



## **Behavioral Assumptions Underlying Energy Efficiency Programs for Businesses<sup>1</sup>**

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This white paper examines the behavioral assumptions underlying utility-sponsored energy efficiency programs offered to businesses in California. It describes how assumptions about business decision making (that are built into the design of these programs) can affect their ability to foster increased investment in energy-efficient technology.

Historically, most utility-sponsored energy efficiency programs in California have been designed to cause businesses to make their buildings more energy efficient and purchase energy-efficient equipment. The policy paradigm underlying these programs is what has been called the Physical Technical Economic Model (PTEM). Within the PTEM paradigm, the only consumer behavior of interest is the consumer's decision to purchase energy-efficient technology alternatives.

PTEM-type programs have achieved substantial success in encouraging investment in energy efficiency in California, but they have been far from completely effective. Despite substantial efforts on the part of utilities to cause businesses to invest in energy-efficient technology using these programs, a significant gap continues to exist between the level of energy efficiency investment that is economically justified and the level of such investment that is being achieved.

This gap between potential and achievable energy efficiency investment is caused by three kinds of problems. First, energy-efficient technologies are penetrating the market as new buildings and manufacturing processes are built and old ones are replaced. So there is an unavoidable time lag between what might happen in an economically ideal case and the situation at any point in time. Second, there are important structural barriers to the penetration of energy efficient technology into the market, such as regulatory distortions, lack of available capital, high transaction costs, and market dominance of inefficient products in product distribution channels. Finally, energy efficiency programs derived from the PTEM paradigm generally rest on the assumption that decision makers are economically rational, and they will select energy-efficient alternatives when they are informed that these alternatives are more cost effective from the perspective of lifecycle cost than other alternatives. Decision making by individuals and firms is much more complicated than what this simple assumption suggests. Factors that can influence the outcome of decisions concerning energy efficiency investment include: (1) consumers can employ a variety of decision-making heuristics when selecting new or replacement products; (2) decisions are often made by groups rather than individuals, and group decision-making processes can lead to decidedly non-rational outcomes; and (3) decisions made by formal organizations are usually heavily influenced by the hierarchy of authority and communications within which they take place. Energy efficiency programs that are not explicitly designed to take account of and leverage the impacts of these behavioral considerations are severely handicapped when it comes to influencing the buying behavior by individuals and firms.

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It is reasonable to ask: to what extent does the current generation of energy efficiency programs in California address the market barriers and behavioral considerations that influence decision making by individuals and firms. To answer this question, the Program Implementation Plans and other testimony provided by the Pacific Gas & Electric (PG&E) Company in support of its recent request for funding for its proposed 2009-2011 energy efficiency program funding cycle were analyzed.

The scope and magnitude of the next generation of energy efficiency programs proposed by PG&E are truly remarkable. Energy efficiency programs offered by PG&E have evolved since the mid-1970s from a few fairly simple and inexpensive information programs (costing only a few million dollars annually) to 85 highly targeted programs providing a wide range of information and design services along with significant economic incentives. The cost of PG&E's proposed next generation of programs is projected to be more than \$500 million per year. This extremely ambitious proposal contains programs that have been crafted to respond to many of the critical market barriers and behavioral factors that influence organizational decision making.

While these new programs have the potential to be dramatically more effective than conventional PTEM-based programs, their development poses significant challenges that should not be underestimated. One extremely important challenge is that many of the key concepts that are being advanced in the next generation of programs are still under development and are proposed to be under development as the next generation of programs rolls out. Building this new generation of programs will require significant expansion of the research and development enterprise on the "front" end of program implementation. It will also require significant funding for program research and development that is focused not on technology but on changing consumer behavior and decision making.

An equally important challenge posed by the next generation of energy efficiency programs arises out of the difficulties that these new program designs pose for program evaluators charged with estimating the energy savings that they have achieved. There are real and serious questions that evaluators will be asked to answer concerning the efficacy of the proposed new generation of energy efficiency programs, and the ability of California's energy efficiency evaluation protocols to answer them.

Unfortunately, these new programs do not fit well within the existing regulatory framework that treats savings obtained from energy efficiency improvements as an energy supply resource: the framework focuses on documenting direct energy savings from measures and not the indirect energy savings that may occur from market transformation. Lastly, because the proposed next generation of programs is still under development, it remains to be seen how well they will work. These are all considerations that stand in the way of the next generation of more effective energy efficiency programs.

It seems energy policy makers are on the horns of a proverbial dilemma. They can force the utilities back to the drawing board to bring forth programs that are more in line with the PTEM model (which will impede the progress of the development of more effective energy efficiency programs); or they can modify the current regulatory framework (resource acquisition policies and evaluation practices) to make it more compatible with the proposed direction of development of the next generation of energy efficiency programs. Either way forward will be challenging.