents in terms of their position. Due to the research and policy focus of the papers, the respondents held different types of positions in the research and policy fields. In addition, the evaluation and program planning/management people were well represented.

Table 2. Respondents' Position

#	Position
1	Evaluator or market researcher
3	Evaluation or market research manager
5	Public policy analyst
4	Public policy developer
1	Program implementer
5	Program planner or manager
11	Other: Grad student (2); efficiency impact forecaster; research planner; professor (2); researcher (3); EE regulatory/strategy/planning consultant (2); marketing, education and outreach manager for EE programs; program planner AND implementer; evaluation and underwriting expert

3. Marketing and Examination of Papers

The primary method for notifying people about the white papers and presentations at public workshops was sending announcements to CIEE's list server and the CPUC's service list. As shown in Table 3, these were the primary ways that the respondents learned about these papers. Interestingly, many respondents heard about the papers and talks from other means: the CIEE website, or a colleague or friend, and, in two instances, through a news item from the Electric Power Research Institute (EPRI).

Table 3. Respondents' Notification About White Papers

#	Source of Information
16	CPUC service list
11	CIEE listserver
7	CIEE website
8	Referred by a colleague/friend/word of mouth
3	Other: Electric Power Research Institute (2)

At the time of the survey, seven of the nine papers had been completed and presented at a public workshop. As seen in Table 4, many of the respondents had read all of the available papers (this is a self-selected motivated group!). Because people could read some or all of the papers at their own leisure, it was not surprising to find less people able to attend the workshops which typically lasted two hours, in addition to traveling to and from the CPUC.

Table 4. Respondents' Examination of Papers

White paper	Read?	Heard presentation?
Market Segmentation and Energy Efficiency Program Design	17	8
Behavioral Assumptions Underlying Energy Efficiency Programs for Businesses	16	10
Process Evaluation Insights on Program Implementation	14	4
Behavioral Assumptions Underlying California Residential Sector Energy Efficiency Programs	16	11
Using Experiments to Foster Innovation and Improve the Effectiveness of Energy Efficiency Programs	15	9
Behavioral Assumptions in Energy Efficiency Potential Studies	18	5
Pursuing Energy-Efficient Behavior in a Regulatory Environment: Motivating Policymakers, Program Administrators and Program Implementers	14	4

4. Benefits and Usefulness of Papers[1]

Many of the respondents believed that the papers were beneficial and useful. The papers represented an extraordinary resource that could be accessed over time for guidance in designing, implementing, and evaluating policies and programs. The papers also reflected cutting edge research that highlighted big ideas, raised questions regarding existing energy policy and programs, and kept them informed on progress in the areas of behavior and energy efficiency.

For some, the greatest asset of the papers was their strong practical application, offering important, actionable insights as well as sound starting points for further investigation. The respondents valued the scholarly and objective high quality syntheses and analyses providing systematic reviews of research and policy/practice areas. For some, having the authors not directly employed by utility companies provided more objectivity. In addition, many felt that the papers were very educational on behavioral change for a wide variety of groups involved in policy, programs, and research. Finally, the papers were inspiring for several of the respondents – for their own work as well as for mentoring and educating others, as noted in the next section.

5. Present and Future Use of Papers[2]

Several of the respondents had not made use of the papers (other than for personal use as a general source of knowledge) but were planning to use them in the future. In contrast, many respondents had already made use of the papers for: general inspiration; training staff; referring to the papers as part of a research study, scientific article, or a proposal; and increasing their understanding of how technology is applied in the market to guide research projects, and of the increasing role of behavioral motivation in energy efficiency.

Respondents have also used the papers for: reviewing study methodologies and proposals (e.g., addressing critical gaps as well as leveraging existing knowledge & programs); supporting recommendations in comments or filings in public proceedings related to utilities, the Smart Grid, advanced metering, or the consumer's role in energy efficiency; and making product feature recommendations about ways that utilities will use consumption and price feedback to inspire conservation among their customers.

Respondents have also used these papers for: designing, developing and evaluating pilots and marketing and outreach strategies; conducting energy savings potential studies; and conducting academic research (e.g., using experimental designs).

[1] This was an open-ended question; detailed comments from respondents are noted in Appendix C and are summarized in this section. The summaries in this section and the following sections reflect the comments of the respondents and not the author of this report.

[2] This was an open-ended question; detailed comments from respondents are noted in Appendices D and E and are summarized in this section.

Finally, while a few respondents had no plans for making use of the papers, other respondents planned to continue their current use of papers (as noted above) and to explore other opportunities, such as: developing program and speaker ideas; building networks of resources for policy makers and program implementers; and strategic planning.

6. Dissemination of Papers[3]

Many respondents simply read the paper or heard the presentation and did not forward the material to others. On the other hand, several respondents forwarded the papers and presentations to their colleagues, other researchers, utilities, students, and consultants.

7. Additional White Paper Topics[4]

While a few respondents did not see (or were unsure about) the need for another set of white papers, most respondents felt that another set of white papers was needed. The list of potential papers was lengthy and diverse (Appendix H). Some of the topics appear to be more than white papers and more like in-depth studies, requiring more time and resources. At this time, we simply list the topics. We hope that the CPUC can later review these potential white paper topics and identify those that should be pursued as either white papers or studies.

8. Improvements to White Papers[5]

Although not asked in the survey, several respondents provided suggestions for improving the preparation, marketing, presentation, and utilization of the white papers.

For improving the preparation of the papers, respondents indicated that the papers needed more editing to remove jargon and to be more useful to a policy rather than an academic audience. Concise, practical recommendations and/or findings for application to program design or policies need to be very clearly presented to policy makers – and these should be contained in a short concise abstract. In addition, the papers should focus more on the energy efficiency market and analyze multiple value propositions and channels among market players.

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[3] This was an open-ended question; detailed comments from respondents are noted in Appendix F and are summarized in this section.

[4] This was an open-ended question; detailed comments from respondents are noted in Appendices G and H and are summarized in this section.

[5] This question was not asked in the survey, but some respondents volunteered this information; detailed comments from respondents are noted in Appendix I and are summarized in this section.

For improving the marketing of the papers, respondents indicated that the email announcements should contain a short concise abstract containing the most useful conclusions and recommendations.

For improving the presentation of the papers, respondents indicated that the presentations should last from 1 to 1.5 hours (max). Additionally, the presentations should all be recorded and available as webinars.

For improving the utilization of the papers, respondents indicated that there should be a feedback loop to know if program and policy people had taken any of the recommended actions, or used the findings in some other way to meet their needs.

9. Additional Behavior and Energy Activities[6]

Several respondents provided suggestions for conducting other activities, besides preparing more white papers, in the area of behavior and energy. One key activity was presenting the information from the white papers more widely by discussing the topics in workshops, conferences, webinars, and journal articles.

Another key activity was conducting research and demonstrations of behavioral motivation principles, especially designing, testing, and evaluating programs using experimental program design, and funding research topics that were identified in these white papers. Additional research activities included: (1) the analysis and ranking of existing utility energy efficiency programs for potential savings from behavior; (2) the dissection of past energy efficiency programs to examine the role of behavior and the type of approaches, programs, communications and incentives that have been found to be most effective; and (3) the identification of best practices in promoting and evaluating behavioral change.

The results from the above research and other field experiments would be contained in a clearinghouse. The clearinghouse could also contain a searchable on-line list of researchers in behavior/energy and brief bios to provide background for disseminating RFPs to facilitate broader funding and more access for policy and program developers.

10. Conclusions

In summary, the respondents felt that additional white papers, field research, and outreach activities should be supported by the CPUC in ensuring that behavioral issues are integrated in the implementation of energy efficiency programs. Because of the numerous suggestions for papers, research and outreach activities, the key challenge facing the CPUC is the amount of resources that should be devoted to each of these

[6] This was an open-ended question; detailed comments from respondents are noted in Appendix J and are summarized in this section.

efforts. Clearly, interest in the topic of behavior and energy has increased both nationally and in California. The CPUC has played a leadership role in this area and is expected by multiple stakeholders to continue this role in the future as California seeks to address the challenges of climate change and the development of a sustainable energy society

11. Acknowledgements

I would like to thank the people who responded to this survey and also to the reviewers of an earlier draft of this paper: Rick Diamond, Tim Drew, Loren Lutzenhiser, Linda Schuck, and Pamela Wellner.

Appendix A. List of Behavior and Energy White Papers

1. Motivating program and policy personnel to help empower consumers
2. Encouraging greater advances in the production of energy-efficient technologies & services
3. Using experiments to foster innovation and improve the effectiveness of energy efficiency programs
4. Behavioral assumptions in energy efficiency potential studies
5. Behavioral assumptions underlying California residential energy efficiency programs
6. Behavioral assumptions underlying energy efficiency programs for businesses
7. Market segmentation and energy efficiency program design
8. Process evaluation's insights for program implementation
9. Energy savings, net to gross, non-energy benefits, and retention from energy efficiency behavior

Appendix B. Behavior and Energy White Paper Survey

In the last year, the California Institute for Energy and Environment (CIEE) and the California Public Utilities Commission (CPUC) have been sponsoring a series of white papers related to behavior and energy efficiency. Most of these papers have been completed and presented at public workshops held at the CPUC (the papers and presentations can be found at the following website: http://uc-ciee.org/energyeff/energyeff.html).

CIEE and CPUC are interested in how these papers have been used by the readers of the papers and/or participants at the workshops (either in person or by phone). In addition, CIEE and CPUC are interested in recommendations for additional white paper topics that should be pursued in the coming years. Thus, we would appreciate if you could respond to this brief survey and send this file back to Ed Vine at CIEE (Edward.Vine@uc-ciee.org) by October 14, 2009. All responses will be kept anonymous and confidential.

1. Which of the following *best* describes your affiliation? (Check ***one*** response)

	Consulting firm		University
	Government – federal, state, or local		Utility – investor owned
	National laboratory		Utility – municipal or other
	Non-profit organization		Other (specify: _____
	Public service/utilities commission		_____)

2. Which of the following *best* describes your job? (Check ***one*** response)

	Evaluator or market researcher		Program implementer
	Evaluation or market research manager		Program planner or manager
	Public policy analyst		Other (specify: _____
	Public policy developer		_____)

3. From which of the following sources did you hear about the white papers on energy and behavior? (Check ***all*** that apply)

	CPUC service list		Referred by a colleague/friend/word of mouth
	CIEE listserver		Other (specify: _____
	CIEE website		_____)

4. Which of the following white papers have you read and/or heard the presentation? (Check ***all*** that apply)

White paper	Read?	Heard presentation?
Market Segmentation and Energy Efficiency Program Design		
Behavioral Assumptions Underlying Energy Efficiency Programs for Businesses		
Process Evaluation Insights on Program Implementation		
Behavioral Assumptions Underlying California Residential Sector Energy Efficiency Programs		
Using Experiments to Foster Innovation and Improve the Effectiveness of Energy Efficiency Programs		
Behavioral Assumptions in Energy Efficiency Potential Studies		
Pursuing Energy-Efficient Behavior in a Regulatory Environment: Motivating Policymakers, Program Administrators and Program Implementers		

5. What do you consider to be the benefits and usefulness of these papers?

6. How have you used these papers in your work? Please be specific.

[It could be in the areas of policy development, program design, program implementation, program evaluation, marketing, education, information transfer, etc.]

7. Are you planning to use these papers in your work? If so, how?

8. Have you forwarded any of the papers to others or referred others to the papers in some way (e.g., mentioned in a conversation)? Please be specific.

9. Would you like to see another set of white papers on behavior and energy funded?

10. What additional white papers should be prepared?

11. In addition to white papers, what other activities should be conducted to support work on behavior and energy?

Appendix C. Benefits and Usefulness of Papers

1. Yes, they were very useful.

2. The way you have developed your work and publish and discuss it over the Internet has revealed an extraordinary resource. The papers I've seen have a strong practical application, and which in my opinion, is a great asset.

3. These papers are very beneficial in understanding the elusive but critical element of human behavior in many aspects of EE (programs, regulation, etc.). Hopefully, these concept papers will lead to the widespread application of "behavioral tools" especially ways to quantify behavioral impacts. Success with the CPUC's Strategic Plan (market transformation) and now the passage of AB 758 (EE in existing buildings) will make this body of knowledge even more necessary.

4. Among the chief benefits are offering systematic overviews of research & policy/practice areas that are crucial to supporting effective energy use and climate change programs, but have not previously received sufficient attention. These overviews bring together crucial information from perspectives that aren't always "talking to each other" and offer important, actionable insights as well as sound starting points for further investigation.

5. It is important to understand how the consumers will use the technology that we produce in our laboratories and institutes, and the features that make those technologies appealing or necessary.

6. I was holding them aside to help guide me in the implementation of the programs under the Public Goods funding and using federal stimulus funding.

7. I was concentrated upon the Chinese urban energy system, which paid little attention to the end users for energy conservation. The white paper brought me some enlightened ideas that promoted my job. I think it is useful and helpful for me, though not everything but something.

8. Opened discussion of the missing pieces — evaluating lasting savings, improving program design to elicit and promote behavior, causing directives to establish synergies between technologies and behavior, stimulate CPUC/IOU/LG review of roles to capture the social aspects of how and why individuals and groups choose to reduce energy use.

9. These papers provide useful information about and insights into energy efficiency program design, innovations, and EM&V.

10. I use them internally to make product feature recommendations within my company and externally to assist in influencing regulators and policy makers about ways to support an energy efficient marketplace.

11. Bringing together useful information. Establishing the state of the art. Identifiying needed research and experiments. Providing lists of existing relevant work (in bibliographies). Bringing new ideas and approaches to light. Questioning the

conventional wisdom.

12. Understanding the motivations of residential and business customers in adopting energy efficiency measures and conservation behaviors is key to designing effective marketing and outreach programs.

13. To better understand the potential of designing or bringing to market new innovative products and services to support program delivery and understand some assumption made that could lead our business to better strategize and support future program designs.

14. They help educate policy, program and research staff on important behavioral research.

15. The white papers bring a more detached scholarly perspective to the design and management of energy efficiency programs. The authors are not directly employed by utility companies and therefore may be more objective in their thinking.

16. A few important very big ideas.

17. It is cutting edge research in an area that is up and coming.

18. It is good to know how to properly evaluate the behavior aspect of energy use.

19. They visit and raise questions regarding existing energy policy as reflected by the programs authorized in CPUC rulings.

20. Papers provide high quality synthesis and analyses. The papers provide some useful insights and reminders about marketing EE. I think of them as food for thought and reminders.

21. They are good for keeping the pulse on progress in behavior and energy efficiency. It's great to know that folks are focused on tackling these issues. It helps confirm what the next steps are.

22. I keep these as references for the particular body of research as well as an indicator of the current state of behavioral research in EE programs.

23. Fundamental research on behavioral responses provides a basis for understanding private sector business response to energy efficiency investment. Since a huge part of implementing energy efficiency investment involves communication of potential benefits and costs to decision-makers, it is important to know what makes them tick, and to have a segmented and more sophisticated understanding of these issues.

24. They were very helpful in highlighting current status of research in this area and potential for future studies.

25. Bring attention to the need to also consider behavioral aspects. Energy is not saved by widgets; it is how people purchase and use widgets that result in

savings.

26. Educate policymakers, implementers, and academics on behavioral aspects. Provide a good source to “go-to” for guidance and lessons for future design and implementation of both policies and programs.

27. Help guide me in the implementation of the programs under the Public Goods funding and using federal stimulus funding.

Appendix D. Present Use of Papers

1. No [6] – no opportunity. / So far, I have not used them. / Have no idea.

2. No, but I hope to communicate the research to program managers when they are relevant.

3. Your papers and talks have inspired me throughout my walk: I've designed and implemented a project to assess and monetize energy efficiency in residences, using smart meters provided by a German company. Therefore, I still monitor my 12 houses. I am planning the social media techniques to better provide personalized feedback to the families and will develop goals and a competition amongst the group. I interviewed families for a control group and the families for the treatment group. So, I tried to follow the guidelines discussed in the papers to select the experimental group, and on how to develop the behavioral experiment.

4. In the Demand Analysis Office (DAO) of the CEC, we have used these papers in the following ways:

    - **Training tool** – a number of our staff are new to energy efficiency; these papers cover a myriad of EE topics and are user friendly.

    - **EE Forecast Method Review** – we are in the process of evaluating our demand forecast methodology. Currently our end use forecast models incorporate EE using the "PTEM" approach, but we understand (and your papers point out) its current limitations. Also, we anticipate that increasingly the impacts of MT programs will need to be incorporated into our modeling methodology. These papers help us to better understand both modeling issues and data collection requirements.

    - **Evaluation of Publicly Owned Utilities' (POU) EE Potential Study** – under AB 2021 the CEC is required to evaluate POU filings of their EE potential studies. The POUs have been influenced by these papers and are incorporating the results of their own customer behavior study (RKS Research) in their joint potential study (Summit Blue).

5. In reviewing proposals and trying to place them with the current body of knowledge, and in understanding how they might be refined to address critical gaps as well as leverage existing knowledge & programs.

6. Mostly in education, but also in understanding how technology is applied in the market in order to guide some of our research projects.

7. I used them as reference or demonstration when I did some research, made a scientific article and even made an application for the scientific funds.

8. I have used these papers as sources for consulting analyses for IOU clients regarding innovations in energy efficiency and ways that different jurisdictions treat market transformation and free ridership.

9. (a) Designing and evaluating dynamic pricing pilots in which my company is

involved; (b) Understanding the increasing role of behavioral motivation in energy efficiency; (c) Making product feature recommendations within my company about ways utilities will use consumption and price feedback to inspire conservation among their customers; and (d) Supporting recommendations in comments or filings in public proceedings related to utilities, the Smart Grid, advanced metering, or the consumer's role in energy efficiency.

10. Both of the Assumptions papers have been helpful in thinking about program strategies.

11. We have tried to use the insights offered by these white papers in the design and development of marketing and outreach strategies for several local government partnerships and the Spanish-language component of the Flex Your Power statewide marketing and outreach program.

12. Program design and support from the business implementation side of delivering programs to consumers.

13. General background for framing a program I'm developing.

14. I mostly used the one on innovation to propose changes to the pilot process at Energy Trust.

15. Experimental design. Academic research.

16. As a sustainable planning consultant, I use what I learn from these white papers as a basis for energy reduction analysis.

17. The papers provide some useful insights and reminders about marketing EE. I think of them as food for thought and reminders.

18. Assisted my writing of the book—Underwriting Sustainable Property Investment—a guide to underwriting and valuation of private sector investment in commercial real estate.

19. I have used the Behavioral Assumptions Underlying California Residential Sector Energy Efficiency Programs paper in my research – it is part of the literature review in a current study on the effects of feedback on energy conservation and a project in which we are designing a feedback system for energy conservation.

20. Shared papers with program implementers to enhance program design.

21. Commented on papers' findings with policymakers to highlight the need to update evaluation policies and practice to align with how customers and markets actually "behave".

22. Greatest asset: strong practical application - offer important, actionable insights as well as sound starting points for further investigation. Useful information about and insights into energy efficiency program design, innovations, and EM&V. Help guide me in the implementation of the programs under the Public Goods funding and using federal stimulus funding.

Appendix E. Future Use of Papers

1. No. Not at this time.

2. In the Demand Analysis Office (DAO) of the CEC: the items mentioned above will continue into the future.

3. I refer to them to help me orient vis a vis research planning and proposal reviews.

4. For the most part, we use the studies indirectly. The conclusions of the papers aid in understanding how our work fits in "the bigger picture".

5. I was waiting to share them with the consultants I will hire with the federal stimulus funding so that they can help us shape not only the marketing we use for the programs, but for the program design itself.

6. I will treat them as the information tank in the research and application for human behavior in the urban energy system.

7. Planning to introduce some real-time smart meters into several homes and document consumer/behavioral changes.

8. As sources for consulting analyses for IOU clients regarding innovations in energy efficiency and ways that different jurisdictions treat market transformation and free ridership.

9. (a) Designing and evaluating dynamic pricing pilots in which my company is involved; (b) Understanding the increasing role of behavioral motivation in energy efficiency; (c) Making product feature recommendations within my company about ways utilities will use consumption and price feedback to inspire conservation among their customers; and (d) Supporting recommendations in comments or filings in public proceedings related to utilities, the Smart Grid, advanced metering, or the consumer's role in energy efficiency. Papers are cited in many public documents or filings.

10. I plan to use them to develop program and speaker ideas and to help build networks of resources for policy makers and program implementers.

11. The white papers will further inform our strategic planning for the 2010-2012 program cycle.

12. Resource and Reference material.

13. I plan to go back more systematically to these papers and write up general findings.

14. To inform our thinking while designing and implementing new programs.

15. I will supervise others that will be drawing on the work to help create and evaluate new behavior-oriented programs.

16. I would hope the staff in my unit would be absorbing, applying, and/or recommending appropriate policies and directions that the CPUC should be applying to or setting expectations for by our regulated utilities.

17. I use them in my experimental design and my academic research papers.

18. As a sustainable planning consultant, I use what I learn from these white papers as a basis for energy reduction analysis.

19. Not explicitly, the papers are one of multiple inputs that we use as we develop program strategies to maximize penetration. The papers seem to adopt a rational economic being perspective. As policy makers increase their emphasis on market transformation, the focus of the research and analysis should shift to better understand and quantify market transformation.

20. These are good references to use when responding to RFPs.

21. The papers are cited in my work and available through links in my Research Library.

22. I hope to use these papers more in my work – most are very interesting. They are quite long, so this presents a barrier, but it also gives much depth to their coverage.

23. Provide supporting documentation to issues I have been bringing up for years on the need to broaden evaluation practices and policies to better align program offerings to how customers and markets “behave”.

Appendix F. Dissemination of Papers

1. No [5].

2. Yes, many times. Last semester I co-supervised a master student, and she was looking again to studies about the usage of energy in the residential sector. I passed along the Experimental Design white paper. I have another colleague, at the university, working in this field whom I referenced your website.

3. I really appreciate the easy accessibility to all the materials through the website and the notices

4. I have mentioned to colleagues as tools I will be using to develop our programs. For one or two of them, I have forwarded the links to the papers and information on the presentations.

5. Actually, in my joint research group China through Japan, I had introduced them to a professor and students.

6. Sent them to my research assistant as a reference to our planned study.

7. I have forwarded the paper on market segmentation to a California IOU client.

8. Probably just referred colleagues to the CIEE website to explore the available research themselves.

9. I have referred the Lutzenhiser paper to several colleagues in DC.

10. I have discussed these papers with other M&O team members here in the office.

11. I've mentioned them to others at NYSERDA.

12. Absolutely. I have forwarded the papers and presentation announcements to several of my colleagues.

13. I have mentioned it in work meetings, to back up assumptions I have made.

14. I routinely forward these papers to staff working on program design, best practices, and marketing. We include the results from the papers in developing recommended program revisions in terms of customer value proposition, program marketing, and program processes.

15. I have forwarded one of these papers to a coworker.

16. I've forwarded all the papers and webinar notices to colleagues who are program managers.

17. Many times to researchers, valuation experts and others working on decision-making in sustainability. I anticipate further use of the papers in my next phase

of work to communicate the findings of my research.

18. We have recommended the study *Behavioral Assumptions in Energy Efficiency Potential Studies* to the contractors and POU staff working on the 2010 efficiency potential studies.

19. I have forwarded these to colleagues in Canada, Mexico and Chile as well as within the USA. I've mentioned these in conversations as well as sent the URLs.

Appendix G. Interest in Additional White Papers

1. No [2] / unless the process was improved [see last section].

2. I'm not sure. These papers were pretty comprehensive.

3. Only if we at the CPUC, alongside utilities and others administering EE programs in California, identify specific needs that they have as program designers and implementors. My sense is that the list of papers commissioned to date were selected by EM&V professionals, but I would be surprised if designers/implementers were guiding this process. The latter matter most in my opinion.

4. Yes [15] / Of course / Very much needed / Absolutely

5. My opinion is that your research is important because it gives structure and orientation to a very pulverized field. Things are growing and changing fast, and this field is not traditionally covered by any faculty / institution, the way you do it. I consider it important that your research / effort gets the necessary support to thrive.

6. During one of the presentations, an attendee referred to energy efficiency markets as a "moving target." Changing economic environments, growing awareness of climate change and other factors continue to impact customer behavior, which would seem to require constant monitoring.

Appendix H. List of Potential White Papers

1. Focus on new individual residential services.

2. Changing consumer behavior regarding the purchase of comprehensive HVAC products and EE performance services.

3. Why don't consumers retain long term HVAC system tune ups services?

4. How to avoid the " If it is running, it must be working properly" syndrome?

5. Consumer awareness on how to start home performance assessments? Do consumers and the market truly understand what building performance is? How to sell this concept to the mass market and create a successful push – pull marketing campaign.

6. Use of technology, such as twitter, in approved programs to test theories.

7. Research how to market towards different groups of people to get the biggest bang for the buck.

8. Focus on different kinds of population with various cultures

9. How culture, ethnicity and language affect behaviors.

10. Take the paper on segmentation to another level as the first one was fairly basic regarding the concept of segmentation. Look more deeply into the way consumer products companies use segmentation and suggest ways that utilities could obtain relevant information with which to segment their customers and use information to more efficiently target and promote.

11. Behavior and group identity.

12. A white paper that follows up two communities using the same assumptions but different approaches and what caused them to be different.

13. Something that would support outreach in the area of behavioral change strategies to contend with climate change.

14. Investigation into the inertia of utility resource planners, and identification of key barriers to their emotional/intellectual acceptance of aggregated forward capacity as a viable resource and transmission planning alternative. Despite directives such as the loading order and successful examples elsewhere such as the New England Forward Capacity market, resource planners have uniformly refused to accept the ability of aggregators to deliver focused capacity impacts via energy efficiency and permanent load shifting programs. What are the drivers for this mindset, and what would constitute sufficient proof to allow Negawatt aggregators to begin competing for future contracts on an even basis?

15. Apply this to larger scale projects - generally need to scale everything up.

16. The range between widgets and behavior has not been adequately addressed—sub-metering and end user supplemental fees for usage above set amounts, master controls, feed back on behavior.

17. Social Marketing – summarization of what it is, how it is used in other fields, what has been learned (benefits, challenges) what experience exists related to energy efficiency actions (consumer and commercial/business/organizational), recommendations for areas to appropriately use social marketing tools to accelerate energy efficiency.

18. Summarization of the chains of decision-making in the buildings efficiency process, where are the greatest challenges, what has been learned by past efforts and recommendations about how to improve the building decisions processes.

19. Life after solar is installed – what changes?

20. Cradle to grave recycling strategies for Solar panels and CFL's – what do we really need to plan for?

21. A summary of behavioral approaches that are being implemented in the field now.

22. Compare the actual results and performance of EE programs designed and managed by the IOUs versus programs designed by non-IOU program designers and managers. Discuss the pros and cons of having programs developed by CPUC regulated IOUs versus non-regulated third party providers.

23. Discuss how better to measure the actual energy savings achieved by the various "market transformation" theory based programs implemented to date.

24. Methods used to measure behaviors associated with energy conservation and how to link these behaviors with energy savings.

25. Techniques for developing quantitative measures from behavioral data. What are the methods developed for specific research types (such as potential studies, EM&V, market assessment, etc.)? - examples of what others have done and their success/failure stories. Did they gain acceptance for their methods/results?

26. Compare the actual energy savings achieved by "upstream" energy efficiency programs that provide incentives to product manufacturers and distributors versus end use customers and measure installation contractors.

27. Compare the actual energy savings and cost effectiveness of programs that provide customers with rebates that pay only a portion of the cost of purchasing and installing EE measures versus programs that pay the entire cost of installing EE measures in customers homes and businesses.

28. Explore ways to better capture the actual benefits and avoided costs associated

with more aggressive EE programs given what we now know about global climate change and its long term effects on California's environment and economy.

29. Explore the feasibility and cost effectiveness of developing new programs that would simply install free EE retrofit measures in all California homes and commercial buildings built prior to Title 24.

30. Rebound and persistence.

31. Paper on how about the vital behaviors that we need to tap into for the biggest impact of energy efficiency.

32. Papers that delve deeper into how to analyze behavior and what to expect from people in regards to energy savings.

33. Evaluate alternative market models, rate designs, and incentive structures to accomplish the state's energy policy objectives. Papers should strongly focus on the following:

    1. Recognize the interrelationship and need to integrate efficiency, demand response, and renewables, especially from the customer perspective

    2. Look at open-market models to deliver and implement efficiency, demand response and renewable – not just a utility centric approach.

    3. Consider the relationship between implementation, performance, and evaluation and emphasize approaches that simplify rather than complicate the process. Example: Baselines are an unresolvable problem subject to manipulation. Why not look at default dynamic rates that eliminate the need for baselines.

    4. Emphasize implementation models that focus on the long-term educational, behavioral, and operational changes necessary to effect infrastructure changes rather than short-term utility programs burdened with high overhead, administrative and conflicting marketing programs.

34. Analysis of upstream vs. point of sale, vs. end-user programs

35. Multi-year commitments for energy efficiency for all actions vs. episodic interventions

36. Value of broadening the value proposition to include sustainability and water conservation

37. Demands to develop multiple marketing strategies to address specific segments if one is to achieve high penetration.

38. Approaches to address the skepticism regarding claimed benefits for energy efficiency options.

39. Dissect some legacy programs such as the home energy audit and come out with some concrete guidance to program managers on how to incorporate behavioral theory/findings, or how to rethink their current implementation within a behavioral science context.

40. Further integration of behavior research and understanding the various obstacles to energy efficiency investment in the private sector. Interestingly, in the commercial real estate markets, there has been significant movement towards the belief that energy efficiency investment should be made, but the industry is focused on 15-30% savings, while government and the energy efficiency-sustainability community is talking of zero net energy buildings. Why the disconnect? What has to happen to overcome this? Why do investors focus only on cost? More sophisticated integration of behavior and risk.

41. Specific strategies for behavioral change – feedback, information, engagement, social norms, etc. Many of these presentations were very broad, which was great for the first round, but now it's time to get specific and do some research to see WHAT works, HOW it works, for WHOM it works, and WHY it works.

42. The conflicting information about whether or not a market is transformed (e.g., CFLs) suggests that more behavioral research needs to be done.

43. Examine the "behaviors" of institutional frameworks (Legislator - Regulator – IOU or Regulator – Non-Profit Implementer, or….). These frameworks at times limit the breadth of energy efficiency efforts. Understanding these limiting factors can help develop new policies to enhance energy efficiency practices.

44. Evaluate the behaviors of evaluators. Who are these folks? What motivates evaluation consultants, research managers, oversight bodies? How can these disparate behaviors be subjected to a framework that enhances evaluation practice?

45. Review of primary drivers to resource efficient behaviors among Californians – this could be a secondary research project that looks at trends from a variety of past research sources.

46. How social media can be used to increase program participation and impacts. Examples from other fields/industries.

47. Look at how liberalized markets work - compare with experience in Germany, for example, and access the new business models to be set between providers and consumers.

48. Papers on utilization of bioenergy alternatives.

Appendix I. Improvements to White Papers

1. Papers need more editing to be most useful to a policy rather than an academic audience. Concise, practical recommendations and/or findings need to be very clearly presented to policy makers.

2. Papers seem to be rather theoretical and are weak on really characterizing market decisions. The papers and recommendations tend take a simplistic view of the market. If one is to achieve the aggressive EE and DR goals, multiple value propositions and channels will need to be developed.

3. Only if we at the CPUC, alongside utilities and others administering EE programs in California, identify specific needs that they have as program designers and implementors. My sense is that the list of papers commissioned to date were selected by EM&V professionals, but I would be surprised if designers/implementers were guiding this process. The latter matter most in my opinion.

4. More substantive guidance on how to implement those theories in EE programs

5. Some readers may find these papers overly filled with jargon—next steps should be to be more concrete.

6. The papers and the email announcements of presentations need to be accompanied by a short concise abstract so that the basic useful conclusions were summarized and easy to access.

7. An hour to 1.5 hours max seminar is most useful, as 2 hours is hard to find for such things, and tends to give presenters too much leeway to not get to the most critical conclusions in a concise fashion.

8. I think the presentations should all be recorded and available as webinars. The problem with the conference calls is that it is hard to hear and I have tried to join calls and not had the opportunity to listen to certain calls. It's a shame that these presentations were not recorded for future use.

9. Future white papers should build on these with suggestions to program implementer and evaluators following up with examples that are further substantiated.

10. Best indications would be if papers and presentations had direct recommendations for application to program design or to policies, and then there were a feedback loop to know if those kinds of practitioners had taken any of the recommended actions, or used the findings in some other way.

Appendix J. Additional Behavior and Energy Activities

1. Workshops that showcase best practices at state and local government agencies and otherwise support peer-to-peer networking and resource sharing.

2. Both the recently approved IOU programs and those programs in conditional status should be reviewed by the CIEE, ED and IOUs for potential significant savings from behavior and ranked. Those high and very high should be the subject for workshops where a mix of theory, program design and evaluation experts exchange insights and suggest possible plans, for implementation including direction from the CPUC and amended instructions through advice letters.

3. Oral presentations and conferences are great ways of communicating these ideas, so you should continue to foster these activities.

4. There should be more widespread presentation of the info to program designers and implementers – at utilities, local governments, third party implementers, and those individuals managers.

5. Conferences, computer-based presentations, published articles.

6. Workshops on specific techniques mentioned above.

7. Professional consensus building on the use of behavioral principles and techniques so that results & their application can have widespread acceptance.

8. Workshops of groups dealing with specific market segments: e.g., have a meeting of people involved with energy efficiency and renewables with very large customers (Commercial real estate property managers/owners, or industrial facilities, or government facilities); or mass market (bring together the advertising and evaluation worlds).

9. Workshops between CPUC, IOUs, others to discuss how to best incorporate behavior work into new programs, and also examine policies and directives that will track the success of these. Current evaluation practice in CA is deficient in this aspect; making IOUs and other implementers shy away at times from promising programmatic interventions due to concerns over ultimate attribution.

10. PLEASE provide funding for research in this area. There are many faculty and graduate students in social sciences who are very eager to work on these problems and funding our research would really help us work towards greater understanding and solutions.

11. Fund research that was suggested in THIS round of white papers. They suggest many promising directions for research that we could pursue at local universities.

12. Joint research program from various research groups may promote the research, especially for those research groups from various countries.

13. Joint research with other university groups, nationally and internationally.

14. More interactions among researchers in this area.

15. Obtaining useful customer data is key to continued success of energy efficiency programs and figure out ways to efficiently and effectively use this information. This would apply to sales data as well as survey data related to behavioral issues.

16. Experimentally designed program tests.

17. Intuitively, the basic conclusions of the paper on experimental design struck me as most useful to the CPUC and California. I agree that experimental program design and evaluation would be useful to proliferate amongst California IOUs.

18. Fund small pilot studies to test the effectiveness of various behavior change tools (not just social norms) in the context of energy use.

19. Since customer "understanding" and "education" are critical foundational elements of behavior, examine the impacts, benefits and relationship of two critical factors: [1] simplifying the utility rates to clearly communicate price and support development of a customer value function – i.e. a cause and effect relationship between what a customer does and how it impacts their bill, and; [2] simplify the customer bill presentment so it becomes a useful tool that supports establishment of a customer value function.

20. Funding support for doing experimental design tests like the NYSERDA funding for an advisor to help program managers design tests to improve their programs.

21. More actual implementations of behavioral motivation principles funded (such as utility or community based feedback and incentive programs).

22. Dissect some legacy programs such as the home energy audit and come out with some concrete guidance to program managers on how to incorporate behavioral theory/findings, or how to rethink their current implementation within a behavioral science context.

23. A rigorous benchmarking and best practices review should be completed. The current benchmarks and best practices analyses do not rigorously normalize the program performance data, nor identify the factors that drive high program performance.

24. Summary research on what has been learned in social marketing programs in other areas and how can that be applied in energy efficiency.

25. How have the recent spate of "behavior" papers been used?

26. Provide California ratepayers with online opportunities to offer feedback regarding their own attitudes and actions might be interesting.

27. Searchable on-line list of researchers in behavior/energy or behavior/climate change and brief bios to provide background for disseminating rfp's to facilitate broader funding and more access for policy and program developers

28. Identify key researchers and research and put on a website.

29. A clearinghouse for write ups of actual field experiments that apply and test some of the behavioral assumptions/findings.