

1 Introduction

The U.S. Department of Energy's (DOE's) Better Buildings Neighborhood Program is focused on creating self-sustaining markets for building energy efficiency that result in economic, environmental, and energy benefits for communities throughout the United States. DOE provided \$508 million in grants to 41 state and local governments to test potential energy efficiency upgrade program delivery and business models that improve the efficiency of buildings across the country. These grants are piloting innovative ways to design programs, services, financial structures, and methods for engaging consumers with the goal of identifying effective and replicable practices. Find out more at <http://www.betterbuildings.energy.gov/neighborhoods>.

A sustainable residential energy efficiency market benefits the public and private sectors through reduced energy usage, increased comfort and health, lower utility bills, job opportunities, and a better environment. In translating publicly funded innovations into sustainable models and expanding the residential energy efficiency marketplace, the private sector will be a necessary and important partner and/or driver.

The ***Better Buildings Neighborhood Program Business Models Guide*** combines early lessons learned from Better Buildings grant recipients, data from existing research studies, and insights from private sector sources to highlight business models that can help pave the way toward a sustainable residential energy efficiency market. These business models should help inform Better Buildings grant recipients, program administrators, contractors, and retail companies seeking to expand their services in and into the residential energy efficiency market. This version of the guide is aimed at enhancing program administrators' understanding of critical market players as programs identify partners for long-term growth. In the future, DOE will incorporate additional information from Better Buildings grant recipients and partner businesses, as well as from other DOE programs, based on their experience implementing residential energy efficiency programs over the years of their grant.

1.1 HOW TO USE THIS GUIDE

This guide was developed to help Better Buildings Neighborhood Program grant recipients, program administrators, contractors, and retail companies expand their services into the residential energy efficiency market.

This version of the guide focuses on helping non-utility program administrators understand key market actors and their perspectives and business drivers. The intent is to position these program administrators for effective partnership opportunities, which will help them enhance their business strategy to achieve long-term program sustainability. For example, the utility program administrator chapter provides information for non-utility program administrators about partnership opportunities with utilities.

Contractors can also use this guide to work more effectively with program administrators, expand their business into energy efficiency, enhance their current business strategy, or better understand the perspectives and business drivers of other market actors. For example, a contractor can use this guide to shape their business plan, benchmark a business relative to a national sample, and find tips to be more successful in the home energy efficiency market.

Note that the insights in this guide focus on common themes and benchmarks at a national level. While the findings hold true across many locales, it is critical to factor in the local/regional conditions and dynamics when applying these insights to a specific market.



DOE is continuously developing tools and resources to assist organizations and individuals seeking to promote energy efficiency. Future versions of this guide will incorporate additional information from Better Buildings Neighborhood Program grant recipients, partner businesses, and other market actors, as well as from other DOE programs, based on their experience implementing residential energy efficiency programs.

1.2 GUIDE DEVELOPMENT AND METHODOLOGY

To identify business models that may help organizations expand and become sustainable in the residential energy efficiency market, the Better Buildings Neighborhood Program studied the market and its key players, with the assistance of the individuals listed on page xii, “Acknowledgements.” The approach for this study included:

- Identifying key actors in the residential energy efficiency value chain through collaboration with Better Buildings Neighborhood Program stakeholders.
- Classifying the common elements of a business strategy using best management practices.
- Identifying potential market interviewees in each of the key actor industries through the DOE Better Buildings Neighborhood Program, Building America, Home Performance with ENERGY STAR, and other industry partner connections.
- Conducting phone interviews with target industry representatives to get a firsthand perspective on current market practices, benchmarks, and goals relating to each of the business model elements. These stakeholders were chosen because they could offer insight into their successes and challenges in entering and operating in the residential energy efficiency market. This allowed for the identification of best practices, as well as critical barriers that could prevent an organization from operating effectively in that market.
- Reviewing research reports and publicly reported financial information to obtain insight into high-level market trends and performance to date.
- Aggregating and analyzing the data to highlight common themes across each key actor’s industry using the business model framework for evaluation and comparison.
- Identifying insights that inform critical market players seeking to expand their services in and into the residential energy efficiency market.
- Identifying potential points of collaboration between the various actors in the market, along with the specific steps necessary to implement strategic partnerships.
- Validating initial findings with key market stakeholders, including Better Buildings grant recipients, private industry participants, and partner trade associations during fall 2011, culminating at the Better Buildings “Business of Energy Efficiency” Workshop held in Burlington, Vermont, on October 24–26, 2011.
- Providing a 60-day comment period for additional stakeholder feedback and review during November and December 2011.

Note that all stakeholder interview data in the guide are anonymous to protect privacy. The information referenced as “industry interview” is data from real programs and private firms that were aggregated and normalized to prevent identification of the source.

The study’s results provide the reader with a comprehensive view of the residential energy efficiency market, including:



- The energy efficiency value chain that characterizes the actors and services in the market
- A business model framework for comparison across the different actors identified in the value chain
- Business model profiles for the six actors deemed critical to the development of a sustainable market for residential energy efficiency
- A detailed look at key financial, operational, and market-related decision-making criteria relevant to the six actors
- Program practices and benchmarks that can assist the market as it evolves toward providing home energy efficiency services
- Key points of interaction among market participants and key opportunities for collaboration

The insights highlighted in this guide are focused on providing common themes and benchmarks at a national level. While the findings hold true across many locales, it is critical to factor in the local/regional conditions and dynamics when applying these lessons learned to a specific market. Insights on specific local/regional markets were beyond the current scope of this study.

1.3 ENERGY EFFICIENCY VALUE CHAIN

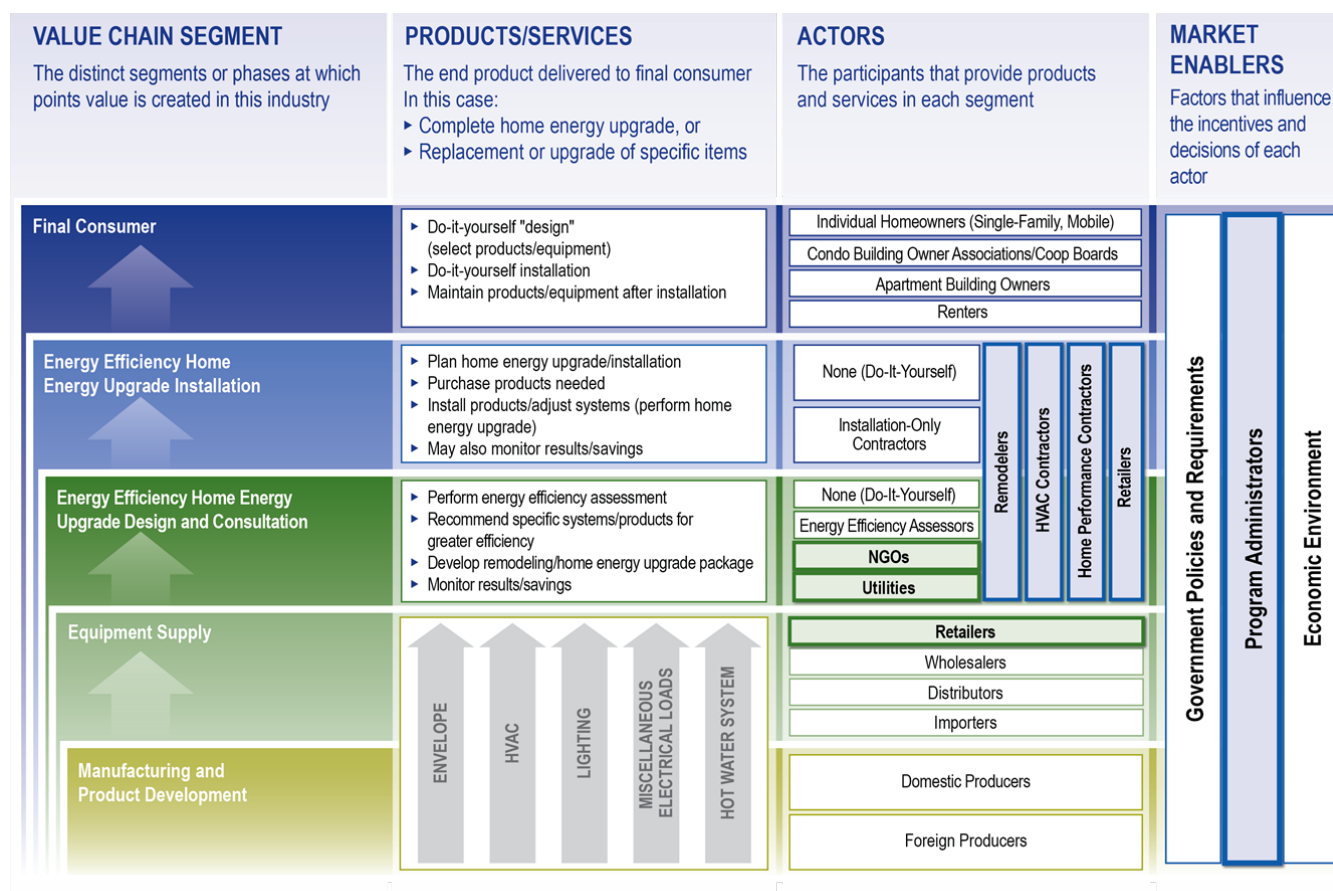
The complex industry in which the residential energy efficiency market resides currently represents only a small share of the overall home improvement market. In 2009, the home improvement market was a \$290 billion industry, while the residential energy efficiency market represented just \$40 billion of that total.⁹ These figures demonstrate that the residential energy efficiency market has substantial opportunity for growth. To better understand the actors and business activities that can influence growth, the Better Buildings Neighborhood Program examined the residential energy efficiency **value chain** (Figure 1-1). The examination showed the complexity of the market and highlighted the types of interactions between key participants. Key components of the energy efficiency value chain include:

A **value chain** is a representation of a market that highlights all key participants and how they interact with one another, each providing value that ultimately reaches the homeowner.

- **Value chain segments**—the distinct segments or phases at which value is created in the industry
- **Products/services**—the end product delivered to the consumer (in this case, home energy upgrades and their component parts)
- **Actors**—the participants who provide products and services in each segment
- **Market enablers**—factors that influence the incentives and decisions of each actor

The sum total of these components gives the viewer a complete picture of the complex elements that form the basis of the home energy upgrade market, highlighting where value is added along the way to delivering a final product to the consumer.

⁹ Pike Research. "Residential Energy Efficiency Market Poised for Strong Growth During the Economic Recovery." (2010). <http://www.pikeresearch.com/newsroom/residential-energy-efficiency-market-poised-for-strong-growth-during-the-economic-recovery>.



Source: Booz Allen research

Figure 1-1: Residential Energy Efficiency Value Chain

1.3.1 Value Chain Segment

The Better Buildings Neighborhood Program defined the products and services, actors, and market enablers across five segments of the value chain:

- Manufacturing and product development
- Equipment supply
- Energy efficiency home energy upgrade design and consultation
- Energy efficiency home energy upgrade installation
- Final consumer

Each segment is critical to delivering the value of energy efficiency services to the final consumer, who is typically a homeowner. The segments represent the various stages at which additional value is created (and, correspondingly, cost is added) to create a final product for consumption. Analyzing the value chain in segments allows the reviewer to see the critical transaction points and cost drivers that ultimately shape the price and delivery of the good or service to the consumer. Where value is added to a particular segment, a corresponding profit margin is charged, increasing the final price to the consumer. Demonstrating where value is created and where costs are incurred is a central focus of the business models in this guide.

1.3.2 Products/Services

The residential energy efficiency market includes a variety of products and services that create value in each of these five segments. From developing a heating, ventilation, and air conditioning (HVAC) product to performing an energy efficiency assessment, these products and services can range from a simple building assessment to a complete home energy upgrade. Each of the contractor/retailer models evaluated in this guide focuses on a range of different products or services that are ultimately delivered to the consumer and shapes how contractors and retailers view the market and make a profit.

1.3.3 Actors

The energy efficiency value chain is complex, with multiple actors from the private, public, and nonprofit sectors providing overlapping services to the market.

Upon mapping the value chain, DOE chose to examine six key market actors that influence and/or provide the opportunity to expand the residential energy efficiency market, particularly at the local level: three types of building contractors, retailers, and two types of energy efficiency program administrators.

- **Remodeler**—a company whose core business is to provide the full array of home improvements
- **HVAC contractor**—a specialized contractor whose core business is to install and/or maintain HVAC equipment
- **Home performance contractor**—a company whose primary business is to deliver the full suite of home energy upgrade services directly to the consumer
- **Retailer**—a private company that sells goods and services directly to consumers and contractors and may be interested in selling energy efficiency services to homeowners
- **Non-utility program administrator**—an organization (e.g., government, non-governmental organization [NGO], or private contractor) that manages a residential or commercial energy efficiency program.
- **Utility program administrator**—an energy efficiency program run by a public or investor-owned entity that is in the business of generating and disseminating energy to a range of customers.

The Better Buildings Neighborhood Program evaluated multiple contractor models (remodeler, HVAC contractor, and home performance contractor) because each can either grow its existing energy upgrade services or expand into the residential energy efficiency market if they do not currently offer these services. These contractors can provide significant partnership opportunities for program administrators, as they are ultimately needed to deliver home energy upgrade services to consumers.

The six key market actors discussed here may also partner or interact with home energy auditors or raters, building science experts who perform quality assurance, building code inspectors, and others who may be part of the home energy upgrade service chain in different localities. Those individuals and business types are not specifically covered in DOE's analysis, but could play an important role in safely and effectively delivering energy efficiency services.

1.3.4 Enabling Environment

Each of these actors faces an enabling environment that influences how it behaves in the residential energy efficiency market. These enabling factors are often shaped or influenced by program administrators and include:



- **Financing**—access to financing and the terms associated with the financing (e.g., loans, equity, and cash)
- **Financial incentives**—the availability of rebates, grants, and tax credits to overcome the up-front cost of upgrades
- **Regulatory framework**—the certifications, standards, and requirements that govern the home energy upgrade process
- **Information providers**—the education and marketing provided by government, NGOs, communities, and news media
- **Transport and logistics**—the shipment and delivery of energy efficiency products and services
- **Energy prices and seasonality**—the impact of variation in energy price on the attractiveness of energy efficiency savings

1.4 BUSINESS MODEL ELEMENTS

There are many frameworks for deconstructing how organizations operate within a market. This guide uses a business model framework with five core elements, outlined in the table below. These elements are critical indicators—useful to both business owners/operators and external observers—of how and why a firm makes decisions regarding its products, services, and customers. While each actor within the energy efficiency value chain uses a distinct business model characterized by its own market and internal dynamics, all businesses can be analyzed according to these five elements.

Business Model Elements			
Element	Relevance	Key Metrics	Questions for Consideration
Governance: How a firm makes decisions in the market	<ul style="list-style-type: none"> ■ Understanding the governance structure associated with a given business model can help uncover what objectives a business will prioritize, how it will respond to both market trends and policy, and whom it recognizes as relevant stakeholders 	<ul style="list-style-type: none"> ■ Priority objectives ■ Market trend and policy responses ■ Relevant stakeholders 	<ul style="list-style-type: none"> ■ Who are the stakeholders involved in investment decisions in your organization? In partner organizations? ■ Once an investment is made, who has responsibility for its oversight? ■ Are there external regulations that may influence the decision-making process?
Financial Model or Structure: How a firm raises capital for startup or expansion and sets performance targets	<ul style="list-style-type: none"> ■ Establishing and tracking a key set of financial metrics and benchmarks across each industry segment can reveal the major motivations for a business to seek change, as well as key decision points 	<ul style="list-style-type: none"> ■ Revenues ■ Costs of goods (or services) sold ■ Required margins ■ Sources of funding and cost of funding 	<ul style="list-style-type: none"> ■ What are the costs and revenues for the business? ■ What are the key factors that influence changes in revenues or costs? ■ How does the business finance investments?
Assets and Infrastructure: How a firm invests and brands itself in order to operate	<ul style="list-style-type: none"> ■ Assessing the benefits and costs associated with an asset or infrastructure enables management to identify opportunities for creating value and reducing costs 	<ul style="list-style-type: none"> ■ Fixed assets (e.g. buildings) ■ Inventory ■ Equipment ■ Brand value ■ Trainings/certifications 	<ul style="list-style-type: none"> ■ What type of investment (e.g., buildings, machinery, equipment) is needed? How costly is it, and are economies of scale a factor? ■ How important are non-physical assets (e.g., brand, certifications) to the success of the business?

Business Model Elements			
Element	Relevance	Key Metrics	Questions for Consideration
Service Offering: What goods and services a firm markets and sells	<ul style="list-style-type: none"> Examining existing service offering and uncovering untapped opportunities to expand core business offerings or enter into partnerships can reveal ways to increase customer traffic, consumption, and revenue over time 	<ul style="list-style-type: none"> Range of service offering an organization provides and how well they align to its strengths Required margins on an average service offering Level of demand in market for each service offered 	<ul style="list-style-type: none"> What are my organization's key strengths and service offering? Are there alternatives/competitors to these services in the market? Can a strategic partnership help my organization expand its service offering or control its costs?
Customers and Customer Acquisition: Who a firm's target market is and how it is reached	<ul style="list-style-type: none"> Identifying customer segments associated with each business model can help to measure probability of success for partnerships and service offering 	<ul style="list-style-type: none"> Marketing and lead generation efforts Cost per lead Customer demographics Key partnerships 	<ul style="list-style-type: none"> Who are the target customers to be served? What is the estimated overall demand for each service being provided? Can a strategic partnership help me capture a larger share of the market?

A unique mix of these business model elements determines how each actor will be affected by various financial incentives, regulations, and fluctuations in the market. This business model analysis provides some insights into possible opportunities for increased energy efficiency services in the market.

1.5 COMMON FINANCIAL TERMINOLOGY AND DEFINITIONS

In addition to the business model elements, this guide uses financial terminology to further discuss the residential energy efficiency market business models. Some of the most common financial terms are listed and defined below.

- **Cash flow**—an organization's net inflow or net outflow of cash resulting from basic operating activities over a given period.
- **Cost of debt**—the interest that contractors must pay on borrowed funds to lenders such as credit card companies or banks.
- **Cost of equity**—represents the compensation, or rate of return, that an investor requires in exchange for bearing the risk of ownership. The cost of equity includes a **risk premium**, which is the amount of funds needed to cover any unexpected costs that may arise.
- **Earnings before interest and tax**—an indicator of a company's profitability, calculated as revenue minus expenses, excluding interest and tax.
- **Financing**—the act of providing funds for business activities, making purchase, or investing (e.g., loans, equity, and cash).
- **Hurdle rate**—the minimum rate of return that a firm requires to consider an investment opportunity. The hurdle rate is equal to the combined cost of debt and cost of equity.
- **Interest expense**—the amount reported by a company or individual as an expense for borrowed money.
- **Life cycle**—the stages a business experiences, including seed, startup, growth, established, expansion, and decline/exit.

- **Line of credit**—an arrangement between a financial institution and a customer that establishes a maximum loan balance that the bank will permit the borrower to maintain. The borrower can draw down on the line of credit at any time, as long as he or she does not exceed the maximum credit limit.
- **Rate of return**—the gain or loss on an investment over a specified period, expressed as a percentage increase over the initial investment cost.
- **Selling, general, and administrative expense (SG&A)**—the sum of all direct and indirect selling expenses and all general and administrative expenses of a company. Direct selling expenses are expenses that can be directly linked to the sale of a specific unit, such as credit, warranty, and advertising expenses. Indirect selling expenses are expenses that cannot be directly linked to the sale of a specific unit but are proportionally allocated to all units sold during a certain period, such as telephone, interest, and postal charges.

Income statements are also a common discussion topic; financial terms associated with these statements are noted in Figure 1-2. An additional detailed list of home improvement and residential energy efficiency market, business model, and financial terms can be found at the beginning of this guide, on page vi.

<p>Revenue is the total amount of money received by the company for goods sold or services provided during a certain time period.</p> <p><i>Program Examples: Interest paid by customers on loans, fees paid by contractors for training</i></p>	Sample Income Statement				
<p>Cost of Goods (and Services) Sold are the direct costs attributable to the production of the goods sold by a company. This amount includes the cost of the materials used in creating the good along with the direct labor costs used to produce the good. It excludes indirect expenses such as distribution costs and sales force costs. (also known as variable costs).</p> <p><i>Program Examples: Cost of loan buy-down, contractor training material development</i></p>	REVENUE	2010	2011	2012 (Forecast)	Total
<p>Gross Margin is the difference between sales revenues and production costs, excluding costs associated with overhead, payroll, interest, and taxes. It is generally used to determine the incremental value of sales.</p> <p><i>Program Use: Measure of what services are most profitable</i></p>	Software Usage Fees	\$115,000	\$117,300	\$119,646	\$351,946
<p>Overhead is the operating expenses of a business which cannot be attributed to any one specific business activity, but which are still necessary for a business to function (also known as fixed costs).</p> <p><i>Program Examples: Reporting administration, rent, utilities</i></p>	Quality Assurance Fees	\$265,938	\$271,256	\$276,681	\$813,875
<p>Net Profit is the total amount a firm makes after all expenses have been accounted for. Positive net profit is critical for a business to stay viable over time.</p> <p><i>Program Use: Measure long-term sustainability</i></p>	Lead Sales	\$265,938	\$271,256	\$276,681	\$813,875
	Total Revenues	\$646,875	\$659,813	\$673,009	\$1,979,696
	COST OF GOODS SOLD (COGS)				
	Quality Assurance Labor	\$(231,250)	\$(235,875)	\$(240,593)	\$(707,718)
	Software Licensing Fees	\$(100,000)	\$(102,000)	\$(104,040)	\$(306,040)
	Education and Outreach Materials	\$(231,250)	\$(235,875)	\$(240,593)	\$(707,718)
	Total COGS	\$(562,500)	\$(573,750)	\$(585,225)	\$(1,721,475)
	GROSS Margin (Total Revenue – COGS)	\$84,375	\$86,063	\$87,784	\$258,221
	OVERHEAD COSTS				
	Program Admin	\$(43,750)	\$(44,625)	\$(45,518)	\$(133,893)
	Rent and Utilities	\$(18,750)	\$(19,125)	\$(19,508)	\$(57,383)
	Total Overhead Cost	\$(62,500)	\$(63,750)	\$(65,025)	\$(191,275)
	NET MARGIN (Total Revenue – Total Cost)	\$21,875	\$22,313	\$22,759	\$66,946

Figure 1-2: Common Financial Terms in Income Statements