3.3.3 Utility Program Administrator Business Model

The following sections focus on the five core components of a utility's business model, highlighting the critical elements of how utilities function within the market and how other organizations within the market can best collaborate with them.

OPPORTUNITY STATEMENT: While many utility programs do not currently offer home energy upgrades directly, their ability to track customer usage data and provide targeted rebates and services makes them highly valuable partners for contractors and non-utility program administrators. However, understanding how utilities evaluate cost, stakeholder value, and service reliability—as well as the regulatory environment in which utilities operate—is critical to informing potential partnership options.

3.3.3.1 Governance

Utilities can be divided into three categories: public (including municipal and federal), cooperative, and IOUs. Figure 3-18 highlights the key governance implications of each structure. In general, as utilities are large organizations, targeting the decision-makers that can shape an energy efficiency program can be challenging for entities seeking to cooperate with utility program administrators.

Utility Governance Models

	Municipal Utility	*Cooperative Utility*	*Investor-Owned Utility*
Description	Nonprofit utilities owned by municipalities	Nonprofit utilities owned by their customers/members	Utilities owned by their shareholders
Key Decision-Makers	Elected officials, board (elected or appointed), executive management	Members, executive management	Shareholders, board of directors, executive management
Profit Requirement	Break even with recovery of costs through rates	Break even with recovery of costs through rates	Shareholders' required rate of return or allowable return under regulations

Source: Booz Allen research

Figure 3-18: Utility Governance Models

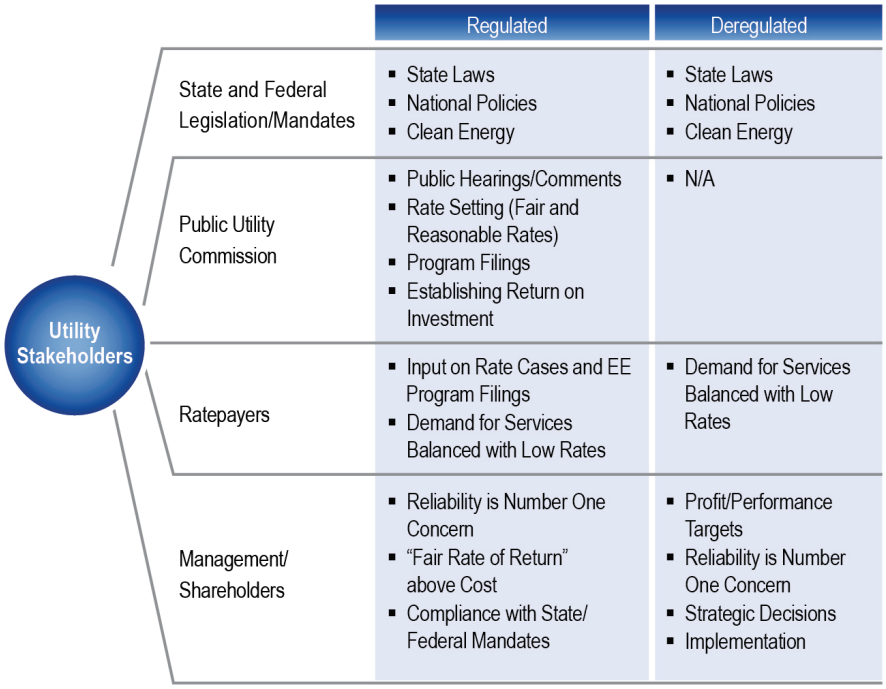
Figure 3-19 further illustrates the differences in governance between **regulated** and **deregulated** IOUs and the implications for utility stakeholders. The graphic also shows the usage of clean energy (renewable energy and energy efficiency) in both types of IOU. Regulated utilities, which serve most residential customers, have significant restrictions on their ability to expand services and set rates.

A **regulated** investor-owned utility is a provider of gas or electric service owned by private shareholders and whose service rates are defined by an external regulator.

A **deregulated** investor-owned utility is a provider of gas or electric service owned by private shareholders that operates in competitive markets.

In working with regulators, utilities prioritize reliability and cost above clean energy unless directed otherwise. Regulated utilities' service offerings are directly influenced by energy efficiency targets, which are in turn influenced by state legislatures.

For non-utility programs and other stakeholders, influencing state policy is, therefore, the best way to shape the mandates that regulators impose on utilities. The intervention stage of the regulatory process is where the general public can influence the rate case and program design of regulated utilities. However, this is a long-term process. In the shorter term, working with utility program managers directly is the best way to influence program design and coordinate activities.



Source: Booz Allen research

Figure 3-19: Utility Regulation Models

Understanding the utility program planning process is critical to influencing its energy efficiency strategies, as well as its rate case to its regulators. To facilitate the regulatory review cycle, many states have adopted a mandatory Integrated Resource Planning (IRP) process for their utilities to follow. This requires the utility to submit a plan to its regulator every few years that outlines the state of its current infrastructure, as well as projected future investments necessary to maintain grid reliability and meet any required renewable or

energy efficiency targets. Programs should have a firm understanding of their local utility's most recent IRP (where applicable) to influence their long-term planning process.

When seeking to engage utility management, it is important to keep in mind that clean energy and energy efficiency are often a lower priority than reliability and cost. A typical utility's priorities are summarized in Figure 3-20.

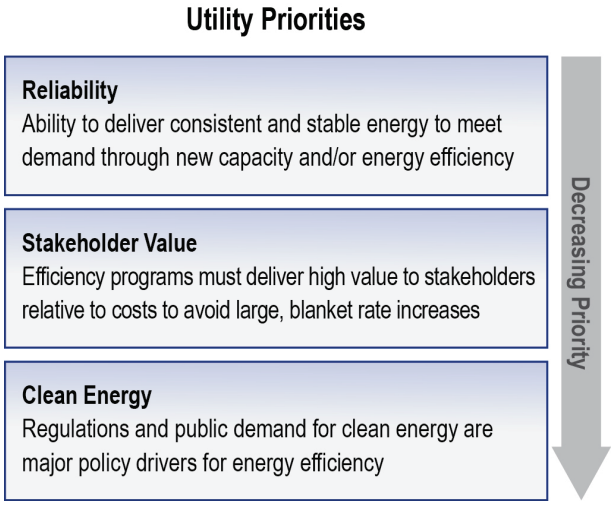


Figure 3-20: Utility Priorities

Given that grid reliability and cost are primary factors in utility decision-making, any partnership proposals made by those seeking to work with a utility's efficiency program should clearly demonstrate benefits to the utility in these areas. For example, a program aiming to encourage a utility to expand its efficiency efforts into home energy upgrades should have ample quantitative data that demonstrates the cost effectiveness of home energy upgrades in reducing loads and by extension, improving grid stability and reducing customer utility bills. Although modeled or calculated savings projections (known as deemed savings) can be used to justify cost effectiveness, real-time data collected from sample buildings is more convincing to utility decision-makers. Utilities are also sensitive to placing significant burdens on program non-participants. Therefore, simply establishing overall cost effectiveness may not be enough to convince utility decision-makers of a partnership's merits. The program should also consider strategies (such as discounted customer financing) that minimize the need for large, blanket ratepayer charges to subsidize energy efficiency investments.

Key Insights

Summary of Utility Program Administrator Insights

	Observations	Impact on Potential Entry into Residential Energy Efficiency Market
Governance	■ Utilities can be divided into three categories: – **IOUs** have a traditional corporate governance structure and are motivated primarily by profit – **Municipal utilities** are influenced by the municipal government and are generally regulated at the local level, rather than at the state level – **Cooperative utilities'** service offerings are driven by the decisions of their members, which are their customers	■ Working with an IOU requires an understanding of the corporate chain of command. Managers of existing energy efficiency programs are key points of contact for program administrators as they are more familiar with energy efficiency. ■ Municipals and cooperative utilities, while regulated, are not driven by profit margins. (The regulations they must comply with

Summary of Utility Program Administrator Insights		
	Observations	**Impact on Potential Entry into Residential Energy Efficiency Market**
	■ IOUs have profitability requirements (the average net margin in 2010 was 8 percent), whereas municipal and cooperative utilities are not bound by similar profit mandates from their stakeholders.[40] ■ Most IOUs are constrained by state regulations that have public agendas that can contrast with shareholders' profit requirements. ■ Municipal utilities are influenced by the municipal government and are generally regulated at the local level rather than the state level. ■ Cooperative utilities' service offerings are driven by the decisions of their members, which are their customers. ■ State legislatures directly impact the regulation of utilities through PUCs. ■ Regulated utilities prioritize reliability above other considerations, unless directed to do otherwise by mandates. Stakeholder value is the second priority followed by clean energy in the hierarchy of utility priorities. ■ Presenting real cost and value data (rather than deemed savings) to decision-makers is critical to making a partnership case to utility decision-makers. ■ Many utilities (and their regulators) are also highly concerned about passing program costs along to program non-participants.	often differ from those covering IOUs.) ■ Program administrators and other entities can work at the legislative level, as a starting point, to influence energy efficiency goals and targets, and can work with the public utility commission (PUC) regarding utility regulations (a long-term process). The intervention process allows for some public participation in regulatory cases, such as rate evaluations. ■ Other programs should be prepared to make a partnership case based on both cost and reliability grounds as well as on the value of efficiency as a social good. ■ Making a quantitative case on the cost and value of efficiency to the utility is critical to influencing management and partnership decisions. ■ Partners that can provide solutions to financing home energy upgrades without resorting to blanket ratepayer charges would be favored by utility management.

3.3.3.2 Financial Model or Structure

The financing of energy efficiency programs differs from that of more capital-intensive investments, such as new generation capacity, for which utilities rely heavily on debt and shareholder equity. Ratepayers are the primary source of funding for energy efficiency programs for both public and investor-owned utilities. Additional sources of funds for utility efficiency programs may include state and local funds, as well as program grants.

Traditionally, utilities have a disincentive to reduce energy consumption, as their revenues have been tied to kWh sales. **Decoupling** and **cost-recovery** mechanisms allow utilities to recover some of the revenue lost from **demand side management** or other energy efficiency programs.

By decoupling energy usage from service charges, a utility separates the amount charged to customers from the number of kWh consumed. In other words, even if customers' energy consumption decreases, they see no change in their utility bill and in effect the cost of energy efficiency is passed on to all ratepayers. Utilities favor this approach, which lets them invest these proceeds without damaging their revenue stream. Decoupling lowers the value of energy efficiency for homeowners, however, as their investment in home improvements is not offset by lower energy costs. One benchmark for when such mechanisms may be implemented is the point at which DSM/efficiency leads to a decrease of more than 1 percent in utility revenue per year, but a variety of methods may be used to determine when cost-recovery or decoupling is indicated.[41]

[40] Source: Booz Allen research.
[41] Source: Industry interviews. (See "Acknowledgements" for a complete list of industry representatives interviewed.)

DSM differs from a wider energy efficiency program in scope, and is a widely used utility strategy at the present time. Energy efficiency programs attempt to modify consumer demand for energy through various methods, such as financial incentives for permanent building upgrades and education. The goal of such programs is to lower the need for investment in future generation resources, as well as to mitigate high electrical usage during peak demand hours. In contrast, DSM programs focus primarily on temporarily shifting and balancing the electrical load on the grid to reduce peak electricity demand. The goal of DSM programs is to meet the demand for electricity during peak hours without activating more expensive peak generators. This strategy reduces stress on the grid and lowers the cost of peak electricity to customers. Demand reduction through efficiency or DSM programs affects revenue and variable costs, such as fuel, but does not lower fixed costs (e.g., transmission, distribution, generation). Again, this approach leads to a decrease in utility profitability if user rates are not decoupled or increased through a cost-recovery rate mechanism.

Cost-recovery mechanisms allow an organization to wait to recognize revenues from an investment until the organization has completely recovered the up-front cost of the investment.

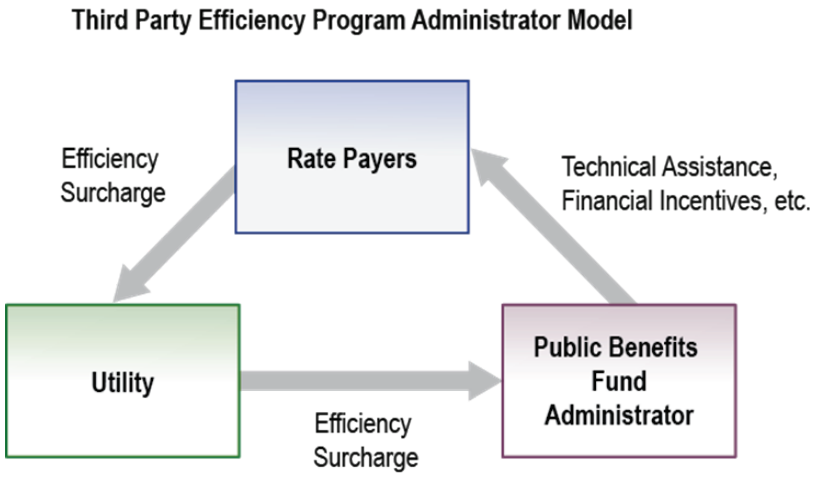
Decoupling refers to a situation where a utility's profits do not depend upon the quantity of energy it sells to customers. By decoupling energy usage from service charges, a utility separates the amount charged to customers from the number of kWh consumed. In other words, even if customers' energy consumption decreases, they see no change in their utility bill.

Demand side management (DSM) programs temporarily shift and balance the electrical load on the grid to reduce peak electricity demand. The goal of DSM is to meet the demand for electricity during peak hours without activating more expensive peak generators. This helps control costs both to the utility and the ratepayer through reduced fuel usage and operation and maintenance requirements.

IOUs focus their rate case with a PUC on the necessity for a reasonable rate of return (or profit) from rates. Gross profit is a primary factor for IOUs, but is not a factor for municipal or cooperative utilities, whose mandate is to break even. Data show that the operating margin for publicly traded U.S. IOUs (regulated and deregulated) in 2010 was approximately 16 percent; operating margin is the ratio of operating income (revenue minus operating expenses excluding interest and tax) over total sales revenue.

Several utilities are testing alternative sources of funding for energy efficiency programs. One structure involves setting up an unregulated subsidiary to provide home energy upgrade services. Because the subsidiary is not subject to PUC rate regulations, it can charge market rates for such services as energy assessments. However, the market penetration of these alternative models remains limited and for the foreseeable future the ratepayer funding model is unlikely to be challenged.

An alternative model for funding energy efficiency programs outside of utility implementation is for states to set up a dedicated energy efficiency utility or third-party energy efficiency administrator. In this model, illustrated in Figure 3-21, ratepayers fund the



Source: Booz Allen research

Figure 3-21: Third-Party Efficiency Program Administrator Model

energy efficiency program through a standard utility fee. The utility then transfers the money to a state or local government-owned "public benefits fund," and the state or local government hires or creates a third-party implementer to manage the fund and provide efficiency services to the consumer. This structure allows the energy efficiency program to use ratepayer funding, but avoids misaligned incentive issues related to a non-decoupled utility (e.g., reduction in utility revenues due to implementation of efficiency). Vermont, Hawaii, New York, Maine, and Washington, D.C., have adopted the energy efficiency utility model.

Key Insights

Summary of Utility Program Administrator Insights		
	Observations	**Impact on Potential Entry into Residential Energy Efficiency Market**
Financial Model or Structure	■ Utilities most commonly finance energy efficiency programs through ratepayer funding. This funding can take the form of a surcharge or cost-recovery rate. ■ Many utilities advocate decoupling revenues from the sale of kWh to customers when developing energy efficiency programs, as the decrease in sales of electricity stemming from DSM negatively affects their profitability. ■ Decoupling lowers the value of energy efficiency for customers as their energy costs may not decrease despite their investments in home energy upgrades.	■ Decoupling is just one of many ways to remove negative financial incentives to utilities for pursuing energy efficiency. Other ways include allowing the utility to increase its rates to compensate for decreased revenues caused by energy efficiency programs, or removing the onus on the utility to run the program altogether. ■ Third-party efficiency program administrators can provide similar benefits to decoupling, while being funded by fees levied on ratepayers. This structure removes the onus for running the efficiency program from the utility itself and provides incentives to homeowners to invest in home energy upgrades.

3.3.3.3 Assets and Infrastructure

The primary asset around which a utility builds its program is generation and transmission infrastructure. The impacts of implementing a large-scale energy efficiency program on the utilization of this asset can be significant, especially financially. For this reason, unless an energy efficiency mandate is in place that requires program implementation regardless of cost, most PUC regulations require that utilities use a Benefit Cost Test to determine whether an energy efficiency program will be more cost effective than adding new generation or transmission infrastructure.

Of Benefit Cost Tests, the TRC test is the most common. The TRC test measures the net costs of a DSM program as a resource option, based on its total costs, including both the participants' and the utility's costs.[42] TRC testing is a comparison of the benefits of energy efficiency on a per-dollar-spent basis. It can be combined in some states with the societal cost test, which includes other factors, such as environmental benefits and negative externalities. Benefits can include avoiding social externalities and "non-price" benefits enjoyed by participants (e.g., improved comfort, aesthetic qualities).[43] The Benefit Cost Test helps evaluate whether a program will provide benefits at a better rate of return than building new capacity. The ratio is typically developed such that a value less than one means the program costs less than building new capacity, whereas a value greater than one means the program costs more than building new capacity.

[42] Source: California Public Utilities Commission. *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects*. (2001). http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF.

[43] U.S. Department of Health and Human Services, Administration for Children and Families. "Glossary of Selected Terms Used in Utility Deregulation." (2011). .http://liheap.ncat.org/iutil2.htm.

However, TRC tests have limitations and most do not fully account for non-quantitative benefits. They have also been criticized for including items among the costs of efficiency programs that are not fully justifiable.[44] This leads TRC tests to undervalue the benefits of efficiency programs. TRC tests can also yield different results depending on the period over which proposed improvements are evaluated.

Although the basic assumption in the two scenarios shown in Figure 3-22 is that energy efficiency program costs are the same, generation costs are significantly higher in the second scenario. This results in higher savings from energy efficiency. When generation costs are low, the benefit cost ratio is below one, which means that the new generation capacity is more cost-effective than energy efficiency. Conversely, when new generation costs are higher, the benefit cost ratio is above one and energy efficiency becomes the most cost-effective option. Note: In Figure 3-22, "incremental measure cost" refers to the total cost to society.

Scenario 1: Low Cost of Additional Generation	
New Transmission/Generation Cost/kW	
Total New Capacity Cost	
Energy Efficiency Cost/kWh	
Program costs	$0.25
Incremental measure costs	$0.50
Generation savings	$(0.25)
Transmission savings	$(0.25)
Other savings (environmental, etc.)	$(0.10)
Net Energy Efficiency Cost	$0.15
Benefit Cost Test	**0.80**
Interpretation: New capacity is preferable to EE	

Scenario 2: High Cost of Additional Generation	
New Transmission/Generation Cost/kW	
Total New Capacity Cost	
Energy Efficiency Cost/kWh	
Program costs	$0.25
Incremental measure costs	$0.50
Generation savings	$(0.50)
Transmission savings	$(0.25)
Other savings (environmental, etc.)	$(0.10)
Net Energy Efficiency Cost	$(0.10)
Benefit Cost Test	**1.13**
Interpretation: EE is preferable to new capacity	

Source: Booz Allen research

Figure 3-22: Benefit Cost Test Illustration

Expanding generation or transmission to meet demand is not always the best option for utilities, particularly when finding a site for new capacity is challenging (often due to such factors as remote location, local opposition, or high cost per kW). Although costs vary based on the location and type of plant, a typical rough break-even generation cost—above which energy efficiency becomes preferable—is $600/kW.[45] On the other hand, depending on the location of the utility and local demographics, energy efficiency savings may not be realized as anticipated, or may have a low potential in the first place, which will impact the comparison with new capacity and can lead to a change in the benefit cost ratio over time.

Overall, tests like TRC can be challenging to meet for energy efficiency programs and can stifle innovative service offerings such as home energy upgrades. A work-around, which has been explored by such utilities as Pacific Gas & Electric (PG&E) in California, is to bundle energy efficiency programs together to improve the potential returns of a particular conservation measure by including it with others that are above the TRC threshold.[46] For example, bundling simple lighting upgrades with insulation and some of the costlier home

[44] Neme, C., and Kushler, M. *Is It Time to Ditch the TRC? Examining Concerns with Current Practice in Benefit-Cost Analysis* (2010). ACEEE Proceedings Paper. http://aceee.org/proceedings-paper/ss10/panel05/paper06.

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

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

energy upgrade components can help the full home energy upgrade package meet the TRC test as part of a larger suite of services. Anyone seeking to partner with a utility program would be well served to gain a basic understanding of how their proposed collaboration may be evaluated relative to other options such as new generation.

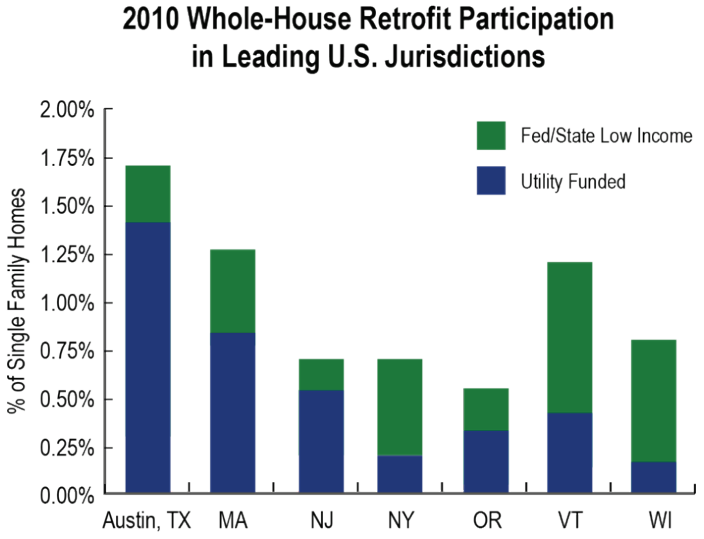
Key Insights

Summary of Utility Program Administrator Insights		
	Observations	**Impact on Potential Entry into Residential Energy Efficiency Market**
Assets and Infrastructure	▪ Utility energy efficiency programs must meet mandatory cost-benefit tests, such as the TRC test. This test compares the generation and transmission cost savings from energy efficiency against the program's operating costs.	▪ If other programs wish to collaborate with utilities in the energy efficiency market, understanding the cost-benefit methodology used by their local utility, as well as their basic infrastructure constraints, is critical to determining how the program can add value to a utility's existing programs. ▪ Expansion into the energy efficiency market can be more cost-effective than creating new capacity. An average tipping point is approximately $600 per kilowatt for the cost of new generation.[47]

3.3.3.4 Service Offering

Although utilities do not commonly offer comprehensive/whole-home energy upgrades at present, they are increasingly working upgrades into their energy efficiency programs. Energy efficiency service offerings, ranked approximately from most to least commonly offered by utilities, include:

- Low-income home weatherization
- Compact fluorescent light bulb (CFL) rebates
- Appliance rebates
- Energy assessments
- New home energy packages
- Subsidized financing
- Load shedding and peak management (commonly offered for industrial and commercial customers but less prevalent in the residential market)
- Home energy upgrades



Source: Regulatory Assistance Project, Residential Efficiency Retrofits: A Roadmap for the Future *(2011)*

Figure 3-23: 2010 Whole-House Retrofit Participation in Leading U.S. Jurisdictions

As shown as Figure 3-23, penetration rates for home energy upgrade programs among locations where energy upgrades are most readily available are below 2 percent. This low-level penetration is also true for the leading location, Austin, Texas, which can be explained by a variety of factors. Generally speaking, the educated customer base that demands energy efficiency in homes is small, and financial mechanisms to overcome up-front cost hurdles are not firmly established. Most

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

of the locations from the graphic are primarily grant-funded programs. Additionally, the lack of a ready contractor base with well-developed sales and business plans and the ability to provide these services is a significant hurdle to overcome to ensure the development of a sustainable home improvement market under the umbrella of utilities.

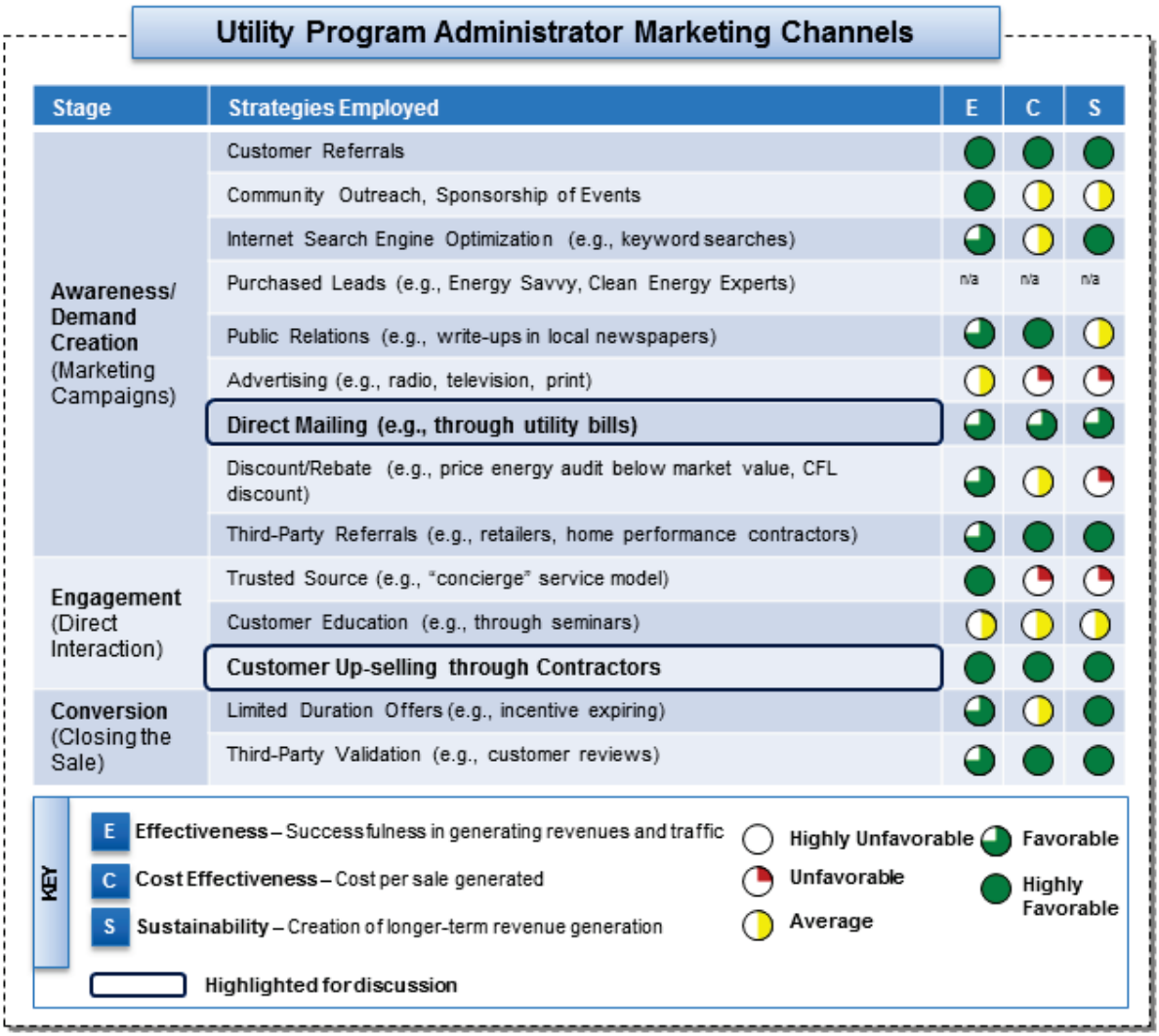
As a general rule, utilities do not like diverting resources to certify and screen potential partner contractors. This has proven to be a significant stumbling block to deploying large-scale whole-home energy upgrade programs. The whole-home energy upgrade approach often requires additional, trusted contractor support. Utilities also do not provide resources to coordinate their program efforts with other existing resources in the market (e.g., other rebate programs). This is a significant limitation for programs because there is an opportunity to bundle utility offerings with rebates at the point of sale to drive consumer demand.

Key Insights

Summary of Utility Program Administrator Insights		
	Observations	**Impact on Potential Entry into Residential Energy Efficiency Market**
Service Offering	■ The services for residential customers in the energy efficiency market may include the following: – DSM – Customer services (rebates, home energy upgrades, loans, and education) ■ Utility energy efficiency programs do not typically offer home energy upgrades, which represent one of the least-commonly offered services among utilities. Penetration rates are under 2 percent, due to a lack of demand, incentives, or sufficient contractor breadth.	■ Utility cost-benefit tests are cited as a barrier for their entry into the energy efficiency market. Bundling packages of highly cost-effective and less cost-effective energy conservation measures together for submission can help get more aggressive measures to pass the test. ■ Utilities can partner with non-utility programs to provide services on their behalf that would not pass a strict Benefit Cost Tests.

3.3.3.5 Customers and Customer Acquisition

As established businesses, utilities have a number of marketing channels already in place that their efficiency programs can use to advertise benefits. Figure 3-24 outlines the range of marketing channels utility program administrators employ to reach their customers.



Source: Booz Allen research

Figure 3-24: Utility Program Administrator Marketing Channels

Primarily, utilities have two unique advantages in marketing their services: direct access to customer energy use data and direct access to customers through their monthly bills. Using their monthly bill **direct mailings,** utilities can advertise their energy efficiency programs without incurring additional costs, a means that has proven effective to generating customer interest in energy efficiency services to date. This is especially true when the utility includes the program information next to the dollar total on the bill, the one area customers tend to focus on when reviewing their statements.

By reviewing energy usage patterns, utilities are better able to target their services across the board to customers that can benefit most from reduced energy savings. This allows the utility to save money and time in that they can focus their marketing and outreach on specific neighborhoods, rather than scattering it across the full market. Outside of the utility itself, however, there are significant barriers to how this data may be shared with others who may wish to use it for similar purposes. From a legal standpoint, concerns about privacy and sharing of personal information limit what information utilities may be willing to share with other programs in their region. This is particularly true when a utility is competing with another program to reach its mandatory efficiency target.

While utilities have these specific advantages in how to target and distribute their messaging, it is also worth noting that local contractors are the primary direct sellers of utility rebates and other utility services. This marketing often happens at the point of sale, with contractors pitching utility rebates or services as part of their overall home upgrade **customer upsell** strategy. As a result, many utilities reach out to their local contractor base to help them stay aware of specific incentive options and deadlines as they roll them out.

Key Insights

Summary of Utility Program Administrator Insights		
	Observations	**Impact on Potential Entry into Residential Energy Efficiency Market**
Customers and Customer Acquisition	■ Utilities have direct access to customer energy usage data, which allows them to target key customers and better measure the effectiveness of specific energy efficiency programs. ■ Utility bills are an often-cited advantage in program advertising, as they provide free advertising to potential customers.	■ Utilities can effectively target customers in the energy efficiency market and enable greater impact of program dollars spent through the use of energy usage data. ■ Positioning the program information next to the total cost of the bill is the optimal way to get customer attention when conducting on-bill advertising.