

City of Milwaukee Net Zero Energy Home Financing Project

EPA Grant Narrative and Work Plan, 6/30/2021

Abstract:

The City of Milwaukee and its Environmental Collaboration Office (ECO) seek to advance the US EPA's goal to deliver a cleaner, safer, and healthier environment for all American's and future generations. The City of Milwaukee is embarking on an ambitious plan to simultaneously address the issues of indoor air quality and safe home environments, local air quality, climate change, affordable housing, equity and environmental justice, and economic development. In particular, the City is working to develop a public-private partnership that will be build new affordable, durable, and net zero energy housing in a new factory in Milwaukee's Century City business park. The broader project will have several facets and funding sources. This EPA grant proposal, in particular, focuses on developing a demand-side financing plan that will allow moderate income Milwaukee residents to purchase these homes and support a steady "pipeline" of housing orders for the factory.

Work Plan

Problem Statement

Milwaukee, like many cities, struggles with a range of interrelated social, economic, and environmental problems that afflict central city residents, particularly residents of color. Many neighborhoods struggle with a lack of family-supporting jobs, deteriorating housing stock, high household energy burdens, and exposure to lead and other environmental hazards in homes. Home ownership is elusive for many families because they lack the incomes to own, maintain, and renovate homes. Milwaukee has a large inventory of vacant lots in many of our neighborhoods where dilapidated houses were razed. Habitat for Humanity recently received 1,500 applications in 36 hours for the 15 new homes they construct each year. The cost to build new stick-built homes on vacant lots exceeds the amount of money that banks are willing to lend due to low surrounding property values. To tackle these persistent problems, we need to change the equation on housing. We need to find a way to simultaneously bring down the cost of housing, drastically increase the supply of environmentally safe housing, and create family supporting jobs for people of color. That's why the City of Milwaukee is working to develop a public-private partnership that will be build new affordable, durable, and net zero energy housing in a new factory in Milwaukee's Century City business park.

Building housing off-site in a factory, which could be either modular or panelized construction, offers several advantages as outlined in the project's [business case](#). By working in a controlled factory environment, the materials can be stored and constructed out of the elements. They can be constructed with more precision to reduce defects and improve energy performance and reduce waste in materials. They also can support a stable, year-round workforce with family-supporting wages.

For the factory to succeed, there needs to be a steady "pipeline" of housing orders to keep the workers at the factory sustainably employed. Traditional mortgage financing markets alone will not make enough capital available to finance a critical mass of homes in the target neighborhoods. Low neighborhood housing values and weak household income numbers mean the City will need to develop a supportive financing plan to get a sufficient number of qualified buyers for the net zero energy homes.

Objectives

This project supports US EPA's strategic *Goal 1: A Cleaner, Healthier Environment*. This project will help deliver a cleaner, healthier environment for Americans and future generations and supports US EPA's mission to protect human health and the environment. The City of Milwaukee is developing a plan to bring new healthy homes to hundreds of our residents every year.

Having a plan to deliver a steady and large pipeline of orders is necessary to even attract a housing factory to Milwaukee. *EPA grant funding from this proposal will help develop a demand-side financing plan to bring affordable, net zero energy homes to scale.* We will develop a plan to combine traditional home mortgages, energy efficiency finance, and other affordable financing tools so that enough low-to-moderate income families can afford to buy the product being built in the factory.

Project Methods:

This EPA grant funded project is one important piece of a broader strategy to design, develop, finance, and build net zero energy homes in the City of Milwaukee, with an eye toward economic development and social justice. The tasks listed are related to the EPA grant but are informed and contingent about the progress of the broader project (particularly task 4). The City does not anticipate that these activities would require a Quality Assurance Project Plan (QAPP), but is willing to discuss that with EPA staff.

Task 1: Program Administration

The Environmental Collaboration Office (ECO) will administer this grant, including letting contracts, organizing the work, and providing required reporting to US EPA. ECO envisions creating a collaborative team that combines local affordable housing finance expertise and national energy financing expertise. ECO plans to fund 2-3 consultants in each of those respective fields to support that work.

Task 2: Outreach

ECO will work with Take Root Milwaukee (<https://takerootmilwaukee.com/>), a consortium of over forty community organizations, neighborhoods groups, HUD-certified housing counseling agencies, realtors, and lenders working to promote sustainable homeownership in the City of Milwaukee. ECO will engage this consortium to help them understand the project and the advantages of modular and net-zero energy homes. ECO and Take Root will develop additional information about the size and characteristics of the potential market for net zero energy homes. The team will conduct approximately five public outreach sessions, two newsletter articles, and documentation of social and conventional media purchases.

Task 3: Energy Efficiency Planning

Pending funding from separate funding proposals, ECO intends to assemble an Architecture and Engineering design team to refine the designs and energy modeling for the net zero energy homes. This includes both gross energy use (that should be minimized through Passive House design standards) and net energy use after accounting for renewable energy use. With separate funding, ECO aims to build five prototype units in 2022. This will allow the City to more accurately project total energy savings and environmental benefits of this new housing program.

when it is fully operational and producing units at scale. ECO is also currently exploring the concept of making these homes “virtual power plants” to support advanced energy infrastructure live electrical vehicle charging and solar that can help the broader grid operate more efficiently.

Task 4: Energy Efficient Homes

Starting sometime in Quarter 4 of year 1 or year 2 of the grant, we aim to have a new net zero energy home loan product available to the market. This will provide the demand-side financing necessary to support the prospective housing factory.

Specific Environmental Outputs

The first deliverable of this project is a demand-side Financing Plan to bring affordable, net zero energy homes to scale. ECO will also document public outreach events and efforts. ECO will also furnish EPA with documentation of the energy and environmental performance of the houses to be built in the housing factory.

Desired Environmental Outcome

The preliminary causal outcome of this project is to have a functioning financial loan instrument to allow a substantial number of low-to-moderate income households to be able to affordably purchase a new, healthy, net zero energy home in the City of Milwaukee. The financing plan will be successful if we can align 1) the sale price of the net zero energy homes produced in in the factory with 2) home buyers ability and willingness to purchase one of the homes with the aid of the financial tool to be developed through this proposal and 3) the prevailing market rate of housing in the target neighborhoods. We need to improve the housing stock at a pace and in a manner that does not lead to the adverse impacts of gentrification, but rather improves environmental justice.

This will support the ultimate environmental outcome of this project: to deliver better indoor environmental quality in Milwaukee’s housing stock, and reduce the City’s greenhouse gas emissions and other air pollution from the combustion of fossil fuels to heat and power our residential buildings. We aim to build a new, large supply of housing that is free of mold, lead, and dangerous substances in the home.

Target Dates and Milestones

Task and Milestones	Year 1				Year 2
	Q1	Q2	Q3	Q4	Q1-Q4
Administration					
Consulting contracts for financing executed with partners					
Financing Plan recommendations published					
Begin working with local and national financial institutions to offer energy efficient housing financing tool					
Energy efficient mortgages or related financial instrument offered to low-to-moderate income customers					

	Q1	Q2	Q3	Q4	2Q1-4
Outreach					
Work with <i>Take Root Milwaukee</i> to understand and promote the modular housing plan	■				
Develop market information about customer demand and price points for energy efficient homes		■			
Conduct outreach to banks and financial institutions to develop net zero energy housing financing tool			■		
Conduct public outreach about financing tool				■	
Energy Efficiency Planning and Home Construction					
Estimate gross and net energy use of homes and reduction of Greenhouse Gas Emissions		■			
Net Zero Energy Housing loans offered to Public					■

Performance Measures

The primary deliverable of this project is a demand-side financing plan that will allow low-to-moderate income households purchase a net zero energy home. Performance should be evaluated on the basis of 1) whether the plan is written by the end of the first calendar year; 2) it opens access to capital to previously underserved populations; 3) whether the loan terms are aligned with the market for net zero energy housing, and ultimately 4) whether financing is provided to at least 100 households to purchase net zero energy and environmentally safe homes before the end of the project term.

Households using the loan product is the outcome of the project, but output measures to support this work include offering at least five public events about the project, at least two newsletter articles, and a record of social and traditional media advertising.

Program Manager/Contact(s):

The Principal Investigator and Grant Contact Manager is:

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The Environmental Collaboration Office has requested that the City create a new position within the Environmental Collaboration Office to manage this overall initiative. If and when that position is created, ECO will notify US EPA of the additional contact.

ECO is also supported in grants accounting by the City of Milwaukee Comptroller’s Office:

Claudia I. Orugbani
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Office of the Comptroller
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Budget Narrative

The total budget for this project is \$39,600, which includes a \$25,000 federal share and a \$14,600 cost share. The Cost Share is comprised of in-kind staff time contributed by the City of Milwaukee staff, including salary and fringe benefits. A total of \$25,000 in federal funds are budgeted on the project. The City understands that year 2 funding on the grant is not guaranteed and subject to future federal appropriations. Budget estimates for year one and two are based on estimates at this time, and actual dollar amounts distributed to the projects by year will be determined by US EPA.

Personnel

Environmental Sustainability Director contributing 10.0035% of his time to the project (Annual salary is \$99,965). This constitutes a \$10,000 projected in-kind contribution to the project that will be distributed over the two years of the grant.

Fringe Benefits

The City of Milwaukee has a 46% fringe benefit rate as documented by the City's Budget Director. A memorandum confirming that fringe benefit rate has been provided to the contract officer.

Contractual

\$22,000 of the federal funds will be used to support two to three consulting contracts. ECO will assemble a team of energy financing experts (likely from the Rocky Mountain Institute (RMI)) and a local affordable housing finance expert from the Take Root Milwaukee consortium. This consulting team will develop the net zero energy housing financing plan. ECO expects to execute these contracts during the first quarter of the first year.

Other

Finally, \$3,000 in federal funds will be used to support public outreach on the project, and will be used to purchase collateral materials about the financing program and paid media to promote the program to the public.

Total Federal Share: \$25,000

Total Local Share: \$14,600

Total Project: \$39,600

