



Market Effects and Market Transformation: Their Role in Energy Efficiency Program Design and Evaluation¹

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This White Paper summarizes the experience of utilities and other publicly funded program sponsors in the design, delivery, and evaluation of programs aimed at achieving market transformation. The California Public Utilities Commission (CPUC) has defined market transformation as:

Long-lasting sustainable changes in the structure or functioning of a market achieved by reducing barriers to the adoption of energy efficiency measures to the point where further publicly-funded intervention is no longer appropriate in that specific market.

The information presented is drawn from the literature in the field and neighboring disciplines, as well as from interviews with program sponsors and regulators familiar with the issues addressed. It is meant to serve as a source book of concepts, strategies, and practical solutions for challenges that typically arise in programs whose objectives include market transformation. We also draw upon documented experience in the field to develop specific recommendations for consideration by the CPUC and the California utilities which we believe will support achievement of stated market transformation goals for the 2009 – 2011 programs.

Key Findings

The authors base their recommendations on the following findings, which appear consistently in the literature and in interviews with practitioners.

1. Ratepayer-supported energy efficiency programs, including those operated by the California investor-owned utilities (IOUs), have contributed significantly and continue to contribute to market transformation in key energy end-uses such as lighting, home appliances, and electric motors.
2. Success in achieving targeted market changes (market effects) and longer-term market transformation requires the consistent collection and analysis of market data and intelligence, and the integration of that analysis into program design and operation. Key applications of market research include the selection of products and services for program support, development of program plans, and execution of mid-cycle program changes.

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3. Research at the regional level strongly suggests that energy efficiency programs influence the measure adoption behavior of *nonparticipating* customers and supply chain establishments within regions served by such programs – at least, at certain stages of market development. Thus, in some, but not all years, energy efficiency programs will cause energy savings beyond those registered by identifiable participants.
4. Evaluation methods have been developed and successfully deployed to quantify the net effect of energy programs on measure adoption within program area(s), including program-related adoptions by non-participants. The available methods have relative advantages in specific applications. However, from the standpoint of social science research standards, they are capable of generating estimates of net program effects that are equal in validity, reliability, and accuracy to the estimates of *participant only* effects that the CPUC currently uses as a key metric of energy efficiency program performance.

Recommendations

1. **Change the definition of the Performance Earnings Basis (PEB) to include spillover and other benefits of demonstrated market effects.** If program sponsors are to be encouraged to expend program resources on efforts that are likely to generate market effects, then the performance of those measures should be assessed and their success compensated. We recommend that the CPUC and utilities undertake the following processes as soon as possible in the current program planning cycle to enhance the likelihood of success of market transformation efforts and to promote fair and useful evaluations.
 - Identify programs in the utility portfolio that are likely to generate market effects during the three-year program cycle, and focus market-oriented planning and evaluation efforts on those programs.
 - For programs deemed likely to generate market effects, develop preliminary evaluation plans that specify the preferred approach(es) to estimating net savings.
2. **Establish a process to identify products or services for which program support should be withdrawn or reduced over the program cycle and to formulate plans for an orderly withdrawal from the market.**
3. **Provide market research support to validate proposed growth strategies for products and services supported by the Emerging Technologies Program.** . The case for public investment to support new technologies will be greatly enhanced by research to validate proposed growth strategies.
4. **Conduct one or more pilot studies involving cross-sectional analysis of the market share for energy-efficient *practices* in California compared to other jurisdictions.** Several High Impact Measures – refrigerant charge and airflow checks (RCA), steam trap replacement, and hot water pipe/tank insulation – involve customer adoption of installation and maintenance practices as opposed to purchase of efficient equipment.
5. **Conduct research to define and assess the validity of indicators of sustained market effects other than changes in codes and standards.**