

Market Share Tracking: How and Why

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ABSTRACT

Understanding the markets for energy efficient products is crucial to evaluating the effectiveness of energy efficiency programs. Tracking product market share is an increasingly important aspect of program assessment. Market share tracking can also be used to inform program design, model markets, evaluate market effects, and estimate energy savings. Both resource acquisition and market transformation programs can benefit from market share information. Several state- and national-level efforts to track market share for energy efficiency purposes are currently underway. These efforts highlight the unique characteristics of each market and each method of tracking. In all cases, however, many challenges confront those who wish to obtain statistically significant samples of confidential sales data repeatedly over time. In this paper, the authors briefly review reasons why market share tracking is an increasingly important aspect of energy efficiency program evaluation. They also summarize, compare, and contrast several approaches to market share tracking. The strengths and weaknesses of various approaches are reviewed, and key factors to consider when designing and implementing market share tracking plans are presented.

Introduction

As the title suggests, the purpose of this paper is to outline the “how and why” of market share tracking. Why is market share tracking an analytical approach that has value for energy efficiency programs and how can the approach be used most successfully? Examination of case studies in which market share tracking has been used for several years provided the source for much of the information presented here.

What Is Market Share Tracking?

Market share tracking refers to the systematic monitoring and periodic reporting of the percentage or ratio of sales of a defined set of products to the total sales of that product-type in a defined area (country, state, region). Market share is often used to measure the percentage of the market for a particular company, or for a particular product type. It can be measured by dollar sales or by units sold. In the energy efficiency community, we are interested in market share by units sold. This is more easily converted to energy usage or savings because it eliminates issues associated with price differences across products with different efficiencies.

Why Track Market Share?

An objective of market transformation and resource acquisition programs is to increase the adoption of energy efficient technologies and products. Market share tracking efforts provide a broad picture of the penetration of energy efficient products, and how this changes over time. They have become more prevalent because of two shifts in energy efficiency programs. First is the shift in some programs toward market transformation goals. The market transformation goals point to measurement of broader market effects, those that occur beyond program participants. Second is the increase in public benefits programs that cover geographic areas larger than one utility's service territory. This makes market tracking more feasible because it increases the opportunity for programs areas to match markets areas.

Market share tracking provides value at all stages of an energy efficiency program's life cycle. Initially, market share tracking can provide baseline data on the potential products to be covered in a program. These data can be used to determine where to focus program efforts for the greatest impact. The process of preparing for the baseline assessment forces a better understanding of the market and key market players, which can then inform the program. Ongoing tracking may provide feedback on specific program activities and promotions, in addition to indicating general market changes. It has the potential to indicate that a market transformation has occurred, or that the incremental benefits of program activity do not justify the costs to continue. Finally, it can be used as a partial measure of program success.

The time-series data compiled in market share tracking studies is invaluable in the development of models to estimate the impacts of programs. It is also helpful in assessing the effect of other external changes, such as economic downturns, on the market. It is, however, limited in its usefulness for attributing overall market effects to particular programs. Market share tracking provides useful information to resource acquisition programs. Although these programs often target individual customer decisions, we have long recognized their impact in the broader market place. We have measured these market effects in terms of free riders and spillover, and have explored the impact that these programs have on product suppliers and manufacturers. Market share data do not address the whos and whys of purchases, but provide broad data on the overall market situation.

In addition to the specific uses of market share data for program planning and evaluation, the data gathered through market share tracking have broader public policy applications. While the success of energy efficiency programs will be gauged by a variety of indicators, in the case of market transformation programs, market shares of cost-effective high-efficiency products and services reflect the economic efficiency with which markets are actually operating and act as the ultimate indicators of the effectiveness of market transformation efforts.

A Review of Regional and National Market Share Tracking Activities

A number of state- and national-level efforts to track the market share of residential and commercial energy efficient products have been in operation for several years. The approaches vary from collecting shipment data from manufacturers or sales data from retailers to consumer interviews. Presented below are case studies from Wisconsin and California. These states have experience in tracking market share of energy efficient

products. These case studies review the logistics of designing and implementing some of their market share tracking plans. We conclude with a review of a national-level tracking effort sponsored by the U.S. Department of Energy and a comparison of the various approaches.

California Utilities Sales Tracking

In the late 1990s, investor-owned utilities (IOUs) in California and the California Board of Energy Efficiency (CBEE) agreed to set aside funds to develop a system to track the market share of high-efficiency products. These market share data were viewed as being critical to assessing the progress of market transformation programs initiated in the state. In 1999, Regional Economic Research, Inc. (RER) conducted a scoping study for developing a residential and nonresidential system (RER 1999). The scoping study had two goals: 1) to identify high priority energy efficiency measures to be tracked, and 2) to develop detailed recommendations on methods, likely budgets, and timeframes needed to develop the systems. The pre-determined requirements for the system included the following:

- The data must be reported in terms of unit sales (rather than dollar value).
- The data collection must allow for breakout by efficiency level as needed. Therefore, line item data would be preferable.
- Data must be reported at the decision type level (new construction, retrofit/replace on burnout).
- Accurate measurements would be required at the state-level and, if possible, at the utility level.

The scoping study led to the tracking of both residential and nonresidential measures in California, beginning in 1999. This discussion highlights these efforts in the residential sector.

Data collection methods and sources. The residential efficiency market share tracking study (RMST) in California uses four different data sources to track appliances, lighting products, HVAC and water heating equipment, and energy efficient measures in new construction.

For *appliances*, the RMST relies on retailer sales information. In particular, data are collected from two sources: D&R International, which collects sales data from some national chains, and sales data from independent appliance retailers. The independent retailers include local or regional retail chains as well as some “mom and pop” stores. The current sample for the RMST study contains data from 42 independent storefronts and over 150 national chain storefronts throughout California.¹

The RMST collects data on *lighting products* including lamps, fixtures, and torchieres.² Point-of-sales data from five market channels (home improvement, hardware, food, drug, and mass merchandisers) are purchased from commercial market research firms.

¹ Presently, RMST collects detailed model data on 49% of all refrigerators, 37% of all dishwashers, 57% of all clothes washers, and 16% of all room air conditioners sold in the California retail market.

² Note that data for fixtures and torchieres are collected for the new construction market only. Plans are under consideration to include these data using point-of-sales data.

These data on compact fluorescent, halogen, and incandescent bulb unit sales are used to report quarterly market shares by market channel, lamp type, and wattage.

Distributor unit sales data are used to track the market shares of *HVAC equipment*. The distributors who contribute data to the RMST database have over 50 warehouse locations throughout California. Data from these distributors include detailed model information on over 20% of all central air conditioners, gas furnaces, and heat pump units sold in California. It has been difficult to recruit HVAC distributors who report directly to a corporate entity, usually outside of California.

For *residential new construction*, the RMST combines data from building department compliance documentation data with on-site surveys of 800 newly constructed residences. The four independently owned utilities that contribute to the RMST provide detailed billing frame data to support the sample design and on-site visits. RER has recruited a sample of over 20 building departments that provide data on installed equipment contained on California's building department compliance forms. These data are analyzed individually, as well as combined to represent the new construction market.

Data tracking costs. The costs of unit sales tracking in California are similar across a range of products and sources (retailers, distributors, and point-of-sales data). For appliances, HVAC, water heaters, and residential lighting, costs are between \$75,000 and \$125,000 annually. By contrast, the cost of new construction tracking, with on-site surveys and building departments as the data sources, is between \$300,000 and \$350,000 annually. The residential new construction data collection process is expensive compared to other types of data collection efforts due to the on-site surveys. It is important to note, however, that the data collected during the on-site visits supports a number of other research objectives in California, particularly in the area of residential building standards.³

Challenges associated with data collection. The RMST has been an on-going concern for just over three years. During this period, a number of challenges to developing and maintaining a market share tracking system have been identified and met.

- Unit sales data are proprietary. As a result, confidentiality agreements with each of the retailers must be drawn up and signed.
- Success of market tracking is enhanced if the participating retailers and distributors receive useful feedback. The RMST provides each participating independent appliance retailer and HVAC distributor with an individualized report that includes a comparison of their market share versus the state average market share of the tracked products. Many of the participants find this report valuable.
- Data will arrive in various formats. Data from retailers and distributors have included hand written sales logs, computer printouts, and electronic databases. Analysts must be prepared to deal with a wide variety of data inputs.
- Line item data are required from appliance retailers and distributors in order to break out data by efficiency groups. Obtaining data with this level of detail requires the significant task of matching models to obtain the required energy efficiency metrics for reporting market shares.

³ The on-site survey database was used to support the Residential New Construction Baseline report (RER 2001).

Lessons learned. In addition to the challenges, researchers have learned a number of important lessons over the course of the RMST.

- Relationships are key to successful market share tracking. These efforts require a long-term commitment, constant maintenance, patience, and flexibility.
- It is important to include the individuals who actually generate the reports in the relationship-building process. Doing so helps to make the reporting process routine. This assists with timely reporting efforts.
- Recruiting participants for market share tracking is most successful when conducted face-to-face. Occasionally, recruiting via telephone is adequate.
- Retailers provide more reliable data than distributors because the retailers are closer to the point of sale.
- One reason that independent and regional chains find the market share information valuable is because they can pinpoint the times at which they have offered promotions and can analyze their effects using the data. This can be used to help recruit chains.
- A great deal of coordination among utility program planners, implementers, and evaluators is necessary to insure continued data sharing and relevancy.

Wisconsin Appliance and Furnace Sales Tracking Studies

Starting in 1993, the Energy Center of Wisconsin (ECW) initiated a biennial study of Wisconsin households to collect self-reports on appliance purchases and consumer attitudes about energy efficiency. The Appliance Sales Tracking study covers the rate at which appliances are purchased, consumer attitudes, shopping experiences, and other related information. In 1997, ECW began collecting quarterly data from distributors on the sales of forced air furnaces and central air conditioners—the Furnace and Air Conditioner Distributor Sales Tracking study.

Appliance Sales Tracking

ECW has conducted an Appliance Sales Tracking (AST) survey through random digit dialing biennially since 1993. The AST study collects data from 3,000 respondents and addresses lighting equipment and five types of home appliances. Web TV surveys have been used to assess the quality of the data and to modify the survey instrument, but are not part of the regular data collection process. Advantages of the appliance tracking approach include:

- The ability to cover multiple products in a single data collection effort,
- Obtaining consumer specific demographic and attitudinal data, and
- Obtaining consumer shopping experiences and reasons for purchases.

Disadvantages include:

- The unreliability of self-reported efficiency levels. The data is so unreliable that we would not recommend this approach for to determine market shares (Tannenbaum 2002).

- Fewer data points from which to extrapolate to the population.
- Declining response rates to telephone surveys.

Furnace and AC Distributor Sales Tracking

The Furnace and Central Air Conditioning Distributor sales tracking study relies on a panel of furnace/air conditioner distributors serving Wisconsin. These distributors provide quarterly sales data for 23 Wisconsin markets by efficiency level. Furnace sales data are collected for two different efficiency bins: furnaces with an annual fuel utilization efficiency (AFUE) of less than 90%, and those with an AFUE equal to or greater than 90%. Central air conditioners are tracked by seasonal energy efficiency ratio (SEER). These 10 distributors represent more than 75% of annual sales of these products in Wisconsin.

While distributors receive no monetary compensation for providing sales data to the contractor, they do receive information on their percent of sales within each market area. Distributors participate in the tracking because they find the data they receive extremely valuable, and of better quality and more useful than that available through AHAM or GAMA. The contractor collecting the data maintains strict confidentiality by masking individual sales data so that ECW cannot attribute sales to any particular distributor. The contractor reports market share by efficiency level for each market area. Collecting these data costs approximately \$65,000 per year.

The cornerstone of success in this tracking process is the human relationships and trust that have been established between distributors and data collectors over the years. Maintaining this across time and through personnel changes within the industry takes work. Advantages of this approach include:

- High level of accuracy,
- Timely results, and
- Identification of changes to market shares within relatively small geographic areas.

Disadvantages of the approach include the following:

- The substantial level of effort required to obtain information. Each quarter several contractors require prodding to provide timely information.
- The need for ongoing personal relationships to maintain distributor participation. Staff turnover at the contractor's site jeopardizes data collection.
- Dependency on a limited number of distributors in which the loss of one key participant would render the data useless. This is due in part to the relatively small size of the Wisconsin market.
- Lack of information on where the equipment is installed and why it was purchased.
- Guaranteeing sufficient confidentiality of data to obtain and maintain participation. Because the ECW is funded in part from utility ratepayer dollars, distributors are concerned that their data not be available to utilities (potential competitors) or other distributors.

National ENERGY STAR[®] Sales Tracking

Since 1996, D&R International has conducted a survey of the national chain stores in the retail market to gather market share information on ENERGY STAR[®] qualified appliance models (Ten Cate 2001). Their survey covers 40 to 45% of the national market. D&R obtains data by store and tracks the results by zip code. Results are reported quarterly at the national and regional levels.⁴ D&R hopes to add mass merchandisers and home improvement stores in 2002. They would also like to expand their product list to include compact fluorescent lighting products and ceiling fans.

The retailer partnership agreement with ENERGY STAR asks retailers to provide sales data and assures them of the confidentiality of this data. Sometimes concerns about providing data can delay the signing of partnership agreements. Not all partners provide these data. To maintain confidentiality, D&R does not specify the retailers included in the study and aggregates data prior to reporting results.

In general, retailers participate in the D&R survey because it allows them an opportunity to benchmark their sales. It is typical for D&R to initially experience resistance from retailers who are reluctant to share sales information due to concerns about confidentiality and how the data will be used. D&R expends considerable time and energy on relationship building in an effort to decrease resistance from retailers, build trust, and increase the quality of information included as the survey has developed. The ENERGY STAR program has itself helped increase participation. For example, one major chain agreed to participate when they realized that ENERGY STAR models were also their more profitable models and that ENERGY STAR promotions were boosting sales.

Advantages of the D&R approach to tracking include:

- The survey results are reported nationally, and some regional information is available,
- The survey results are available quarterly,
- It is easy to add products to the mix, since large retailers participate, and
- The quality of the data has improved over time with increased involvement by retailers.

Disadvantages of the D&R approach include:

- The data are not completely comparable from year-to-year, since partners come and go and the sample composition varies as a result,
- Participation by retailers is limited and recruiting additional retailers to participate is a slow process,
- When specifications change, D&R does some verification but cannot ensure that all retailers are providing accurate data,
- Not all retailers provide model-by-model data,

⁴ Initially only annual results were reported.

- Coverage varies regionally with the distribution of chain stores, and
- No detailed information is available about coverage.

Discussion

As researchers embark on a market share tracking project, whether large or small, they can benefit from the experience of earlier studies. Table 1 summarizes the strengths and weaknesses identified in the three market share tracking examples provided earlier in the paper. These studies provide the basis for the discussion below. They illuminated issues, trade-offs and factors to be considered in the design of a market tracking effort.

Table 1. Summary of Strengths and Weaknesses of Selected Market Share Data Sources

| Data Source | Site/Product | Strengths | Weaknesses |
|--|---|--|---|
| Distributors sales data | Wisconsin/Furnace and AC California/HVAC | Good coverage of market | Requires cooperative relationships to ensure coverage. |
| Retailer sales reports from local stores, regional chains, and national chains | California/home appliances, U.S./home appliances | accurate and timely data on confirmed sales Opportunities to repeat data collection at regular intervals once relationship is established | Requires cooperative relationships to ensure coverage and statistical representativeness |
| Point of Purchase/SKU data from commercial market research firms | California/CFL bulbs | Minimum burden on respondents Accurate and timely data | Cost of obtaining and developing data Not available for all product categories |
| On-site surveys of end users | California/residential new homes | Opportunity to assess many products in one visit Opportunity to collect detailed information on installed equipment | High cost associated with on-sites Intrusive; difficult to arrange long-term follow-up |
| End-user Interviews | Wisconsin/home appliances | Relatively inexpensive Many kinds of information from one source | Less accuracy in self-reports Difficult to ensure representative sample |

One of the trade-offs in designing market share tracking is the decision about where in the supply chain to collect data for a particular product type. Markets for different products vary in the supply chain—how the product gets to the consumer. The most efficient way to collect market information is to identify the point where the smallest number of individual contacts will yield data on the largest percentage of the overall market. Minimizing the number of contacts required reduces the costs of data collection. It does, however, increase the vulnerability of the study, since the loss of one or two key contacts could render the data useless.

Obtaining and maintaining participation from data providers is essential. There are two key attributes to successfully accomplishing this. First, potential data providers must see

some benefit to providing the data, whether financial or informational. Second, the researcher must cultivate trusting relationships with the individuals responsible for providing the data. Because of the sensitive and proprietary nature of the data, both the institutions and the individuals supplying it must be convinced that data attributable to companies will be kept confidential. In some cases this requires written confidentiality agreements between researchers and data providers.

Throughout the data collection process, the potential burden on the institutions and individuals supplying the data must be minimized. Ideally, data collection should not interfere with normal business practices or activities. This often means accepting the data in whatever format provided and spending resources to combine disparate datasets. It can also mean transferring information from printouts into electronic format (data entry).

Matching the geographic area of the data to the geographic area of interest can be a market tracking challenge. Geographic boundaries of product markets may not match the geographic boundaries of interest to program providers or funders. In addition, a program may have multiple parties interested in the data based on different segments, such as service territory or legislative district. A single market tracking effort for a program may not be able to provide data at the level required by all interested parties. Researchers must recognize this and be prepared to make trade-offs in the decisions they make regarding the design of the research. Changes to the program in funding, products, or geographic coverage area can further complicate this. One factor to consider when designing market share tracking is whether there are opportunities to piggyback on existing market tracking efforts. For example, D&R tracks market shares of energy efficient household appliances at the state, regional, and national level, but based on data only from national chains. Researchers could supplement this data for their state or region by collecting similar data from regional chains and independent retailers. The key to using multiple data sources is to make sure they are mutually exclusive and that consistent definitions are used in the different sources. The percentage of the market represented by each source must be known (or estimated) so that data are weighted accordingly.

As with all research, data quality concerns must be addressed in market tracking research. Are the data actual sales (or shipping) data, or are they estimated? Are the establishments providing the data representative of the marketplace? Is the sample size large enough to detect changes at the levels anticipated? Finally, another important issue to consider is whether the process to gather the data is simple enough that it can be repeated in the future and in other areas. If standard approaches are used around the U.S., the data become richer and more valuable to all energy efficiency researchers. This will allow for comparisons across large market areas, with the potential to explain differences based partly on programmatic effects.

One disadvantage of market tracking efforts that rely on the supply chain as a source of information is what is unknown. Specifically, these market tracking efforts cannot address exactly who is making a purchase and why. Demographic, attitudinal, and experiential information is not possible.

Another finding from these case studies is that self-reports regarding the efficiency of individual purchases are highly unreliable. While not a good option for market share tracking, self-reports do provide demographic and attitudinal insights (Tannenbaum 2002).

Market share tracking merits attention and effort despite these challenges. In the case studies presented above, researchers have managed to overcome at least some of these

challenges. Since each market share tracking effort will face a unique set of circumstances and requirements, researchers need to maintain an open mind about how to approach each effort. Leveraging existing relationships with suppliers and retailers that serve many geographic areas and sharing information about methodologies, sampling strategies, and market structure within the energy efficiency community will enhance our understanding of energy efficiency programs and markets.

Conclusions

Understanding the markets for energy efficient products is crucial to understanding the effectiveness of energy efficiency initiatives. Market share tracking is an important aspect of market assessment that can be used to evaluate energy efficiency program design, inform policy makers, evaluate market effects, and estimate energy savings. As the case studies and discussion show, market share tracking can help researchers achieve the following goals.

- **Detection of market changes at regular intervals over time.** If data are available, market shares can be estimated retrospectively for some products, as well as allow for the monitoring of changes going forward. For all energy efficiency programs with a goal of changing purchasing behavior of consumers and the availability of products within the marketplace, it is important to be able to detect changes in market conditions over time.
- **Use of results to benefit a diverse audience.** As the case studies revealed, market share information initially collected to serve one purpose proved valuable for other purposes. For example, HVAC market share data collected for utilities proved to have value to HVAC distributors in Wisconsin. New construction data in California are used by program planners and designers of California's building standards. The diversity of audiences served by the data contributes to the continuing success of market share tracking in these states.
- **Capturing the big picture market effects of energy efficiency programs.** Tracking results capture the overall effects of energy efficiency programs. In the parlance of resource acquisition programs, they include free riders, spillover, and nonparticipant spillover, as well as program participants. Unfortunately, they also include the impacts of other changes in the market that may be unrelated to programs. For programs that focus "upstream" on the supply side or cannot track individual consumers, market share tracking is helpful in assessing program performance.

Several state- and national-level efforts to track market share for energy efficiency purposes are currently underway. These case studies provide valuable insights about how to conduct market share tracking. As illustrated in the case studies, crucial features of a successful tracking effort include the following.

- **Identification and understanding of issues unique to each market.** Different approaches to tracking market share data are suitable for different products. Once an approach is selected, it is likely to need refinements as new issues are discovered during implementation.

- **Flexibility.** Typically, considerable time will be spent developing well-planned data collection approaches for the tracking effort. However, once implemented, it could become evident that some of these approaches are not adequate to accomplish the tasks at hand. Do not hesitate to be flexible in both the approach taken and to adjust the expectations for the resulting data. A solid yet flexible working relationship between the funder and the implementers of the tracking system is invaluable.
- **Emphasis on building relationships with data providers.** Build relationships to establish credibility and trust and to ensure confidentiality of data being shared. Successful tracking efforts are built on good relationships as much as on sound study design. The establishment and ongoing maintenance of these relationships, while costly in terms of time and project budget, is essential to the success of the project.
- **Coordination of efforts with others in the energy efficiency community.** Market share tracking efforts should involve close coordination between the tracking team and other professionals in the energy efficiency community, mainly utility program planners and other market assessment and evaluation (MA&E) project managers and consultants. Coordination avoids wasteful duplication of effort and leveraging of information and contacts. Program implementers often have a greater understanding of the marketplace than evaluators and can provide valuable insights into developing more effective recruiting tools and often can help compile samples and other valuable data development assistance.
- **Coordination with other data collection efforts already in place.** There are significant advantages in identifying and leveraging other projects and data collection efforts already in place. For example, sales data collected from national retailers to assess the ENERGY STAR program are invaluable to tracking the market shares of residential appliances in California. Retailers may be unwilling to share this data with another entity because of the extra effort (no matter how minimal) and trust issues.
- **Understanding of the reluctance of third parties to provide data.** Most data obtained to support market share tracking are sensitive. Although considerable effort is expended to develop and maintain trusting relationships with data providers, they are reluctant to provide data to third parties. To mitigate this problem, it is helpful to sign confidentiality agreements with data providers to ensure that company-specific data will remain proprietary, stress that any information released would be sufficiently aggregated so that no one data provider's information would be transparent, recognize the value to participants of the information they provide, and return to them data in a format that adds value from their perspective.

In conclusion, experience from the case studies suggests that design criteria and the requirements of data users, together with the unique characteristics of each market and each method of tracking, drive the development of the market share tracking system. However, there are some common challenges that confront those who wish to obtain statistically significant samples of confidential sales data repeatedly over time. How these challenges are met play a large role in the success of the system.

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