

MULTI-YEAR RETROSPECTIVE REFRIGERATOR MARKET SHARE ANALYSIS

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Program, Purpose, and Research Questions: San Diego Gas & Electric (SDG&E) and Pacific Gas & Electric (PG&E) have been implementing residential information and rebate programs focussing on refrigerators for many years. They recently collaborated on a study to estimate the effect of their programs on the market over time. Part of this study included an innovative analysis of changes over time in the market share of efficient refrigerators. The effort had two distinct goals, first it was designed to support a broader market effects analysis as one of the first of a group of market effects studies done in conjunction with the CADMAC Market Effects Subcommittee in California. Second, it supported a regulatory filing claim for impacts for PG&E's 1996 refrigerator program.

Methodology: The study examined the program actions that sought to achieve market effects. This involved looking at the number of refrigerators rebated and their average savings over time. The study then examined evidence of market effects in PG&E and SDG&E service territories and in the rest of the country (which we used for the comparison area). This showed how the market for energy efficient refrigerators increased over time in California – over and above what happened in the rest of the country and over and above the relevant federal standards. We used these data to estimate the percent of the total savings that could be attributed to direct program effects (rebated refrigerators) and the percent that could be defined as spillover.

We collected historical refrigerator efficiency information using a customer survey. We identified people in California and in the rest of the country who bought refrigerators in 1996, 1991, and 1986 and asked them to locate and read over the phone the brand name and model information from their refrigerators. This information allowed us to calculate the exact size, type, efficiency, and electricity use per year of each refrigerator. We then calculated the electricity each would have consumed had it been only as efficient as the federal standards in force during the year it was purchased. Comparing numbers from these calculations gives an estimate of the amount of electricity a given refrigerator saves compared to the relevant federal standard. With this method we were able to analyze historical efficiency information to estimate changes in market share over time. We also used a customer phone survey to estimate free ridership rates. Using a combination of this data we calculated a net-to-gross ratio and disaggregated total savings into savings attributable to true participants, free riders, and spillover.

Research Findings: The efficiencies of refrigerators bought in California in 1986 were not significantly different from those bought in the rest of the country. However, by 1991, the average refrigerator purchased in California was 10.2% more efficient than the federal standards, which was significantly higher than the 5.7% found in the rest of the country. By 1996, the gap between the average refrigerator purchased in California and in the rest of the country had increased even more.

Lessons Learned: Our approach proved to be a straight-forward and practical method for accurately measuring changes in market share over time. We learned many lessons about the nuts and bolts of implementing this kind of analysis and about its applicability to other technologies and types of programs. The study demonstrated a simple yet effective method of explaining the key ingredients of program impacts and how various types of analysis can be used to disaggregate program impacts. The study also demonstrated a viable method for measuring changes in market share and spillover over time. This approach is quite accurate and simple in theory but is not appropriate for all technologies and must be carefully implemented to yield valid results. The study identified most important lessons and made recommendations for when this approach can prove to be useful.