

2.3.3 HVAC Contractor Business Model

The HVAC contractor model reviews the operating environment for contractors whose primary service offering is HVAC installation and repair. The model also highlights their advantages over general remodelers in expanding their service offerings into the residential energy efficiency market.

OPPORTUNITY STATEMENT: The HVAC contractor possesses many unique advantages for expanding into the residential energy efficiency market. These include lower expansion costs due to fewer additional asset and training requirements than a general remodeler. Further, an HVAC contractor has established repeat business streams through service contracts and a reputation for maintaining home comfort—a natural selling point for home energy upgrade services.

2.3.3.1 Governance

HVAC contractors typically are small, private companies with clear lines of decision-making authority, as shown in Figure 2-11. The few large, established contractors in the marketplace are completely stakeholder-owned entities or have multiple investors beyond the owner and immediate family members. Consequently, governance is not a significant constraint on an HVAC contractor’s ability to develop new business strategies.

HVAC Contractor Governance Models			
	<i>Completely Stakeholder-Owned Entity</i>	<i>Privately-Owned Entity</i>	<i>Sole Proprietorship (Half of Current Industry)</i>
Description	Entity is owned by a group of equity holders	Entity is privately-owned (single owner or small group of shareholders)	Entity owned by individual
Stakeholders Involved in Decisions	Equity holders, board of directors, shareholders (if public)	Owners, management	Owner
Implications	Product and service mix affected by equity or shareholder interests and community needs; profit motive is influential	Free to form partnerships and set prices; profit motive is influential in key business decisions	Ability to make decisions easily, but very limited resources

Source: Booz Allen research

Figure 2-11: HVAC Contractor Governance Models

Key Insights

HVAC Insights		
	Observations	Impact on Potential Expansion into Residential Energy Efficiency Market
Governance	<ul style="list-style-type: none"> ■ Most HVAC contractors are sole proprietorships or family-run businesses. ■ HVAC contractors typically have a lean governance structure that is centered on the owner or a few key players. 	<ul style="list-style-type: none"> ■ The owner has limited time to evaluate expansion opportunities for the residential energy efficiency market and may require assistance in that area. ■ Lean governance provides HVAC contractors with the flexibility to make decisions quickly.

2.3.3.2 Financial Model or Structure

Understanding the financial structure of an HVAC contractor's company, particularly the key profit drivers, is an important step toward developing sustainable relationships between a program administrator and HVAC contractors.

Small, start-up HVAC contractors generally are funded through personal finance, while more established contractors typically are funded through business lines of credit (see "Contractor Sources of Funds," Figure 2-4, Section 2.1.1.4). As the largest components of the equipment that is necessary to start an HVAC contractor business (e.g., trucks) can be leased, large amounts of debt are not immediately necessary, so most contractors prefer to use their own savings to start up the business. More established contractors can also reinvest profits into their business to improve their equipment or to expand their business.

Due to the seasonality of the HVAC business, with the prime HVAC replacement and maintenance season lasting only seven months in many climates, HVAC contractors rely on lines of credit to cover their cash shortfalls. This includes the cash needed to make lease payments on vehicles and pay technicians' salaries. To maintain profitability, despite the seasonality of the industry, HVAC contractors rely on a pricing system for their jobs that builds in a high gross profit margin on equipment and that limits labor. The gross profit margin (i.e., revenues minus the cost of goods sold, divided by total revenues) on equipment is approximately 45 percent, but the gross profit margin on labor is much lower. While material costs for a given type of job tend to be relatively consistent, labor costs are highly variable and drive down the overall profit margin on a job. Therefore, it is in the HVAC contractor's business model to generally limit the amount of labor hours on a job, focus on quickly completing the project, and move on to the next job. An HVAC contractor's key metric is the "gross margin per man day." This metric, which is calculated by dividing the gross profit margin by the average number of hours worked per day, allows contractors to measure how much profit the firm has realized against the time spent by technicians on a given job. As a result, HVAC contractors generally avoid labor-intensive jobs, which lower their overall profitability.

Figure 2-12 presents a sample income statement for an HVAC contractor. The target operating income is approximately 12 percent for an HVAC contractor; this metric is calculated by dividing earnings before interest and tax by total revenues. Generally, 12 percent is a solid, average target that HVAC contractors will use as a measure of

Sample Income Statement HVAC Contractor Year End 2011, \$ Thousands	
REVENUES	
Sales	\$2,000
Total Revenues	2,000
COST OF GOODS SOLD (COGS)	
Labor	220
Materials	740
Subcontractors	40
Others (Permits, etc.)	36
TOTAL COGS	1,036
GROSS PROFIT	964
OPERATING EXPENSES	
Marketing and Advertising	576
General and Administrative	144
Total Operating Expenses	720
OPERATING INCOME	244
OTHER EXPENSES	
Interest Expense	10
Total Other Expenses	10
NET INCOME BEFORE TAXES	\$234

Variable costs that can be most influenced

- Common profitability measure is gross margin per man-day: (revenue – COGS) ÷ average labor hours per day
- Target operating income/revenue is ~12% for general HVAC

Source: Industry interviews

Figure 2-12: Sample HVAC Contractor Income Statement

profitability when evaluating business opportunities.

In comparing the HVAC contractor business model to that of a home performance contractor, the disparity in how labor is valued is the core difference between the two models. In general, HVAC contractors see home energy upgrade jobs as being more labor-intensive than traditional HVAC jobs and, therefore, less profitable. However, this thinking does not take seasonality into account. Home energy upgrade jobs can be done year-round, which could enable HVAC contractors to generate revenue and avoid using lines of credit to fund payroll and other fixed costs. Offering home energy upgrade jobs would also increase the number of times per year the HVAC contractor is in a home, in turn increasing the opportunities to pitch additional HVAC work to the customer. Appropriately pricing home energy upgrade jobs to reflect higher labor and lower equipment costs would increase the profitability of these jobs on a per-man-day basis. This step, however, would require a change in business focus and a separate pricing method for home energy upgrade jobs.¹⁷

Figure 2-13 shows how adding home energy upgrade services can allow an HVAC contractor to maintain its 12 percent target operating income margin while minimizing seasonality issues. The calculations are notional and assume a well-established contractor with a solid base of HVAC customers. While the cost of training additional staff is not included here, it is more than offset by potential increases in HVAC revenue from additional sales due to expanding home performance sales visits (a trend that has been shown to exist in several HVAC contractors to date).¹⁸

Sample Job Profitability Analysis

	Conventional HVAC Projects	Energy Efficiency Add-on Projects	Integrated Services
Jobs Performed	670	60	730
Operable Months	7	12	12
Total Revenue	\$2,000,000	\$240,000	\$2,240,000
Total Expense	\$1,760,000	\$220,800	\$1,971,200
Operating Income	\$240,000	\$19,200	\$268,800
Operating Margin	12%	8%	12%

Source: Booz Allen research

Figure 2-13: Sample Job Profitability Analysis

In addition to conducting whole-home upgrades year round, some HVAC contractors work with their customers to defer work, other than an HVAC replacement, to the slow season (when outside temperatures are comfortable). This can help even out the flow of work for the HVAC contractor and the cost for the customer. One challenge with this approach is when a program limits the availability period for incentives such that they do not coincide with the slow season. The slow season is also the best time of year to engage HVAC contractors in the program and to provide training.

¹⁷ Source: Industry interviews. (See “Acknowledgements” for a complete list of industry representatives interviewed.)

¹⁸ Source: Industry interviews. (See “Acknowledgements” for a complete list of industry representatives interviewed.)

Key Insights

HVAC Insights		
	Observations	Impact on Potential Expansion into Residential Energy Efficiency Market
Financial Model or Structure	<ul style="list-style-type: none"> ■ The HVAC business is seasonal: most HVAC repair and replacement jobs occur during the seasons when occupants are least comfortable with their climate. ■ HVAC contractors are generally funded through personal finance and often rely on lines of credit to cover their cash shortfalls during off-seasons. ■ Successful HVAC contractors typically aim for about a 12 percent net margin for profitability. ■ An HVAC contractor's gross profit is higher for equipment (approximately 45 percent on average) than for labor.¹⁹ It is generally in the HVAC contractor's best interest to limit the amount of labor hours on a job in order to keep average margin up. 	<ul style="list-style-type: none"> ■ Personal credit cards carry a high cost of debt and high risk. A high cost of start-up debt lowers profitability of smaller firms. ■ The seasonal nature of the HVAC business provides an opportunity for expansion into the residential energy efficiency market. Such a shift gives HVAC contractors a chance to bring in revenue year-round, as home energy upgrade demand is not seasonal in nature. ■ The slow season is the best time for programs to collaborate with HVAC contractors to provide training and incentives because contractors have time to take advantage of program offerings. ■ HVAC contractors can maintain desired levels of profitability even after shifting to a more labor-driven model by focusing on home energy upgrade sales during their slow season. ■ To avoid shifting too far toward a labor-driven model, HVAC contractors can subcontract more labor-intensive components of home energy upgrade services to specialists such as insulation contractors.

2.3.3.3 Assets and Infrastructure

Starting up an HVAC contractor business can cost up to \$100,000, assuming that all the business assets are purchased up front. However, trucks can be leased and many tools can be acquired secondhand at a significantly lower cost, which minimizes cost as a main barrier to entry into the HVAC industry.

As shown in Figure 2-14, an HVAC contractor business general expands into the residential energy efficiency market in two phases. The first phase generally centers on taking advantage of manufacturer trainings focused on basic equipment efficiency, and on acquiring specialized equipment that would allow the contractor to specialize in efficient installation specifically. Many HVAC contractors in the market have already reached phase one as part of their core service offerings, with costs for a standard HVAC business plus basic energy efficiency services.

¹⁹ Gross profit is revenues minus cost of goods sold.

HVAC Contractor Expansion Model

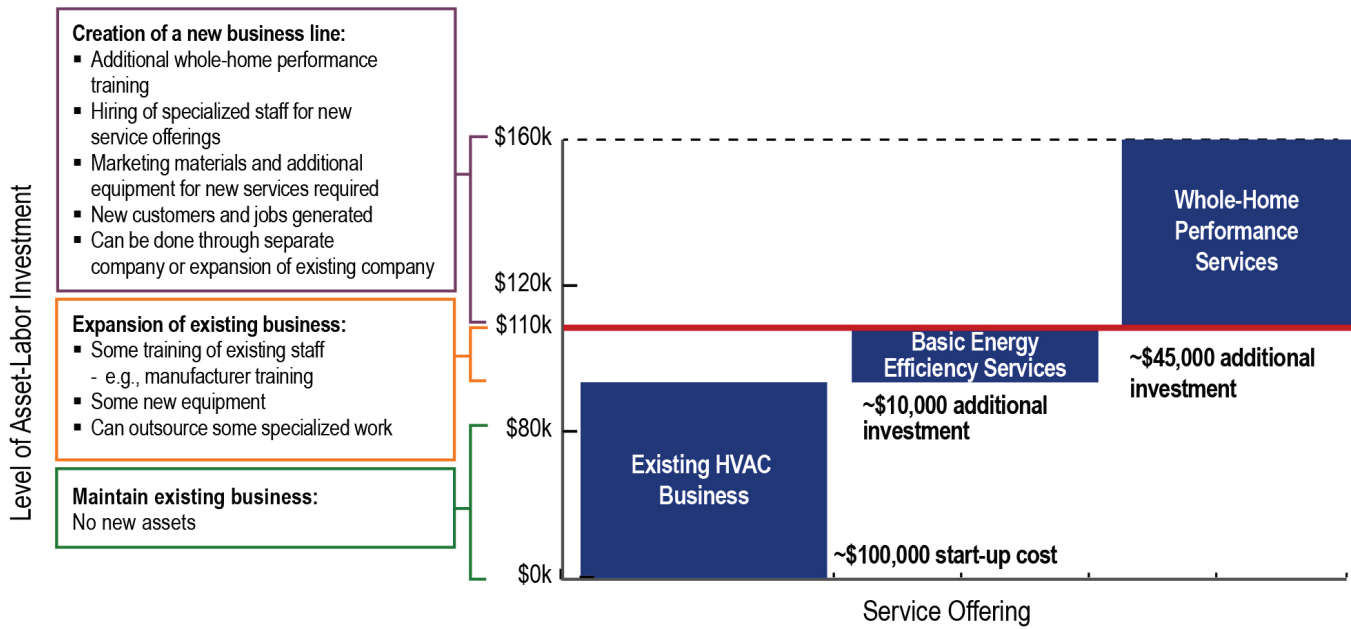


Figure 2-14: HVAC Contractor Expansion Model

Phase two involves setting up a dedicated line of business that allows for a separate business strategy for whole-home performance services. To enter phase two, HVAC contractors need to hire specialized staff, purchase additional equipment, and develop new marketing materials to advertise their new service offering. Specialized tools, such as a blower door, are also necessary to provide simple home energy upgrade services. The basic assets of an HVAC contractor closely align with those of a home performance contractor, so there may be cost efficiencies in the HVAC model that limit the cost barrier of entering into the residential energy efficiency market beyond those of a remodeler or a home performance contractor. Additionally, the most specialized services, such as insulation installation, can be outsourced to other contractors if the HVAC contractor does not wish to completely expand its in-house service model. This would also limit the types of assets required by the HVAC contractor during expansion.

The respective costs of each phase are presented in the business expansion model (Figure 2-14). The additional investment required for an HVAC contractor to expand its business into the whole-home performance market is about \$45,000, if the contractor already offers basic energy efficiency services. This estimate includes:²⁰

- Training costs: \$1,000
- Certification costs: \$500
- Licenses and registrations: \$600
- Diagnostic equipment: \$3,000
- Installation equipment (per crew): \$5,000
- Vehicles (per vehicle): \$30,000

²⁰ California Center for Sustainable Energy. *Contractor Blueprint: Getting from HVAC to Home Performance*. (n.d.). http://energycenter.org/index.php/incentive-programs/self-generation-incentive-program/sqip-documents/doc_download/1091-contractor-blueprint.

- Computer (IT) equipment: \$1,000
- Software: \$500

These costs do not include salary for additional trained staff. Note that the estimated expansion cost to the HVAC contractor is the maximum likely cost to the contractor, should it not have any of the necessary equipment at hand already, and wish to provide the full array of home performance services in-house rather than subcontracting them out.

2.3.3.3.1 Training

Training HVAC contractor employees in home energy upgrade concepts is the first step toward HVAC contractors being able to expand their services. HVAC contractors generally are not true franchises of a manufacturer, although smaller contractors can be affiliated with a specific brand. Larger contractors are more likely to carry multiple brands and choose which equipment to install. Manufacturers offer training as an incentive for contractors to install their equipment. Manufacturer-supplied training is attractive to smaller businesses, because that training is free and conducted at the HVAC contractor’s site. However, such training is not as complete as certification preparation training. Larger contractors are more willing to pay for certification training, which is more technology-neutral and more comprehensive than manufacturer-supplied training. However, even for medium-size contractors, the time spent on acquiring and maintaining certifications can be a barrier to service expansion.

Key Insights

HVAC Insights		
	Observations	Impact on Potential Expansion into Residential Energy Efficiency Market
Assets and Infrastructure	<ul style="list-style-type: none"> ■ HVAC asset requirements are broadly similar to those of a home performance contractor. ■ HVAC contractors tend to lease their equipment, reducing the need to invest a significant amount of capital in assets up front. ■ The largest investment necessary for an HVAC contractor to expand into the residential energy efficiency market is training for existing staff in home energy upgrade concepts. ■ Dedicating a line of business to home energy upgrades requires HVAC contractors to hire specialized staff, purchase additional equipment, and develop marketing materials. 	<ul style="list-style-type: none"> ■ Limited assets are required to expand services from HVAC into home energy upgrade services. The marginal investment needed to enter the residential energy efficiency market is approximately \$45,000, and typically lower for an HVAC contractor than a remodeler. ■ HVAC contractors can leverage existing HVAC manufacturer training to mitigate some of the cost of technical training. ■ Labor-intensive components of home energy upgrade work (such as insulation and air sealing) can be subcontracted out to home performance contractors during the initial phase of expansion.

2.3.3.4 Service Offering

HVAC contractors provide specialized services, focusing on the installation of heating and cooling equipment, including central air conditioning units, furnaces, and hot water heaters. Proper installation is critical for ensuring that heating and cooling equipment performs to its advertised capacity and efficiency. Correct installation requires expertise in proper sizing of equipment, duct sealing, optimizing of air flow, and proper refrigerant charge for central air conditioners and heat pumps.

Homeowners associate HVAC contractors with making their homes more comfortable, which is a primary benefit they cite as a reason for having home energy upgrades. This places HVAC contractors in a solid position to provide home energy upgrade services.



Additionally, in a traditional HVAC contractor model, the primary drivers of revenue for HVAC contractors are maintenance contracts. HVAC contractors indicated that they consider a portfolio of 500 service contracts to be a reasonable threshold to ensure the sustainability of an HVAC business.²¹ Service contracts lead to revenue, partly from annual maintenance visits, but mostly from repairs to and replacement of units sold during those visits, which can be used to drive the sales of home energy upgrades as well as standard HVAC equipment. Annual maintenance visits represent another key advantage HVAC contractors have in transitioning to a home performance contractor model.

While the assets and service delivery model of HVAC contractors are both geared to a home performance expansion model, the transition from an equipment- to a service-based model represents a key difficulty. To expand their services from traditional HVAC services to home energy upgrades, contractors need to change their business focus from the sale of equipment to the sale of services. As a result, technicians who traditionally have been asked to install and repair HVAC units in homes will now be asked to expand their focus, becoming sales consultants able to demonstrate the value of home energy upgrades to customers. Additional sales training from program administrators or manufacturers may be needed. This change of mindset can be particularly challenging for smaller contractors who, to close sales with customers, rely more heavily on their association with the brand of equipment they are selling than on their own service offerings. The key differences between the traditional HVAC service model and the home performance contractor model are highlighted in Figure 2-15.

HVAC Contractor Service Offering Expansion		
	Traditional HVAC Contractor	Home Performance Contractor
Customer Base	~10,000 for mid-size firm	~20% of total (2,000 for mid-size firm)
Services Provided	HVAC installation and maintenance	Energy assessments, insulation, air-sealing and lighting
Frequency of Sale	Service visits once or twice/year	Specialized sales pitch necessary to drive sales; can be one-time
Seasonality	Sales occur only seven months/year on average	Stable business year-round: <ul style="list-style-type: none"> - Through successful marketing of services to their customers, home performance contractors will have the ability to grow their business sustainably - An HVAC contractor's business becomes sustainable when it reaches approximately \$2 million in annual revenues
Training	High base levels of technical training	Additional specialized training such as lighting
Profit Driver	Key driver is equipment sales	Key driver is sale of services

Source: Industry interviews

Figure 2-15: HVAC Contractor Service Offering Expansion

Shifting from traditional HVAC contracting to home energy upgrades requires an expansion into more labor-intensive areas. If the HVAC contractor does not wish to develop its staff in-house, it can expand through subcontracts with specialists in insulation installation and other contractors. Ultimately, the HVAC contractor will have to broaden the focus of its primary sales and operational strategies to successfully incorporate energy efficiency into its business model.

²¹ Source: Industry interviews. (See "Acknowledgements" for a complete list of industry representatives interviewed.)

Key Insights

HVAC Insights

	Observations	Impact on Potential Expansion into Residential Energy Efficiency Market
Service Offering	<ul style="list-style-type: none"> HVAC contractors provide specialized services that focus on heating and cooling equipment installation, such as central air conditioning units, furnaces, and hot water heaters. The HVAC contractor's key revenue driver is repeat business from maintenance contracts. Roughly 500 service contracts is a reasonable threshold for an HVAC business to be sustainable. As part of their core business, HVAC contractors may also provide high-efficiency equipment and thermostat installations. 	<ul style="list-style-type: none"> Adding labor-intensive home energy upgrade services to a service mix primarily focused on material sales will require a shift in strategic thinking and may require additional sales training (from program administrators or manufacturers). Because service contracts are key sources of revenue for an HVAC contractor and involve regular home visits, they can be leveraged to help drive sales of home energy upgrades as well. An expansion in service offerings can also affect the way HVAC contractors organize their annual schedules—for example, keeping staff employed year-round rather than seasonally.

2.3.3.4.1 Customers and Customer Acquisition

As shown in Figure 2-16, HVAC contractors generally take a similar approach to the market as home performance contractors, focusing on a target upper-middle income class that has sufficient annual income to purchase a new HVAC unit instead of implementing minor repairs.

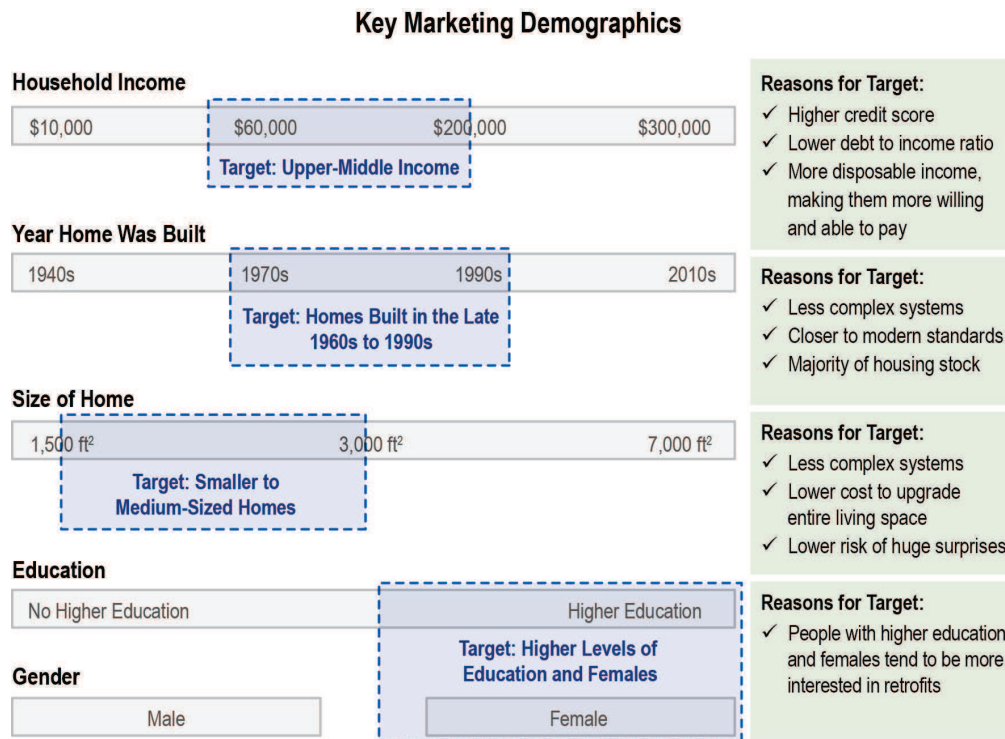
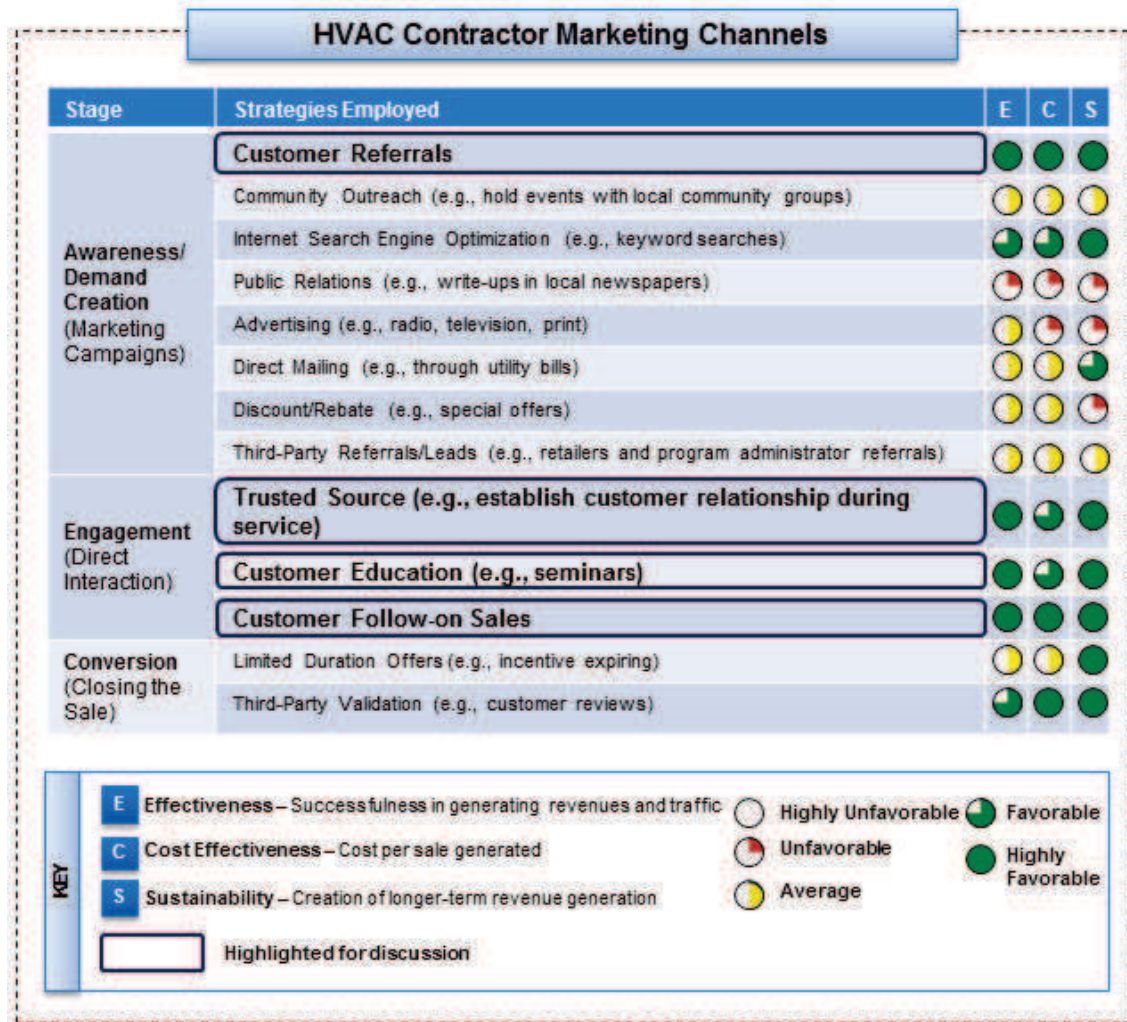


Figure 2-16: Key Marketing Demographics

However, much like remodelers, HVAC contractors benefit from a steady stream of repair jobs to help them maintain consistent revenues, the largest of which take the form of dedicated service contracts that recommend annual visits for unit evaluation and maintenance.

In addition to sales made through these service visits, HVAC contractors use a wide range of marketing techniques and channels to reach their customers. Acquiring customers through marketing can represent a significant expense for HVAC contractors. Industry sources estimated that acquiring a single customer costs an HVAC contractor between \$200 and \$300. These marketing channels include radio and television advertising, mailers, newsletters, and partnerships with utilities to advertise energy-efficient HVAC units. The most important of these marketing efforts are highlighted in Figure 2-17, below.



Source: Booz Allen research

Figure 2-17: HVAC Contractor Marketing Channels

Residential customers generally consider HVAC contractors a **trusted source** for home comfort and health and safety—the primary drivers of sales according to the HVAC contractors interviewed. However, the American Home Comfort Study ranks “cost savings” as the primary reason why customers consider switching to a more efficient HVAC unit.²² The disconnection between these two perspectives is interesting. It suggests that HVAC customers view cost as a primary driver of home upgrades, but actually choose to invest in home improvements that materially improve the comfort of their home—even if those improvements

²² Decision Analyst. *American Home Comfort Study: Strategic Intelligence on Energy Efficiency, Home Comfort, and HVAC*. (2008). <http://www.decisionanalyst.com/Syndicated/HomeComfort.dai>.

come with a slightly higher price tag. This is especially true of home energy upgrades, which are relatively expensive and whose primary demographic group for sales is upper-middle-class families for whom cost is much less of a consideration than it is for the majority of those included in the study. According to one contractor interviewed, homeowners chose 90 percent of the time to invest in home energy upgrades to improve comfort or safety in their home rather than to create future energy savings.²³

Annual service and maintenance checks are the primary means by which HVAC contractors drive **follow-on sales**. These routine visits to customers give HVAC contractors a key competitive advantage over general remodelers or specialized home performance contractors. HVAC contractors can build on the existing trust of their customers to offer additional home energy upgrade services. Face-to-face interactions that **educate customers** are therefore the most effective marketing technique for HVAC contractors. Once a sale is made, quality work is the best way to generate additional **customer referrals**, the other primary source of HVAC contractor leads. Third-party validation from customer reviews is another important source of new business, because it helps build the image of trusted service provider.

Summary of HVAC Insights		
	Observations	Impact on Potential Expansion into Residential Energy Efficiency Market
Customers and Customer Acquisition	<ul style="list-style-type: none"> Direct interaction with customers through repeat service visits is the primary means of generating revenue for HVAC contractors. HVAC contractors are considered experts in “home comfort,” health, and safety by consumers because they can moderate air temperatures. 	<ul style="list-style-type: none"> Service contract touch points provide HVAC contractors with an optimal means of providing energy assessment services, helping to drive year-round sales of home energy upgrades. Home comfort, health, and safety give HVAC contractors a natural platform to offer home energy upgrades, because consumers already rely on HVAC contractors to improve their home comfort by repairing HVAC units.

²³ Source: Industry interviews during Better Buildings “Business of Energy Efficiency” workshop, October 24–26, 2011.