THE GREATEST GENERATION

A new retail store model for delivering energy efficiency

Elijah M. Hutchinson
Master of City Planning Candidate, 2012
Massachusetts Institute of Technology

Harvey Michaels, Advisor, Energy Efficiency Strategy Project
James "Jim" Buckley, Reader, Lecturer in Housing

Why a Retail Store Strategy?

With $2.1 billion in investment in energy efficiency over three years, Massachusetts has supported strategic interventions in the market for energy efficiency products and services through utility investment. The Mass Save program model has been the primary means to delivery efficiency to residential consumers, but as the easiest to access consumers pass through the program, new strategies that bring energy efficiency closer to consumers is needed. Growing trends in energy efficiency retail stores and the growing demand for effective utility programs in the broader market suggest that a retail store integrated with utility programs may be a compelling force in the energy efficiency market. Based on previous program evaluations, interviews, new case studies, and market information, what follows is an investigation into a proposed retail model for energy efficiency products and services. A proposed retail store, "The Greatest Generation", addresses many of the market transformation barriers for energy efficiency while providing a consumer-focused platform that is scalable, cost-effective for utilities, and more able to penetrate the market for energy efficiency with harder to reach customers. The development of a pilot utility-funded retail store using a third-party private operator is a viable option within Massachusetts to address climate change.

A one-stop-shop retail store model functioning as a vendor for utility-funded efficiency services and other energy technologies and services is an approach deserving further investigation. Current trends in retail stores and energy efficiency have shown great promise in their ability to deliver energy efficiency and other energy services in a customer focused and cost effective way. Yet across the United States, there is little rate-payer and utility financial support for a retail store model for selling efficiency. This is an investigation into the elements of retail store model that could make the model viable in Massachusetts, the benefits and costs of such a model, and a review of how energy efficiency and retail stores work to encourage consumers to

purchase efficiency.

I hypothesize that energy efficiency in order to be scalable needs better commodification for it to be consumed at scale. The willingness of consumers to purchase energy efficiency partially depends on how efficiency is presented and explained. A retail model has several advantages: this innovation would emphasize messaging and branding; be nimble enough to adjust to changing technologies and markets; could be customized to meet local demand; and focus on a customer-centered perspective that could shift energy efficiency from something a customer *needs to do* to something a customer *wants to* do. The challenge is to connect effectively with a consumer base or community and subsequently deliver services that satisfy customer interests, while meeting energy savings objectives within program budget allocations. A fully integrated utility-funded retail program model for energy efficiency products and services currently does not exist, but there are nascent beginnings of a shift for both utilities and the retail market in realizing the economic and climate potential of bringing energy efficiency into a retail store setting.

However, being a retail store alone does not address all existing program and market barriers. The advantages of retail are constrained by how the retail is designed, operated, and it's suite of offerings and services. Retail has the ability to make utility-sponsored energy efficiency programs more approachable, while also allowing vendors to customize energy efficiency plans that respond to the physical uniqueness of homes, and the unique interests of each customer. The more transparent interface permits a broader and more intimate customer engagement. A compliment to existing programs, this retail store model has broader implications beyond energy efficiency and beyond the residential sector. Furthermore, taking into consideration the ability to franchise and scale retail stores, and the flexibility of retail to adapt to evolving technologies and changing markets, a successful retail store model supported by utilities as a means to deploy efficiency has implications beyond Massachusetts and for other energy-related sectors beyond efficiency.

Already major chain retailers like Home Depot and Best Buy have expanded into the retrofitting, efficiency, and the energy technology market. Other boutique-style retailers and entrepreneurs have also lent credibility to the retail store model. While the relationship between retail and utility-funded energy efficiency programs is nascent, a few organizations, large companies, and entrepreneurs have attempted to varying degrees of success to target energy efficiency in a retail setting. Retailers are beginning to understand that people can spend money on efficiency even if it is not subsidized, and that it can be a "lifestyle" product, an accessory, or a gift to give to someone else. Massachusetts has an opportunity to open up the marketplace for energy efficiency and expand the accessibility of existing programs in a way that some other utilities and businesses have already realized.

Proposed Model

Energy efficiency and retail stores are coming together to take advantage of the growth in consumer products and the growth in the energy conscious consumer. Retails stores have found that they can play a critical role in educating consumers to further develop the energy efficiency market share. A range of technologies and service offerings in the energy industry have facilitated a range of retail store models from boutique style retailers like Green Depot and Current Energy to more of a department store model like Best Buy. These models are operating with minimal utility integration and with no direct subsidy, yet are yielding their investors profits, yielding customers with energy savings, and are adding to the growing body of knowledge around consumer preferences and energy efficiency. Current utility integration with retail stores is mostly through the supply of discounted buy-down products, but increasing access to this growing customer base can increase participation for existing programs, access hard to reach customers, and integrate a broader range of energy management options to get deeper energy savings. Through segmenting the customer base, targeted marketing, and customer service, purchasing energy efficiency can be made into an enriching and enjoyable experience that can service, for example, both urban residential and small-business commercial clients in addition to traditional program participants.

The question is: How can a retail model create market transformation for energy efficiency products and services in Massachusetts? I propose the development of “The Greatest Generation”, a one-stop-shop retail outlet for energy efficient products, energy services, and utility-sponsored programs, where consumers would have readily available and reliable information about product performance, pay-backs from installation measures, educational resources, and the ability to address broader customer energy management and supply needs. Creating a physical space to vend utility programs and demonstrate technological potential is an important part of increasing market penetration. Increased transparency and a customer-focused interface to utility programs that is inviting and exciting will aid in getting customer buy-in to get deeper retrofits. A retail store also provides the opportunity to learn about products and services beyond energy efficiency and cater to themes that customers care about, like home comfort, energy security, and other social benefits for example.

The Greatest Generation however will have those capacities, while also being a place that directly supports utility-sponsored energy efficiency programs. The value of piloting this approach rests in its environmental impact, scalability, and ability to transform the marketplace for energy efficiency products and services. As a retail store it can be responsive to shifts in consumer preferences, local market demand and demographics, and evolve to take advantage a growing field of technologies and energy services. It is also an approach worth piloting because

it could get consumers to make investment and purchasing decisions beyond using just cost-effectiveness as a metric and increasing a customers' willing to spend on efficiency. Through a series of interviews and market research with stakeholders already invested in or interested in the retail store model, as well as stakeholders for residential retrofit programs, a framework for developing a pilot illustrating program and market transformation potential is described.

The Model Defined

The retail model will reach a broader customer base by increasing customer access to existing programs using one-on-one representatives that function similar to an owner's representative or tenant advocate. A key strategy for increasing customer volume and obtaining deep energy savings is to address long-term energy savings through commitments to programs and services in addition to short-term satisfaction through selling consumer electronic energy-related products. With on-site consultation services, product demonstration, education and training, and bundled energy services, The Greatest Generation will take advantage of growing trends in energy efficiency retail and responds to challenges in existing utility programs. Unlike what is currently offered in the market place, this retail model would be structured so that it could be the recipient of system-benefit charges utilities collect to support energy efficiency programming and products. Rate payer funds can support a retail model based on the estimated environmental benefit of products sold or installed measured. In addition, incentive payments can be made to the retail operator based on their ability to increase program participation levels.

Goals

- Increase access to existing programs
- Deeper energy savings
- Inclusion of more demographics
- Integrated Information Resources (Energy Usage & Education/Training)
- Take advantage of evolving product and service offerings in the market

Customer and Market Segmentation

Market segmentation, or the process of dividing a market into smaller groups with distinct needs who may require separate products or marketing mixes, allows for the creation of value for targeted customers. Figure 1 shows the market segmentation for energy efficiency products and services split into generalized customer profiles and their potential engagement with a retail store. These customer profiles represent who Massachusetts may like to target with a retail strategy and their respective characteristics that would interest them in particular product and service offerings. The offerings and customer targets can change with shifting policy

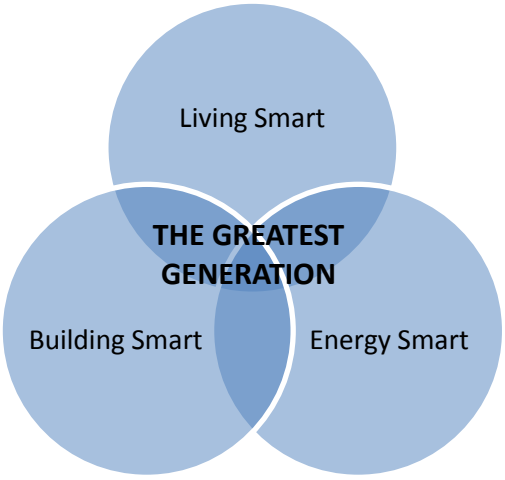
priorities and changes in market demand or local housing characteristics for example. Envisioned in Figure 1 is what a central city urban location may offer to both residential and commercial clients.

Figure 1: Customer and Market Segmentation

	Customer Category	Residence Profile	Energy Profile	Possible Retail Store Engagement
RESIDENTIAL	Non-City Dweller	Single-Family Home Owner	Energy Hog	Mass Save Retrofit; Development Consultant; Solar Installation
	Urban Dweller	Multi-Unit Rental	Doesn't Know	Energy Dashboard; Lighting; Water Management
	High-Income Urban Dweller	Condo Owner, New Rental Building	Energy Conscious	Eco-Friendly Products; Remote Controls; Appliances
	Low-Income Urban Dweller	Multi-Unit Rental	Expense Conscious	Lighting; Weatherization Information Services
	Low-Income Rent Restricted	Multi-Unit Rental	Subsidized	Education; Gifts & Gadgets Indoor Air Quality
COMM.	Small Business Retail	3,000 SF Mixed-Use Building	Mixed	Deregulation; Refrigeration; Lighting
	Commercial and Industrial	10,000 SF Stand Alone Building	Energy Hog	Demand Response; Solar Installation Supply-Chain/Waste Mgmt
	Office	Multi-Floor, Dense	Energy Hog	Demand Response; HVAC Low-VOC flooring

For marketing purposes, the range of offerings fall into three generalized areas which can be called, “Building Smart”, “Energy Smart” and “Living Smart”. These simplified categories are the basis for the retail concept and can be used to target products and service offerings of interest to the EEAC. The greatest efficiency and energy savings can be found at the intersection of the three, as in, getting a retrofit under “Building Smart”, plus arranging for a solar contractor under “Energy Smart”, and then getting eco-friendly products such environmentally conscious cleansers under “Living Smart”. This approach more holistically addresses how someone can live an energy conscious lifestyle, which includes, but is not limited to energy efficiency. The intersection of all three is the greatest energy savings, or “The Greatest Generation” as seen in Figure 2.

Figure 2: Retail Concept and Offering Divisions

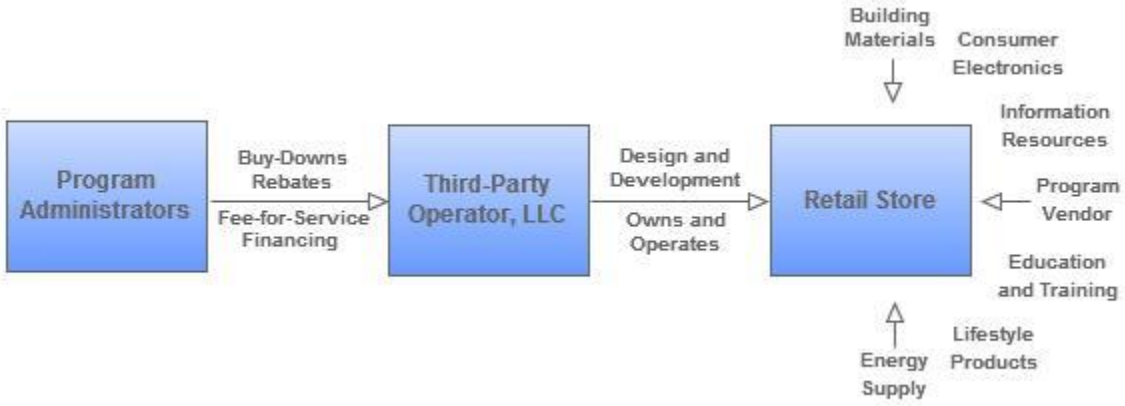


Building Smart	Energy Smart	Living Smart
Mass Save Retrofit	Solar/Renewables	Eco-Friendly Products
Building Materials	Lighting	Gifts & Gadgets
Building Systems	Demand Response	Monitoring and Controls
Development Consultant	Deregulation	Information Services
Audits/Weatherization	Waste Management	Education/Training

Organizational and Ownership Structure

PAs or utilities are rarely the direct owners and operators of retail stores, but there is interest from existing HPCs in the Mass Save program, entrepreneurs, and established retailers who are interested in partnering with utilities to operate a retail store. The EEAC and PAs would put together a Request for Proposals (RFP) for the operation of a retail store by a third party entity, generically labeled "Third-Party Operator, LLC" (TPO) in Figure 3. Once a decision is made by the EEAC to pilot a retail store and the PAs select a TPO, the TPO is then responsible for the development and operations of the retail store in accordance with a framework established by the PAs and EEAC during the RFP process.

Figure 3: Retail Model Ownership and Operations



Possible Product and Service Offerings

Vendor for Mass Save

CSG is the lead vendor the for the two largest administrators of Mass Save, NSTAR and National Grid. Recently, more flexibility in the Mass Save program model has been added permitting qualified Home Performance Contractors to deliver the Mass Save program from audit through installation. Marketing for the Mass Save program can direct people to the retail store, allowing the intake process to begin at The Greatest Generation before customers are forwarded to the appropriate Vendor, HPC or CAP Agency. In a retail model, "intake" starts when a customer walks into a store and customer representatives can guide customers through which programs and products would address their needs. If an HPC is itself the operator of the retail store, then their contractor can be fully integrated into the retail concept and program delivery model. An HPC or CSG being part of the partnership that operates the retail store could improve the customer service experience and quality assurance by presenting a consistent interface to the customer and limiting the number of steps the customer may have to go through to get an energy assessment and retrofit.

A retail model could help increase participation in the Mass Save program by improving the intake process for harder to reach customers. A retail store provides open access and information sharing in a way that may make hard to reach populations more accessible. A in-person session with a program representative may help in getting the most complete picture of the customers housing and demographic information. It might also aid in getting the potential customer to share sensative information related to income verification, housing occupancy, and

available budget for upgrades. With added personal attention earlier in the procees, the program could be tailored so that customers are aware of all available options and installation measures before the contractor visit, maximizing available options. Multi-lingual customer service representatives and language neutral messaging (e.g. IKEA instruction manuals) could appeal to Massachusetts' diverse population. In addition, some of the most popular sales at Best Buy and Current Energy were programmable thermostats, smart outlets, remote home monitoring/security devices, lighting, and alternative charging or power management for consumer electronics—all popular with renters.

Under the Mass Save program 49% of participants who receive rebates have two or more visits from an auditor. One of the biggest complaints from both consumers and contractors is the logistical challenges and costs associated with many home visits and limited windows of time for installation work. Participants often have to take the day off from work in order to schedule an assessment. Flexibility in installation hours, evening and weekend hours, and limiting the number of home visits will provide benefits that will outweigh the costs (including opportunity costs) of doing the two- to three-visit model is energy audits.

Information Resources

Customers would have the ability to walk in with their bill or account information and receive detailed energy usage data. This is one competitive advantage this store will have as compared to other models that are not more fully integrated with a utility. Using this data, their housing characteristics and their planned budget, a customized plan for saving energy can be developed. A benefit of having this utility-supported model for retail is that its functions can be integrated with utility data on energy usage pre- and post-installation. With a retail format, the customer can instantly permit the vendor to access energy usage information and can even elect to share that information with others. This will not only help with measurement and verification for installed measures, but also help to engage the customer, perhaps even through the use of energy usage visualizations for the customer. Not being able to visualize or sense energy efficiency can make the sale of efficiency challenging. Supported with utility data, the visualization of energy efficiency could take many forms, and be made into an engaging centerpiece of the store that draws in customers.

Buy-Down Products Vendor

Utilities and product distributors already have relationships with building supply retailers like Home Depot, manufacturers, and distributors, where rebates are taken out of the price for a product before the product is on the shelves. The Greatest Generation could be another location where these products are offered, or a policy decision could be made to concentrate

buy-down products within this one retail store so as to give the retail store a pricing advantage and cross-expose customers to utility programs and other energy saving ideas.

Energy Service Plans

Massachusetts' deregulated energy market means that consumer can choose to get their energy from a few possible distributors. As was the case in Current Energy, The Greatest Generation can provide distributors with new customers and customers with new rate plans. These alternative rate plans could include more renewable energy resources or variable pricing mechanisms.

Development Consulting

Development consulting for new building or retrofits involves being a green building specialist able to give recommendations for how to improve the efficiency and comfort for proposed building plans. This is a more thorough engagement with a project sometimes lasting months and ranging from recommending green building materials to being the contracted party for energy services and HVAC installation. Development consultants usually work on behalf of the developer, but have to work closely with architects or engineers on improving an projects overall energy performance.

Sublease Market

The Greatest Generation can sublease part of its retail space to other vendors seeking increased access to a retail customer base. There are several emerging markets within the energy industry, and this flexible space ensures that The Greatest Generation remains relevant to changing technologies and diverse consumer needs. In Boston, an example could be providing a sublease to EnerNoc for meeting with and signing up commerical landlords and building operators for demand-side energy management. These internal store partnerships ensure a full suite of services are being offered. Other examples include Current Energy subleasing with a commerical water management and conservation contractor and Best Buy contracting with Geek Squad to coordinate its energy efficiency services.

Education and Training

There are ways in which other interests could be brought into the space of The Greatest Generation to maximize collaboration and customer outreach. Space could be provided at no cost to not-for-profits in the area that are looking for a forum to demonstrate community energy efficiency practices. Suppliers and other businesses also look for spaces to demonstrate their products and hold training seminars. Owners with rental units who contract with The Greatest Generation for energy efficiency remodeling could also have their tenants receive an

introduction to what's being greened and how it should be cared for, as well as assist in scheduling concerns. This could reduce the "split-incentive" problem for property owners hesitant to upgrade to more expensive, but more efficient, building systems.

Program Costs

Program costs can vary substantially by the exact components of the retail store. Main operating cost drivers are rent, staffing, and inventory. Upfront non-operating costs are mostly driven by outfitting a retail store. Figure 23 breaks out what start up and operating costs may be for the model described.

Figure 4: Start Up and Annual Operating Costs

Start Up Costs	
Inventory	$400,000
Renovation/Outfitting	$250,000
Contingency at 15%	$140,958
Mortgage or Lease Deposit	$90,000
Professional Fees	$20,000
Store Fixtures, Signs & Equipment	$20,000
Insurance	$5,000
Licenses, Permits & Registration	$5,000
Office Supplies & Store Use Items	$5,000
Website Development	$5,000
Utilities Deposits/Connection	$500
Total	**$941,458**

Annual Operating Expenses	
Rent Payment	$600,000
Wages	$333,760
Inventory	$200,000
Advertising/Marketing	$10,000
Insurance	$10,000
Utilities	$8,000
Web Hosting	$1,000
Total	**$1,162,760**

Almost half of the annual operating expenses are due to rent payments. It is assumed that the store would need to be located on a premier retail stretch with a regional draw and high customer volume. Independent retailers such as Current Energy and Green Depot cited their location as being key to attracting a customer base that is aware of energy issues, interested in technology, curious to learn more, and owners invested in the long-term energy performance. Being able to feed off the foot traffic from other adjacent retailers seeking similar demographics helped these start ups get discovered by new customers. The Newbury-Boylston retail corridor in Boston bordered by Massachusetts Avenue and the Boston Public Gardens is one of the highest trafficked retail corridors in the region attracting a diverse range of high-end to more

edgy and independent retailers. The median rental rate in that submarket is approximately $120 per square foot.[1] Assuming 5,000 square feet of retail space, annual rental cost is $600,000.

Wages are another significant source of operating expenses, accounting for almost a third of the annual budget. The smaller independent retailers have between 2 and 8 employees, with those focused on building supplies and larger floor plates having about 25 employees. The Green Depot in Stoneham, Massachusetts currently has only one employee assigned to the retail portion of the store, but about 20 contractors associated mostly with commercial installation services. Assumed in The Greatest Generation model in Figure 4 are wages associated with 7 employees consisting of four sales representatives, two managers, and one administrator at competitive wages. The highest median wage within the retail sector is $11.51 per hour and Genius Bar workers at Apple Stores are paid about $13 per hour. The Greatest Generation assumes an $18 wage for sales staff due to a higher degree of specialization required and $25 per hour for management, which is the median managerial wage in Boston.[2]

Another significant cost driver is layout and space considerations, which is also related to rental expenses. About 5,000 square feet permits a location in an urban retail market and is typical of retail stores located in malls and other shopping districts. Current Energy was 3,000 square feet, Best Buy and the Smart Living Center had about 4,000 square feet dedicated to energy efficiency, and Green Depots range from 2,000 square feet to over 10,000 square feet if building materials are being stocked on site. 5,000 square feet should be an area sufficient to accommodate product display, program vendors, and subleases to other energy related businesses that may find a synergy with the customers of The Greatest Generation. Experience stores like Sharper Image and the Apple Store for example allow customers to test products and familiarize themselves with technologies. Staged areas, like in the product displays for IKEA, also permit the customer to see how the product would work in a recreated environment. For example, instead of having a wall with different lights that can be adjusted (i.e. experience store), a staged area would recreate a living room or exterior façade to recreate where the lights would actually be installed. Walking through a recreated environment allows a customer to visualize how these products can be integrated into their existing residence or outdoor space. Furthermore, an experience store provides the customer with an engaging and entertaining retail experience.

Market and Program Impact

One way to size the impact of a retail store is to estimate the sales volume, as sales volume would correlate with environmental impact and customer volume. Figure 5 illustrates the sales volume for a sample of existing energy efficiency retailers.[3] Green Depot in Stoneham, Massachusetts in the Boston metro area had about $8 million in sales volume in 2010 for both the commercial and residential sectors. More specifically focusing on the residential sector,

[1] "CBRE Study Highlights Newbury Street Surge", Boston Business Journal. July 20, 2010.
[2] "Retail Sector Economic Planning Initiative", Boston Redevelopment Authority. Fall 2003.
[3] ESRI Business Analyst. Accessed: 12.18.11.

Currently Energy earned about $6 million in revenue from retail sales and about $2.5 million in residential services, $1 million of which was earned from the sale of residential energy audits.

Figure 5: Sales Volume for Energy Efficiency Retailers, 2006

Store Name	City	2006 Sales Volume ($ millions)	Employees
Green Depot	Chicago	4.2	12
Green Depot	Brooklyn	4.2	12
Green Depot	New York	-	-
Green Depot	Newark	2.1	6
Green Depot	Stoneham, MA	8.8	25
Green Depot	Newark	0.2	-
Green Depot	Philadelphia	-	2
Current Energy Services	Dallas	18.8	100
Current Energy Retail	Dallas	2.1	8
Ecohaus	Seattle	17.5	50
Ecohaus	Portland	5.3	15

Of the 500 customers who received an energy audit annually through Current Energy, about 400 had some measures installed. This 80% success rate in getting a customer to install recommended measures is much higher than the success rate for Mass Save. Current Energy's energy savings goals were also a two-year payback for installation measures, with customers saving approximately 50% on their energy expenditures. Under Mass Save, energy savings are more likely to be in the 5% to 20% range.

Considering start-up and operation costs and potential benefits, the value proposition for the customer, utility, and operator would be substantial. Already these stores are selling efficiency at a profit and without much utility support. Current Energy for example had about 75,000 customers enter their store annually and earned $20 million, using less than $1 million in start up capital and with an annual operating budget of less than $1 million. Customers also benefit by saving about 50% on their energy bill. For The Greatest Generation, exactly how the profits are distributed across stakeholders are a point of negotiation and further investigation for the EEAC and the Massachusetts Attorney General charged with protecting consumer interests for GCA. Windfall profits under Mass Save have been prevented through profit caps on sales. A similar method of consumer protection could be employed for the TPO of a retail store.

If a store located on Newbury street attracted 75,000 customers, and free energy audits and subsidies were available to those earning less than 120% AMI, audit volume could be much greater than the 500 audits Current Energy sold for a median price of about $1,000. If 10% of customers took advantage of audits and subsidies, then 7,500 audits could be completed annually. With an 80% success rate of getting a customer to install some measures from an energy audit, 6,000 energy upgrades could be completed annually through an annual operating

investment of about $1 million. That's an annual cost of $167 per customer, not to mention the other energy benefits that may be conferred from other energy-related and environmentally conscious product and service purchases. As a comparison, Mass Save costs about $45 million annually to get 45,000 program participants, or a cost of about $1,000 per participant (Figure 6).[4] The benefits in Figure 26 are just for participating in audits and energy upgrades and do not account for the additional energy and environmental benefits of participating in "Living Smart", "Energy Smart", or other aspects of the "Building Smart" business lines. In addition to a simple analysis of energy saved per dollar invested, other non-economic benefits like equity and health for hard to reach customers should also be considered in program evaluation of The Greatest Generation.

Figure 6: The Greatest Generation Program Costs and Outcomes

The Greatest Generation	
Annual Store Entrants	75,000
% Sign Up for Audit	10%
# of Audits	7,500
% Install Measures	80%
# Energy Upgrades	6,000
Energy Savings	50%
Annual Energy Expenditures	$2,486
Annual Energy Savings	$1,243
Annual Program Cost	$1,162,760
Cost per Upgrade	$194
Mass Save Program Cost, 2010	$40,480,075
Mass Save Participation, 2010	40,753
Mass Save Cost per Upgrade	$993

[4] Bureau of Labor Statistics. "Table 7. Housing tenure and type of area: Average annual expenditures and characteristics, Consumer Expenditure Survey 2010". http://www.bls.gov/cex/2010/Standard/tenure.pdf. Acessed: 12.30.11.