How Is the Neighborhood? Preliminary Results from the Better Buildings Neighborhood Program

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ABSTRACT

The U.S. Department of Energy (DOE) Better Buildings Neighborhood Program (BBNP) supports 41 organizations to design and implement community-specific whole building energy efficiency upgrade programs. This preliminary process evaluation, which began in late 2011 and finalized in December 2012, conducted interviews with DOE staff and contractors, 36 grantees, 4 nongovernmental stakeholders for the BBNP, and 26 market informants familiar with whole building energy efficiency, as well as surveys with participating and nonparticipating contractors operating in 22 of the 41 grantee areas. This evaluation focused on developing early findings to provide insight to DOE and the 41 grantees during their final year of operation.

This evaluation found that DOE's framework of four pillars – marketing, financing, workforce, and data and reporting – are necessary for an effective energy upgrade program. Further, the research confirmed that these components must work together for the program to be effective and successful, and that one pillar alone is not enough. Additionally, there is no best way to implement each pillar and each pillar needs to have multiple supporting elements to create an integrated whole. Finally, data and reporting are critical to understanding and evaluating program success, and they are a key component to gaining long-term funding.

The BBNP is not a narrowly prescribed scientific experiment; instead, it encourages innovative ideas to be tried and assessed through the evaluation process. The BBNP is generating a wealth of experience in alternative and sometimes very innovative approaches to developing the demand and supply markets for whole house and building upgrades.

Introduction

Through its Better Buildings Neighborhood Program (BBNP), the U.S. Department of Energy (DOE) allocated \$508 million in American Recovery and Reinvestment Act (ARRA) funds to support 41 government or nonprofit organizations to design and implement community-specific whole building energy efficiency upgrade programs. DOE offered the funding in 2010 and all funding will terminate by September 2013. In addition to funding, DOE offered technical assistance, account management, conferences, peer-to-peer networking, newsletters, and a variety of tools to facilitate grantee success.

The funding initially targeted city and state governments, local neighborhood associations, nonprofits, colleges and universities, utilities, and financial institutions through the competitive Energy Efficiency and Conservation Block Grant Program (EECBG) Retrofit Ramp-Up Solicitation (DOE 2009).¹ DOE made 25 awards to local governmental or nonprofit organizations through subgrants to local governments, with awards ranging from \$1.2 to \$40 million. Nine similar grantees from DOE's Formula EECBG program (DOE 2010) and seven from DOE's State Energy Program (SEP) solicitation

¹ In April 2010, when the first grants were awarded, the program was termed the *Retrofit Ramp-Up* program. By September 2010, the program had been re-titled as the *Better Buildings Neighborhood Program*.

²⁰¹³ International Energy Program Evaluation Conference, Chicago

(DOE/NETL 2010) – four of whom are part of a National Association of State Energy Officials (NASEO) multistate collaborative – were included in BBNP, for a total of 41 grantees.²

The three primary objectives for BBNP are:

- Initiate programs to support building energy upgrades that promote projects estimated to achieve 15% energy savings at the portfolio level in more than 40 communities.
- Demonstrate more than one sustainable business model for providing energy upgrades to a large percentage of the residential and/or commercial buildings in a specific community.
- Identify and spread the most effective approaches to completing building energy upgrades that support the development of a robust retrofit industry in the United States.³

BBNP seeks to increase the overall energy efficiency of residential and nonresidential facilities through assessments that lead to energy improvements and, in some cases, through loans and rebates to drive demand for energy efficiency upgrades.

A comprehensive evaluation is underway for the program. DOE engaged the evaluation contractors in late 2011 to develop research plans and conduct both preliminary and final process, market, and impact evaluations. The preliminary process evaluation, finalized in December 2012, focused on early findings that could provide insight to DOE and the 41 grantees during their final year of operation.

Because many grantees had not fully launched during the first year of operation, yet were anticipating they would fulfill their obligations, it was important not to draw hasty conclusions about the findings. In addition, it was understood at the outset that no further support for the grantees would be forthcoming from DOE after the grant funding ended. Given this setting, key challenges of the process and market evaluation included:

- Identifying a success metric given the variety of programs operated by the 41 grantees;
- Obtaining sufficient data to conduct the evaluation, despite the early stage of implementation for many grantees; and
- Determining what results from this study could be most useful for the grantees and DOE as they approached the final year of implementation.

Methodology

The preliminary process evaluation included a review of secondary data, as well as primary data collection. The secondary data included a *Salesforce* database that is used for communication between the account managers and the grantees, and a Google website that acts both as a repository for BBNP documents, webinars, reports, etc., and has a discussion group feature used by grantees to ask each other questions. We conducted interviews with DOE staff and contractors supporting BBNP, as well as interviews with 36 of the 41 grantees, and 4 nongovernmental stakeholders for the program. The team also surveyed participating and nonparticipating contractors operating in 22 of the 41-grantee areas.⁴

² A description of the 41 Grantees and their programs may be found at the Better Buildings Neighborhood Program website. <u>https://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/</u>. Documentation for the BBNP uses varying language to refer to grantee activities. The *Better Buildings Neighborhood Program Grant Recipient Management Handbook (Version 2.0)*, for example, refers to each grantee's set of activities as a *project*, while other sources refer to grantee *programs*. In the energy efficiency community, *program* usually refers to a collection of activities that an administrator carries out to induce uptake of energy efficiency measures, and *project* usually refers to a specific equipment replacement or facility upgrade meant to improve energy efficiency for a specific end-user. As this appears to be the usage currently preferred by DOE, we will use it in this paper.

³ The term *retrofit* refers to changing equipment out to improve its energy use prior to its natural need for replacement. The Better Buildings team shifted their terminology to use *energy upgrade* rather than *retrofit* as a more commonly understood and positive term that referred to improving a building, not just early replacement of equipment.

⁴ The market evaluation portion of this study is discussed in Clendenning et al. 2013.

²⁰¹³ International Energy Program Evaluation Conference, Chicago

We analyzed and compared the interview and survey data for grantees so that we could ascertain their basis of success. This required the development of a success metric and the integration of the success metric into our analysis.

Success Metric

DOE captures accomplishment data from the grantees in a program specific database, the Better Buildings Information System (BBIS). Data on the assessments and upgrades supported by the program are included in the database. Grantees submit quarterly data within a month after the quarter ends. Then DOE and its contractors review and vet the data to ensure accuracy. Thus, the available evaluation data lag program accomplishments by several months. Further, the metric only addresses residential projects. In second quarter 2012, commercial projects were not numerous enough to be included.

The evaluation team used the data in the BBIS to create a success metric. Because of the lag in data availability, as well as the general lag in grantees having sufficient assessments and upgrades completed to report to DOE, the team developed the success metric for the preliminary process evaluation in late August 2012, based on second quarter 2012 (June 30, 2012) accomplishment data.

Neither the total number of upgrades completed nor the total savings achieved is an appropriate metric, as grantees vary considerably in terms of grant size, target population size, and other factors that affect the number of upgrades completed and savings achieved. Instead, we examined several ratios as potential success metrics:

- Progress toward goal (number of upgrades completed as a percentage of upgrade target)⁵
- Rate of conversion of audits to upgrades
- Average cost per upgrade completed
- Average cost per unit of energy saved

Each of the four metrics provides reasonable indications of success, but none by itself is completely reliable. In such situations, if the various metrics are intercorrelated, combining them into a composite metric provides improved measurement (Allen & Yen 2002). We examined the intercorrelations of the four metrics. All intercorrelations were statistically significant ($p < .05^6$) and showed a consistent pattern: 1) progress toward goals and conversion rate were positively correlated (grantees that had shown greater progress toward goals also had higher conversion rates, and vice versa); 2) likewise, average cost per upgrade and per MMBTU saved were positively correlated (grantees with higher average upgrade costs also tended to achieve greater savings per dollar spent); and 3) the first two were inversely correlated with the latter two (those grantees with greater conversion rates and progress toward their goals had lower costs per upgrade and per MMBTU saved).

We constructed a composite success metric from all four metrics rather than relying on any single one. So that each element of the composite had equal weight, we converted raw values for each of the four metrics to ranks before combining them. For two of the metrics (cost per upgrade and cost per MMBTU saved), a higher rank (lower number) means a greater cost per upgrade or amount saved – an indication of less success to date. For the two metrics, progress toward goal and conversion rate, a higher rank means greater success to date. Consequently, we reversed the rank-orders for the cost

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⁵ Note that many of the grantees commented that their goals were modified more than once during implementation; the goals as presented in the BBIS, assumed to be those agreed to by the grantee and DOE, were used.

⁶ Three of the four success metrics had distributions that were far from normal, with skewness ranging from 2.0 to 5.8 (p < 0.05 in all cases). Therefore, we used the nonparametric Spearman correlation coefficient.

metrics prior to combining them with the others.⁷ The result was an index that ranged in value from 25 to 159. The lower the score; the greater the grantee's success to date, as shown in Figure 1.



Figure 1. Comparison of Component Success Metrics

Findings on DOE Program Support

DOE established a core staff team to oversee BBNP. The staff included a program manager, a project officer, six account managers (not all of whom are dedicated to the program full time), a lead for data and evaluation, and a variety of contractors who provide support to DOE staff and the grantees. This equals a full-time equivalent (FTE) of six DOE staff for a ratio of six FTE and 41 grantees (1:6.8).

The account manager position is unusual for DOE grants, and both DOE staff and the grantees found the position valuable. The account managers helped the grantees to understand the requirements of the grant, and coached them on how to develop and implement their programs. Grantees viewed this as incredibly important, as the majority of the grantees had no experience in designing or running energy efficiency upgrade programs.

In addition to the account managers' roles in helping grantees, DOE wanted to facilitate the grantees helping each other and themselves. They did this in two ways: one was to provide technical assistance to the grantees, and the other was to establish a variety of mechanisms for communication and sharing among the grantees. DOE provided limited technical assistance to grantees from energy efficiency consultants who helped grantees design and launch their programs. Grantees that needed support after fall 2011 funded it from their own resources.

The sharing resources included a Google site, which served as a common location for resources and as a group discussion site. Each grantee had its own log in, and DOE posted every webinar and report, as well as data and newsletters that pertained to BBNP-type activities. DOE also sponsored peerexchange calls: audio conferences in which different grantees discussed their experiences and other grantees had the opportunity to ask questions, and webinars in which energy efficiency experts

⁷ We subtracted each grantee's original rank from 41, the total number of grantees. For example, if a grantee was ranked 25^{th} on cost per upgrade, that grantee had the 25^{th} highest cost per upgrade (i.e., 24 other grantees had higher costs per upgrade). The reversed rank for that grantee became 41 - 25 = 16, meaning that the grantee had the 16^{th} best (lowest) cost per upgrade. **2013 International Energy Program Evaluation Conference, Chicago**

presented technical material pertaining to topics of possible interest to BBNP grantees. The webinars were often open to other DOE grantees, not just those from BBNP. DOE sponsored conferences and workshops for grantees to come and learn from energy efficiency experts and each other. These conferences and workshop were among the resources grantees most valued, largely because they had the opportunity to meet the people behind the peer-to-peer discussions and develop relationships that they could count on when they had later questions about their programs. DOE also supported a grantee-specific newsletter (*The Insider Blast*) and a newsletter (*The Better Buildings Neighborhood View*) on the BBNP program for the public.

Nearly all the grantees viewed these resources positively. The organizations with previous experience with DOE and federal grants noted that these resources were effective and useful, and made the program different than previous grant experiences.

Findings on Overall Progress to June 30, 2012

Figure 2 shows overall grantee progress in terms of number of upgrades achieved through Q2 2012. Progress is shown separately for all grantees, as well as the grantees categorized as high, medium, and low success on our composite success-to-date metric. The rate of increase in number of upgrades over time does not appear to differ appreciably between high-success and medium-success groups.



Figure 2. Upgrades Achieved through Q2 2012 by Level of Success to Date

Figure 3 shows the mean progress toward goals (number of upgrades completed as a percentage of target) over time for the high-, medium-, and low-success groups.⁸ Not only are the most successful grantees above the rate for all grantees, the slope for their progress is also steeper.

We don't expect any time trends for the other two success metrics (*audit-upgrade conversion rate* and *cost per upgrade*) to be meaningful. While we might expect *cost per upgrade* to decrease over time as grantees become more effective at selling upgrades, the presence or absence of such a trend would not necessarily be an indicator of program success. The same applies to *audit conversion rate*. Moreover, we might expect to see an initial increase in *audit conversion rate* as early audits are converted to upgrades, and then a dip in the rate in the last months of data capture, as additional audits

⁸ We selected a line graph for this figure to better illustrate the continuum of progress. Also, while the column chart format captures the fact that the figure for *All Grantees* is a sum of all other figures, the line graph for percentage of goals achieved better captures the fact that for this metric, the progress for the most successful grantees is above that for *All Grantees*. **2013 International Energy Program Evaluation Conference, Chicago**

have been performed that will be converted to upgrades later. Neither of those short-term trends, if they occurred, would provide any indication of program success, but both might mask any indication of increased program effectiveness. The final success metric may have different components once all data are available.



Figure 3. Grantee Progress toward Goals by Level of Success to Date

Correlates of Progress

To understand the source of progress, we looked at whether the grantee's rank on the success metric was related to:

- The type of organization administering the grant (government, nonprofit, etc.)
- Uses of subcontractors and types of partnerships established
- Prior experience doing energy efficiency
- The grantee state's ACEEE energy efficiency ranking (ACEEE scorecard)
- Aspects of program marketing, including the use of marketing professionals and the timing, breadth, and extent of marketing activities
- The types of residential segments targeted
- Whether or not the grantee provides training or certification to contractors
- Whether or not the grantee provides financing and the type of financing mechanisms established

Seven grantees included in the BBNP evaluation received SEP awards. The award and program launch dates were much later than for the other grantees, so we excluded them from this analysis. In addition, we eliminated one grantee because it had been sending progress data incorrectly since Q4 2011.

Even among the non-SEP grantees, launch dates varied. Not surprisingly, we found that the amount of time elapsed since program launch was related to the score on our composite metric (Kendall's T = .328, p = .009) – i.e., the shorter the amount of time since program launch, the lower the score. Therefore, we used linear regression to create an adjusted success metric that takes into account time since program launch. We then examined the relationship between the various grantee and program characteristics and the adjusted metric score.

The value of examining the adjusted success metric is illustrated with the following example. We examined whether grantee success to date was related to whether the grantee was a government entity or some other type of organization. When using the unadjusted success metric, grantees that were not government entities did better than government entities (59.5 vs. 95.8; z = -2.68, p = .007).⁹ However, grantees that were government entities launched their programs about one month later than other grantees did, so they appeared to lag behind the other grantees on the *unadjusted* success metric. When we analyzed the relationship using the success metric adjusted for time since program launch, the relationship was no longer statistically significant (79.0 vs. 87.3, z = -1.20, p = .23).

The only other factors that we found related to grantee success to date related to the types of partnerships that grantees had formed. Those grantees that partnered with financing authorities¹⁰ did better on the success metric than did other grantees (79.1 vs. 91.6, z = -2.12, p = .03). On the other hand, those that partnered with local community-based low-income weatherization programs *did not do as well* on the success metric as other grantees did (95.2 vs. 81.8, z = -2.32, p = .02). This finding may reflect challenges serving the target market rather than any issues with the partner, a hypothesis we will explore in the final evaluation.

In addition to the above, one relationship was marginally significant and may warrant further investigation. Those grantees that partnered with nonprofit organizations not focused on energy did better on the success metric than did other grantees (83.5 vs. 85.1, z = 1.89, p = .06).

Grantee success-to-date, as measured by our composite metric, was not related to prior experience with energy efficiency, ACEEE energy efficiency ranking for the state, segments targeted, contractor training or certification, financing, the use of program implementation or marketing contractors, or the type or even amount of marketing they carried out.

Although our statistical analysis did not indicate that success-to-date was related to grantees' prior energy efficiency experience, we believe this finding is an artifact of our difficulty quantifying grantee prior experience. Our qualitative findings strongly suggest that success-to-date is related to prior grantee energy efficiency experience. Our quantitative indicator of grantee experience is imprecise, as some grantees without prior experience worked with program implementation contractors that had experience.

Findings on Driving Demand and Stimulating Supply

The DOE BBNP team defined four pillars of success for an integrated residential energy efficiency program:

- 1. Driving Demand is concerned with creating the demand for energy upgrades.
- 2. *Financing* ensures that financial mechanisms are available so that home and business owners can make the energy upgrade.
- 3. *Workforce Development and Contractor Capacity* ensures that assessment and energy upgrade contractors are trained and have sufficient staff to meet the demand for energy upgrades.
- 4. *Data, Reporting, and Evaluation* establishes the principle of collecting and reporting data to document the program and evaluate how well the program is meeting its goals.

 $^{^{9}}$ Note that a low score indicates better success, as it represents higher ranks on progress toward goals, conversion rate, low cost per upgrade, and low cost per MMBTU saved. Because the sample sizes were small and the adjusted success metric was not normally distributed, we used the nonparametric Mann-Whitney test for differences between means. The test statistic for Mann-Whitney is *z*, which follows the *t* distribution.

¹⁰ Grantees had varied financial partners, including community banks, credit unions, private sector banks, community development financial institutions, etc.

²⁰¹³ International Energy Program Evaluation Conference, Chicago

These four pillars create the framework for the activities the BBNP team (DOE staff and its contractors) and grantees pursue. The four pillars should not be confused with program theory and logic, as programs may use different activities and outputs to drive demand for energy upgrades, finance energy upgrades, or support a contractor market for energy upgrades.

In our evaluation, we examined how grantees were driving demand for energy upgrades and how they were stimulating the supply in the market though workforce development and contractor capacity. We found, and discuss below, that financing is an element in both driving demand and stimulating supply. Our findings touch only briefly on the fourth pillar (data, reporting, and evaluation), as it is more pertinent to the sustainability questions that we are dealing with in the final process and market evaluation.

Driving Demand

We found four factors related to driving demand:

- *Marketing* the marketing messages and methods
- *Sales* the messages for making the sale (securing the upgrade)
- *Financial Incentives and Free Services* the strategies for reducing first-cost barriers in marketing and sales
- Financing financing as a tool to stimulate demand for retrofits

Marketing. Marketing for many grantees began by promoting assessments. Yet, a key lesson learned in the first year of BBNP is that driving assessments does not equal driving upgrades. Overall, just 27% of the completed assessments resulted in upgrades by June 30, 2012.¹¹

Grantees reported the most success with messages that use *comfort*, *health*, and *safety*, as opposed to *bill savings* and *environmental effects*. While *bill savings* and *environmental effects* had positive results, for those grantees that used combinations of these messages, *comfort*, *health*, and *safety* had the greatest effect. And successful grantees (as characterized per the success metric) were nearly twice as likely as the other grantees to mention that they use messages of *comfort*, *health*, and *safety*.

Grantees also reported that non-traditional methods were more effective for delivering messages. Those grantees that used billboards and mass media did not find them very effective. This is consistent with a premise that we find important in understanding grantee programs. These programs enter a marketplace where energy efficiency upgrades are a new product with a name that does not speak to the needs and wants of end-users. Potential customers need assurance that an upgrade can deliver the claimed benefits for their specific home or building, and can be obtained from someone who they feel reasonably confident can deliver. Mass media is not the best vehicle for such a message. What grantees found to work included: endorsements from friends, families, neighbors, and community leaders; along with messages about comfort, health, and safety, and, if appropriate, community benefits; and showcases of actual upgrades.

Sales. Driving demand is not solely increasing awareness, but more critically is the sales aspect in which the deal is closed and the consumer proceeds with an upgrade. We found five perspectives on how to sell the upgrade and these were reflected in the way the grantees designed and implemented their programs:

¹¹ Typical audit to conversions for utility programs vary from 30% to 90% depending on type of audit. However, programs that prescreen into the assessment tend to have higher conversions; those BBNP programs that did so had conversions closer to 70% (ECONorthwest 2010; PA Government Services 2005; Thorne Amman & Lowenberger 2010).

- *The assessment sells the upgrade* the assessment reflects high quality building science and constitutes assurance that the energy savings will be there; energy savings assurance sells the upgrade.
- *The independent auditor "sells" the upgrade* the auditor is an independent building science professional; his or her independence from the upgrade contractor's sale provides assurance that the savings potential will be realized.
- *The upgrade contractor sells the upgrade* the contractor, who may also conduct the audit, sells the upgrade based on one or more benefits and sells his or her firm as capable of doing quality work.
- *The program staff sells the upgrade* some member of the program team sells the upgrade based on the assessment.
- *Financial incentives and/or financing sell the upgrade* the assessment report sells the desirability of the upgrade and financial incentives and/or financing remove the primary barrier of first cost.

At this stage of the evaluation, there is no clear indication of whether one approach or another is most effective. These models have different costs and implications for sustainability. The final process evaluation will provide a more clear assessment.

Financial Incentives and Free Services, and Financing. Grantees often used incentives, the installation of free measures or free services, and financing in the form of loans to drive demand.

Incentives received mixed reviews. For some grantees, offering a large incentive appeared to be effective in closing the deal and getting upgrades, though the budget tended to be expended quickly in these cases. For other grantees, a low/moderate incentive was sufficient. Grantees' collective experiences speak to the need for rebates to get end-user attention and to meet their desires for good deals; however, it is not yet clear how large the rebate needs to be for the general market.

Free assessments risk stimulating assessments without generating upgrades, though they appear to be important for low-income customers. A handful of grantees directly installed conservation measures during the assessment; this type of direct installation is another approach to providing services for free. These free installation services produce the valuable outcomes of immediate energy savings and increase the experience and skills of the contractors conducting this work. However, they do not promote a sustainable market approach to building upgrades, which requires some direct economic exchange between end-users and suppliers, even if that exchange is subsidized.

Financing has been slower for grantees to develop. Grantees need to find a partner and develop useful financing products. Some grantees have found little participant interest in financing when rebates are available. Some grantees have found ways to combine financing and rebates to make projects more appealing. What seems most important for financing is the integration of financial loan offerings with other efforts to drive demand. While the programs typically have a financial partner, the programs can help ensure participants qualify for loans and can thus obtain the administrative loan fees for their program. One grantee integrated the loan product and the rebates by creating a performance-based incentive that increases the ratio of project costs eligible for incentive funding, as opposed to loan funding, as participants achieve greater energy savings as a way to motivate participants to pursue more comprehensive projects.

Money and services are important, but how they are packaged to drive demand for upgrades has been the focus of much of the grantees' learning during the first two years.

Stimulating Supply

We found three components that stimulate supply:

- *Interaction with the Contractor Market* training and coordinating the supply of contractors capable of doing energy upgrades
- Supply of Energy Efficiency Financing developing financial products that support energy financing
- *Utility/Program Administrator Relationships* coordinating and working with program administrators of ratepayer-funded energy efficiency programs

Interaction with the Contractor Market. The basic roles and their variants for how grantees work with the contractor market can be characterized along three dimensions:

- *Facilitation* either the program staff facilitates the participation process for end-users (such as with an Energy Advisor) *or* no facilitation role exists.
- *Assessment* either the program conducts or assigns the assessments to an assessor *or* the end-user selects the (program-approved) assessor.
- *Upgrades* either the program conducts or assigns the upgrades to contractors *or* the end-user selects the upgrade contractor.

We found that four of the six grantees that use facilitation are among the most successful grantees; this clearly suggests facilitation provides value, although it is not essential. It is costly to the program to use program staff in an advisor role. Thus, it is a model that will evolve as the supply market matures and contractors develop the technical and sales skills to drive quality upgrades.

In some cases, grantees choose to conduct or assign assessments directly because they use a simplified audit or, more commonly, because the supplier market included few firms – perhaps a single firm – with the necessary assessment qualifications.

For those grantees using independent contractors for the assessments, quality assurance drove their preference. A few grantees have program staff with the necessary qualifications to conduct quality control (QC) inspections. Most grantees do not require that assessors have BPI certification, because so few firms have this.

Upgrades are installed by program staff in a few cases, primarily direct install programs; in other cases, independent contractors install measures. Figure 4 depicts the various roles of independent contractors for upgrade and assessments.





Seven programs, including five successful ones, require assessments be conducted by individuals holding BPI certification.¹² However, three of these programs (all successful) use program staff or support contractors as assessors, so that the requirement of BPI certification for assessors may not reflect a large supply of qualified assessors in the marketplace. The success of grantees that require that assessors have BPI certification may be a result of the certification requirement, a program design that

¹² Additional grantees require at least one individual in the firm to hold BPI certification and many grantees encourage, but do not require, BPI certification.

²⁰¹³ International Energy Program Evaluation Conference, Chicago

hand-selects the assessors, or a bit of both. One successful grantee also requires upgrade contractors to be BPI-certified.

Among other program variants with respect to certification, one program had BPI certification requirements for its insulation and air sealing residential contractors, but not for its residential equipment contractors or for its commercial contractors.¹³ Two grantees (serving the commercial sector, including multifamily) require some type of broadly relevant certification, accepting contractors with BPI, Certified Energy Manager, Certified Commercial Energy Auditor, Professional Engineer, and comparable certifications.

Six of the grantee programs, including the programs of two successful grantees, require that upgrades meet Home Performance with ENERGY STAR (HPwES) requirements. Five of these programs do not require participating contractors to have BPI certification, yet require HPwES training and the ability to deliver an HPwES-qualifying upgrade.

Six of the ten successful grantees and about 20% of the other grantees spoke during our interviews about the importance of communicating with their program's contractors. Programs benefit when staff confer with the contractor community before launch. The resulting feedback provides staff with an opportunity to ensure that their assumptions about how end-users and contractors engage in the marketplace are correct and that program processes will work for participants and contractors.

The variety of models and the limited confirmation that any one model leads to success may surprise readers, but it confirms that there are many ways to stimulate the supply of contractors capable of delivering energy upgrades. In fact, generally we conclude that there must be multiple factors to be successful and that the key is the engagement and involvement with the contractor market so that it can grow and develop. At the same time, confusion in these roles can cause problems and thus being clear about the roles is an important component of BBNP.

Supply of Energy Efficiency Financing. Grantees have taken two broad approaches to ensuring that an adequate supply of financing is available to support energy efficiency projects. First, some grantees have used their grant funding or other capital to make loans directly through mechanisms like revolving loan funds. These grantees noted that using their own capital to make loans provides them greater control over lending requirements and allows them to use the interest that the loans generate to support their programs. However, these grantees also noted that this strategy places them at risk if participants default.

The second broad approach used to ensure an adequate supply of financing for energy efficiency projects involves partnering with a financial institution that will agree to supply the capital and administer the loans in exchange for the interest the loans generate.

Grantees found that credit unions, community development financial institutions (CDFIs), and smaller, local banks are more receptive to offering energy efficiency financing than larger, national banks. This is consistent with the findings of an ACEEE white paper, which states that the assets generated by efficiency finance programs are typically well below the amounts that large commercial banks seek (Freehling 2011).

Interview findings also suggest that grantees' experiences offering financing outside of energy efficiency may facilitate their efforts to establish loan offerings for efficiency projects. Grantees who had offered financing in other areas (such as for community development) noted that having staff with the skills and knowledge to administer financing programs, and already having addressed regulatory issues, allowed them to launch financing programs more quickly.

In order to overcome concerns over the risk associated with energy efficiency loans, grantees provided financial institutions with incentives to offset the risk of loans and motivate more attractive

¹³ This grantee requires each participating residential insulation/air sealing contractor firm include at least one BPI-certified staff member, and requires that person to sign off on each air sealing and insulation job. This grantee also requires all workers on a job to have completed a two-day training that they developed and dubbed *BPI-light*.

lending terms. Grantees have most often used loan loss reserve funds¹⁴ for this purpose. The interviewed grantees reported mixed results in their efforts to motivate financial institutions through loan loss reserves. While some credit their loan loss reserve funds with helping to leverage a great deal of capital from lenders, others reported that lenders were reluctant to take on efficiency loans, even when offered the reserve.

The experience of grantees with more established financing offerings suggests that financial institutions become more willing to provide financing as their experience with efficiency loans grows – and as efficiency loans lose their status as new products.

Grantees described efforts in defining lending requirements that balance the need to serve prospective participants with sufficient protection against loan defaulting. Loans are typically offered to the most creditworthy applicants unless programs use another criterion, such as utility bill payment history. This approach was effective when it was used. Yet, for at least one grantee, over time the lenders became comfortable with the loan just from the experience of having successful loans, so that neither enhancements nor extra conditions are now necessary to engage lenders.

Utility/Program Administrator Relationships. Existing utility-funded energy efficiency programs are an important element of the energy efficiency markets in which grantees operate. Like grantee programs, many utility programs seek to both drive demand for energy efficiency retrofits and ensure that the market can provide a sufficient supply of energy efficiency products and services. When possible, grantees have sought to leverage utility program offerings, including incentives and energy audit programs. Utilities can also provide grantees with access to data important to determining the impact of program efforts.

Grantees reported primarily positive or neutral experiences working with utilities. Anecdotally, a strong utility-grantee relationship appears to support grantee success and for the final report, we expect to have more data to explore this. The most successful grantees reported their interactions with utilities as positive more often than less successful grantees. Grantees reported that they benefited from the utility's depth of experience in efficiency and said that the utility partnership improved uptake of the grantees' program offerings.

Recommendations

Our findings reinforce the notion that the four pillars offer a sound framework for developing an integrated energy efficiency program. *Demand* (marketing) and *supply* (workforce and financing) strategies, and the program processes that support them (including data and reporting) must work together – have the same objectives, complement each other, and reinforce each other – in order to attain any degree of market success. For each of the aspects of the demand and supply side that we investigated, successful grantees vary in their approaches, a finding that indicates there are no "must have" features. Further, some grantees used one or more aspects of the demand and/or supply side approaches used by the successful grantees, yet still were less successful – a finding that indicates no single feature guarantees success.

Nevertheless, we believe the following specific factors will increase BBNP success, regardless of the variation among grantees and their programs. Keeping these factors in mind, DOE should, in this final program year:

• Encourage grantees to clearly identify who has or should have the role of selling the upgrade and then provide sales training to those individuals.

2013 International Energy Program Evaluation Conference, Chicago

¹⁴ *Loan loss reserve* is the accounting of funds held in reserve to cover loan losses, the need to differentiate reserve amounts is related to perceived riskiness of the investment and can vary from quarter to quarter.

- Encourage grantees to include messaging that emphasizes comfort and solutions to building problems.
- Encourage grantees in their continued efforts to simplify assessments and connect the assessment to the upgrade sales process.
- Encourage grantees to sponsor meetings that give contractors opportunities to share their experience and insights with each other and with the grantees' program teams.
- Encourage grantees to have a program with multiple components that together logically and coherently drive demand and stimulate supply.
- Promulgate these findings to market informants who lack an empirical evidence of the reasons for program success and failure, and are generally unaware of the BBNP efforts.

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