City of Phoenix
Energize Phoenix Program

Award Number: DE-EE0003563

BBNP Name: City of Phoenix

Project Title: Energize Phoenix

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DISCLAIMER

Executive Summary

Energize Phoenix (EPHX) was designed as an ambitious, large-scale, three-year pilot program to provide energy efficiency upgrades in buildings, along Phoenix's new Light Rail Corridor – part of a federal effort to reduce energy consumption and stimulate job growth, while simultaneously reducing the country's carbon footprint and promoting a shift towards a green economy.

The program was created through a 2010 competitive grant awarded to the City of Phoenix who managed the program in partnership with Arizona State University (ASU), the state's largest university, and Arizona Public Service (APS), the state's largest electricity provider. The U.S. Department of Energy (DOE) Better Buildings Neighborhood Program (BBNP) and the American Recovery and Reinvestment Act (ARRA) of 2009 provided $25M in funding for the EPHX program.

The Light Rail Corridor runs through the heart of downtown Phoenix, making most high-rise and smaller commercial buildings eligible to participate in the EPHX program, along with a diverse mix of single and multi-family residential buildings. To ensure maximum impact and deeper market penetration, Energize Phoenix was subdivided into three unique parts:

i. commercial rebate program,
ii. commercial financing program, and
iii. residential program

Each component was managed by the City of Phoenix in partnership with APS. Phoenix was fortunate to partner with APS, which already operated robust commercial and residential rebate programs within its service territory. Phoenix tapped into the existing utility contractor network, provided specific training to over 100 contracting firms, and leveraged the APS rebate program structure (energy efficiency funding) to launch the EPHX commercial and residential rebate programs. The commercial finance program was coordinated and managed through a contract with National Bank of Arizona, NBAZ, which also provided project capital leveraging EPHX finance funds. Working in unison, approved contractors jointly produced more than 161,000 labor hours in pursuit of EPHX goals over the life of the project. Labor hours were spread among electricians, heating, ventilating and air-conditioning (HVAC) technicians, marketing professionals, engineers, sales, and administrative support staff across the approved contractor workforce. Program participants received both the utility rebate along with the EPHX rebate, and depending on project size and utility rebate structure some projects resulted in low to no-cost upgrades for customers.

Phoenix also partnered with ASU, a grant sub-recipient, to leverage the institution's expertise in research and data analysis. In this partnership, ASU accepted marketing responsibilities for the grant and partnered with DRA Communications (DRA), a Phoenix-based marketing firm, to create and communicate the message out to the marketplace.

Program Goals

- Upgrade 30 million square feet (sq ft) of commercial space;
- Upgrade 1,700 residential units;
- Leverage $125 million in resources (5:1);
- Reduce commercial energy use by up to 18%;
- Reduce residential energy use by up to 30%.

Program Results

The EPHX program has completed its energy upgrade activities. A review of the work completed by ASU revealed that the EPHX program substantially exceeded the program's stated goals by retrofitting/upgrading over 33 million sq ft of commercial space (*30 million sq ft goal exceeded by 11%*) and 2,014 residential units (*1,700 unit goal exceeded by 18%*) along the Light Rail Corridor. The program helped stimulate economic growth by adding $31million to the local economy and enhanced an already robust energy efficiency contractor network. This contractor network will continue to promote utility energy incentives to sustain energy efficiency upgrade activities in the future. Finally, EPHX helped reduce participants annual energy consumption by 135 million kilowatt-hour (kWh) translating into over $12.5 million of annual energy cost avoidance for the community. This also resulted in projected payback period of 4.5 years for total investment by all parties and reduced greenhouse gas emissions by over 95,000 metric tons of carbon dioxide equivalent (CO2e), per ASU data analysis (EPHX: Yr-3 Summative Report, Jan 2014.)

Final Technical Report

Program Design

In response to a funding opportunity announcement, the City of Phoenix in partnership with ASU and APS originally submitted a $75 million proposal for the EPHX program. The program was originally designed to create a sustainable large-scale model for urban energy efficiency in a portion of the Phoenix urban core over the course of three years. Post award and in negotiations with the DOE team, a $25 million program that addressed a smaller geographical area was created with the following goals:

- Upgrade 1,700 residential units for greater energy efficiency and reduce energy consumption for residential participants by up to 30%;
- Upgrade 30 million square feet of office and industrial space for greater energy efficiency and reduce energy use for commercial participants by up to 18%;
- Cut carbon emissions by as much as 50,000 metric tons per year;
- Leverage federal funds 5:1 with other investment;
- Create up to 1,000 direct and indirect jobs;
- Create a sustainable revolving loan fund to perpetuate the program beyond the three-year award period.

As the prime recipient of grant funding and the lead organization of the EPHX program, Phoenix partnered with ASU and APS. ASU was awarded $3.8M in sub-recipient funding from Phoenix to perform research, data analysis and program marketing. APS did not receive grant funding but provided the critical program rebate funding, infrastructure and utility data needed to measure the energy savings of program participants.

Phoenix ensured compliance with all federal guidelines, including Davis Bacon Act and Historic Preservation. Phoenix coordinated all federal reporting to DOE along with ARRA reporting on a quarterly basis.

EPHX offered several rebate, grant, and financing options to help residential and commercial customers make energy efficiency upgrades to their properties. Because APS already offered an incentive program, EPHX incentives were structured to work in synergy with the APS program. Phoenix also developed additional incentive programs for specific target audiences, such as multi-family rentals, not directly addressed by utility programs at the time.

Driving Demand

In close coordination with Phoenix program staff and focus groups facilitated by DRA, a logo was created for EPHX along with unique ads intended to peak interest and drive customer demand to the EPHX website and program. The Energize Phoenix logo was created to provide program identification, brand identity and accompanied all marketing material throughout the program. The website was designed to provide information and program details assisting customers with program sign-up. The website also included a tool that allowed both customers and contractors to determine whether a customer address was in the effective corridor.

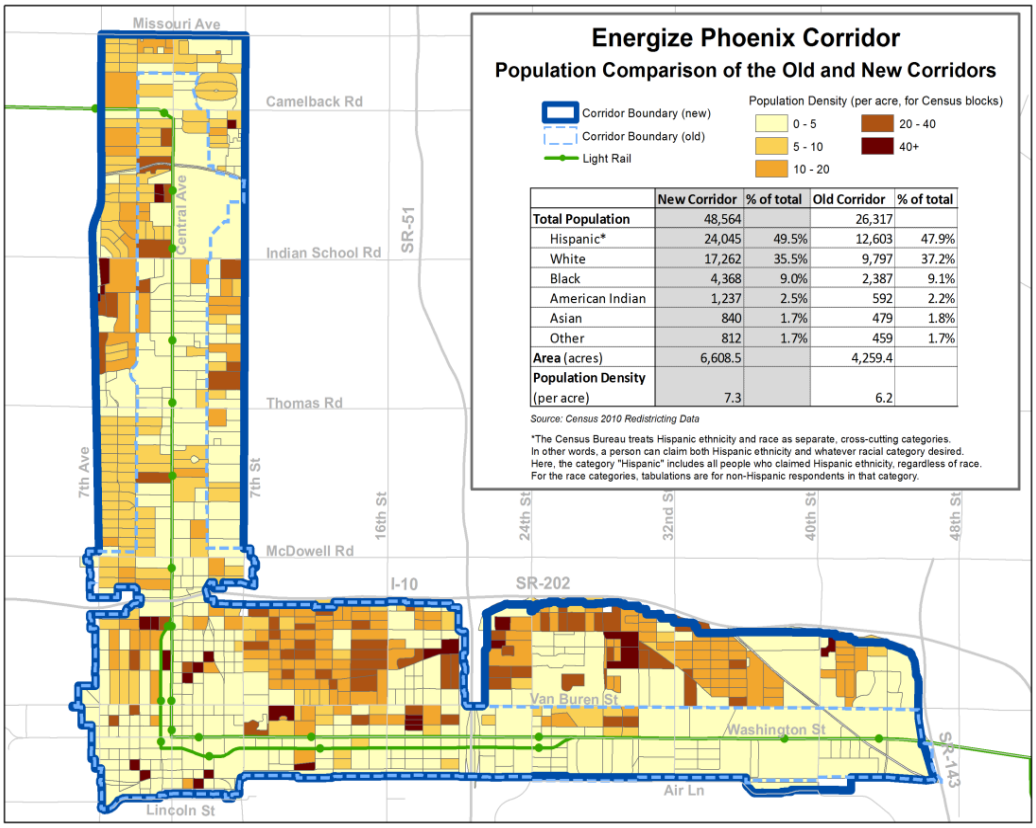
EPHX Logo

Marketing EPHX required a geographically focused approach. A focused area marketing approach to a specific area was required due to the boundaries of the program area. To avoid issues with mass marketing campaigns, and potentially confusing customers outside the corridor, the following steps were taken to reach the target audience.

- Print ads were placed along the Light Rail Corridor at each of the 15 light rail stops in program area;
- Direct marketing (door to door) by both city staff and ASU students to both commercial and residential customers;
- Presentations by city staff to homeowner groups to lend credibility to direct marketing efforts, explaining program requirements and time constraints;
- Inserts with program information in water bills, APS utility bills and Neighborhood Services Department newsletters in the target area;
- Neighborhood recruitment event in spring of 2012 brought together contractors and residents of targeted neighborhoods. Incentive amounts were increased for certain efficiency measures to get residents to take action;
- Shift marketing message, in early 2013, from explaining the program to a final call for action. Messaging stressed the time limit of the program and called customers to action.

Program Territory

Following is the approved program area for EPHX including the original (dashed blue) and expanded (bold solid blue) boundaries. The EPHX program corridor was expanded in 2012 to encompass a greater number of residential neighborhoods along the Light Rail Corridor and increase participation in the program.



	New Corridor	% of total	Old Corridor	% of total
Total Population	48,564		26,317	
Hispanic*	24,045	49.5%	12,603	47.9%
White	17,262	35.5%	9,797	37.2%
Black	4,368	9.0%	2,387	9.1%
American Indian	1,237	2.5%	592	2.2%
Asian	840	1.7%	479	1.8%
Other	812	1.7%	459	1.7%
Area (acres)	6,608.5		4,259.4	
Population Density (per acre)	7.3		6.2	

Source: Census 2010 Redistricting Data

*The Census Bureau treats Hispanic ethnicity and race as separate, cross-cutting categories. In other words, a person can claim both Hispanic ethnicity and whatever racial category desired. Here, the category "Hispanic" includes all people who claimed Hispanic ethnicity, regardless of race. For the race categories, tabulations are for non-Hispanic respondents in that category.

Workforce Development

Leveraging a robust and skilled contractor base was critical to the success of the EPHX program, which was designed to last three years. APS offered contractor training and continuing education for their approved contractors. City staff also prepared and presented a series of training classes to contractors who wished to participate in the program. These sessions provided in-depth explanations of the program, its geographic boundaries, application and rebate processes and other administrative requirements to participate as an approved contractor. During these training sessions, 47 individuals received training specific to the EPHX program. Below is a list of training activities provided to contractors and staff.

- **June 2011 - Introduction to REM Design: S**oftware training for energy and economic performance of various energy design features including envelope, insulation, air leakage control, duct leakage control, active and passive solar systems, heating and cooling equipment, and mechanical ventilation.
- **April 2012 - BPI Multifamily Analyst Training and Testing.** Building Performance Institute (BPI) training and testing focused on multi-family properties.

- **July 2012 - Essentials of Healthy Homes Training and Certification Exam.** Healthy Homes, a concept and philosophy of DOE, was adopted and incorporated into the EPHX Program.
- **March 2013 - ASHRAE 62.2 -Static Pressure Course** – Required by DOE for the Weatherization Program, this training and certification focused on ventilation standards.
- **October 2013** – **BPI Analysis Training and Certification**. The BPI training and certification focused on residential projects. BPI certification is accepted as the "standard" for energy efficiency experts.
- **October 2013 – Foundation for Senior Living -Southwest Building Science Training Center – Infrared Thermal Imager Class.** Training for conducting inspections and scope writing, utilization of thermal cameras for detection of air leaks, water leaks and insufficient insulation.

Financing & Incentives

Two financing options were available to program participants:

i) The residential financing program provided financing to Energy Assist 60/40 participants. Participants needed to be in single-family units with moderate income, 200 – 400% of federal poverty level. The program provided a grant for 60% of upgrade costs with financing covering up to 40% of the remaining project costs. The City served as the lender; Neighborhood Housing Services of Phoenix, a non-profit community revitalization organization, serviced the loans.

ii) The commercial financing program, a revolving loan fund, was available to non-residential customers interested in financing energy efficiency projects. The minimum project loan amount was $50,000, after APS and EPHX incentives. The revolving loan fund was made available through a partnership with National Bank of Arizona, leveraging private capital as well as EPHX funds and structured with 70% bank funds and 30% EPHX funds. Program participants could obtain low, fixed-interest rate loans for a period of 12 to 120 months. Collateral was generally required, depending upon loan size, term, and underwriting requirements by the bank.

EPHX program incentives/ rebates, were designed to enhance existing utility company rebates and accelerate program participation. A cap of $125,000 per owner was set at the beginning of the program to ensure wide distribution of funds in the community. A mid-program evaluation and adjustment raised the cap to $200,000 per owner. Program staff worked with a challenging commercial and residential market, during the time of the grant, and made periodic adjustments to program parameters to ensure success.

Data & Evaluation

Data was collected and shared among grant partners, but only after Memoranda of Understanding (MOU) were established among the groups. Privacy concerns for utility customers and their data were addressed as pre- and post-retrofit utility data was shared on each EPHX project.

ASU provided the following;

- Input on design of the residential community survey and codifying responses;
- Database infrastructure to manage project data and work with program partners to determine protocol for data requests;
- Development and implementation a data security plan;
- Management of all database users and access privileges;
- Populating database with data collected throughout the project process (initial analysis, completion, final projections);
- Fulfilling data requests from internal ASU partners;
- Data management and reporting to Phoenix for DOE reporting requirements;
- Database archiving (with the exception of APS provided data).

Accomplishments

The EPHX program began by leveraging an existing energy efficiency rebate program and a robust contractor network established and trained by the local utility company. This proved to be the key driving force in the success of the program with customers and contractors already familiar with energy efficiency programs.

The program's targeted area, along the Light Rail Corridor, runs through the heart of downtown Phoenix, allowing most high-rise and smaller commercial buildings to participate along with a diverse mix of single and multi-family structures. This combination of building stock and density allowed the EPHX program to exceed program goals and deliver tremendous economic benefit to the community.

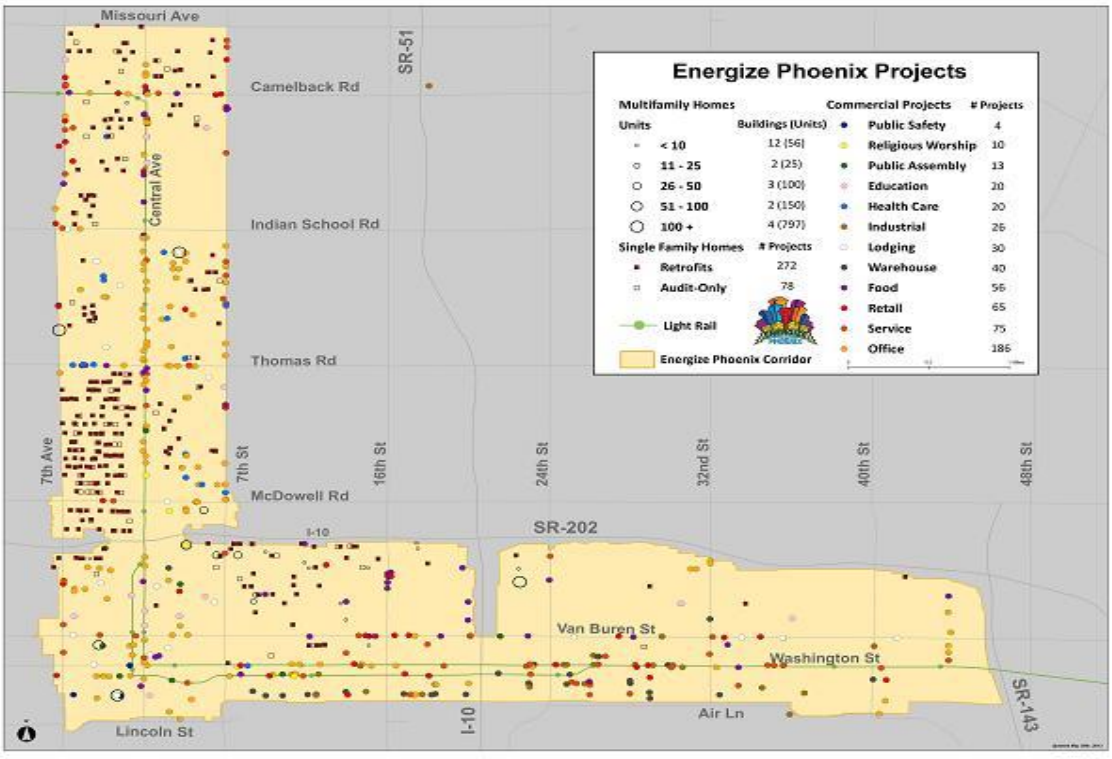
The EPHX program has completed its energy upgrade activities; exceeding its primary goals by having accomplished the following:

- Residential units upgraded 2,014 units;
- Commercial square footage upgraded 33,350,506 sq ft;
- Projected average annual CO2e reduction 95,256 (metric tons);
- Projected annual energy savings 135,009,120 kWh/yr;
- Projected annual dollar savings $12,632,863/yr;
- Projected payback period (total investment) 4.5 Yrs.;
- Impact to local economy $31 million.

The Commercial Finance program successfully funded six commercial projects totaling over $1 million. This program is in partnership with National Bank of Arizona (NBAZ) and structured with bank funding at 70% and EPHX funding at 30%. The longest loan period was for five years with two loans having already being repaid. Interest earned along with loan repayments to the city will be reinvested in future energy efficiency projects that follow Better Buildings guidelines.

In 2012, the EPHX corridor was expanded to accommodate more residential and commercial customers. These additional residential units in the expanded corridor helped drive the single family and multi-family audit and project upgrade numbers to exceed 2,000 units, and reduced long-term energy consumption by 12%.

The corridor map below indicates the distribution of commercial and residential project activity as of April 2013. EPHX project staff worked tirelessly with marketing materials, contractor training and customer contact to ensure that all everyone in the corridor had opportunities to participate in the program. Representative classes of customers include small and large commercial, warehouses, schools, churches, hotels/motels, eating, retail, and service establishments. Over 800 projects upgrades were completed by EPHX contractors involving more than 600 customer sites.

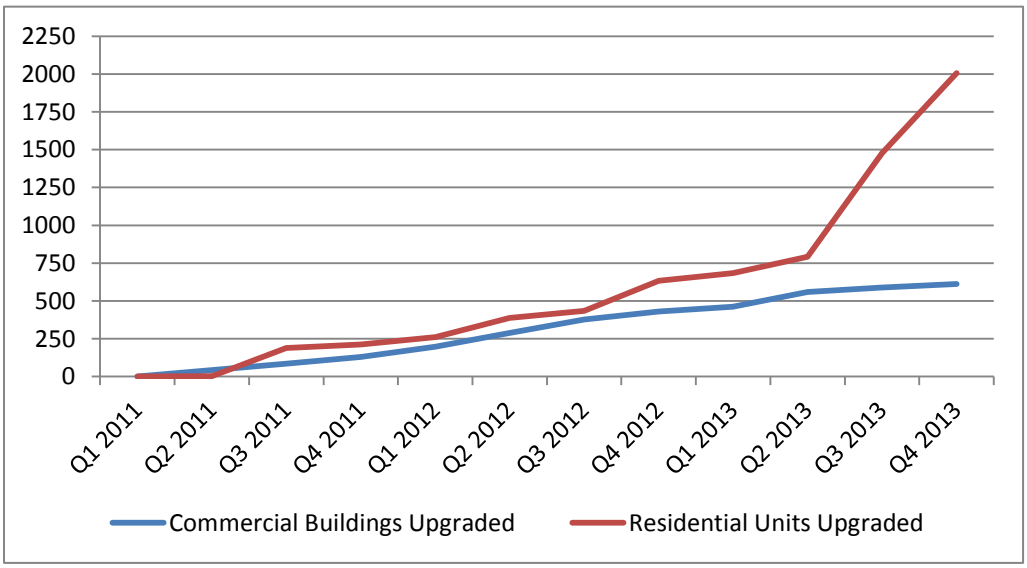


EPHX projects dispersed throughout the effective corridor (data as of April 14, 2013.)
Source: ASU – EPHX -Yr. Three Report: Results

Typical energy upgrade projects that were performed in the EPHX corridor include,

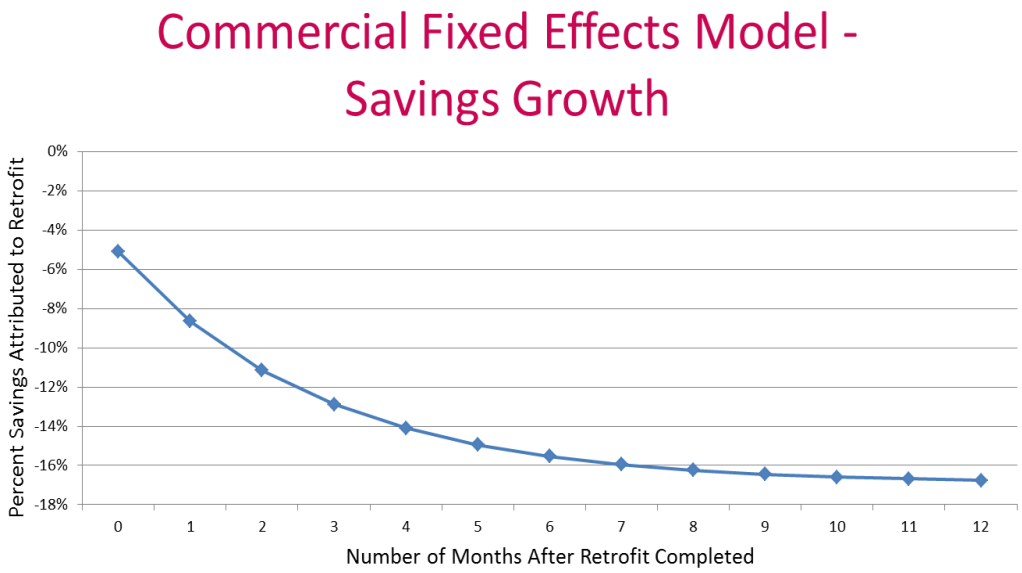
Commercial: lighting, daylighting controls, chiller replacements, HVAC tune-ups, motors and Variable Speed Drives.
Residential: insulation, air sealing, duct sealing, HVAC upgrades, HVAC tune ups, sunscreens and solar water heaters.

EPHX project activity by quarter for both commercial and residential projects I sshown below. Indicative is the residential activity picking up in late 2012 and 2013 with various program adjustments and many multi-family projects completing work at that time.



EPHX upgrade data by Quarter (Source: ASU – EPHX Year Three – Final Report)

Finally, the graph below indicates the long-term effect of commercial upgrade activity on energy savings, reaching 17% after the first year. (Source: ASU – EPHX Year Three Report)



Challenges

Several challenges presented themselves during the course of the grant period. Staffing, budgets, communication between grant partners, acceptance of the program by residents and businesses as well as market conditions all presented challenges and opportunities.

Staffing can be a challenge when deploying a grant funded pilot program, as the grant and the corresponding positions eventually come to a close. Key project staff that was involved in the launch of the program left for other opportunities mid-way through the program period. New staff were hired, or promoted from lower level roles to fill these key positions.

During the end of 2012 there was some uncertainty with utility rebate budgets which delayed some commercial project activity. This issue was resolved in early 2013, but the rate of new projects being submitted showed a significant slowdown. It is not clear if the slowdown was due to funding uncertainty going forward or if market saturation was beginning to occur. Constant communication between EPHX program staff and utility company representatives kept the process moving.

Communication in general among three large organizations can be challenging in any situation, and not unique to the EPHX program. One solution that was implemented early in the program was the use of a SharePoint website. This site allowed the utility to communicate project information with the EPHX team in a secure manner. This system replaced the emailing of a comprehensive project spreadsheet back and forth between the partners.

Another challenge that presented itself early in the program was showing commercial and residential customers that this was a legitimate program being led by the city of Phoenix. Some customers were initially hesitant when approached by an approved contractor marketing the program. The hesitancy resulted from some potential customers being contacted by solicitors who were not affiliated with EPHX selling various energy efficiency services. Several customers contacted city staff to confirm that EPHX was an approved city program. Those conversations were excellent opportunities to educate Phoenix businesses and residents on the program, and provide the legitimacy the contractor needed to secure the business. Strong messaging, community outreach and consistency were necessary to reassure business and residential customers.

Finally, the biggest challenge in administering commercial finance program activity was the market itself. As economic challenges peaked during the period between 2010 and 2012, in the residential and commercial markets, the few commercial finance projects that had expressed interest either never got traction or dropped out of the market altogether. This resulted in the Phoenix team having to reprogram monies from finance to commercial rebate activities stressing those resources for timely project completion. Ultimately, six commercial projects proceeded with financing and were completed in time, with loan repayments scheduled into 2018.

Program Sustainability Plans

While Energize Phoenix in its current format has completed all programmed activities, there are mechanisms in place to make sure its legacy continues. The utility rebate program that provided the framework for the EPHX rebate programs will continue to operate through the utility for commercial and residential customers. A Revolving Loan Fund (RLF) and Loan Loss Reserve (LLR) was a small component of the EPHX commercial program during the grant period. As loans are repaid, the principal and interest will be held in an account managed by the city of Phoenix and any unused LLR funds will be returned to the city after the last loan has been paid in full. The city of Phoenix will formulate a plan in 2014, with DOE approval, on how to best utilize these remaining funds for future energy efficiency activities.

The city of Phoenix Neighborhood Services Division has created a series of 'How To' videos that were released in late 2013. These videos provide Phoenix residents with useful information on how to make their homes more energy efficient along with other sustainability tips. This information will also be displayed on the city of Phoenix Sustainability website.

Finally, the Neighborhood Services Department will integrate sustainability focused courses into their 'Neighborhood College' curriculum. These programs are delivered by professional staff who are experts in their respective fields at no cost to the residents who attend.

Developed Products

During the course of the EPHX program, ASU produced an annual summative report for each year of the program with a final Results publication in January 2014. Year One and Year Two Reports highlighted program design and implementation and preliminary program results while Year Three Report provided analysis of program data, lessons learned and recommendations for local governments considering developing energy efficiency programs and partnerships of their own.

APPENDIX – A

Quotes/Owner Stories

From Holiday Decorations to Summer Savings and Comfort: Phoenix resident Sandy J. remembers the day her husband was rearranging some holiday items in their attic. *"I was worried about him (it was a really hot day) and he kept saying "it's fine up here.'"* He realized the fact that the attic was a reasonable temperature might be a problem, which their first summer utility bills soon confirmed; twice as high as their previous house, which was 1,100 square feet larger. Sandy remembered the three consecutive Energize Phoenix door hangers that she had discarded, visited the website and chose an approved contractor. *"They were extremely professional and spent half the day conducting an audit. They came back with an entire workbook of graphs and photos. We chose to have the ductwork sealed, sunscreens on the west side of the house, and sealing the building envelope."* Another contractor upgraded the insulation in the attic. *"The biggest difference we have noticed is that out home feels more comfortable. Our utility bills have come down, and we are not wasting energy. If I had to do it again, I would only say "I would not have waited so long.'"*

Supermarket Saves a Bundle through Upgrades: A total upscale Asian supermarket decided to take advantage of Energize Phoenix when the store's manager first heard he could save his store a lot of money through the upgrade program. Two contractors had stopped by the store to discuss energy saving opportunities. After an evaluation of the facility by one of the contractors, the store manager went with upgraded motors, controls, and lighting in all the walk-in and open-air coolers, predicted by the contractor to save 282,183 kWh a year – about $25,000 in electricity costs. The upgrades cost $76,604, but APS incentives of $54,718 and Energize Phoenix rebates of $18,293 brought the final cost down to only $3,593, implying a simple payback of less than two months. While evaluated savings calculated by ASU have not exactly matched pre-upgrade estimates, the store manager is more than satisfied. He has noticed not only lower bills but also that he no longer spends money on labor and materials to replace lights in the food cabinets, which now have long-lasting LED bulbs. Participating in Energize Phoenix really paid off for this small business.

Facing Mounting Utility Bills, the Residents of Regency House Vote for Efficiency: Built in 1964, the 22-story condominium Regency House was saddled with a nearly 50-year old mechanical system that was economically inefficient and unreliable. The residents voted to replace their cooling towers, chillers, and boilers as well as upgrade lighting in their common parking garage. Their timing could not have been better. As they prepared bid documents for the project, their contractor alerted the Homeowners Association about Energize Phoenix. With $65,000 in combined incentives available from APS and Energize Phoenix, they upgraded to a more efficient chiller than initially planned. The incentives and HVAC energy savings also helped with lighting upgrades which they could not afford otherwise. Regency House representatives say the results are fantastic and EPHX data analysis shows savings are even higher than the contractor predicted (22% vs. 15%). Not only do residents have better quality lighting in their underground parking garage, they have reduced their energy bills, increased the reliability of their mechanical systems, and improved the comfort in 118 condominiums in central Phoenix.

APPENDIX – B

Marketing Material

Smart Money

With the money you save on your utility bill, you can buy the things you want.

ENERGIZE PHOENIX

Find out how.
Visit www.energizephx.com
or call 602-495-5275.

Save Money by Saving Energy!

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Easy Money

With the money you save on your utility bill, you can buy the things you want.

FREE Home Check-Up! Limited Time Offer.

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With the money you save on your utility bill, you can buy the things you want.

FREE Home Check-Up! Limited Time Offer.

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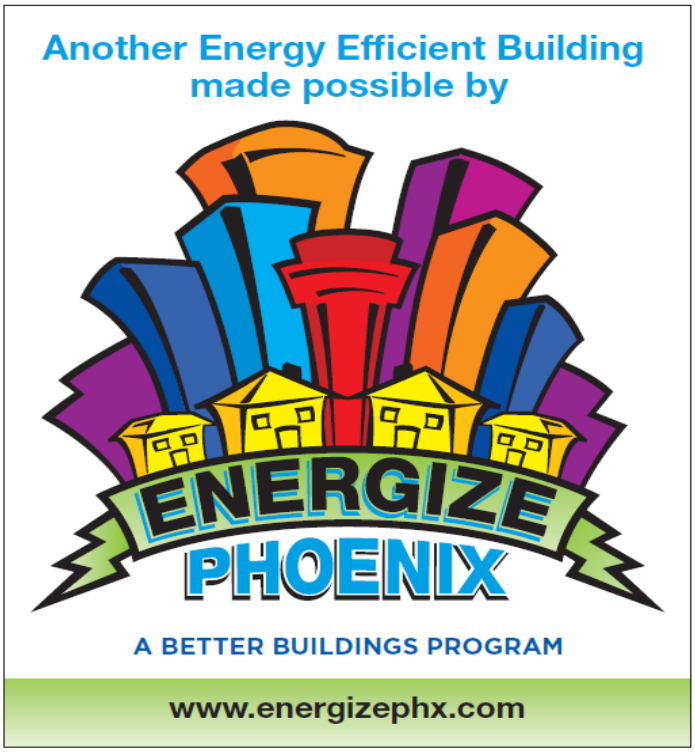
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