Herding Cats: The Approach and Challenges of the Preliminary Impact Evaluation of the National Better Buildings Neighborhood Program

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ABSTRACT

The Better Buildings Neighborhood Program (BBNP) was first announced in April, 2010 and is a component of the Better Buildings Initiative—a program within the U.S. Department of Energy (DOE). DOE issued $508 million for energy efficiency programs for residential, commercial, industrial, and public buildings to 41 grantees across the US. DOE wants these programs to deliver high quality retrofits resulting in significant efficiency improvements to buildings within targeted communities.

A preliminary impact evaluation of the BBNP is being conducted in an effort to develop independent, quantitative estimates of the direct energy and cost savings impacts for projects completed with program funding. This evaluation will assess projects completed through the second quarter of 2012 by utilizing measurement and verification (M&V) techniques on a sample of grantees and participants.

The scope of programs offered by the grantees varies from prescriptive rebates for energy efficiency measures to whole house/building energy audits and weatherization. Grantees are using a variety of methods for calculating project impacts, including energy modeling, deemed savings, and engineering algorithms.

Challenges that the impact evaluation team faced during the planning of the evaluation include: scale and scope of BBNP; varying reporting and tracking systems; varying approaches and methods for calculating impacts; and the timing of the evaluation activities in relation to the grant funding schedule. The evaluation team designed and is currently implementing a flexible approach to effectively addressing these key challenges. This paper describes the planning methods utilized to address these challenges, our overall evaluation approach, and lessons learned to date.

Introduction

The BBNP was first announced in April 2010 and is a component of the Better Buildings Initiative—a program within the DOE's Office of Energy Efficiency and Renewable Energy (EERE). DOE issued two separate funding opportunities to support BBNP partners. In October 2009, DOE issued the first competitive funding opportunity announcement (FOA), using Energy Efficiency and Conservation Block Grant (EECBG) funds to provide grants to state and local governments for the purpose of testing potential energy upgrade business models and improving building energy efficiency across the country. In June and August 2010, DOE awarded $482 million to 34 grant recipients in amounts ranging from $1.4 million to $40 million. According to the FOA, "DOE is specifically targeting these funds for high-impact awards that will enable large-scale programs of ongoing energy efficiency retrofits on residential, commercial, industrial, and public buildings in geographically focused areas. These programs should result in high-quality retrofits resulting in significant efficiency improvements to a large fraction of buildings within targeted neighborhoods, technology corridors or communities (i.e. "whole-neighborhood" retrofits)."

In April 2010, DOE issued a second competitive FOA under the State Energy Program (SEP) for additional awards and in November 2010, DOE awarded $26 million to seven SEP award recipients. In summary, total funding under the BBNP was approximately $508 million for energy efficiency upgrade and improvement programs for residential, commercial, industrial, and public buildings. The state and local governmental entities that were awarded the grants are working with nonprofits, building energy efficiency

experts, financial institutions, utilities, and other organizations to develop community-based programs and incentives for building energy upgrades. Grantees are located across the country as depicted in Figure 1:
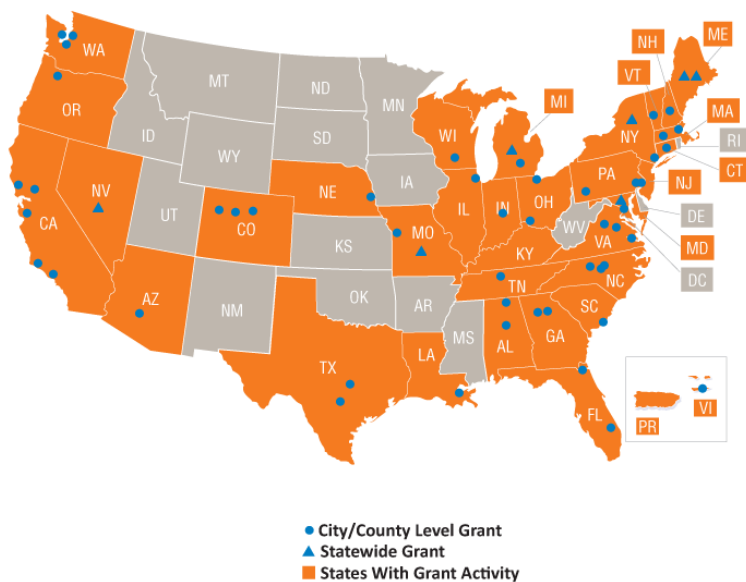
Figure 1: Grantee Locations

BBNP Objectives and Expected Program Effects

The DOE outlined four primary objectives for the BBNP:

1. Initiate building energy upgrade programs that promote projects estimated to achieve energy savings in more than 40 communities.
2. 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.
3. 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.
4. Document lessons learned that can be replicated beyond initial grants and their jurisdictions, in order to expand impacts of BBNP investments.

Based on these objectives, the DOE's expected program effects for the BBNP include:

➡ Develop sustainable energy efficiency upgrade programs
➡ Upgrade more than 100,000 residential and commercial buildings to be more energy efficient
➡ Save consumers approximately $65 million annually on their energy bills
➡ Achieve at least 15% energy savings from energy efficiency projects
➡ Reduce the cost of energy efficiency program delivery by 20% or more
➡ Create or retain approximately 30,000 jobs
➡ Leverage more than $3 billion in additional resources.

In order to achieve the metrics outlined by the DOE, the grantees developed numerous programs to improve the energy efficiency of buildings in both the commercial and residential markets. These programs generally focused on providing education and training for residents, business, or contractors, and/or providing financing and/or rebates for the installation of energy upgrades. Most grantees offered programs

for the residential market while approximately two-thirds offered programs for commercial or agricultural markets.

Impact Evaluation Objectives

The overall objective of the preliminary impact evaluation is to develop independent, quantitative estimates of BBNP's direct impact on energy and cost savings for projects completed through the second quarter (Q2) of 2012. Through Q2 2012, approximately 28,000 projects have been implemented across 39 of the 41 grantees. Additional metrics to be evaluated as part of the impact activities include lifetime energy savings, greenhouse gas emission savings, and demand savings. Job creation will be the only non-energy benefit analyzed, which is examined as part of the economic evaluation. This preliminary impact evaluation will help inform the DOE and the individual grantees about the status of their programs after approximately two years of implementation efforts. A final impact evaluation is planned and will focus on verifying a sample of grantees reported activities after Q2 2012 and quantifying impact metrics for the entire grant cycle of the BBNP. DOE's key metrics to be measured as part of this evaluation include:

→ Number of energy units saved – by project, by program

→ Costs saved – by project, by program

→ Number of energy efficiency measures installed

→ Number of households/businesses retrofitted

→ Number of renewable installations

→ Number of jobs created/retained

→ Economic output, personal and business income, tax revenue.

An evaluation plan was developed for the preliminary impact evaluation in an effort to address these key objectives. The plan was approved in February 2013 and was implemented through the beginning of June 2013. The draft report of the preliminary impact activities and results was delivered to DOE on June 17, 2013 and is currently under review.

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While at the surface, it may appear that many of the programs offered by grantees are similar to utility-funded DSM programs, the BBNP programs are quite unique. In contrast to typical utility energy efficiency programs, which have a goal of capturing cost-effective energy savings, the BBNP was launched with multiple, often conflicting, goals. Through the BBNP, the DOE is looking to stimulate the economy, spend money quickly, create jobs, develop the "market" (supply and demand) for home retrofits, try innovative approaches, and "learn" about how to accomplish home retrofits, all in addition to capturing energy savings. In addition, individual grantees program approaches and design decisions are often emphasizing different goals, resulting in a very complicated mix of program offerings.

Therefore, any examination of the energy savings and "cost-effectiveness" of BBNP must be placed into that context. These lofty and conflicting goals, along with the scattered nature of the grants awarded around the country, all lend themselves to a challenging and atypical impact evaluation.

From the beginning of the evaluation planning period, the team foresaw several methodological and logistical issues that would create challenges in the development and implementation of the impact evaluation activities. At a high level, these include:

➡ *Scale and Scope of BBNP*: The BBNP provided funding to 41 grantees, who are implementing a wide range of programs across the country. During the planning period, the team worked to develop a statistically significant, yet cost-effective evaluation approach for the M&V activities.

➡ *Reporting and Tracking:* Grantees use a wide variety of tracking and reporting systems that range from Excel spreadsheets to specially designed software. The team worked with both the DOE and grantees to gather and analyze data tracked and reported in these multiple database formats.

➡ *Calculation of program impacts:* Each grantee calculates energy and demand impacts utilizing different energy models, numerous deemed savings values and engineering analysis approaches. The evaluation team developed standardized approaches for verifying gross[1] program impacts.

➡ *Program schedule:* The impact evaluation activities are being conducted over a three year time period. There is about a 7 month overlap of the preliminary evaluation activities while the grantees are still operating programs and shortly after, many grantees will begin shutting their doors. The grantees are very busy during these last few months of their grant funding cycle and are also in the midst of trying to plan an approach to keep their programs operational after the funding cycle is over. The evaluation team prioritized data requests and made the grantees aware of the importance of getting access to project details for the preliminary impact evaluation.

The remainder of this paper describes each of these challenges and how the initial evaluation planning and overall evaluation approach worked to address these challenges. The team found the need to be dynamic and flexible throughout the evaluation because many of the challenges continued to evolve and change as data requests were made and information was being received from the grantees.

Scale and Scope of BBNP

BBNP is significant in size, breadth and depth, as well as unique in scope. A total of 41 grantees were granted$508 million in funds to offer energy efficiency programs that needed to be created quickly and frequently by grantees with little experience offering such programs. Table 1outlines the progress of BBNP through Q2 2012, the time period applicable to the preliminary impact evaluation.

Table 1: BBNP Progress through Q2 2012.

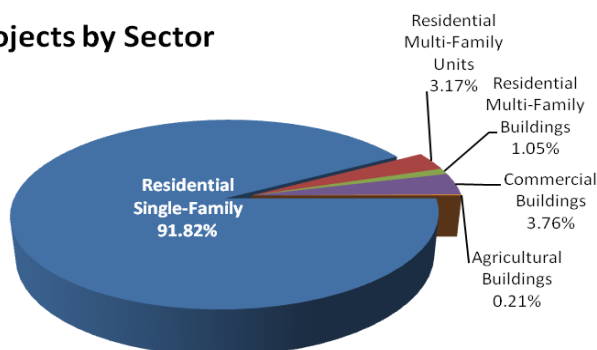| METRIC	RESULTS THRU Q2 2012	OVERALL PROGRAM BUDGET/GOAL	% TOTAL ACHIEVED
Spending	$258 million	$508 million	51%
Projects	27,853	172,792	16%
Grantees with Projects	39	41	95%
Total Reported Energy Savings (Source)	1,784,699 MMBtu	-	
$/MMBtu Saved (Source)	$142/MMBtu[2]	-	

To further understand the scale and scope of BBNP, the breakdown of projects and reported energy savings by sector was assessed. It was found that while the majority of projects completed by participants

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[1] The estimation of net savings is another challenge the team faces. The focus of this paper is on gross impacts and other members of the evaluation team examined and addressed the net savings issue.

[2] Savings as reported to DOE by Grantees for projects completed through Q2 2012.
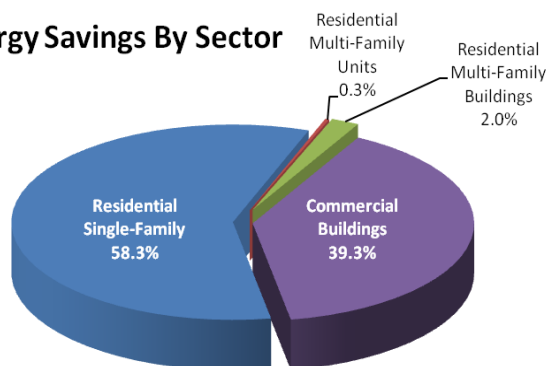
occurred in the residential sector (92%), only 58% of the reported energy savings occurred in that sector. Nearly all of the remaining energy savings were found in the commercial sector. Multi-family projects counted for a very small percent of both projects and savings. Figure 2 shows the breakdown of projects by sector, and Figure 3 shows the breakdown of energy savings by sector. From these initial results, it was apparent that the evaluation team would need to take into consideration during the evaluation planning that while there are significantly more residential projects, the commercial sector still represents a large portion of the overall reported energy savings.

Projects by Sector

Residential Multi-Family Units 3.17%

Residential Multi-Family Buildings 1.05%

Commercial Buildings 3.76%

Residential Single-Family 91.82%

Agricultural Buildings 0.21%

Figure 2: Projects by Sector

Energy Savings By Sector

Residential Multi-Family Units 0.3%

Residential Multi-Family Buildings 2.0%

Residential Single-Family 58.3%

Commercial Buildings 39.3%

Figure 3: Energy Savings by Sector

Approach

The impact evaluation team felt that in order to address and manage the scale of the scope of the BBNP, the sampling and work approach needed to be carefully designed and succinct, and the impact evaluation team needed to provide one point of contact between the grantee and the evaluation efforts.

Sample Design: In order to effectively manage the scale and scope of the BBNP for the evaluation, the impact evaluation team designed an approach to conduct M&V activities on a sample of projects completed across the grantees. The goal for the sampling task was to achieve a practical and manageable approach, which still provided a high level of confidence and precision for the overall BBNP. This has proven to be challenging given the large number of grantees and projects and the wide variety in the types of programs offered and projects implemented. Unlike a utility-funded demand-side management (DSM) program that has a more narrow focus, BBNP has a wide focus and a wide variety of offerings. In order to address this and provide the most cost-effective sample for the M&V activities, a Value of Information

(VOI) approach was employed[3]. VOI is used to balance cost and rigor and follows a process to allocate the bulk of the M&V funds to areas with high impact and high uncertainty. Ultimately, 385 projects were selected for the sample frame of the M&V activities. The M&V activities included desk reviews and telephone surveys on the full sample. A subset of this sample population, which was established based on available budget, was selected for on-site verification activities. In order to balance costs, these on-sites were clustered at randomly selected grantees rather than spread across all grantees.

The BBNP sample frame was then stratified into three strata based on the key sectors receiving services from the grantees: residential, multi-family, and commercial. This stratification allowed for the grouping of similar project types that will aim to increase the homogeneity within each stratum and reduce the expected variation in the verified results. Stratification occurred at the project level, as opposed to the measure level, due to the lack of detail provided in the reporting databases regarding measures implemented. The evaluation team allocated samples to each stratum based on the magnitude of the reported savings for each sector in the sampling frame. Table 2 outlines the sampling approach for each of the three strata.

Table 2: M&V Sampling First-Level Stratification

Strata	# of Projects Implemented *	Source Energy Saved (MMBtus)	% of Sample Frame Savings	Desk Analysis With Telephone Survey Verification Method	On-Site Analysis Verification Method (Subset-Sample)
				Anticipated Sample Size (# of projects)	Anticipated Subset Sample Size (# of projects)
Residential	23,461	821,112	61%	237	40
Multifamily	390	31,891	2%	9	-
Commercial **	1534	482,864	36%	139	25
Totals	**25,385**	**1,335,867**	**100%**	**385**	**65**

*Data obtained from Q2 2012 Data Summary from DOE for grantees selected for M&V sampling

**Includes Agricultural as these retrofits focused on building improvements on farm buildings

The next step was to allocate the sector sample size to the populations within each sector. Due to the differing characteristics between each sector, the team used three allocation methods:

➡ The Dalenius-Hodges method[4] was used to create strata boundaries according to the size of the grantee energy savings within the residential stratum. This method created three sub-strata within the residential stratum: small, medium, and large.

➡ The Neyman allocation method[5] was used to allocate the sample to each of the three stratum created by the Dalenius-Hodges methodology. An allocation variable was created as a function of total strata reported energy savings and the assumed coefficient of variance (Cv) of the particular

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[3] Value of information is utilized in the California Evaluation Framework as a way to address uncertainty and to determine the appropriate allocation of resources to an evaluation. See page 305 in *The California Evaluation Framework,* prepared by TechMarket Works and project team members, June 2004.

[4] Cochran, William. *Sampling Techniques*. Third Edition. 1997. The Dalenius-Hodges methodology is used to determine optimal strata boundaries based on the cumulative root frequency method.

[5] Cochran, William. *Sampling Techniques*. Third Edition. 1997. Neyman allocation is a sample allocation method that is most often used with Dalenius-Hodges. It allocates sample size to strata based on product of stratum size and uncertainty in order to maximize survey precision, given a fixed sample size.

strata. The team assumed that the grantees with a smaller level of savings would likely have more variance relative to each other and thus increased the assumed Cv for the small sub-stratum relative to the large.

➡ Random selection of samples within each of the sub-stratum allowed for the allocation of samples across the entire sample frame of the grantees within that stratum; wherein, if a further sub-stratum was created that allocated the samples further based on reported savings, several smaller grantees may implicitly be eliminated from the sample frame.

This overall sampling approach resulted in the selection of 30 of the 39 grantees who had implemented projects by the end of Q2 2012. Many grantees offer programs for both the residential and commercial sector, therefore, some were selected for both sector samples, resulting in 22 grantees with residential projects and 15 grantees with commercial projects in the sample frame. Three of the 9 grantees offering multi-family programs were included in the sample frame as well. Of the 30 grantees selected for sampling, on-site activities were selected for 9 of them, across the residential and commercial projects.

The results of the M&V activities are currently under review and, therefore, results, and the impact of the sampling strategy, are not available at this time. Due to some data inconsistencies found by the evaluation team and inaccessibility to data, adjustments to the originally proposed sampling strategy have been necessary. For example, one grantee selected for on-site activities was only able to provide limited contact information for their participants, resulting in smaller than expected samples. Re-allocations were made to account for these activities in order to allow for the sample sizes and stratification approach to remain intact.

Grantee Assignments: Due to the fact that the evaluation activities involved the review and analysis for 30 different grantees and their programs, grantees have been strategically assigned to one evaluation team member, and one team member is assigned no more than 6 grantees each. This allows the evaluation team to build stronger relationships with the grantees to help ease data requests and allow the team member to gain a strong understanding of their grantee programs and project types, both during the preliminary and final evaluation activities.

Accuracy in Reporting and Tracking

A critical component to the effective implementation of the impact evaluation is access to complete and accurate data from the BBNP. These data are needed to develop reported savings values, design sampling strategies for verification activities, calculate verified savings, develop realization rates, and determine statistical confidence and precision of the analysis. Discussions with the DOE staff and a review of the data uncovered two main issues associated with the accurate reporting and tracking of the BBNP energy savings that impacted both planning and evaluation activities.

First, there is a wide variety of tracking and reporting systems used by the grantees. Each grantee uses internal tracking and reporting systems. These systems range from basic Excel spreadsheets to tailored reporting/tracking software with each grantee capturing varying levels of information and details from the respective program participants. As part of the evaluation activities, these tracking and reporting systems are being reviewed and analyzed, to help the team effectively understand the grantees' programs and projects.

The wide array of tracking and reporting systems also result in complexities with the data compiling process. Each quarter, grantees are required to submit program implementation results using a DOE-provided form. The DOE then uploads the information from these reports into a central database and uses the data to generate grantee and BBNP totals for savings, projects implemented, grant money spent, and other key reporting metrics. Additionally, the DOE creates reports detailing energy savings and measures

implemented at the project level. However, this upload and compilation process depends on the accuracy and completeness of the data submitted by the grantees. Due to inconsistencies with grantee reporting and tracking, proper use of the DOE-provided forms, and the tracking of different fuel type savings, the data often do not accurately sync across DOE-generated reports.

Approach

The evaluation team understands the significance of accurate reporting and tracking and how greatly this can impact the efforts and results of a program evaluation. Significant time and resources were spent interviewing DOE and grantee staff to help clearly understand the data collection and submittal process. A multi-pronged approach was used to ensure that the tracking and reporting systems are accurate, such as:

→ Working closely with DOE staff to understand the data gathering and reporting processes and the actual databases with project and grantee level information. The team reported any issues or particular areas of concern to DOE staff for explanation and resolution.

→ Conducting a thorough analysis of documentation associated with a sample of projects selected at random across the grantees. This analysis helped the team understand the development of the reported savings values and determine whether reporting issues may have impacted the accuracy of the reported savings values.

→ Conducting both phone and on-site verification surveys. These surveys enabled the team to verify the accuracy of the reported project details by interacting with participants to both verify what measures were installed as well as to understand key information about their residence/business that impacts energy savings.

These activities hopefully ensured that the tracking and reporting data provided by the DOE are accurate, and therefore, will enable the evaluation team to achieve the desired level of confidence and precision of the overall results.

Calculation of Program Impacts

The DOE provide guidance and feedback to the grantees regarding approaches and methodologies for calculating energy savings, however, the grantees often needed to structure their programs to meet the specific needs of their local communities. This structure often included the calculation of energy savings resulting from their projects. In order to calculate the energy saving estimates reported to the DOE, grantees are using a deemed approach, or a modeled approach, or a combination of both. The deemed approach involves the use of predetermined energy savings values for measures implemented for each project. These deemed values are gathered from a wide range of sources including local utilities, implementation contractors, DOE provided data, etc. The modeled approach involves the use of energy models that are built specifically to the project parameters (i.e. building type, square footage, energy using systems, weather, etc.) in order to determine an energy savings estimate. There are at least 19 different energy modeling software programs in use across all the grantees, and some grantees are using more than one modeling software programs. The majority of grantees (~70%) are using either a modeling-only or a combination modeled and deemed savings approach. The remaining grantees are using a deemed-only approach.

The variety of methods used by the grantees to calculate energy savings creates challenges for DOE and the evaluation team. One effect of the wide-ranging approach to determining energy savings is that the reported savings on a per-project basis are quite varied across the grantees. Figure 4 shows how the average savings per residential project ranges from less than 10 MMBtu to 120 MMBtu and Figure 5 shows that the

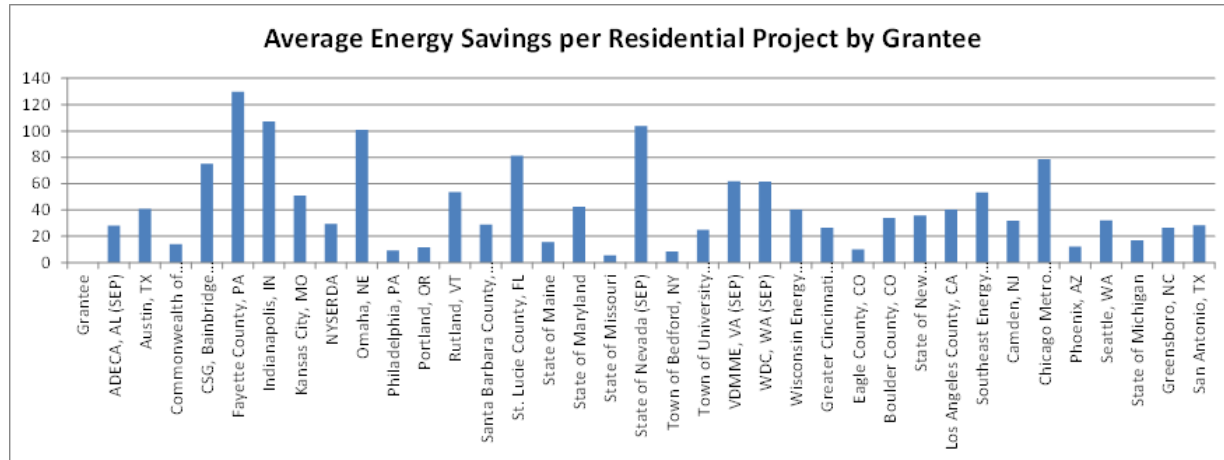commercial average savings range from less than 100 MMBtu to more than 5,000MMBtu on a per project basis.

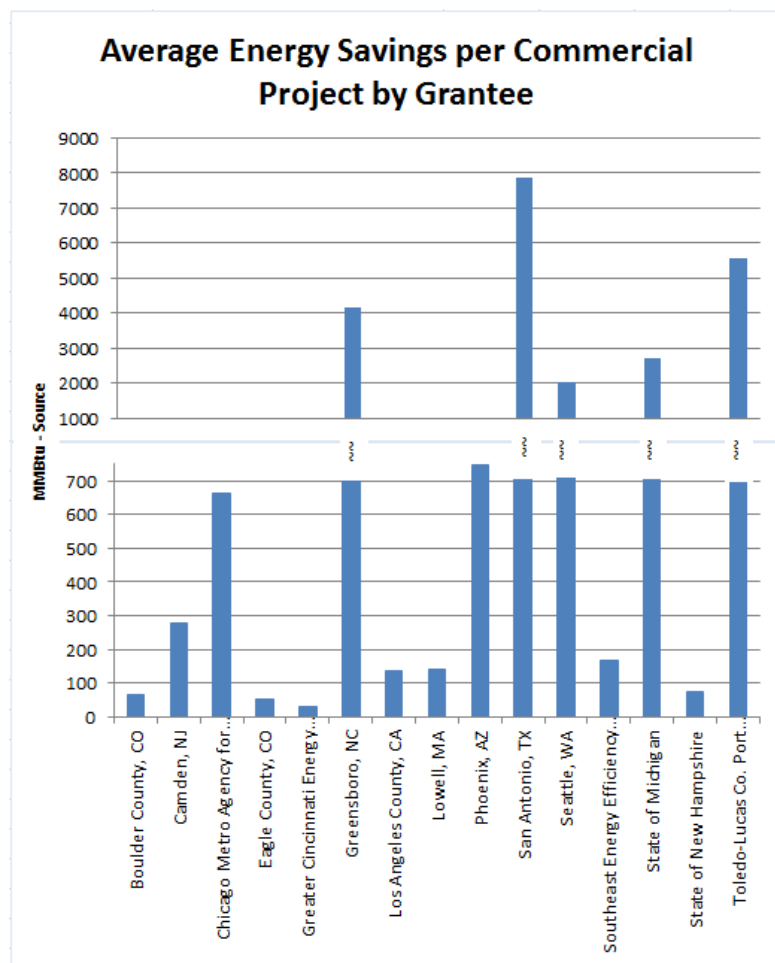**Figure 4: Average Savings per Residential Project by Grantee**

Figure 5: Average Savings per Commercial Project by Grantee

An important part of the roll-up activities for the evaluation is the determination of project-level realization rates. In a typical utility program evaluation, savings estimated from impact activities are aggregated at the project level and compared to reported savings from project documentation to determine a project type realization rate. This realization rate is then used to calculate an overall verified savings value by multiplying it against reported savings. Therefore, the project-level reported savings value is a significant factor in the accuracy of extrapolating the sample results to the population, and determining the program impacts.

Approach

In order to address this challenge, the evaluation team worked closely with the grantees to understand their savings assumptions built into either deemed savings or energy modeling. These assumptions are being further researched using secondary sources to verify accuracy and appropriateness of use. Ultimately, the methodology used to calculate program impacts was dependent upon the estimation methods used by the grantee due to the project-specific information that is available and tracked, as summarized below:

→ *Computer Modeling:* In cases where a grantee requires that an energy model be developed for each implemented project and an energy model is available for review, information gathered during the M&V activities was utilized to verify the input parameters used in the model, including the baseline condition, and to assess the inputs for reasonableness.

→ *Deemed Approach:* Many grantees are using a wide variety of deemed energy savings values for measures implemented through their programs. For these cases, standard engineering algorithms were used to determine verified energy savings. These algorithms include formulae and procedures for taking local weather conditions into account. Stipulated values were used for variables that cannot be verified or measured through the telephone surveys or on-sites. This approach is proving to be more time consuming than originally planned due to the geographically scattered nature of the grantees. Engineering algorithms and stipulated values have been developed for nearly 20 different 'cases' based on geographical location and local standard practices (i.e.. the use of local Technical Reference Manuals[6] (TRM's) or guidelines such as the Uniform Methods Project[7], Regional Technical Forum[8] (RTF), Database on Energy Efficiency Resources[9] (DEER), etc..

The evaluation team did conduct utility bill regression analysis on those grantees that were able to provide sufficient billing data. The results from the billing analysis were rolled up with the results of the measurement and verification approach in order to estimate a BBNP program-wide realization rate.

Timeframe for the Evaluation Activities vs Program Funding Schedule

The evaluation activities of the BBNP will span a three-year time frame. Therefore, the evaluation efforts for the preliminary evaluation are occurring while the programs are being offered and as projects are being implemented. This creates challenges in understanding anticipated budgets, reported energy savings,

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[6] Several local and regional TRM's were used in the analysis. Examples include the Efficiency Vermont TRM (February 19, 2010), the State of Ohio Energy Efficiency TRM (August 6, 2010), State of Illinois Energy Efficiency TRM (June 1, 2012), among others.

[7] NREL Uniform Methods Project. http://www.nrel.gov/extranet/ump/ Draft Protocols March 27, 2013 version.

[8] http://rtf.nwcouncil.org/

[9] The Database for Energy Efficient Resources (DEER). Database maintained by the California Public Utilities Commission and the California Energy Commission. http://www.energy.ca.gov/deer/. Accessed 7/9/2012.

and detailed scope of the services and projects offered by the grantees. Also, programs and strategies for implementation have evolved as grantees continue to learn more about program delivery both from their own experience and the experience from other grantees. This has resulted in program changes mid-stream that contribute to reporting and tracking inconsistencies both during the preliminary evaluation timeframe and, more significantly, during the final evaluation timeframe.

Ideally, conducting an evaluation while the program is still operational would present an opportunity for the evaluation team to work with grantees and advise them on program best practices, as well as how to gain accessibility to utility data and methods for tracking and reporting data in a form that the evaluation team can use. However, most of the grants are coming to the end of their program cycle, and programs will cease to exist in their current DOE-funded form by the end of third quarter (Q3) 2013. Grantees are, therefore, very busy as they are nearing the end of their grant cycle and looking for funds to continue their current program offerings, leading to challenges in obtaining the necessary project level data needed to conduct the evaluation activities.

This has already and will continue to result in dynamic changes to the M&V approach. In addition, this schedule will provide additional challenges to the evaluation team for the final evaluation activities because many grantees may be shutting their doors just as the final evaluation is getting underway.

Approach

Preliminary assessment activities included interviews with grantees and program staff which inquired about the history and future of each program. The evaluation team has and will continue to move quickly to gather the information needed for the preliminary evaluation and the final evaluation. Data requests were prioritized and the relationships built with grantees were utilized in efforts to gather project specific information as quickly as possible for the preliminary evaluation. In addition, the evaluation team set "hard-stop" dates related to data requests in order to allow for enough time to reallocate samples to areas where sufficient program data was not received. This helped the evaluation team maintain statistically significant samples sizes for the M&V activities without extending the timeframe of the preliminary evaluation.

Stop Chasing Your Tail: Lessons Learned to Date

The draft report of the findings for the preliminary evaluation activities was delivered to DOE on June 17, 2013 and is currently under review. The level of cooperation from the grantees varied significantly, and the amounts of data provided by the grantees also varied. The evaluation team has learned many lessons throughout the process and expects to learn more in the future. Several lessons-learned to date include:

➡ *Allow sufficient time to request and gather data from the Grantees:* Initial data requests were made to the 30 grantees on February 25th, 2013, shortly after the final approval of the Research Plan. By May 31, 2013, participant contact data and project data had been received by 24 grantees. Grantees are busy, frequently understaffed, and unlike most utility companies, they are not equipped with the tools and databases to easily extract participant and project level information. It is necessary to give them sufficient time to gather the data that are being requested. In addition, making clear and concise data requests are necessary to help speed up the response time and alleviate any concerns or questions that they may have regarding data needs.

➡ *Proper sampling techniques:* When seeking to examine savings across multiple and diverse programs such as those offered through BBNP, the team needed to examine the effectiveness of the sampling and the level of rigor employed on the sample. Budget and time constraints put limits on the ability to sample at a high level of rigor across all the grantees. The team designed the sampling strategy with the knowledge that the programs were very diverse and that the reporting procedures were varied and not always consistent. Therefore, the sampling parameters

we used to determine the sample sizes took this uncertainty and potential range of error into account.

→ *Know when to stop asking:* When requesting data from 30 different grantees, many of whom are not already practiced in the area of program evaluation, it is necessary to be patient yet persuasive regarding the importance of the data requests. It is also necessary to know when to stop asking for more data and just move forward with what has been provided. The team set a 'drop-dead' date that acted as a hard-stop on data requests as related to the preliminary evaluation. This was necessary in order to allow the team to meet the deadlines related to the preliminary evaluation, and to develop an evaluation plan for the final impact evaluation.

→ *Be flexible:* The evaluation plan was based on preliminary grantee interviews and the review of available data at a certain point in time. After the team fully analyzed the data that were provided by the grantees, changes were made in the sampling design and approach. Additionally, grantees provided periodic project updates which adjusted savings and project counts throughout the evaluation activities. The team had to analyze these adjustments to determine the impact on the validity of the sample.

→ *Design and enforcement of proper reporting processes:* The design of proper reporting processes and concise yet all-inclusive data capturing procedures is the key lesson learned from the preliminary evaluation. This lesson can be carried into energy efficiency program design, both for utility-funded structures and for non-utility structures such as those that exist in BBNP. Designing a reporting structure that captures the basic data effectively and accurately is essential to a successful program both in the near term and the long term. Clear reporting procedures lead to a better understanding of the program effects, which in turn, helps lead to better program design in the future and greater program success. Additionally, some level of enforcement regarding the proper reporting helps encourage accountability.

The evaluation activities being conducted for BBNP appear, at the surface, similar to a typical utility-funded program evaluation, and many of the lessons learned to date can be extrapolated to the design and evaluation of a typical DSM program evaluation. However, different from most utility-funded programs, BBNP grantees were not given energy savings goals, or cost-effectiveness targets. Instead, they are being asked to offer programs in their cities and counties that will help transform the market (both for the consumers and the contractors), and stimulate economic activity and employment. Grantees have developed a wide range of innovative programs with these goals in mind. It is the evaluation team's challenge to remind the grantees about the importance of achieving energy savings through their programs, to help document results, and to determine how effective the numerous BBNP strategies have been at achieving that energy savings objective.

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