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Market Segmentation and Energy Efficiency Program Design[1]

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Market segmentation – identifying populations that respond similarly to commodities and marketing messages – can provide a powerful method from which to design and spur the adoption of products, services, and ideas. While there are various approaches to segmenting markets, they typically rely on (statistically) examining qualitative or quantitative data to identify the relationships between social, economic, and demographic characteristics, particular goods, services, ideas, and adoption behaviors. Successful segmentation schemes identify the timing of and reasons behind key decision factors related to different commodities for a given population, so that these elements can be matched with products, services, and messages. Market segmentation has been successfully used to speed the creation and adoption of a wide array of consumer products and services, ranging from automobiles to beverages, as well as part of campaigns to modify a variety of social behaviors (e.g., HIV/AIDS and tobacco use).

While electric utilities are increasingly experimenting with segmentation schemes – with some notable successes – development of effective segments has been slowed by: (1) a lack of comprehensive data, particularly related to such hard-to-reach but ubiquitous sectors as small businesses; (2) a tendency to base demand-side management (DSM) programs on traditional broad industry sectors, such as residential, commercial, and industrial customers; and (3) an energy regulatory process that emphasizes technological solutions to DSM that are principally based on engineering economics analyses. However, with encouragement from regulators and as a result of active third-party solicitations, the state's investor-owned utilities are now exhibiting a greater use of segmentation in their recently proposed energy efficiency programs for the 2009-2011 program years.

Segmentation schemes tailored to residential customers typically focus on attitudes and motivations. For example, attempts are made to demographically or geographically isolate groups of consumers by whether they are likely to change their products or behaviors as a result of environmental, economic, or social messages. Segmentation schemes for businesses also rely on motivating factors, and seek to isolate similar energy end-use technologies, ownership patterns, economic characteristics, and associated behaviors, and match these with energy efficiency products and services. For example, the hospitality sector may be useful segmented into independent economy hotels, economy chains, and higher end hotels, and provided with devices that address a specific need (e.g., free, direct installation of sensors that regulate air conditioning in vacant rooms).

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As California attempts to achieve the ambitious energy-reducing goals associated with reducing greenhouse gas emissions, regulators and utilities need to pay greater attention to how best to apply market segmentation to the development and fielding of efficiency programs. High benefit-cost ratios estimated by an engineering economics framework that assumes significant adoption rates without clear marketing pathways should be carefully examined. Without a comprehensive approach to developing and marketing energy efficiency measures that is based on well-described segments, programs are unlikely to be fully successful. Examples of potentially successful segments include:

- *Corner markets*: typically independently-owned, with old, inefficient lighting and equipment, low profit margins, and minimal access to capital. This segment might be addressed through direct installation programs that focus on lighting and refrigeration. Marketing is best conducted door-to-door, with easy-to-read materials and frequent references to neighboring stores that have adopted the measures.

- *Warehouses*: exhibit a variety of ownership patterns, and frequently do not pay, or even see, their utility bills. This segment can be further deconstructed by end-use activities, such as whether the operation is reliant on lighting, refrigeration or battery-powered equipment. Because of split incentives (e.g., the energy bill may be paid elsewhere, or the warehouse operators may rent), energy efficiency measures must be simple and immediately adoptable (e.g., timers for load-shifting battery-powered equipment). Because in many cases there will not be an energy manager, it's a difficult segment to market to, triggering the need for long-term efforts (e.g., three to five years).

- *Low income families*: may not own their homes, have old or inadequate equipment, be poorly educated on energy uses, and have little time to manage their energy use. Efficiency offerings need to provide a direct service, be low- or no-cost, and, directly installed. To the extent that energy programs offer co-benefits (e.g., outdoor sensors, which also increase security), they will be more attractive. Marketing is best done with community-based groups that have a long-term presence in the neighborhood and the necessary language and cultural skills.

In addition, energy regulators and utilities should be thoughtful about how fast they move towards integrated approaches to demand-side management. Although in many cases ratepayers will welcome comprehensive energy (and other resource) saving measures, a significant portion of the population may prefer one-at-a-time solutions. In particular, families and small businesses may not have the capacity to adopt multiple measures simultaneously; for segments within these populations, multi-year, stepwise approaches to increasing efficiency may be preferably to all at once comprehensive programs. Alternatively, if "whole house" tactics are strongly preferred by policymakers, segment-specific barriers to adoption (e.g., financing and staffing capacity) need to be identified and effectively addressed.