Better Buildings
NEIGHBORHOOD PROGRAM
U.S. DEPARTMENT OF ENERGY

Austin, Texas, Summary of Reported Data From July 1, 2010 – September 30, 2013

Better Buildings Neighborhood Program

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ACKNOWLEDGMENTS

This document presents a summary of data reported by an organization awarded federal financial assistance (e.g., grants, cooperative agreements) through the U.S. Department of Energy's (DOE's) Better Buildings Neighborhood Program (BBNP) from July 2010 or September 2010 through September 30, 2013. Although some awards have been extended into 2014, only the data reported through the end of September 2013 are included in this document.

We would like to thank the BBNP recipients who submitted these data, reviewed the information in this document, and provided revisions. We appreciate their perseverance and patience with the reporting process.

We would also like to thank Rebecca Ciraulo and Aayush Daftari at Navigant Consulting and Dave Roberts and Mike Heaney at the National Renewable Energy Laboratory (NREL) for compiling the quarterly information and the graphs and tables for this report.

Please contact Dale Hoffmeyer at betterbuildings@ee.doe.gov with any questions about this report.

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AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

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Awardee Number	Recipient Name	State	Total Grant
3555	Austin	Texas	$10,000,000[1]

1.1 Introduction

This document presents a summary of data reported by an organization awarded federal financial assistance (e.g., grants, cooperative agreements) by DOE's BBNP from July 2010 or September 2010 through September 30, 2013. Although some awards were extended into 2014, only the data reported through the end of September 2013 are included in this document.

This document is not an evaluation of the recipient's BBNP program or a final report of the recipient's activities. The purpose of this document is to provide a summary of data reported quarterly by recipients. As the programmatic and building upgrade project data reported quarterly by each recipient is released, it will be available on the BBNP website at http://energy.gov/eere/better-buildings-neighborhood-program/progress. This report may be useful to researchers and others who plan to study what recipients reported.

This document, and one like it for each BBNP award recipient, follows a similar structure with graphs and tables. Each document includes the following sections: Funding Synopsis, Program Design Synopsis, Driving Demand Synopsis, Financing Synopsis, Workforce Development Synopsis, and Energy Savings Synopsis. A similar document showing results from all BBNP recipients titled *Better Buildings Neighborhood Program Summary of Reported Data* is also available on the BBNP website.

Two additional sources of information may be useful to researchers interested in the accomplishments of BBNP award recipients. The first is an independent evaluation of BBNP conducted by Research Into Action, NMR Group, Nexant, and Evergreen Economics. A Preliminary Process and Market Evaluation report was released in December 2012, and a Preliminary Energy Savings Impact Evaluation report was released in November 2013. Final reports will be released in 2014 and 2015. Second, as the recipient's final technical report is completed, it will be available online on the BBNP website. The final technical report was written by the recipient and contains more detailed information about the recipient's

[1] Austin, Texas, Award Summary (2013), Recovery.gov, Accessed June 2014: http://www.recovery.gov/arra/Transparency/RecoveryData/pages/RecipientProjectSummary508.aspx?AwardIdSur=105637.

accomplishments and lessons learned. Some recipients conducted independent evaluations of their programs, and the final technical report is a source for locating those evaluations.

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

1.2 Source of Data

BBNP included 34 (i.e., 25 Topic 1 and 9 Topic 2) competitively awarded Recovery and Reinvestment Act (ARRA or Recovery Act)-funded Energy Efficiency Conservation Block Grants (EECBGs) and 7 competitively awarded FY10-funded State Energy Program (SEP) cooperative agreements. Topic 1 EECBGs were awarded at the beginning of June 2010, Topic 2 EECBGs were awarded in August 2010, and SEP agreements were awarded in October 2010. The first Quarterly Program Reports were due from recipients for Q4-2010 (grant start date through December 30, 2010) regardless of when the awards occurred.

All BBNP financial assistance agreements were originally set to expire between May and September 30, 2013. Four EECBGs awards were completed in 2013 (i.e., Toledo, Ohio; Connecticut; Omaha, Nebraska; and University Park, Maryland).The remaining agreements were modified to expire in 2014. For awards with an extended expiration date, the BBNP spending in this report will not equal the total awarded amount.

Organizations that received federal financial assistance under BBNP were required to submit a quarterly Federal Financial Report (SF-425), DOE Progress Report, and a BBNP Program Report. Most of the information in this document is based on recipient's' BBNP Program Report submissions. A copy of the BBNP Program Report (Excel Template) may be obtained by emailing betterbuildings@ee.doe.gov. Recipients were also given the option to submit Program Report information via XML Web service.

EECBG awards were funded by the American Recovery and Reinvestment Act (ARRA or Recovery Act). All federal recipients of ARRA funds were required to submit quarterly ARRA reports, in addition to agency-specific reports, via the ARRA federal reporting website. Information reported under the authority of ARRA is available on www.recovery.gov. Estimated job creation information in this report was obtained from www.recovery.gov.

EECBG (34) and SEP (7) awards had slightly different mandatory reporting requirements for BBNP Quarterly Program Reports. For example, reporting job hours worked was mandatory for EECBG awards and voluntary for SEP. Reporting workers trained and certified was mandatory for SEP awards and voluntary for EECBG. Reporting the number of active contractors performing building upgrades under the program was mandatory for EECBG awards and voluntary for SEP.

1.3 Data Quality

The data summary provided in this document is based on information recipients formally submitted to DOE using the BBNP Quarterly Program Report or ARRA report (EECBG only). Recipients reported quarterly totals for some information like spending, estimated energy savings, assessments completed, and workers trained or certified. Information like invoiced cost and loan amount was reported for each upgrade project. A total invoiced cost or loan amount is obtained from summing all the values reported for each upgrade project record that included this information. Estimated energy savings was reported as a total for the quarter and an estimate was reported for each upgrade project. Where appropriate, the percent or quantity of upgrade projects that had complete information has been indicated. These upgrade project records were used to determine some values in the figures and tables.

The data reported by recipients may include three types of errors: non-response, incorrect response, or processing errors.

Non-Response: Although some data in the BBNP Program Report was mandatory and other information was optional, not all recipients consistently reported the mandatory data elements. Missing mandatory data elements can be characterized as not available, not applicable, or not reported.

Incorrect Response: Data reported by recipients could be incorrect because the requested information was not understood; there was a lack of attention to detail; or information was misrepresented.

Processing Errors: Data reported could also be incorrect because of errors introduced when extracting the data from Program Reports and loading it into a central database. Processing errors can also be introduced when querying the central database to provide summary information.

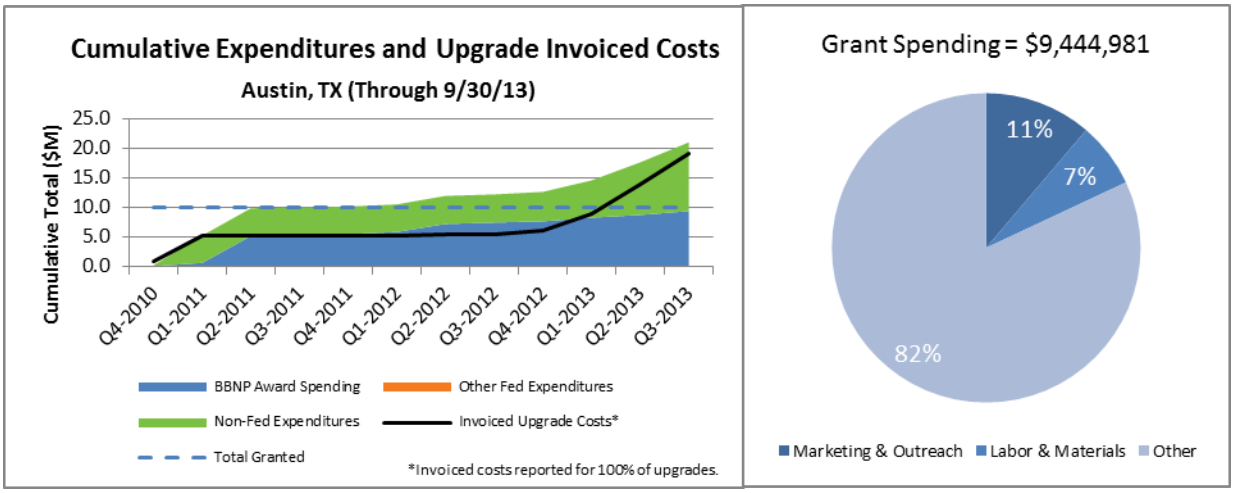
DOE made several attempts to ask recipients to provide missing information and to verify the information that was reported. For example, recipients were provided a summary of what had been reported and a list of data quality issues following each quarterly reporting period, along with numerous requests to correct errors.

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

1.4 Funding Synopsis

The City of Austin, Texas, received a $10 million EECBG. Figure 1 shows total recipient expenditures, other federal expenditures,[2] and non-federal expenditures[3] (e.g., leveraged spending) compared to the total investment in building upgrades (reported as invoiced cost). Almost half the BBNP grant funding was spent by Q2-2011 and then activity stalled for several months in order to address problems identified during a pilot stage.

Figure 1. Austin Cumulative Expenditures and Upgrade Invoiced Costs



The pie chart in Figure 1 shows recipient-reported spending by category. Eleven percent of grant spending was for marketing and outreach activities; 7% for labor and material expenses associated with energy assessments or building improvements; and 82% for other program expenses. Fifty-two percent of grant funds were invested for a residential loan loss reserve fund and for interest rate buy-down and explain the large expenditures in Q2-2011 indicated in Figure 1. Labor and material expenses included the costs associated with providing a $500 grant bonus rebate to program participants for undertaking comprehensive upgrades during the promotion period. The bonus rebate was in addition to rebates paid by Austin Energy and Texas Gas, and those utility rebates should appear as non-federal expenditures in the graph, in addition to loans funded by a third-party financial partner.

[2] Other federal expenditures may include additional federal financial assistance award funds or loans from DOE or another federal agency.

[3] Non-federal expenditures may include third-party, in-kind contributions and the portion of the costs of a federally assisted project or program not borne by the federal government. This should include building owner contributions to building upgrade project cost.

1.5 Program Design Synopsis

Austin's first program offering was the "Best Offer Ever" in the winter of 2010/2011, during which 568 single-family homes were upgraded and benefited from enhanced rebates and an interest rate buy-down to 0%, complemented by federal tax credits. Following this brief but high-volume offering, staff paused to incorporate process improvements and carefully design and test several pilot programs.

The Energy Returns™-branded multifamily performance program launched in September 2012 with Residential Energy Services Network (RESNET)-certified raters and Building Performance Institute (BPI)-certified contractors signing on to participate. The program was recognized by the American Council for an Energy Efficient Economy (ACEEE) and Alliance for Water Efficiency as an "Exemplary Program That Saves both Water and Energy" Honorable Mention. A total of 1,837 multifamily units were upgraded under the program at 22 different complexes. Ten of these complexes applied for additional rebates for exterior lighting.

A "mid-tier" single-family program launched in October 2012. It was based on Austin Energy's existing Home Performance with ENERGY STAR® (HPwES) program but used a point system to identify energy upgrades that were expected to reduce annual energy consumption at least 15% and offered low-interest loans plus rebates to interested customers. An "advanced-tier" promotion was launched in January 2013, adding third-party energy modeling and performance-based rebates to encourage higher energy savings (more than 20%), as well as an energy advocate appointed to guide homeowners through the lengthier process.

Starting in April 2013, the rebate levels for both offerings were reduced, and a new offering launched, making it possible to combine solar upgrades with energy efficiency work, both covered under a 3.99% loan. Starting in July, the interest rate for single-family upgrades was bought down to 1.99% to encourage the use of financing. In August, rebate levels were again reduced to further shift emphasis to sustainable financing. The advanced-tier promotion wrapped up in September 2013, with a total of 12 single-family homes participating. The combined solar offering continued to be available but had low uptake with only four homes participating. The mid-tier program continued to see strong uptake after September 30, 2013.

A heating, ventilation, and air conditioning (HVAC) system performance check-up program was offered over the summer (i.e., June through September 2013), and was designed to be a point of entry for contractors to evaluate HVAC systems and lead to participation in comprehensive energy upgrades. A rebate was available to offset part of the cost for the homeowner.

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

1.6 Driving Demand Synopsis

To ensure a successful Best Offer Ever promotion, Austin Energy hosted a collaboration meeting with HPwES contractors. These contractors agreed to help market the promotion with billboards and other advertising. Austin Energy also worked with the contractors to shorten the time lag in payments that sometimes occurs while homeowners wait for their energy upgrade rebate reimbursement from the City of Austin.

The City of Austin typically has a six-week turn-around time on invoice payments. Under the Best Offer Ever promotion, customers could assign their rebates directly to the contractor, and Austin Energy developed a faster turn-around payment system that delivered electronic rebate reimbursement directly to the contractor within two weeks. As a result, these professionals passed the discount onto the homeowners who had assigned their rebates to them.

Under a marketing contract, the grant program developed a website, www.energyreturns.austinenergy.com, which included customer testimonial videos and a contractor portal; sent direct mail to customers advertising promotions; placed media buys on radio, TV, and newspaper; placed targeted internet advertisements; and produced collateral advertising the multifamily program, among other tactics listed in the recipient's quarterly progress reports.

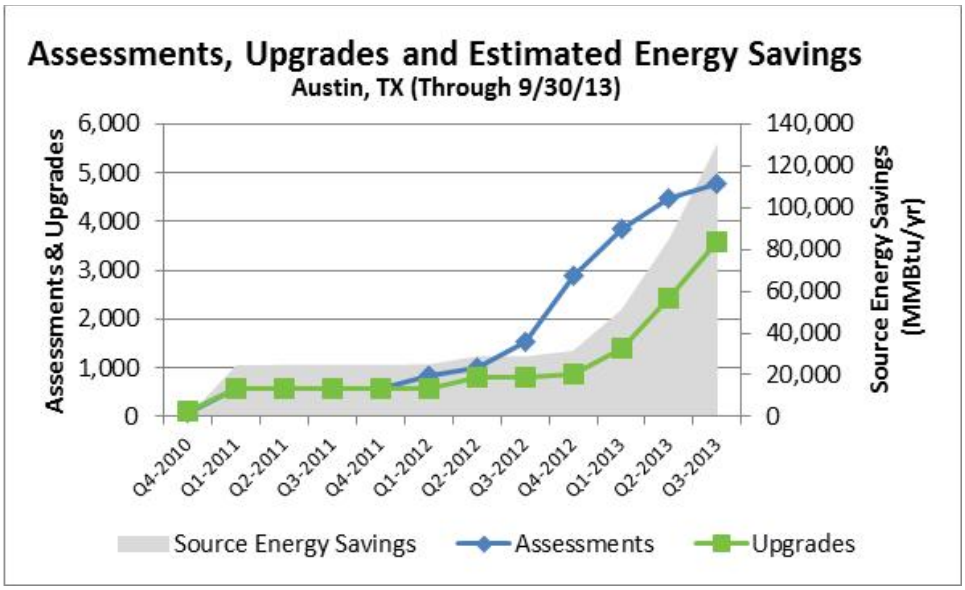
Toward the end of the grant period, marketing activities shifted to outreach-based events, including reaching out to homeowners at festivals.

Figure 2 shows the cumulative energy assessments and upgrades reported by Austin, Texas, from all building sectors through September 30, 2013, and the estimated annual source energy savings[4] (right axis).

[4] Source energy, also called primary energy, is the amount of fossil fuels and electricity plus the losses associated with the production of electricity (i.e., losses that occur in the generation, transmission, and distribution). Total estimated source energy savings was calculated by DOE. See Appendix B.

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

Figure 2. Austin Assessments, Upgrades, and Estimated Savings



	Residential Single-Family	Residential Multi-Family Units	Commercial Buildings	Industrial Buildings	Agricultural Buildings
Assessments	1850	2930	0	0	0
Upgrades	1728	1837	0	0	0

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

1.7 Financing Synopsis

Table 1 shows the grant funding investments in revolving loan funds (RLFs), loan loss reserves (LLRs), or interest rate buy-down (IRBDs).

Table 1. Financing Investments and Results (Through September 30, 2013)

Financing Investments and Results (Through 9/30/13)	
RLF (Commercial)	$0
RLF (Residential)	$0
Percent of Total Award Invested in RLF	0%
LLR (Multi-Sector)	$0
LLR (Commercial)	$0
LLR (Residential)	**$5,000,000**
Percent of Total Award Invested in LLR	50%
Interest Rate Buy-Down	**$233,000**
Total Financing Investment	**$5,233,000**
Percent of Total Award	52%
Total Capital (Private and Other Non-BBNP) Leveraged for Lending	**$35,000,000**
Results	
Amount loaned out (Residential)	**$7,435,861**
Number of Loans (Residential)	**945**
Average Loan Amount (Residential)	**$7,869**

To make it easier for both businesses and homeowners to finance energy efficiency upgrades, Austin Energy's lending partner offered a loan approval turnaround of about an hour. Summary of financial products offered:

- Loan plus rebate offering
- Interest rate buy-downs
  - To 0% during Best Offer Ever
  - To 1.99% starting July 1, 2013
- Loan loss reserve
  - $5 million (not available during Best Offer Ever)
- Combined solar and efficiency loan
- More than $3.5 million in loans pre-approved and secured

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

1.8 Workforce Development Synopsis

Table 2 shows the total number of workers trained and certified as reported by recipients. Most recipients reported the number of workers trained and certified each quarter; the table shows the cumulative total through September 30, 2013. The table also shows the number of active participating contractors reported by recipients for one quarter. The number of participating contractors may increase or decrease each quarter. However, it is not summed across quarters because many of the same contractors actively participated during multiple quarters. Therefore, only the number of participating contractors reported in the most recent quarter is provided in the table.

Table 2. Workforce Development Results (Through September 30, 2013)

Workforce Development Results[5] (Through 9/30/13)	
Number of Trained Workers	62
Number of Certified Workers	62
Active Participating Contractors (Q3-2013)	51

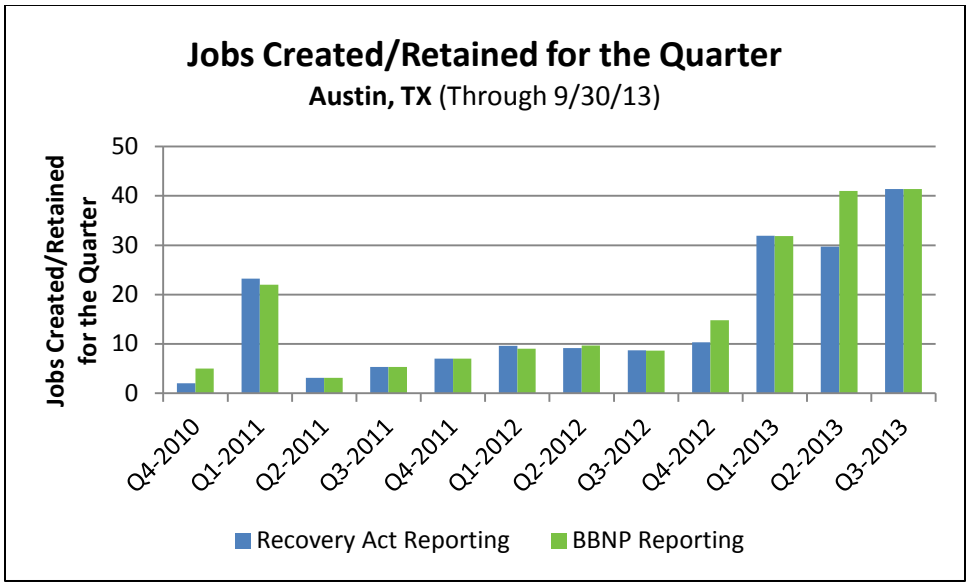
Figure 3 shows jobs created or retained. EECBG recipients were required to report jobs created or retained expressed as ‘‘full-time equivalent’’ (FTE) for Recovery Act reporting. The Recovery Act reporting specified direct jobs created and retained by sub-recipients and vendors. This information is in blue in Figure 3.

EECBG recipients were asked on the BBNP Program Report to report hours worked per quarter directly funded by BBNP funds, as well as hours worked administrating or working on the BBNP program if funded by other federal and leveraged funds (e.g., state and local funds, utilities, financial institutions, private contributions, etc.). This includes but is not limited to administrative staff, consultants, and contractors involved in the management or deployment of BBNP-related building upgrades and assessment activities. This information is in green in Figure 3 and is estimated based on total hours worked during the quarter reported by the recipient divided by 520 hours per quarter. The BBNP Program Report definition was broader than direct jobs reported for the Recovery Act and is one reason why Recovery Act Reporting and BBNP Reporting in Figure 3 differ.

[5] Reporting the number of trained and certified workers was mandatory for SEP and voluntary for EECBG. Reporting the number of active contractors was mandatory for EECBG and voluntary for SEP.

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

Figure 3. Austin Jobs Created/Retained for the Quarter[6]



Austin Energy focused on both the details and the big picture when it engaged its contractors to launch the Best Offer Ever promotion. However, conflicts over program requirements stalled the program shortly after it was launched. The recipient met several times with contractors to address their concerns, collect input on program ideas, and obtain real-time feedback on what was and was not working in the field. This strategy eventually paid off and conflicts were resolved so that the program could get back on track.

The recipient's Q2-2013 Progress Report indicated that RESNET HERS Rater Training was offered for participating contractors and energy assessors in May 2013. The training provided a comprehensive curriculum of classroom and field training for candidates to complete both a projected and confirmed Home Energy Rating System (HERS) Rating. Fourteen participants including contractors, auditors and Austin Energy staff attended. Additionally, 18 contractors attended weatherization training offered earlier in 2013. A total of 62 workers received training and certifications.

[6] Reporting job hours worked was mandatory for EECBG and voluntary for SEP. ARRA Reporting only includes EECBG data.

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

1.9 Estimated Energy Savings Synopsis

Recipients reported estimated energy savings in two ways. First, recipients were asked to report estimated savings data quarterly: total kilowatt-hours (kWh) of electricity, therms of natural gas, gallons of fuel oil, and gallons of propane saved, along with dollars in energy costs saved. Table 3 shows the total estimated annual energy savings of the recipient's activities reported through September 30, 2013.

Table 3. Estimated Annual Energy Savings (Through September 30, 2013), as Reported in Program Summaries

Estimated Annual Energy Savings (Through 9/30/13)	
kWh Electricity	10,336,748
Therms Natural Gas	153,147
Gallons of Oil	0
Gallons of Propane	67
Total Estimated MMBtu Savings (Source Energy)[7]	135,416
Total Estimated Energy Cost Savings	$1,286,893
Average Percent Savings per upgrade / Number of Upgrades Used to Calculate	Residential SF 19%/1734 Residential MF 22%/1836

Secondly, recipients were asked to report estimated savings data quarterly for each upgrade project. Table 4 shows the sum of the estimated energy savings of all building upgrade projects reported by the recipient through September 30, 2013. The second column shows the number of upgrade projects that were summed to estimate the energy savings in the third column.

Table 4. Estimated Annual Energy Savings (Through September 30, 2013), as Reported for Individual Upgrade Projects

Sum of Estimated Annual Energy Savings (Through 9/30/13)		
	Number of Projects Summed	**Sum of Estimated Savings Reported**
kWh Electricity	3,558	10,277,018
Therms Natural Gas	2,189	163,077
Gallons of Oil	0	0
Gallons of Propane	6	116
Sum of Est. Annual Energy Cost Savings	3,553	$1,300,251
Method(s) of Savings Prediction	DEEMED SAVINGS, NEAT, REM/RATE ENERGY MODELING	

[7] Total estimated source energy savings was calculated by DOE. See Appendix B.

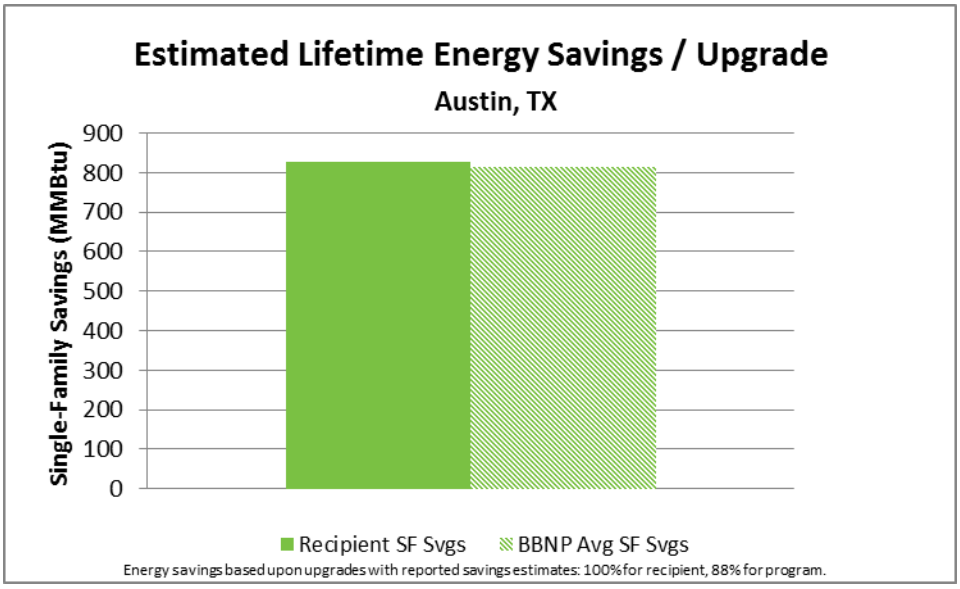
AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

The program-reported total in Table 3 will not necessarily equal the sum of estimated savings in Table 4. Recipients were originally asked to only report individual building upgrade projects that were estimated to achieve at least a 15% reduction in total building energy use. Recipients were also told to include estimated energy saving from all upgrades in their program summaries, including upgrades that achieved less than a 15% reduction in total building energy use, in their program totals. In 2012, recipients were given the option to continue to report only building upgrade projects that saved 15% or to report all building upgrade projects so long as the total portfolio of projects (by building sector) achieved an average savings of 15%. Austin decided to pursue the portfolio average approach and the average percent savings per upgrade and the number of upgrades used to calculate the portfolio average is included at the bottom of Table 3.

1.9.1. Estimated Lifetime Energy Savings per Upgrade Analysis

From the beginning of BBNP, recipients expressed interest in understanding how their results compared to other recipients. Figure 4 shows an estimated lifetime energy savings per upgrade for the recipient and an average estimated lifetime energy savings per upgrade based on all BBNP-reported projects. This analysis was completed by NREL using recipient-reported project information. The methodology used to complete the analysis is provided in the Appendix C. Eighty-eight percent of the reported BBNP upgrade projects were used in the analysis to calculate the BBNP average because energy savings estimates were missing or incomplete for 12% of reported projects.

Figure 4. Estimated Lifetime Energy Savings per Upgrade[8]



[8] SF is single-family home. CB is commercial building.

AUSTIN, TEXAS, SUMMARY OF REPORTED DATA

There could be several reasons why a recipient's results are higher or lower than the BBNP average. Recipients implemented a variety of program design approaches, including different mixes of energy efficiency measures, and targeted different building types and customer segments. Reviewing the summary report of other recipients may provide insights into program design choices and other factors that could influence results.

In addition to program design decisions, other factors could influence results. For example, programs in more energy-intensive climates may be able to achieve greater savings per upgrade because average energy consumption is higher than the national average. Programs in states with high energy costs may find that customers are more motivated to save more energy than states with low energy costs.

APPENDIX A: GLOSSARY OF TERMS

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ARRA or Recovery Act:	American Recovery and Reinvestment Act of 2009
Active Participating Contractors:	Active contractors are qualified (qualified according to the individual recipients' program guidance) contractors who have performed one or more building upgrades in the reporting quarter.
Assessments:	Expert review of a building's energy savings opportunities, which typically includes an onsite inspection of the building and its systems and results in recommendations for building energy performance improvements.
BBNP:	Better Buildings Neighborhood Program
BBNP Award Spending:	Total outlay amount for recipients through 9/30/13
Certified Workers:	Number of workers with a nationally-recognized certification. Recipients could choose to adopt an alternative to nationally-recognized certification and provide a justification for the alternative certification chosen.
EECBG:	Energy Efficiency Conservation Block Grant
IRBD:	(Interest Rate Buy-Down) Program administrators provide lenders or investors with an up-front payment when a financial product is originated to reduce the interest rate a customer pays. The payment is typically the present value of the difference between the interest rate the customer will pay and the "market" interest rate of the financial product over the expected life of the financial product.
Invoiced Upgrade Costs:	Total cost of the building energy efficiency upgrades, as invoiced by the contractor performing the work, which includes the building owner's contribution, and any incentives or grants funded by BBNP funds, other federal funds or non-Federal sources intended to reduce the building owner's cost.

APPENDIX A: GLOSSARY OF TERMS

Jobs Created/Retained:	For the purpose of Recovery Act reporting jobs created and retained was estimated based on the job hours directly funded with BBNP funds during a reporting quarter divided by 520 hours per quarter. EECBG recipients were required to report jobs created or retained expressed as ''full-time equivalent'' (FTE) for Recovery Act reporting. The Recovery Act reporting specified direct jobs created and retained by sub-recipients and vendors. For the purpose of BBNP Quarterly Program reporting, jobs created and retained was estimated based on the job hours worked directly funded with BBNP funds and job hours worked funded by other federal funds and leveraged funds (i.e. state and local funds, utilities, financial institutions, private contributions, etc.) during a reporting quarter divided by 520 hours per quarter. This includes, but is not limited to; administrative staff, consultants, and contractors involved in the management or deployment of assessment and building upgrade activities. The BBNP Program Report definition was broader than direct jobs reported for the Recovery Act
LLR:	(Loan Loss Reserve) A form of credit enhancement through which a program administrator (or other entity) promises to pay a lender some portion (less than 100%) of losses the lender endures on a financial product or pool of financial products. 5% to 20% LLRs are common.
Labor & Materials:	Recipient outlays of BBNP award funds incurred as part of an assessment or upgrade directly associated with the installation of energy efficient equipment, appliances, or building components (e.g. insulation, windows, etc.). This includes incentives or grants to reduce a building owner's labor or material costs to complete and energy assessment or upgrade.
Marketing & Outreach:	Recipient outlays of BBNP award funds for communication activities designed to identify, reach and motivate potential customers to participate in a program and learn more (e.g. assessment or other informational activity) about energy efficiency or initiate an energy efficiency upgrade.
MMBtu	One million British thermal units (Btu).
Multi-Family Unit:	A unit in a building with multiple housing units--a structure that is divided into living quarters for two or more families or households in which one household lives above or beside another. This category also includes houses originally intended for occupancy by one family (or for some other use) that have since been converted to separate dwellings for two or more families.

APPENDIX A: GLOSSARY OF TERMS

Non-Federal Expenditures:	These may include third-party, in-kind contributions and the portion of the costs of a federally assisted project or program not borne by the Federal Government. This should include building owner contributions to building upgrade project cost.
Other Federal Expenditures:	These may include additional federal financial assistance award funds or loans from the Department of Energy or another federal agency.
Other Program Expenses:	Recipient outlays of BBNP award funds not classified as labor & materials or marketing & outreach. These expenses are often associated with program overhead. Outlays are distinct from DOE's definition of expenditures, which is most relevant with financing programs (i.e., Funds drawn down and provided by the recipient to a third party, to capitalize a loan fund, are considered outlays. Funds drawn down by the recipient to capitalize a loan fund in-house are not considered outlays until the funds are loaned out.).
RLF:	(Revolving Loan Fund) Funds of capital used to provide loans for energy efficiency and renewable energy improvements; loan repayments recapitalize the funding pool to enable additional lending.
SEP:	State Energy Program
Single-Family:	A housing unit, detached or attached, that provides living space for one household or family. Attached houses are considered single-family houses as long as they are not divided into more than one housing unit and they have an independent outside entrance. A single-family house is contained within walls extending from the basement (or the ground floor, if there is no basement) to the roof. A mobile home with one or more rooms added is classified as a single-family home. Townhouses, row-houses, and duplexes are considered single-family attached housing units, as long as there is no household living above another one within the walls extending from the basement to the roof to separate the units.
Source energy:	Also called primary energy, is the amount of fossil fuels and electricity plus the losses associated with the production of electricity (i.e., losses that occur in the generation, transmission, and distribution).
Total Capital (Private and Other non-BBNP) Leveraged for Lending:	Capital committed by one of more third parties for financing energy efficiency building upgrades. This can include federally funded (non-BBNP) revolving loan funds and private capital from credit unions, banks or other financial institutions.
Trained Workers:	Number of workers trained under a nationally-recognized organization or curriculum. Recipients could choose to adopt an alternative to nationally-recognized training and provide a justification for the alternative training chosen.

APPENDIX A: GLOSSARY OF TERMS

Upgrades:	Also called building upgrades or retrofits, an individual or group of measures that a customer undertakes to improve building performance, with benefits including more efficient energy use, improved comfort and indoor air quality, ensured combustion safety, and lower utility bills.

APPENDIX B: METHODOLOGY TO CALCULATE SOURCE ENERGY SAVINGS

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DOE used the following methodology to calculate source energy savings:

where,

E_{svgs} is the total annual energy savings in MMBtu
$E_{svgs\ source,i}$ is the annual source energy savings in MMBtu for each energy type *i* as shown in Table B- 1
$E_{svgs\ site,\ i}$ is the total estimated annual site energy savings for each energy type *i* as shown in Table B- 1
$CF_{MMBtu,\ i}$ is the MMBtu conversion factor for each energy type *i* as shown in Table B- 1
$CF_{Site\ to\ Source,\ i}$ is the site to source conversion factor for each energy type *i* as shown in Table B- 1.

Table B- 1. MMBtu and Site to Source Conversion Factors by Energy Type

Energy Type	MMBtu Conversion Factor	Site to Source Conversion Factor
Electricity	0.00341214 MMBtu/kWh	3.365
Natural Gas	0.1027 MMBtu/ccf	1.092
Natural Gas	0.1 MMBtu/therm	1.092
Fuel Oil (Type 2)	0.14 MMBtu/gallon	1.158
Propane/LPG	0.09133 MMBtu/gallon	1.151
Kerosene	0.135 MMBtu/gallon	1.205
Wood	20 MMBtu/cord	1

APPENDIX C: LIFETIME ENERGY SAVINGS CALCULATIONS

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The Lifetime Energy Savings, LES, is the total source energy savings over the expected life of the installed efficiency upgrades, expressed in MMBtu. An LES value is calculated for each grant recipient as follows:

–

where,

is the Lifetime Energy Savings for grant recipient *r*

$E_{svgs,r}$ is the total estimated annual energy savings for all projects reported by the recipient (MMBtu/yr)

– is the project weighted lifetime of the efficiency upgrades reported by a recipient, expressed in years and calculated as follows:

– – –

where,

– is the source energy-savings-weighted lifetime of the residential efficiency upgrades installed for a recipient

$E_{svgs,res}$ is the total estimated annual source energy savings in MMBtu for all residential upgrades reported by the grant recipient

– is the project-count-weighted lifetime of the commercial efficiency upgrades installed for a recipient

$E_{svgs,com}$ is the total estimated annual source energy savings in MMBtu for all commercial upgrades reported by the grant recipient

– is calculated as follows:

–

where,

i is the type category of efficiency upgrades installed as shown in Table C- 1.

Cnt_i is the number of energy efficiency upgrades of type *i* installed by a recipient

APPENDIX C: LIFETIME ENERGY SAVINGS CALCULATION

$E_{svgs,i}$ is the assumed annual energy savings in MMBtu for each energy efficiency upgrade of type *i* as shown in Table C- 1.

L_i is the assumed lifetime in years for energy efficiency upgrades of type *i* as shown in Table C- 1.

Table C- 1. Residential Project Energy Upgrade Categories, Lifetimes and Energy Savings[9]

Type Category	Description	Assumed Lifetime (Years)	Assumed Source Energy Savings (MMBtu/yr/measure)
R1	Simple direct-install measures including CFL's, low-flow showerheads, water heater blankets, HVAC tune ups and other low cost measures	5	0.5
R2	HVAC replacement, programmable thermostats, refrigerators, dishwashers, hot water heaters and any large appliance	15	7
R3	Duct sealing and duct insulating	15	10
R4	House air sealing, house insulating, window replacement and any other insulating (except duct insulating)	20	20

– is calculated as follows:

–

where,

j is the type category of efficiency upgrades installed as shown in Table C- 2.

Cnt_j is the number of energy efficiency upgrades of type *i* installed by a recipient

L_j is the assumed lifetime in years for energy efficiency upgrades of type *j* as shown in Table C- 2.

[9] Assumed Lifetime for residential measures was estimated by NREL based on a review NAHB Study of Life Expectancy of Home Components, DEER, and consulting with evaluation experts. Assumed Source Energy Savings was estimated/adapted from the Better Building Energy Savings Measure Packages developed by NREL using BEopt. General methodology is documented here: http://www.nrel.gov/docs/fy11osti/50572.pdf

APPENDIX C: LIFETIME ENERGY SAVINGS CALCULATION

Table C- 2. Commercial Project Energy Upgrade Categories and Lifetimes[10]

Type Category	Description	Assumed Lifetime (Years)	Assumed Source Energy Savings (MMBtu/yr/measure)
C1	CFLs, faucet aerators and HVAC tune ups	5	100
C2	Commercial kitchen equipment, thermostats	11	6
C3	HVAC (packaged), refrigeration, hot water heaters, LED and linear fluorescent lighting	15	100
C4	Chillers, boilers, PV, solar thermal, insulation, windows	20	100

[10] Assumed Lifetime for commercial measures was estimated by NREL based on a review of DEER and consulting with evaluation experts. Assumed Source Energy Savings was derived using regression analysis of reported commercial projects with energy savings and installed measures. A measure may include several instances of one technology installed in a project.

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