Residential Energy Efficiency Retrofit Projects That Create Jobs:

Insights from the Buildings Upgrade Prize

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The Buildings Upgrade Prize is a competitive program administered by the U.S. Department of Energy (DOE). The Buildings Upgrade Prize is designed to support innovative approaches to retrofitting buildings to include high performance technologies. Building upgrades may include improving building resiliency and efficiency through measures such as insulation and air sealing and installing efficient electric equipment, including heat pumps and heat pump water heaters. Together, these efforts will help reduce energy costs, while improving indoor air quality and occupant comfort. The Buildings Upgrade Prize supports upgrades to aging building stock and the development of local workforces.

The Buildings Upgrade Prize consists of four phases (Concept, Plan, Pilot, and Full Scale), with technical assistance available to all awardees. The four-phase structure offers a unique opportunity for awardees to consider lessons learned and to investigate best practices as they progress in their plan development. The AnnDyl Policy Group, on behalf of the Building Performance Association, has engaged prize recipients[1] as they are in the planning and/or piloting phases of their projects and found five common themes for anticipated program success:

1. Develop a Local Energy Efficiency Workforce Through Training
2. Incorporate Resident Education on Energy Efficiency Measures and Their Benefits
3. Invest in Local Outreach and Campaigns to Increase Program Awareness
4. Include Pre-Upgrade Barrier Mitigation Measures in Program Design
5. Streamline and Support the Braiding of Funding Sources

This white paper focuses on the earlier phases of awardee projects. As the programs progress, we plan to report on the later prize phases and additional best practices that may have been uncovered.

[1] The AnnDyl Policy Group contacted a select number of prize recipients for this report to glean tips for success for education of a broader audience. Inclusion of a team in this report does not constitute an explicit or implicit endorsement of the team for receipt of any future prizes from DOE for any phases of the Prize.

Overview of Interviewed Recipients

Energy Smart Colorado Inc. (Frisco, CO)

Energy Smart Colorado (ESC) launched in 2010 to provide energy efficiency services to households in the central mountain region. Their Buildings Upgrade Prize project includes energy efficiency upgrades to 750 rural households across 18 counties in Colorado.

Green & Healthy Homes Initiative Inc. (Baltimore, MD)

Since its founding in 1986, the Green & Healthy Homes Initiative (GHHI) has worked to eliminate health and safety barriers in homes that can lead to asthma, lead poisoning, injury, and more. Their Buildings Upgrade Prize project aims to expand their existing retrofits to better serve the residents of East Baltimore.

IMPACT Community Action (Columbus, OH)

IMPACT Community Action was founded in the mid-twentieth century to alleviate the conditions of poverty. Their Buildings Upgrade Prize project will deliver energy savings of upwards of 30% to low-income families in Columbus, Ohio, as well as create the first African American net zero neighborhood in the country in American Addition, OH.

Louisville-Jefferson County Metro Government (Louisville, KY)

The Louisville-Jefferson County metropolitan area is home to upwards of 1.1 million people and represents the largest metropolitan area in Kentucky. The city's Buildings Upgrade Prize project seeks to eliminate severe energy burdens for low-income households and offer supplemental support for building benchmarking, financing, and workforce development.

New North Carolina Project & Upper Room Outreach International (Concord, NC)

The New North Carolina Project (NNCP) seeks to invest in underserved localities in North Carolina. Their team partner, Upper Room Concord International, collaborates with local ministries to support families and provide resource assistance. The team's Buildings Upgrade Prize project aims to leverage existing trust in the area to improve the efficiency and health and safety conditions of homes and small commercial buildings in two North Carolina counties.

Zero Home Corporation (Golden, CO)

Zero Home Corporation offers a digital service to streamline the process for installing high performance technologies in homes. Their Buildings Upgrade Prize project plans to

pair their innovative technology with financing mechanisms to offer simple and affordable upgrades to rural populations in Colorado.

I. Develop a Local Energy Efficiency Workforce Through Training

Several of the Buildings Upgrade Prize winners expressed concerns about a shortage of energy efficiency contractors in their respective areas, especially in rural areas of the country. Generally, all awardees expressed a need for more trained contractors in the energy efficiency sector, as a limited workforce can lead to higher overall project costs. Several awardees have taken innovative approaches to strengthening the local workforce with their prize funds or even other DOE or state funding. Therefore, another best practice identified is supporting a local energy efficiency workforce through training.

- For example, the **NNCP** team emphasized their partnership with **Building Efficiency Resources (BER)** as a way to facilitate training contractors in the area. BER is a company providing technical assistance and expertise services to home energy efficiency contractors across the country. In collaboration with BER and the Urban League of Central Carolina, the NNCP team has trained several contractors.
    - Specifically, the team approaches HVAC students and BER trains them to become home energy auditors, which are also critical for home energy upgrades. The team also stated intentions to start up a training program if they secure a weatherization contract from the North Carolina Department of Environment and Natural Resources.
- The **ESC** team, which is focusing on rural homes, explained that a shortage of contractors in rural areas has been a challenge, especially since they do not frequently install heat pumps. The contractor shortage has led to higher bids for projects, making home energy upgrades more expensive. The team used Buildings Upgrade Prize money to hire a workforce development manager who is working to identify gaps and propose potential solutions. The team is also working to improve bid accuracy.
- The **Zero Home** team in Colorado highlighted a shortage of contractors in rural areas, which has been a challenge. To address this challenge, the team has partnered with local utilities, city governments, and trade associations to find installers who can perform the upgrades for the projects.

II. Incorporate Resident Education on Energy Efficiency Measures and Their Benefits

One theme identified by all interviewed Buildings Upgrade Prize recipients was that homeowners are often unaware of certain energy efficiency measures, and when they are aware, can be skeptical of their merit. People are hesitant to trust a technology that they are unfamiliar with, particularly if the installation has the potential to impact their utility bills when they are energy insecure. One of the best practices identified by the prize recipients was to invest resources into energy efficiency and high-performance technology education efforts.

- For example, **ESC** identified that households were often concerned about the performance of heat pumps at high altitudes. The team offered webinars and workshops to inform their customer base, as well as elevated personal anecdotes of folks living in similar climate zones who had positive experiences with the technology.
- In Baltimore, the **GHHI** team developed a neighborhood advisory board to help build trust with residents. Board members were recommended by local partners based on their existing relationships with the localities. These relationships were then leveraged to alleviate concerns surrounding home performance retrofits and utility data access by allowing a trusted face to present the information to the locality.
- The **Zero Home** team partnered with installers, leveraging contractors to educate households on the benefits of heat pump technologies. The team emphasized that this effort was most successful when it was purely educational, without the contractors making a sales pitch. Zero Home stressed that when people feel as if they are being sold a product or service, they are more likely to be wary of it than if it were to be presented as an option available to them if they choose to pursue it.

III. Invest in Local Outreach and Campaigns to Increase Program Awareness

A step beyond customer education surrounding energy efficiency measures at large is customer awareness of a specific program and its offerings. A common theme among the interviewed prize recipients was that a locality must be knowledgeable about a program to fully take advantage of it. Often times, participation in a building retrofit is voluntary. If the target audience is unaware of the existence of such a program, they will not have the opportunity to benefit from the initiative. Most of the interviewed awardees acknowledged

that lack of public awareness could impede program success and offered a myriad of solutions to better educate local areas.

- For example, a representative of the **NNCP** team stated that they leveraged non-partisan canvassers used for local elections to go door-to-door in neighborhoods and spread energy efficiency program awareness and education. They also distributed flyers at local neighborhood gatherings, ranging from youth athletic games to barber shops.
- The **Louisville-Jefferson County Metro Government** team noted that as a municipal government, they found partnerships with local nonprofits incredibly important. They noted that nonprofits tend to have more established relationships with residents than the city does. These existing, trusted relationships offered a better avenue to disseminate information and did not require the team to build educational channels from the ground up.
- The **IMPACT Community Action** team shared that they used neighborhood meetings as a venue for education on the program. Flyers were distributed at meetings to provide people with a physical resource they could reference related to the program. The promise of refreshments helped increase turnout at these events.

IV. Include Pre-Upgrade Barrier Mitigation Measures in Program Design

Some of the Buildings Upgrade Prize winners expressed concerns about homes, especially in low-income areas or in multifamily buildings, being "un-weatherizable," meaning the home has health and safety barriers that could exacerbate risk for residents if left untreated prior to weatherization. Another best practice identified by the awardees was incorporating pre-upgrade barrier mitigation measures in the program design to avoid challenges when weatherizing or upgrading a home.

- For example, the **Louisville-Jefferson County Metro Government** team discussed the challenge of weatherizing homes in the area, as the housing stock (particularly affordable multifamily homes) includes several old buildings, many built in the 1800s. The team cited foundation issues from flooding and increased rainfall as one of the more significant barriers to upgrades, as well as other structural issues and mold.
- The **IMPACT Community Action** team emphasized that one of the biggest issues when getting a home heat-pump ready is lack of insulation, which, in some cases, requires opening walls of buildings. The team mentioned that they are first choosing to upgrade homes that are ready for upgrades and do not require pre-

weatherization work, such as new construction or homes built in 2016 in the neighborhood. The reason behind this is to ensure that homes that receive upgrades do not have any upfront costs.

- The **GHHI** team focuses mostly on single-family homes in East Baltimore, many of which are old. Many of the residents of the area are low-income seniors, and they cannot afford to fund structural repairs for their homes. There are also roof issues for attached single-family homes that share walls. Therefore, GHHI cannot always address these pre-weatherization barriers and refers these residents to other local partners.

V. Streamline and Support the Braiding of Funding Sources

Several of the Buildings Upgrade Prize winners highlighted their efforts to braid funding sources, whether they be federal, state, or municipal, to maximize barrier mitigation, weatherization work, and upgrades. Incorporating funding from a variety of sources allows the positive impacts of a program to stretch further, benefiting more households in a locality. Braiding funding sources also supports increased training initiatives and local outreach to homeowners and renters who might be in need of home upgrades.

- For example, the **NNCP** team highlighted that they partnered with the North Carolina Community Action Association, which is funded by Duke Energy. Duke Energy has provided the project team with funding for upgrades, to be used in combination with Buildings Upgrade Prize money, to maximize energy efficiency upgrades in homes.
- The **ESC** team used funding from their Energy Efficiency and Conservation Block Grant (EECBG) to hire staff in preparation for receiving Buildings Upgrade Prize funding. The team also aims to use Home Energy Rebate funding to cover costs for home energy upgrades for their Buildings Upgrade projects.
- The **Louisville-Jefferson County Metro Government** team is braiding Community Development Block Grant Program funds with their Buildings Upgrade Prize money to provide multifamily affordable housing projects with needed upgrades. The team is also seeking funding from a bank that finances environmentally friendly projects, to be able to upgrade more buildings.
- The **IMPACT Community Action** team is braiding DOE's Weatherization Enhancement and Innovation grant (WAP E&I) and a city grant from the City of Columbus, Ohio, with their Buildings Upgrade Prize. Specifically, the team is utilizing this funding to support their installation work in a Columbus neighborhood with a high energy burden.

- The **GHHI** team, to be able to finance pre-weatherization costs and other support costs, has leveraged supplemental funding such as the Maryland EmPOWER Rebates and the Home Energy Rebates. The Maryland EmPOWER Rebates are meant to provide no-cost energy efficiency upgrades to low-income homes in the state.
- The **Zero Home** team in Colorado has stacked Buildings Upgrade Prize money with utility funding for their rural electrification efforts in the state. Given that the costs of electrification are high, stacking funds minimizes the costs for households.

Conclusion

The Buildings Upgrade Prize helped equip awardees with the resources and technical support necessary to develop thoughtful and effective energy efficiency programs. The framework of the prize allowed recipients to both seek advice and learn as they progressed, resulting in them developing a robust set of best practices. The best practices identified by awardees offer key insights into the necessary components of a successful building retrofit program. Without the Buildings Upgrade Prize, awardees would not have had a similar opportunity to draw these conclusions and share them with others. Sustainable, consistent funding through the phases of the Buildings Upgrade Prize will allow for additional best practices to be determined as recipients continue to develop and implement their plans.