

Choosing the Right Tools

How Different Markets and Programs Call for Different Approaches to Estimating Net Impacts

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Two Examples of Market Effects Evaluations

- California Residential New Construction Market Effects Evaluation
 - Conducted for California Public Utilities Commission
 - Under Direction of California Institute for Energy and Environment
- Multi-State Modeling of the Market Effects of CFL Programs
 - Conducted for program administrators in California, Colorado, Connecticut, Massachusetts, Michigan, New York, and Wisconsin



Topics

- Comparing Evaluation Objectives
- Options for Estimating Net Impacts
- Key Program and Market Differences
- Methodologies Selected
- Summary: Factors in Selection of Methodology

Comparing Evaluation Objectives

- Similarity: Both Seek to Estimate Net Energy Savings Stemming from Market Effects
- Similarity: Both Involve Baseline Estimates
- Similarity: Both Start with Gross Savings Estimates and apply Net-to-Gross Ratios
- Difference: Treatment of Participants and Non-Participants
 - Residential New Construction: Examines non-participant spillover only
 - Multi-State CFL Modeling: Examines net effects at the market level, without differentiating free ridership, participant spillover, and non-participant spillover

Options for Estimating Net Savings

- Deemed or Stipulated Savings
- Self-Reported or Survey-Based Estimates Estimates
- Cross-Sectional Estimates
- Structured Expert Judgment
- Historical Tracing

Key Program and Market Differences

- Degree of Comparability to Markets in Other Areas
 - Residential new construction
 - Unique state building codes
 - Unique climate(s)
 - Local primary market actors: builders, HVAC contractors, Title 24 consultants, HERS raters
 - CFL programs
 - Similar products across different states
 - National and multi-national market actors

Key Program and Market Differences

- Ability to Identify Participants and Non-Participants
 - Residential new construction
 - Participating homes from program database
 - Non-participating homes from new meter hookup requests
 - CFL programs
 - With upstream programs, participants are anonymous
 - Participants usually not aware that they are participants

Key Program and Market Differences

- Diversity and Complexity of End-Uses or Practices Targeted by the Program
 - Residential new construction
 - Materials, building and installation practices, modeling, more
 - CFL programs
 - Fairly narrow range of fairly simple products

Key Program and Market Differences

- Availability and Quality of Sales or Shipment Data
 - Residential new construction
 - Equipment sales data often do not differentiate new construction from other applications
 - Only tangentially helpful for whole-house savings
 - CFL programs
 - National- and state-level data tantalizingly available
 - What is missing makes the data misleading

Key Program and Market Differences

- Who the Ultimate Decision Makers Are
 - Residential new construction
 - Largely builders
 - Title 24 consultants and HERS raters have strong influence
 - CFL programs
 - Largely consumers
 - Retailers and manufacturers have strong influence

Key Program and Market Differences

- Reliability of Survey Responses
 - Residential new construction
 - For builders, unlike Title 24 consultants, efficiency is not a primary concern
 - Builders unlikely to admit not building to code
 - CFL programs
 - In telephone surveys, consumers cannot accurately report number of CFLs installed or purchased

Key Program and Market Differences

- Market Actors' Knowledge of the Broader Market
 - Residential new construction
 - Builders—much less home buyers—may not be in a position to know how the IOU programs have influenced the market
 - CFL programs
 - End-Users typically do not know they are participants and may not even know there is a CFL program

Methodologies Selected

- Residential New Construction
 - Unique and local market
 - Precludes cross-sectional approach
 - Ability to identify participants and non-participants
 - Allows self-reporting and estimation of non-participant spillover
 - Diversity and complexity of end uses and practices
 - Home buyers can't answer most questions about efficiency practices
 - Home buyers usually aren't the ultimate decision makers
 - Availability and quality of sales and shipment data
 - Not always available
 - Do not allow specification of efficiency of house as a whole

Methodologies Selected

- Residential New Construction
 - Who the Decision Makers and Influencers Are
 - Builders are primary decision makers
 - Title 24 consultants are key influencers
 - Reliability and Validity of Survey Responses
 - Builders have motives to exaggerate efficiency of homes they build
 - Title 24 consultants involved in every home, unlike HERS raters
 - Focus exclusively on efficiency, unlike builders
 - Market Actors' Knowledge of the Broader Market
 - Home buyers can't answer most questions about efficiency practices
 - Home buyers usually aren't the ultimate decision makers
 - Builders may not know effect of program on availability, pricing, etc.

Methodologies Selected

- Residential New Construction
 - Opted for expert judging
 - Delphi panels of Title 24 Consultants and industry experts
 - Gross savings from on-site audits of non-participant homes
 - Above-code homes compared to just-code homes
 - Just-code homes compared to below-code homes
 - Panel members see gross savings estimates and assign attribution scores to IOU programs and other factors to derive net savings estimates

Methodologies Selected

- CFL programs
 - Markets similar across U.S.
 - Cannot identify participants and non-participants
 - Similar products and markets in different states allow cross-sectional approach
 - Missing pieces too problematic to allow use of sales and shipment data
 - Who the primary decision makers and influencers are
 - Consumers primary decision makers
 - Manufacturers and retailers key influencers

Methodologies Selected

- CFL programs
 - Reliability and validity of survey responses
 - Consumers cannot reliably report how many CFLs they are using or have purchased
 - Manufacturers and retailers may not be willing to provide comprehensive sales information
 - Market actors' knowledge of the broader market
 - Consumers cannot know the influence of programs on pricing and availability
 - Manufacturers and retailers have more knowledge, but may be motivated to exaggerate program influence

Methodologies Selected

- CFL Programs
 - Opted for cross-sectional approach – specifically multi-state modeling
 - No need for perfect comparison area
 - Model controls for household level variation
 - Pooling resources gives large sample sizes
 - Used on-site assessments for estimation
 - Program areas and non-program geographic areas included – 16 in all
 - 9,325 telephone interviews, 1,444 onsite audits

Methodologies Selected

- CFL Programs
 - Dependent variable: purchases in 2008
 - Independent variables
 - Presence/absence and strength of CFL program
 - Demographics
 - Years using CFLs
 - Saturation at the beginning of 2008
 - Many others attempted
 - NTG: $(\text{with-program sales} - \text{no-program-sales}) / \text{program-supported sales}$
 - NTG applied to gross savings

Conclusion

- Good net savings estimates:
 - Ensure wise expenditures of program resources
 - Tie rewards to actual savings
 - Guide programs toward maximizing savings
- But very difficult to estimate net savings
- Start by examining available estimation options, and compare requirements of methods with conditions of the particular market and program