

The Next Generation of Consumer Electronics Programs

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Introduction

This poster summarizes findings from a qualitative study of the potential for consumer electronics energy-efficiency programs in Massachusetts in 2012. It describes the current barriers to and opportunities for greater energy efficiency for each of the key consumer electronics product areas, touches on saturation of consumer electronics products in the state, and describes findings and offers related program recommendations. While the results are focused on a particular state, the findings are relevant to other jurisdictions across the U.S. and Canada.

Background

As of 2010, consumer electronics was estimated to comprise 13% of residential electricity consumption (Urban et al. 2011), making it a product category worthy of program attention. Yet consumer electronics is a particularly challenging area for energy efficiency programs. For example, the consumer electronics market moves at a far faster pace than most other product areas and especially than the utility regulatory environment. As a result, programs risk lagging behind the market and incentivizing free riders or obsolete products. The global nature of the market is also a challenge for program attribution. Variations in consumption associated with user behavior and the numerous possible combinations of peripheral devices that could increase the consumption associated with products of interest make identifying deemed savings and reductions from consumer electronics difficult.

Drawing on both secondary and primary research, the study focused on a series of product categories that together represent more than three-quarters of consumer electronics energy consumption: TVs, set-top boxes, computers and displays, and video game consoles (Urban et al. 2011). It also included an assessment of savings opportunities from “smart” power strips (also known as advanced power strips [APSs]).

Methods

Research methods include a review of current literature, in-depth interviews, and a study of product saturation in Massachusetts. The research team chose literature for review based on relevance to the topic, timeliness, and the research team’s perceptions of quality and reliability. The team conducted in-depth interviews with 21 organizations and 26 individuals representing five different types of organizations: program administrators running leading consumer electronics programs, stakeholders and policymakers involved in setting specifications or regulations, retailers, manufacturers, and media service providers and industry representatives. The team also conducted an onsite saturation study of residential retail products in the state, collecting data to identify the rate at which different consumer electronics were found in 150 households in the state. All data collection and analysis was completed in 2012.

Results

While the study was conducted on behalf of Massachusetts program administrators, the findings and observations are broadly relevant across the U.S. and Canada. The following are some of the research team's key observations from literature and in-depth interviews:

- The consumer electronics market changes quickly, facilitating rapid saturation and free ridership. Updating program criteria frequently and relying on more rigorous specifications will diminish free ridership.
- Collaboration between program administrators and a broad range of other programs and stakeholders will increase the likelihood of program engagement with larger retailers and manufacturers. Program administrator interviewees noted that identifying a single point of contact for consumer electronics programs across a region makes program participation less burdensome for industry.
- Successful consumer electronics programs are designed with an understanding of the typical design, production, and sales cycle of each product.
- Product-specific challenges exist. For example, TV efficiency likely will not dramatically increase in coming years, and desktop PCs and displays markets are shrinking and as a result are not relevant program foci.
- Increasing the efficiency of set-top box devices alone will not sufficiently address their energy consumption. Incorporating their functions into thin-client boxes or TVs to decrease the number of devices per home can reduce their energy consumption.

The findings raise some fundamental questions about the place of consumer electronics in energy-efficiency programs. The research team suggests four basic approaches to consumer electronics for program administrators to consider. While program administrators could potentially abandon program support for consumer electronics in the face of the challenges of addressing them, the research team does not recommend this option. The research team concludes that programs could consider limiting their support for consumer electronics to focus on encouraging the development of more rigorous energy efficiency specifications and standards. Programs may also want to take long-term market transformation approaches to reduce overall miscellaneous plug loads as a broad category instead of through product-by-product incentive approaches. The fourth option is for programs to continue to offering product-focused programs, but with modifications integrating the findings from this study to improve effectiveness.

References

Urban B., Tiefenbeck V., and Roth K. 2011. *Energy Consumption of Consumer Electronics in U.S. Homes in 2010*. Final report to the Consumer Electronics Association. Cambridge, MA: Fraunhofer Center for Sustainable Energy Systems.

[NMR Group, Inc. 2012. *Massachusetts Consumer Electronics Potential Qualitative Research*. Submitted to Massachusetts Program Administrators and Energy Efficiency Advisory Council Consultant.](#)

[NMR Group, Inc. 2012. *Massachusetts Residential Retail Products: Consumer Electronics Saturation*. Submitted to Massachusetts Program Administrators and Energy Efficiency Advisory Council Consultant.](#)

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Findings from a Qualitative Potential Study for Massachusetts Program Administrators

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Research Objective

NMR conducted this consumer electronics qualitative potential study in 2012 for the Massachusetts energy efficiency program administrators. Currently, the Massachusetts' ENERGY STAR Appliances and Products Program administers an initiative addressing consumer electronics. The primary goal of the qualitative potential study was to identify factors affecting consumer electronics energy efficiency that the Program could address directly through program activities.



Research Scope

The study focused on identifying and understanding program opportunities for, and barriers to, technologies and interventions that represent the greatest sources of potential savings from consumer electronics. In 2010, together the following represent over three-quarters of the total U.S. energy consumption of consumer electronics: Televisions (TVs), Set-top boxes (STBs), Video game consoles, Personal computers (PCs), and Displays.¹ Smart or advanced power strips (APs) were also addressed in this study as energy saving devices for consumer electronics.

Research Methods

For the potential study the research team collected data via two methods: a review of current literature and in-depth interviews. The literature review for this study was conducted between April and May, 2012. In-depth interviews were conducted between June and August 2012. Given the fast-changing nature of the consumer electronics market, some of the information presented here may have changed in recent months.

Literature sources were chosen based on their relevance to the topic, recentness, and the team's perceptions of their quality and reliability.

The team conducted in-depth interviews with 21 organizations and 26 individuals representing five different types of organizations:

- Program administrators outside Massachusetts running leading consumer electronics programs, and staff of the implementation contractor responsible for running the Massachusetts Program. The research team identified "leading" consumer electronics programs based on the literature review and input from other interviewees.
- Stakeholders and policymakers involved in setting specifications or regulations related to the energy efficiency of consumer electronics, including advocacy organizations working on consumer electronics energy efficiency.
- Retailers of consumer electronics. Since Massachusetts Program efforts have targeted larger retailers, the research team interviewed representatives from large chain retailers.
- Manufacturers of consumer electronics.
- Media Service Providers and Media Industry Representatives. Media service providers control media transport through cable, satellite, or Internet networks

Key Observations from Literature and In-depth Interviews

Consumer Electronics Overall

- **Consumer electronics specifications would save energy more effectively if they were more rigorous.** There is little reason to expect manufacturers to make, or retailers to promote, energy efficient products without programs and without voluntary specifications such as ENERGY STAR to encourage these activities. Program administrator input could drive more rigorous specifications.
- **A product-by-product approach may not be sufficient to reach ambitious program savings goals.** A long-term market transformation approach to reduce overall miscellaneous plug loads as a broad category may be more effective than a product-by-product incentive approach.
- **Midstream incentives appear to be more effective than downstream incentives.** The vast majority of programs do not offer downstream incentives for consumer electronics. A retailer interviewee observed that high processing costs from downstream incentives are not generally effective for consumer electronics products.
- **Removing inefficient electronics from the grid could be a promising program approach, particularly for TVs.** Adding efficient TV models does not remove less efficient models from the grid. For example, after purchasing an energy-efficient TV, customers will often turn their older TV into a secondary TV instead of removing it from the grid entirely.
- **Successful consumer electronics programs are designed with an understanding of the typical design, production, and sales cycle of each product.** One program administrator representative indicated that understanding the buying cycles of consumer electronics retailers is especially important given the rapidly changing consumer electronics market.
- **Collaboration between program administrators and a broad range of other programs and stakeholders will increase the likelihood of program engagement with larger retailers and manufacturers.** Program administrator interviewees noted that identifying a single point of contact for consumer electronics programs across a region makes program participation less burdensome for industry.
- **Third parties can successfully facilitate data collection from retailers to help inform program design plans.** The third party facilitation will not risk retailer privacy because the third party is not under the same regulatory requirements to make its documentation public as are program administrators.
- **Programs must provide retailers with training around program offerings.** Retailers need substantial assistance in adapting to efficiency program needs.
- **Online or mobile tools can help guide consumers to program-eligible products and to retailers selling such products.** One program administrator interviewee suggested that Internet-based applications could help consumers identify energy-efficient, program-eligible models of consumer electronics.
- **The consumer electronics market changes quickly, facilitating rapid saturation and free ridership.** Updating program criteria frequently and relying on more rigorous specifications will diminish free ridership.

Set-top Boxes

- Increasing the efficiency of the device alone will not sufficiently address STB energy consumption. Incorporating STB functions into thin-client boxes or TVs to decrease the number of STBs per home can reduce STB energy consumption.
- Partnering with media service providers to reduce STB energy consumption has led to program success. However, the Massachusetts program administrators have tried this approach in a previous program with little success.

Desktop and Mobile PCs

- Desktop PCs are a shrinking market and as a result are not a relevant program focus.
- Cost is a major market barrier to advancing energy efficiency for desktop PCs.
- Desktop and mobile PC programs have been unsuccessful.
- ENERGY STAR has penetrated the mobile PC market.
- Cloud computing continues to grow, shifting power requirements to data centers. As a result cloud computing will reduce home desktop and mobile PC energy consumption.

Displays

- Consumer behavior may inhibit savings from displays.
- Displays may be an irrelevant product category given that the market appears to be shrinking.

Advanced Power Strips

- Savings from APs will diminish as other devices become more efficient.
- The savings associated with APs are difficult to quantify.
- APs are not appropriate for use with mobile PCs.
- Consumers lack awareness around APs and how to use them.
- Direct install approaches have effectively increased the installation and usage of APs.

Recommendations

Observations from the literature and in-depth interviews suggested four basic options to consider as alternatives to Massachusetts Program Administrators' approach to consumer electronics as of 2012:

- Abandoning program support for consumer electronics
- Limiting support for consumer electronics to encouraging the development of more rigorous energy-efficiency specifications and standards
- Changing the focus for the consumer electronics portion of the Massachusetts program from individual products to overall reduction of miscellaneous plug load energy use intensity through market transformation efforts, including but not limited to consumer education and behavior change
- Maintaining the current product-focused program, but with modifications to improve effectiveness



References

Urban B., Tielebeck V., and Roth K. 2011. *Energy Consumption of Consumer Electronics in U.S. Homes in 2010*. Final report to the Consumer Electronics Association. Cambridge, MA: Fraunhofer Center for Sustainable Energy Systems.

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