



ENERGYFIT NEVADA BETTER BUILDINGS NEIGHBORHOOD PROGRAM EVALUATION

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Executive Summary

Program Description

The EnergyFit Nevada (EFN) Better Buildings Neighborhood Program (BBNP, and referred to in this document as the EFN program) currently encourages Nevada residents to make whole-house energy-efficient improvements by providing rebates, financing, and access to a network of qualified home improvement contractors. The BBNP funding, consisting of 34 Energy Efficiency Conservation Block Grants (EECBG) and seven State Energy Program (SEP) grants, was awarded for a three-year period to the State of Nevada in 2010 and used for initial program design and implementation.

Goals and Achievements

During the planning period, the State of Nevada's goals for the program involved upgrading 1,750 homes by 2013 to a minimum of 20% energy reduction per participating home, developing the workforce, and creating the foundation for a self-sustaining program that would facilitate upgrades in 5% of all single-family homes in Nevada by 2021. In 2012, the overall goal for the initial grant period was adjusted to 1,250 homes.

By the end of first quarter in 2014, the program had achieved upgrades in 553 homes, with an average energy reduction of 32% per home. Other achievements included:

- Completed 893 residential energy audits and installed upgrades in 0.05% of all Nevada single-family homes¹
- Achieved an overall conversation rate of 38.1%²
- 7,089,089 kWh of modeled energy savings³
- Total annual homeowner energy savings of approximately \$525,752³
- Efficiency upgrades completed on 1,100,484 square feet of homes³
- \$139,992 granted in loans to homeowners for energy-efficiency upgrades
- 29,285 hours of labor and \$3,864,272 worth of work conducted by Nevada auditors and contractors⁴
- 40 contractors trained in Nevada
- 37 contractors with Building Performance Institute (BPI) certification in Nevada
- 19 contractors actively participating in the EFN program in Nevada

¹ Calculated using 2012 U.S. Census data reporting 1,182,870 homes in Nevada.

² Conversion rate through March 31, 2014, for all Nevada Retrofit Initiative (NRI)-funded projects, calculated using the EFN tracking database.

³ OptiMiser energy modeling, based on current utility rates.

⁴ This is the sum of \$3,596,561 in retrofit invoice value and \$247,711 in audit invoice value.

The EFN program and the state continue to actively engage Nevada homeowners, energy-efficiency contractors, and other program partners. Although the program has not achieved its goal of financial sustainability, the work completed to date shows significant progress toward establishing a sustainable market for energy-efficient products and services. EFN staff continue to explore new opportunities to leverage public and private funding sources that will enable the program's continued success.

Background

HomeFree Nevada (HFN) was founded in 2009 as the nonprofit sponsor of Home Performance with ENERGY STAR® (HPwES) for the state. Originally, HFN's funding was provided through the EECBG, which awarded grants to the City of Henderson, City of Las Vegas, and Clark County.

In 2011, the NRI SEP grant, which received BBNP funding through the U.S. Department of Energy (DOE), was awarded to the Governor's Office of Energy (GOE) and subsequently awarded to five sub-grantees: HFN, University of Nevada, Las Vegas (UNLV), University of Nevada, Reno (UNR), Truckee Meadows Community College (TMCC), and the City of Las Vegas, collectively referred to in this report as the EFN Team.

The NRI was designed to implement HPwES, increase the quality of Nevada's residential retrofit market, and upgrade a minimum of 5% of all single-family homes in the state by 2021. To accomplish these objectives, the EFN Team launched the EFN program in April 2012. In the fall of 2012, HFN was rebranded as EFN to clarify messaging to customers and cut down on confusion. Also in 2012, the GOE and all sub-grantees agreed that EFN should be the umbrella organization and take the lead in organizing and managing program efforts going forward.

Partners

The EFN program is unique among BBNP grantees in that it was funded as a nonprofit, municipality, and university collaboration with no utility partnerships or funding. These partners were tasked with marketing and outreach, exploring financing opportunities, program implementation, and creating job training programs:

- UNLV conducted market research based on purchasing behavior analysis, identified target markets through focus groups and homeowner surveys, and provided a final report in November 2012.
- UNR engaged financial institutions to research low-interest loan options for homeowners, and submitted a report on the findings in December 2013.
- TMCC provided job training programs and BPI certification courses through summer 2013.
- The City of Las Vegas and Purdue Marion and Associates, a public relations firm, initially spearheaded marketing and outreach efforts, and continued to work with HFN and EFN through spring of 2014.
- HFN provides quality assurance, processes rebate payments, and assists participants through the program.

Marketing

Over the three-year grant period, the EFN Team tested and tracked the results of over 30 different types of marketing. Through this careful testing process, the EFN Team learned that there is no best way to market this kind of program; rather, a combination of different marketing approaches yielded the most success. EFN program marketing and outreach emphasizes the value of energy-efficient upgrades, incentive availability, and low-interest loan opportunities and targets major employers, churches and civic organizations, retailers, homeowners associations, and real estate groups. Customer outreach events have been varied and included booth visibility at farmers markets, First Friday art events, home shows, and model home open houses.

Incentives and Financing

The EFN Team also continued to adapt and test different strategies for incentives, subsidies, and rebate amounts; it concluded that a performance-based program structure that ties incentives directly to savings correlates to higher participation rates.

The original grant was written to offer homeowners an incentive of \$1,000 for qualifying retrofits that would result in a 20% reduction in energy consumption. Beginning in 2012, the EFN Team introduced additional incentive strategies to try to boost participation.

After recognizing that the audit cost was a barrier for many customers, the EFN Team found that a standardized audit cost of \$199 was the most successful approach for motivating customers to take the first step. Several other strategies, including various limited-time bonus offers, were tested throughout the grant time period and are summarized in the Driving Demand portion of the Lessons Learned section below.

Nevada State Bank, Green Chips, and the City of Las Vegas built upon American Recovery and Reinvestment Act (ARRA) funds to establish low-interest loans of up to \$7,500 for eligible homeowners. In addition, contractors often offered participants in-house financing. Wells Fargo also expressed interest in financing and marketing outreach and sent direct mailings detailing energy efficiency and the EFN program to 44,000 Federal Housing Authority (FHA) loan customers who were eligible for refinancing.

Quality Assurance

Quality assurance (QA), provided by HFN and based on the HPwES framework, includes:

- Initial Home Performance Assessment (test-in assessment), documenting:
 - General information about the home and homeowner
 - Utility bill analysis
 - Existing conditions and complete physical inspection of building components
 - Diagnostic testing (blower door air infiltration, ventilation, and duct leakage analysis)
 - Prioritized recommended improvements

- Health and safety-related issues and combustion appliance testing
- Modeled energy-savings projections
- On-site inspections of 15% of homes after retrofit work is complete (this percentage exceeds the HPwES requirement of 5%). The inspection includes the following test-out procedures:
 - Visual inspection of installed measures, review of commissioning reports, and diagnostic tests as necessary to confirm that the installation satisfies manufacturers' specifications and industry-accepted standards
 - Combustion safety checks for all projects where improvements might impact combustion appliance performance
 - Blower door tests to verify savings from installed measures impacting infiltration rates
 - Duct leakage testing to verify savings from duct sealing

All QA procedures adhere to BPI standard practices and HPwES best practices. Currently, EFN has completed desk reviews of 100% of the projects and conducted on-site QA inspections for 16% of all participating homes.⁵

Trade Ally Networking and Job Opportunities

In response to the workforce development objective, employment opportunities have increased as a result of the EFN program. From spring 2011 to spring 2013, TMCC offered training and BPI certification. BPI training provides contractors with the necessary qualifications to conduct home energy audits. Through spring 2014, 40 contractors completed training, and 37 received BPI certification.

EFN continues to sponsor training through EnergyLogic™, a company that offers training and certification courses to home energy professionals, to reach both the northern and southern portions of the state. EFN also offers contractors free training in business development, which includes bridging the gap between leads and sales; adding heating, ventilation, and air condition (HVAC) services to HPwES; and marketing through social media, the State Energy Office (SEO), and website use.

Overview of Findings

To satisfy its reporting requirements to the DOE, EFN contracted with Cadmus to conduct a high-level evaluation of the EFN program to identify and verify its data collection processes and to determine the effectiveness of program design and implementation activities. This report documents the evaluation findings.

⁵ Any on-site visit anytime during the process that includes assessment, installation, test-out, or post test-out qualifies as an on-site inspection.

Lessons Learned and Challenges

The EFN Team tracked and reported on lessons learned throughout the grant period, which will be a valuable resource as it moves into the next phase of the program. The EFN Team has already acted on several of these lessons, including:

- Recognizing and taking on a leadership role to manage the program and ensure coordination in the future.
- Realizing the importance of a local presence in both the northern and southern regions of Nevada, especially for marketing and contractor support and training.
- Recognizing that a contractor-based model is essential for this type of program and continuing to find ways to support contractors, such as soliciting their feedback when creating marketing materials; implementing a web-based project management system to simplify paperwork; offering training and training reimbursement to contractors for joining the trade ally network; and changing the loan process so contractors can be paid promptly for their work.
- Realizing that the program is driven primarily by contractors and customer referrals, and putting significant time and marketing dollars toward supporting these two activities.
- Recognizing the importance of tracking different marketing and incentive strategies, then using the most successful of these to maintain a multidimensional approach to marketing and customer motivation.

Statement of Project Objectives

The EFN Team achieved almost all of the 15 objectives they developed for the grant request as described in the Statement of Project Objectives (SOPOs) within the three-year grant period. These accomplishments are described in greater detail later in this report. Only three targets have not yet been fully achieved:

- Tracking energy savings related to water distribution and treatment through water conservation
- Developing partnerships with retailers
- Achieving 100% financial self-sustainability

Documenting a set of objectives or targets is very useful when creating a new program design and establishing a program delivery and implementation structure, especially in the early stages of program development.

Cadmus reviewed the EFN Team's 15 objectives to confirm if each was met as originally stated. We found that the objectives contained some valuable content but the language was vague, which made it difficult to compare them to actual achievements. We recommend that EFN carefully consider its goals for the next three to five years and revise the SOPOs to clearly define focused and measureable goals for comparison to achievements. The full results of our review are described in the Accomplishments section.

Data Review

Cadmus found that the database and OptiMiser® software file inputs were mostly complete and accurate; however, certain sections of the database were not filled out because the EFN program has gone through several structural improvements during the last three years. Cadmus also found documentation inconsistencies in the OptiMiser files of electrical and natural gas providers. Optimizer allows for modeling of multiple fuel types; however, when there are more than two sources, it can sometimes be unclear. Although not common, some houses have electricity, natural gas, and also an old fuel oil or propane heater (mostly in northern Nevada).

Despite these small inconsistencies in data collection, EFN has collected enough data—in both the participant database and the OptiMiser files that contain participant home details—to conduct both a high-level impact evaluation and to calculate a simple cost-effectiveness ratio in the future, if desired. These impact evaluation and cost-effectiveness study activities are:

- ***Calculate a verified gross savings value.*** This could be calculated based on site-visit installation verification or on a home-modeling approach.
- ***Calculate a net-to-gross (NTG) value.*** This could be calculated using data gathered through a customer self-report survey.
- ***Calculate a cost-to-savings ratio at the household and/or program level.*** Both costs and savings are available at the household level and could be used to calculate simple cost-effectiveness.

Benchmarking

Cadmus conducted benchmarking research, which revealed that the EFN program is similar to other BBNP programs in many ways, such as conversion rates, incentive amounts and structures, marketing efforts, barriers, financing offers, contractor outreach and training, and percentage of budget spent on marketing.

The EFN program reported almost twice the amount of average savings per household than two of the benchmarked other BBNP programs (12,819 kWh compared to 4,111 kWh and 5,231 kWh). It is worth noting that EFN reports a modeled gross energy savings, not net, because EFN lacks access to actual utility usage data. The EFN program also has higher standards for contractors, being one of only two programs that require BPI certification of the six programs in the comparison.

Lessons Learned

Over the last three program years, the EFN Team has established how to make this program successful in Nevada, through its efforts to design, implement, and market the program; facilitate contractor training and networking; and collaborate with partnering entities. Each of these topics is discussed in this section in the context of these six program pillars:

- **Market Position and Business Model.** Identifying unmet needs in the marketplace that can be filled through a well-designed organizational business model that balances costs and revenues.
- **Program Design and Customer Experience.** Designing and implementing an integrated residential energy upgrade program that provides a positive experience to customers.
- **Driving Demand.** Inspiring homeowners to action through effective marketing and other strategies for driving consumer demand for home energy upgrades.
- **Financing.** Ensuring that consumers have access to affordable financing that will enable them to pay for energy upgrade activities.
- **Workforce and Contractor Relationships.** Recruiting, training, and working in partnership with the energy-efficiency contractors who will complete energy upgrade work in customers' homes.
- **Evaluation and Data Collection.** Devising and implementing plans for continuously and periodically evaluating program efforts to identify successes and areas of weakness that require attention.

Market Position and Business Model

Sub-Grantee Coordination and Leadership

When the GOE first awarded the grant money to the five sub-grantees, each had its own set of responsibilities and tasks that it accomplished largely independently. The DOE provided strong support in the form of check-ins, webinars, calls, and even in-person visits. Similarly, the GOE hired a grant manager to oversee operations at the state level. However, as the grant progressed, all parties realized that more leadership and coordination was needed to help increase program success. In 2012, GOE assigned the leadership role to EFN (formerly called HFN and one of the five sub-grantees) to ensure consistency, communication, and common goal orientation moving forward.

EFN now coordinates program implementation and rebate processing, marketing and outreach, training and contractor networking efforts, partner recruitment, and customer financing opportunities. With such a complex program, EFN's leadership is crucial—not only to make sure there is clear communication and coordination among all parties, but also to recognize and take full advantage of opportunities created by different efforts and to build on these successes.

Geography

One unique challenge the EFN program faces is the population split between north and south Nevada, represented by the Reno and Las Vegas metropolitan areas, respectively. These two regions are 400

miles apart and have different climates, housing stock, and energy needs that create challenges for marketing, QA, and contractor training. At first, contractor training efforts focused mostly in the north and the QA and marketing efforts were concentrated in the south. It became clear that a local presence in both regions was essential, especially for recruiting and training contractors and conducting marketing and outreach. EFN now provides both marketing and contractor training in house and has successfully established a local presence in both regions.

Program Design and Customer Experience

Quality Assurance

HPwES provided a framework for the EFN program by detailing national standards, such as QA and quality control (QC). Throughout the grant period, EFN worked to improve the QA process while balancing requirements, customer interests, and contractors' time. To ease the paperwork burden on contractors, EFN worked with Energy Savvy, a software developer, to implement a web-based project management system to help contractors meet HPwES data requirements and provide job-specific details.

At first, the EFN Team found it challenging to recruit QA staff because the HPwES program model was still relatively new in Nevada. Now EFN has three full time, local, trained staff who conduct QA for the program and provide support to contractors.

Auditing

The EFN Team found that a contractor-based auditing model was more successful at building program participation than an open-market auditor-based model. At first, the EFN Team used an auditor-based model, where independent auditors were responsible for driving customers to install improvements. The EFN Team quickly realized this model was not going to grow the program. Although independent auditors completed many audits, with no real incentive or program materials, they did not market the program or encourage customers to make home improvements. As a result, conversion rates from sign-up to home performance upgrade under the auditor-based model were very low.

Additionally, the auditor-based model incurred longer than necessary project timelines, high costs, communication difficulties, and excessive paperwork. One of the EFN Team's first steps was to standardize the audit cost at \$199 per home. It also offered contractors and auditors a \$100 incentive for submitting paperwork, so the EFN Team could follow up with the customer and help them engage in the upgrade process. In this way the audit became a tool to feed the program instead of operating as a stand-alone step, and the conversion rate increased significantly.

Now almost all audits are conducted by high-volume installation contractors who, unlike independent auditors, have an incentive to drive customers to make home improvements. Moving forward, EFN has a goal to perform home audits as well.

Driving Demand

Referrals

The EFN Team found that homeowners are much more likely to complete retrofit projects through the program if they hear about it from a source they trust, such as family, friends, neighbors, or a familiar news source. On July 1, 2012, the Reno Gazette Journal, which is considered a trusted source, ran an article about the program which, as of October 2013, had generated the largest response of any single media outreach activity. The article prompted over 100 customers to sign –up for the program, 81 to have a home energy audit, and 32 to have a retrofit.

The EFN Team also offered a Groupon® for a half-priced energy assessment (\$99) and a larger rebate amount (\$2,000 for 20% energy savings). These offers were advertised on employee boards and other trusted referral mechanisms.

Marketing

The EFN Team recognized that marketing must be multidimensional and use all available channels; however, the grant did not provide adequate funding to pursue intensive marketing. The EFN Team tested marketing through as many channels as possible with the available funding: direct mail; community events; social media such as Twitter, Facebook, LinkedIn, Instagram, and Google+; radio, newspapers, and television; and Internet marketing.

EFN program marketing and outreach emphasizes the value of energy-efficient upgrades, incentive availability, and low-interest loan opportunities, and it targets major employers, churches and civic organizations, retailers, homeowners associations, and real estate groups. Customer outreach events have been varied and included booth visibility at farmers markets, First Friday art events, and home shows.

The City of Las Vegas, City of Henderson, City of North Las Vegas, City of Sparks, City of Reno, City of Carson City, Washoe County, Clark County, and the State of Nevada all declared EnergyFit Nevada days in 2012 and 2013 in celebration of October’s ENERGY STAR® month and to encourage residents to participate in the program. To expand program visibility and help build program awareness, the EFN Team, led by the City of Las Vegas and City of North Las Vegas, opened several model homes to the public that had received energy-efficient retrofits.

EFN plans to dedicate a larger budget to marketing in the future, which will help fund larger outreach efforts through more diverse marketing tactics, and can also be used to continue supporting the most important marketing channel—program partners.

Incentives

The EFN Team experimented with different incentive amounts over the three-year grant and concluded that a performance-based program structure that ties incentives directly to savings correlates to higher participation rates. The original grant was written to offer homeowners an incentive of \$1,000 for

qualifying retrofits that result in a 20% reduction in energy consumption. The first modification the EFN Team offered was a lower incentive for reduced energy savings, thinking this would encourage the participation of any homeowners who did not think they could reach the 20% energy-reduction goal. Homeowners who achieved between 15% and 19% energy reduction received a \$500 incentive, rather than the standard \$1,000 incentive for a 20% reduction. However, the program did not see a notable increase in participation as a result of this effort.

Beginning in 2012, the EFN Team introduced additional incentive strategies to try to boost participation. After recognizing that the audit cost was a barrier for many customers, the EFN Team found that a standardized audit cost of \$199 to be the most successful approach for motivating customers to take the first step. Other tested strategies were paying auditors \$100 (later raised to \$150 per audit), paying contractors \$200 per completed jobs, and offering an additional \$100 for every 1% reduction over 20%, up to a maximum of \$2,000. Limited-time bonuses were also offered, ranging from \$1,000 to \$3,000 for energy savings between 20% and 30% energy reduction.

Program participation increased every time one of these rebate specials was offered, even when it was tied to a requirement for increased energy reduction.

However, contractors voiced concerns regarding fluctuating incentives, because homeowners were sometimes reluctant to commit to a retrofit project if they thought the incentive amount could increase in the future. However, they also recognized that when rebates increased, so did the number of homeowners willing to complete home retrofits.

Financing

Low Interest Loans

EFN partnered with Green Chips, a local nonprofit, the City of Las Vegas, and Nevada State Bank and using ARRA funds created a loan program with a low-interest rate of 2.3% for eligible homeowners. Despite the fact that financing is often cited as a barrier for home performance programs, the EFN Team learned that a low interest rate alone is not enough to ensure homeowner uptake and that many contractors offer their own financing options to customers.

When the low-interest loans were first offered, contractors were required to carry the cost of the upgrade, as well as any rebate, until all upgrades had been completed and final approval issued following a QA visit. The EFN Team decided to make this process easier for contractors by allowing funds to be disbursed upon approval of the audit and scope of work. Loan funds are now issued to the homeowner when the statement of work is defined so the homeowner and contractor can work out a partial and final payment plan.

Partnering with Loan Programs

UNR explored the possibility of partnering with the Clinton Foundation's Home Energy Affordability Loan and the Warehouse for Energy Efficiency Loan programs, but recognized this would take additional time,

resources, and possibly even legislative intervention, all of which were beyond the scope of this initial grant. EFN plans to explore these options and other possibilities in the future.

Energy Efficiency Mortgages

Over the grant period, the EFN Team completed and approved some projects funded through Energy Efficiency Mortgages (EEMs), but despite its efforts to promote this alternative, few homeowners have taken advantage. The EFN Team learned that in order to successfully incorporate EEMs in the future, it will need to establish a system to help homeowners step through the process and manage the paperwork.

In the future, EFN plans to implement changes such as hiring an in-house mortgage facilitator, conducting internal staff training and external training with partners such as lenders and realtors, and creating print media for partners to share with customers. EFN plans to set aside a specific budget for this effort.

Workforce and Contractor Relationships

Partnerships with Contractors

Although the EFN Team recognized the important role of contractors in the success of a home performance program, it faced some challenges in establishing partnerships with contractors and auditors, primarily because of strict state requirements for both contractors and auditors.

Participating contractor firms must have at least one BPI-certified staff member employed. Auditors must obtain a state-issued auditor's license, which requires BPI certification and involves 40 hours of classroom training, a background check, and proof of insurance with a minimum coverage of \$1 million in errors and omissions and \$1 million in general liability. Additionally, and perhaps most challenging of all, in order to protect customers the state does not allow auditors to perform both the audit and home retrofits for the same project. An unintended consequence is that this discourages contractors who can offer both as a turnkey service.

Despite these challenges, the EFN Team slowly gained contractor partners by consistently soliciting contractor feedback when designing new marketing materials. These included yard signs, truck magnets, door hangers, finance marketing material, co-branded marketing materials, subsidized booth space at community events and home expos, and subsidized sponsorships of events that reached homeowner audiences.

In 2011, all home upgrades completed through the program had been introduced in some way by a program partner. By 2012 and 2013, other marketing efforts were beginning to yield participation results as well, but at least 50% of completed program home upgrades were still a result of program partner marketing.

Training

Initially, TMCC provided contractor training in northern Nevada. However, initially there was no structure or incentive in place to link the training to the EFN program, and therefore it was not helping to build a network or support the program as intended. The EFN Team implemented a training reimbursement component to ensure that newly trained contractors would have an incentive to partner with the program.

With EnergyLogic, EFN has improved its business network, increased support of the program, and expanded training into southern Nevada. The goal is to eventually bring the contractor training in house and offer training statewide.

Evaluation and Data Collection

Reporting

HPwES program sponsors are required to track and report program data to the DOE, such as participating contractors, projects completed, and field inspection results. This process can be quite time consuming and is further complicated because the EFN Team has been unable to access energy usage data directly from utilities, such as that accomplished for other HPwES and BBNP programs. Despite this, the EFN Team developed and submitted program reports that satisfy the DOE requirements.

Development in the half second of 2013 of the industry standard for the Home Performance XML, DOE's standardized data sharing system, has greatly reduced the manual data entry needed to track project-level data.

EFN will continue tracking and reporting these metrics through the established progress reporting system, as well as through strategic planning meetings with staff and the board of directors.

Accomplishments

Statement of Project Objectives

SOPO Task 1: Achieved

The Recipient will work with the DOE, NETL, and EERE's SEP to make any revisions requested to the submitted program/strategy plan.

- **Target:** Work with the DOE, National Energy Technology Laboratory (NETL), and Office of Energy Efficiency and Renewable Energy (EERE)'s SEP to make requested revisions to the submitted program or strategy plan.
- **Actual:** The EFN Team completed an official revision to the program/strategy plan in October 2012 and submitted it to all grant partners for comments and revisions.

SOPO Task 2: Achieved

The Recipient will formalize initial teaming arrangements including inter-agency agreements, Memorandums of Understanding (MOUs), and Requests for Quotes (RFQ) packages to secure subcontracts with other services providers.

- **Target:** Formalize initial teaming arrangements through MOUs and RFQ packages.
- **Actual:** Team arrangements, MOUs, and RFQ packages were formalized.

SOPO Task 3: Achieved

Based on guidance from the DOE, NETL, and EERE-SEP meetings, the Recipient, with input from the NRI team, will finalize the Program Implementation Plan, including a specific marketing plan and the Project Management Plan. The Project Management Plan will include a project milestone log.

- **Target:** Finalize the Program Implementation Plan, marketing plan, and Project Management Plan, including a project milestone log.
- **Actual:** The sub-grantees developed and finalized a Program Implementation Plan, marketing plan, and Project Management Plan. The team further submitted progress reports and program reports on a quarterly basis that detailed project milestones.

SOPo Task 4.A: Achieved

NRI team members will work with mortgage brokers, lending institutions, private investors, counties and cities, and legislative entities to develop and refine partnerships and legislation through mechanisms such as revolving loan funds, loan guarantee programs, PACE programs, and/or other instruments to ensure a self-sustaining program. The NRI team will educate these stakeholders on the benefits of and approaches to home energy retrofits.

- **Target:** Work with lending partners and legislative entities to develop and refine homeowner financing opportunities and/or other instruments to ensure a self-sustaining program. The NRI team will educate these stakeholders on the benefits of and approaches to home energy retrofits.
- **Actual:** Initially, UNR researched and produced a white paper on financial institutions and customer-financing opportunities. Meanwhile, the EFN Team developed and promoted a low-interest loan program through Green Chips, the City of Las Vegas, and Nevada State Bank. Wells Fargo Bank developed a PowerPoint® presentation to educate sub-grantee team members about the EFN program and EEMs, and sent out 44,000 direct mailings to FHA loan customers that included information about energy efficiency and the EFN program. The EFN Team sponsored several green realtor trainings and realtor outreach events in 2012 and 2013.

SOPo Task 4.B: Achieved

NRI team members will work to support the expansion of HomeFree Nevada's affiliate role to provide affiliate services statewide.

- **Target:** Work to support the expansion of HFN's role to provide affiliate services statewide.
- **Actual:** The EFN Team set the foundation necessary to implement the EFN program statewide (in Southern Nevada until June 2011, then launched statewide) by building program-support structures, such as training, marketing, and QA, in both the northern and southern regions of Nevada. EFN also took on an organizational leadership role, which will prove useful for statewide program coordination.

SOPo Task 4.C: Achieved

Home Energy Raters (HERs) and BPI professional training and certification programs will be developed and expanded through the NRI to provide qualified auditors and contractors to perform HPwES retrofits and provide proper estimation of energy savings and QA of work performed.

- **Target:** Develop and expand HER and BPI professional training and certification programs.
- **Actual:** In both the northern and the southern regions, the EFN Team offers training that is used to recruit and build the program trade ally network. HFN conducts all QA/QC inspections and works with contractors to provide further support and training opportunities as needed.

SOPO Task 5.A: Achieved

NRI team members will conduct focus groups to ensure the marketing messages are targeted and effective. The marketing campaign will provide information about benefits of retrofits, incentives available, and be designed to engage homeowners in implementation of energy retrofits. Media campaigns will be developed and implemented. Marketing partnerships will be solidified.

- **Target:** Conduct focus groups to ensure marketing is targeted and effective. Develop marketing and media campaigns that provide information about incentives and the benefits of retrofits.
- **Actual:** UNLV conducted focus groups to collect feedback from customers to determine if marketing messages are effective. EFN, with help from the City of Las Vegas, created marketing collateral including brochures, PowerPoint presentations, and other printed media that explain the benefits of retrofits and describe the available incentives. Furthermore, the City of Las Vegas established EnergyFit Nevada Day, facilitated public open houses for two energy-efficient model homes, and created a customer referral system. EFN has been accepted by the Greater Las Vegas Association of Realtors as a preferred vendor to promote the program to other vendors and clients.

SOPO Task 5.B: Partially Achieved

NRI team members will work with home builder associations/green building programs, and water authorities to engage them in the promotion of green building retrofits to incorporate water efficiency/conservation and indoor environmental quality issues with energy efficiency to maximize home performance/retrofit benefits and achieve additional energy savings in water distribution and treatment through water conservation.

- **Target:** Work with home builder associations, green building programs, and water authorities to engage them in promoting green building retrofits and energy savings through water conservation.
- **Actual:** EFN communicated the value of energy-efficient homes to the real estate community by sponsoring green realtor designation courses and high-performance home summits and promoting EEMs. The EFN Team has not specifically tracked energy savings that are related to water distribution and treatment or achieved through water conservation activities.

SOPO Task 5.C: Partially Achieved

NRI team members will seek to develop partnerships with national home improvement retailers including Lowe's, Home Depot, and Ace Hardware. Leverage in-store marketing and service delivery channels that specifically target both homeowners and contractors engaged in home improvement projects.

- **Target:** Seek to develop partnerships with national home improvement retailers to create in-store marketing that targets both homeowners and contractors.
- **Actual:** Purdue Marion and the EFN Team tried to engage Lowe's and Home Depot to build upon in-store marketing. A proposal developed for Lowe's was denied, and the NRI team encountered

difficulties reaching corporate representatives at Home Depot. EFN plans to continue to try to engage with retailers to develop partnerships in the future.

SOP Task 5.D: Achieved

NRI team members will provide outreach to contractors and their associations will provide information on HPwES goals and benefits, HomeFree Nevada and professional training programs, the NRI, and benefits and approaches to participating in delivery of home energy audit and retrofit services. NRI team members will solicit participation from contractors with specializations such as HVAC tune-up/insulation; encourage them to expand service offerings or build alliances to include other home performance services, and engage contractors in bulk purchase pricing opportunities. NRI team members will work with providers to ensure the marketing messages are understood and disseminated throughout the industry and leverage existing marketing programs to help contractors reach property owners in need of additional building-related services.

- **Target:** Provide outreach to contractors and engage them on the benefits and goals of HPwES, professional training programs, the NRI, and energy audits and retrofits. Solicit their participation to expand service offerings to other home performance offerings.
- **Actual:** HFN solicited contractor and auditor participation and guided them through the program and QA process. Workforce Connections provided training to increase contractors' effectiveness at converting leads into sales. Contractors were also provided with messaging and branding guidelines, website-generated leads, marketing collateral, and EFN program training.

SOP Task 5.E: Achieved

NRI team members will formalize partnerships with state utilities to leverage advertising and rebate incentives, to work with utilities to develop and implement the NRI rebate program, and approaches for the NRI evaluation, measurement, and verification (EM&V).

- **Target:** Formalize partnerships with state utilities to build upon advertising and rebate incentives, develop and implement the NRI rebate program, and develop approaches for conducting EM&V.
- **Actual:** HFN has always ensured that EFN program contractors share all available information about utility incentives with customers, and hosted several collaborative events with the utilities and NV Energy to facilitate information sharing.

SOPO Task 5.F: Achieved

NRI team members and the city and county partners participation through MOUs, community-based organizations including schools, employers, governments, and other social networks will be engaged to build awareness and motivation participation, generate word of mouth advertising and create community visibility/recognition mechanisms. Community-wide contests will be developed in which partnering organizations encourage member households to complete retrofits within a given timeframe. This will also help create a sense of urgency to take action through limited time offers and declining incentive levels over time.

- **Target:** Create community visibility and recognition to encourage households to complete retrofits and create a sense of urgency.
- **Actual:** The EFN Team has targeted homeowners associations and religious organizations and created neighborhood events through churches, schools, fire stations, and direct mail. Furthermore, the EFN Team created two demonstration homes, which were open to the public in target neighborhoods, and offered a Groupon to increase visibility and encourage participation. Finally, the EFN Team offered several limited-time bonus incentives to drive participation and create a sense of urgency.

SOPO Task 6.A: Achieved

NRI team members will develop the criteria and conditions for provision of rebate incentives necessary to achieve initial acceleration of retrofit implementation to fuel development of a market that can become self-sustaining. The Recipient will administer the rebate program through a contractor secured for that purpose. Information from the rebate applications will be used to provide necessary information for EM&V.

- **Target:** Develop the criteria and conditions for incentives to achieve initial acceleration of the program and develop a self-sustaining market.
- **Actual:** Following some experimentation with incentive levels, the EFN Team implemented performance-based incentives that successfully accelerated program development and customer awareness. Through these and other activities, such as training and engaging the contractor and partner communities, the EFN Team has contributed to developing a robust, self-sustaining efficiency market in the Las Vegas and Reno metropolitan areas. EFN is currently working to diversify funding sources to include both private and public funds, as well as legislative funding at the state level, to use in continued program offerings in the future.

SOPO Task 6.B: Achieved

NRI team members will develop a web-based database to inform the public about energy efficiency in Nevada. The database will provide a “one-stop shop” for consumers, retailers, providers, commercial entities, and others to learn about energy efficiency in Nevada and guide them through the process of implementing energy efficiency, including utilization of contractors, HPwES, financial incentives, and financing mechanisms. The website will be designed and hosted by a contractor secured for that

purpose. NRI team members, utilities, and the city and county partners will provide content for the site.

- **Target:** Create a comprehensive web-based database to inform the public about energy efficiency in Nevada.
- **Actual:** A website was originally designed by Walden Hyde then redesigned by Energy Circle Pro. The website is comprehensive and guides customers through energy-efficiency retrofit implementation. It includes contractor availability and financing options.

SOP Task 7

Evaluating the success of the proposed program is essential to continued refinement of an accelerated, self-sustaining retrofit program. The evaluation of the project under this task includes evaluating the performance of the HPwES providers to refine retrofit practices and training, establishing a best practices methodology that is transferable as the project matures, and to confirm energy saving performance for quantifying project impacts and cost-effectiveness. Additionally, an evaluation of the various components of the program will be used to refine strategies and target markets to ensure the program matures as expected. The Recipient will engage with NRI partners and the city and county partners participating through MOUs to ensure the development of an EM&V plan and EM&V report that meet project objectives.

- **Target:** Evaluate the performance of the HPwES providers to refine retrofit practices and training and establish a best practices methodology that is transferable as the project matures. Develop an EM&V plan to confirm energy-saving performance and cost-effectiveness.
- **Actual:** EFN hired Cadmus, a third-party evaluation firm, to review the program processes and performance and conduct a data review to determine the accuracy of EFN's savings analysis methodology and reported energy savings. Cadmus found that the database and OptiMiser file inputs were mostly complete and accurate and EFN has collected enough data to conduct both a high-level impact evaluation and calculate a simple cost-effectiveness ratio in the future, if desired.

Challenges

The EFN Team had difficulty reaching its program goals due to several outside factors, such as changes in state legislation and Nevada having among the highest rates of foreclosure and unemployment in the country from 2011 to 2014.

The EFN Team faced several implementation challenges as well. These included the sub-grantees operating largely independently, geographic diversity, difficulty recruiting contractors and auditors, changes in legislation, and insufficient funding to execute the marketing plan. The EFN Team resolved many of these challenges by changing the program design and creating additional partnership opportunities.

Program Leadership and Coordination

When the GOE first awarded the grant, five sub-grantees received funding, and each worked largely independently on different tasks. As the grant progressed, it became evident to all that centralizing the organization was needed to provide leadership and create a more successful program. EFN took on this leadership role in 2012.

Geography and Population Distribution

The EFN program is unique in that it must target two diverse populations, one in the north centered in the Reno metropolitan area and the other in the south centered in the Las Vegas metropolitan area. Grant recipients determined that a local presence in each region would help them offer consistent opportunities and maintain equally high standards for QA, contractor recruitment, training, and marketing in order to ensure program success.

Legislation

Under the initial GOE grant, state law dictated that all homes must undergo a home energy audit at the point of sale; this shaped the EFN Team's expectation that 1,750 homes would go through the program over the three-year grant period. However, soon after the program was launched, the state legislature repealed this requirement, changing the program from an opt-out program to a voluntary opt-in program. The change in legislation prompted the EFN Team to lower its goal from 1,750 to 1,250 homes in 2012, and the program reached 553 homeowners during its three-year grant period.

The legislation also stated that auditors must obtain a state-issued license that requires BPI certification and involves 40 hours of classroom training, a background check, and proof of insurance, with a minimum coverage of \$1 million in errors and omissions and \$1 million in general liability. Additionally, and perhaps most challenging of all, in order to protect customers, the state does not allow auditors to perform both the audit and home retrofits for the same project. An unintended drawback is that this discourages contractors who can offer both as a turnkey service.

Despite these challenges, the EFN Team slowly gained contractor partners by consistently soliciting contractor feedback when designing new marketing materials. These included yard signs, vehicle magnets, door hangers, finance marketing material, co-branded marketing materials, subsidized booth space at community events and home expos, and subsidized sponsorships of events that reached homeowner audiences.

QA Staff, Contractor, and Retailer Recruitment

The EFN Team also encountered difficulties finding QA staff and recruiting retailers and contractors. Finding QA staff was difficult at first, because the HPwES program design was relatively new to Nevada and a successful QA team must understand customer service and national technical standards, as well as have the ability to balance program requirements and the contractor perspective. Now, EFN employs three QA staff who conduct all program inspections in the state.

Although the EFN Team reached out to retailers, it was unable to establish partnerships.

Contractor recruitment challenges largely stemmed from stringent state licensing and insurance requirements and the contractors' reluctance to carry the full cost of project upgrades—either the rebate or the loan and rebate—until all QA paperwork had been submitted. Loan funds are now issued to the customer when the statement of work is defined, allowing customers and contractors to work out a payment plan based on upgrade approval.

Funding for Marketing and Financing

The EFN Team recognizes that it needs both a multidimensional marketing approach and a variety of financing options to achieve a successful retrofit program. Insufficient funding during the initial grant period created some challenges to increasing program awareness. However, the EFN Team deployed a limited marketing campaign through diverse creative, low-cost channels, such as its website, social networking, earned media, and paid advertising.

The EFN Team has also worked with local partners to develop and promote a low-interest loan to Nevada homeowners to encourage them to complete upgrades through the program. In the future, EFN plans to allocate a larger budget for marketing and to develop EEMs and other financing offerings.

Verification of Data

Cadmus reviewed the program database and a sample of OptiMiser (audit report) files as well as all progress reports, summary reports, and program reports that the EFN Team developed to satisfy DOE reporting requirements.

Completeness and Accuracy of Data Inputs

Cadmus found the database and OptiMiser file inputs to be mostly complete and accurate; however, certain sections of the database were not filled out because the EFN program has gone through several structural improvements during the last three years. For example, “EFN Rebate Requested” and “Date Submitted” were not always filled out in the “Upgrade” section, and the “Date/Time of Test Out” was blank because these fields were replaced by “Date Completed,” a BBNP-required field. Some fields were missing values that were not added to the database until 2012. For example, the “EFN Rebate Requested” field was added when the incentive structure became more complex and incentive amounts fluctuated due to varying energy savings, and the “Date Submitted” field was added in 2012 when EFN began processing all submissions; previously, rebates were processed either through City of Las Vegas or by GOE staff, using slightly different systems.

Cadmus also found inconsistencies in the OptiMiser files documentation of electrical and natural gas providers. These areas were not always filled out, and occasionally the natural gas section conflicted by listing oil or liquid propane as an “Other Fuel Type.” OptiMiser allows for modeling of multiple fuel types, although when there are more than two sources, it can sometimes be unclear. Although not common, there were cases where a house had electricity, natural gas, and also an old fuel oil or propane heater (mostly in Northern Nevada).

Evaluation Capabilities

Despite these small inconsistencies in data collection, the EFN Team has collected enough data that contain participant home details—in both the participant database and the OptiMiser files—to conduct both a high-level impact evaluation and to calculate a simple cost-effectiveness ratio in the future, if desired. These impact evaluation and cost-effectiveness study activities are:

- **Calculate a verified gross savings value.** This could be calculated based on site-visit installation verification or a home-modeling approach.
- **Calculate a NTG value.** This could be calculated using data gathered through a customer self-report survey.
- **Calculate a cost-to-savings ratio at the household and/or program level.** Both costs and savings are available at the household level and could be used to calculate simple cost-effectiveness.

Additional data would need to be collected to conduct more rigorous analyses, such as billing analysis and/or a total resource cost (TRC) ratio. To conduct a billing analysis, the EFN Team would need access

to participants' pre- and post-retrofit energy consumption data at a household level. To determine a TRC ratio, several more inputs would be needed including measure costs, measure lives, and NTG ratios at the measure and program levels. Additionally, utilities would need to provide the EFN Team with further data, such as avoided costs, load shapes, and discount rates.

Benchmarking

Cadmus benchmarked the EFN program to five retrofit programs in three different regions. All had an audit component and comparable program design components.

Table 1 provides an overview of the structure, savings, barriers, and marketing associated with these programs. Table 2 provides a comparison of EFN program design elements to benchmarked programs.

We also reviewed budget breakdowns for two HPwES programs and one home energy audit program to compare spending allocations in the marketing, administrative costs, and measure incentives categories. Figure 1 shows these budget allocations.

The EFN program reported almost twice the amount of average savings per household than two of these other programs (12,819 kWh compared to 4,111 kWh and 5,231 kWh). It is worth noting that the EFN Team reports a modeled gross energy savings, not net, because it lacks access to actual utility usage data. The EFN program also has higher standards for program contractors, being one of only two programs that require BPI certification of the six programs in the comparison.

Table 1. Tracked Program Metrics, Incentives, Marketing, and Barriers

Name	Average Savings/ Household	Conversion Rate	Incentives	Marketing Types		Barriers
<i>EFN</i>	12,819 kWh	38.1%	\$199 audit \$1,000 for 20% energy reduction Bonuses: \$500 rebate for \$20 % \$1,000 for 20%; +\$100 for each additional 1% up to \$2,000 \$2,000 for 20%; +\$100 for each additional 1% up to \$3,000 \$1,500 for 20% \$1,500 for 30% \$2,000 for 20%	TV and radio Newspaper (earned media) Digital ads Social media Paid advertising Door hangers Yard signs	Website and online advertising Model home open houses Contractor vehicle magnets Cooperative advertising with contractors Customer referral cards Community events	Financing, limited customer awareness of program and benefits
<i>Northeast Program 1</i>	N/A	32%–40% (estimated by contractors)	Homeowner pays \$100 of audit cost, program pays remainder of audit cost (between \$350-\$500), and homeowner is then eligible for up to \$2,500 of incentives for prescriptive measures	Phone-a-thon Yard signs Bus signs/posters Door hangers Bill inserts “Energy parties”	Website and Facebook page Newspaper \$20 referral coupons Cooperative advertising with contractors	Cost, homeowner time constraints
<i>Southeast Pilot Program 1</i>	N/A	61%*	Audit cost reimbursement (\$350) if 20% energy savings is achieved	Limited budget for marketing. Relied primarily on locally focused marketing and outreach campaigns: Word-of-mouth Local organizations Participating auditor/contractor		Partial participants consistently pointed to cost as a key barrier to retrofit measures
<i>Southeast Program 2</i>	5,231 kWh	N/A	25% of audit cost reimbursement, audit fully rebated (100%) if a 15% savings was achieved post-audit. This program built upon existing utility rebates, values unknown.	TV and radio Newspaper Online ads Bill inserts	Neighborhood outreach Events including home and garden shows, and Home Makeover Contest Social media through utility and credit union websites	N/A

Name	Average Savings/ Household	Conversion Rate	Incentives	Marketing Types	Barriers
<i>Southeast Program 3</i>	4,111 kWh	N/A	Built upon existing utility audit rebate: Customer pays \$35 for audit, program covers the remainder. After completing audit, homeowner is eligible for up to \$3,000 in utility rebates for installed measures	Began with TV ads featuring a celebrity spokesperson. Low uptake led them to increase grassroots marketing. Community canvassing, yard signs were more effective.	N/A
<i>Southwest Pilot Program 1</i>	N/A	N/A	Basic Package: Up to \$1,000 to install required measures (10% energy savings) Advanced Package: Rebates scale with savings, up to \$4,500	Community-based social marketing Home makeover contest Retail partnerships	Limited understanding of comprehensive retrofits and the benefits.

*Note that auditors' selective use of the audit tool may have led to an unusually high audit-to-retrofit conversion rate in this program. One contractor explained that in homes where he saw potential for 20% or greater energy savings he used the scorecard tool "so that the homeowner could qualify for rebates."

Program Design Metrics

Table 2 below cross-references the program design elements found in the EFN program with the benchmarked programs. When we compared programs, a few themes stood out.

All programs offer some type of financing in the form of a loan offer. Southeast program 2 offers interest rate buy-downs and loan loss reserves, a dedicated pool of funding held by a lender. Southwest program 1 offers unsecured five-year loans from a variable rate starting at 8.66% to a fixed rate of 6.99%.

Although contractor certification requirements vary, most contractors have to complete some type of training. Workforce development is also a key piece of several of the programs Cadmus reviewed.

Table 2. Program Design Elements

Programs	Performance-Based Incentives	Offer Financing?	Implementer for Audits?	Workforce Development Component*	QA	Contractor Certifications
<i>EFN</i>	√	√	√	√	√	√
<i>Northeast Program 1</i>		√		√		None
<i>Southeast Program 1</i>	√	√				Encouraged BPI, but not required
<i>Southeast Program 2</i>	√	√	√		√ *	Pre-screening and approval process for participating contractors; built a network of affiliated contractors
<i>Southeast Program 3</i>		√		√	√	Utility partner began requiring BPI certification for their contractors during the program
<i>Southwest Program 1</i>	√	√		√	√	Pilot program trained HVAC contractors to become QI certified

* Program has a stated goal to increase the skill level of area contractors, and it conducted audit trainings or similar skill development as part of the program.

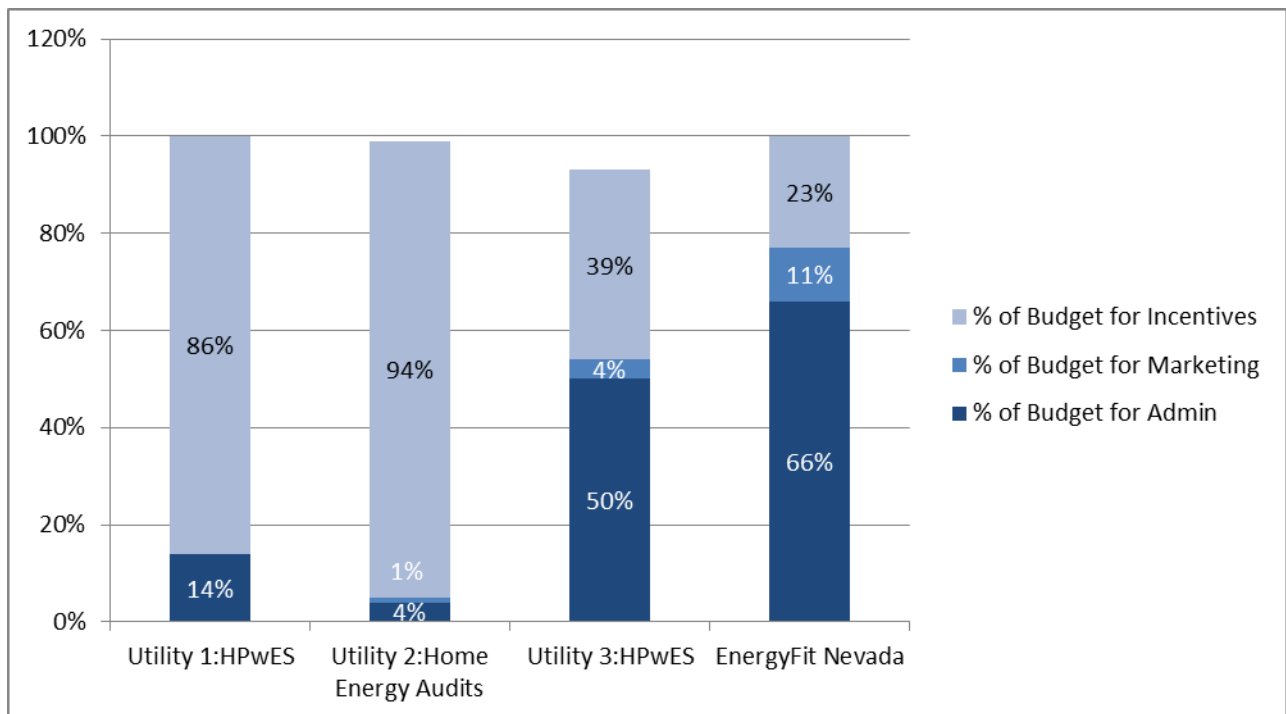
**This program has a partial QA component, as the utility does QA inspections, but these do not cover all rebated measures the program offered.

Spending Priorities

Figure 1 compares the EFN program budget allocations among three of the utility programs (two HPwES and one home energy audit program). In two programs, incentives make up the majority of total spending. Administrative budgets vary considerably among the programs, with one comparison program spending half of the budget on administrative costs and another only 4%. However, we noted that the programs may define administrative spending categories differently, which would affect these allocations.

Marketing is under 10% for each program except for EFN. Utilities often have integrated marketing campaigns to promote their energy-efficiency programs at the portfolio level. So, although a utility might dedicate a smaller percentage of its program-specific budget to marketing, other marketing and outreach activities that are not reflected in the program budget may also contribute to program awareness. EnergyFit Nevada's budget breakdown is most similar to the HPwES program offered by Utility 3. Marketing spending is comparable across all four programs as the smallest portion of the budget. Both EnergyFit Nevada and the HPwES program for Utility 3 allocate half or more of their budget to administration, and a smaller portion to incentives than Utility 1 or Utility 2.

Figure 1. Budget Allocation by Spending Category



Developed Products

These products were developed as part of implementing the EFN program:

- EFN organization website: <http://www.energyfitnevada.org/>
- BBNP online partner profile: <http://energy.gov/eere/better-buildings-neighborhood-program/nevada-sep>
- Financing through Green Chips: <http://greenchips.org/>
- Salesforce program database from spring 2012 through winter 2013
- Worked with Energy Savvy to implement a web-based project management system: <https://www.energysavvy.com/>
- Southwest Regional Home Performance Collaborative
- Economic Analysis Report prepared by RCG Economics⁶
- Policy paper on the status of financing research and implementation⁷
- Nevada Homeowners' Energy Conservation Statewide Survey Focus Group Supplement⁸

⁶ RCG Economics. *EnergyFit Nevada Economic Analysis*. 2013.

⁷ Nevada Small Business Development Center. *Status of Financing Research and Implementation*. December 30, 2013.

⁸ University of Nevada, Las Vegas. Nevada Homeowners' Energy Conservation Statewide Survey Focus Group Supplement. November 29, 2012.