

From Fossil Gas to Thermal Energy – Equitably Decarbonizing the Bryant Neighborhood

1. OVERALL PROJECT SUMMARY AND APPROACH

a. Background

Building upon nearly 3-years of direct engagement and project co-design through charrettes, door to door outreach, workshops, and public forums, this project unites two distinct but adjacent areas, North Bryant and South Bryant (an EJScreen disadvantaged neighborhood), into a single project (hereafter referred to as “Bryant”; Figure 1) that models how transitioning to sustainable heating (networked geothermal) and deep energy efficiency improvements can equitably and affordably decarbonize housing in cold climates. North Bryant is an underserved, majority non-White community, consisting of 262 households, of which 75% are considered low-income with median household incomes of \$45,464 and the Forest Hills Cooperative (South Bryant) is a diverse, family-friendly, income-



Figure 1: Bryant neighborhood, consisting of North Bryant (262 homes) and Forest Hills neighborhood (consisting of 308 homes).

qualified community of 306 members, including couples with children, students, single-parent families, and retirees. Most residents in Bryant are Black, Indigenous, People of Color (BIPOC) who have largely been pushed to the fringes of the City due to rising costs, gentrification, and intentional land use policies such as exclusionary zoning. Over one-third of households in Bryant are energy burdened and while many households qualify for weatherization assistance, many other households are in too poor of a condition to be served by weatherization and other income qualified programs. Additionally, Bryant is directly adjacent to the City’s capped landfill and a busy highway system, is prone to flooding, has extremely low tree canopy coverage, and is deficient in well-cared for natural system amenities enjoyed in all other areas of the City.

b. A History of Bryant

The Bryant area was planned as Ann Arbor’s largest privately constructed and owned low-income housing development. The development was built between 1969 and 1971 and comprised three projects: Stoneybrook (the original name of what we call North Bryant), Forest Hills Townhouse Cooperative (what we call South Bryant), and Arbor Park Townhouses in East Bryant. As part of the Department of Housing and Urban Development (HUD) Section 235 program, homes in Stoneybrook were originally priced at just \$21,000-\$24,000¹. Around 80% of the homes received subsidized mortgages, and residents moving to the

¹ Ann Arbor District Library Archives: <https://aadl.org/node/81423>

IN-DESIGN NETWORKED GEOTHERMAL SYSTEM IN NORTH BRYANT

In 2023, the City of Ann Arbor was one of 11 communities selected by the US DOE to design a community geothermal heating and cooling system¹. For this design phase, the project team, consisting of the members of this CPRG application, are focused on designing a community-scale geothermal system that covers at least 75% of the heating and cooling load for the 262 households in the North Bryant Neighborhood, a local school, a County community mental health service center, and the City of Ann Arbor's public works facility. The project includes community engagement, analysis and design, and workforce development as core workstreams. This is a one-year planning grant that will conclude in October 2024 with a fully realized system design co-created and signed off on by community members, a workforce development plan for scaling up good paying, family-sustaining jobs necessary to replicate this project, and a replicable model of both community engagement and geothermal design that can be scaled. At the conclusion of this grant, the Department of Energy will down select one of the eligible communities for implementation support. Concurrently, the City of Ann Arbor is pursuing other implementation dollars in case our project is not selected. The plan is to implement the design as soon as funding is available. Learn more at: www.a2gov.org/sustainability.

new development were predominantly young families, with roughly one-third being Black. With planned parks and gently curved streets, Bryant was a desirable option for those seeking affordable housing.

While Stoneybrook and Forest Hills provided much-needed housing options for low-income families, the development also had its fair share of challenges and deficiencies. Residents voiced concerns and frustrations with the quality of home construction as well as misleading marketing, but these concerns were largely ignored by the developer and City who claimed the buildings were built to code². In some cases, renting tenants were even threatened with eviction if they complained about the poor condition of their home. In the early 70s, the community was plagued with one of the highest breaking-and-entering rates in Ann Arbor. Despite residents' pleas for more patrols, the police blamed the high crime rate on the community's lack of interest and the design of the townhouses themselves³. Other City services and amenities were also notably inadequate, as residents bemoaned their lack of recreation facilities and programs, poor garbage collection and snow removal services, and an absence of sidewalks⁴. Eugene White, then board president of Forest Hills Cooperative, was quoted in the Ann Arbor News in 1973 saying, "Constantly we pay taxes and constantly we get nothing"⁵, and again in 1974 saying, "First of all we are helping ourselves. Second, we are doing the work of the City."⁶ Justifiably, these issues left a legacy of residents feeling underserved and ignored by the City, a sentiment held by many of Bryant's long-term residents to this day.

Understanding the story of Bryant Elementary school, which opened in 1973 in the middle of the North Bryant neighborhood, also helps illuminate the historical and racial context of the area. The Ann Arbor school district first began studying and identifying ways to reduce racial segregation in 1963. Despite more

² Ann Arbor District Library: https://aadl.org/sites/default/files/aa_news/aa_news_clippings-housing-p00712.jpg

³ Ann Arbor District Library Archives: <https://aadl.org/node/345144>

⁴ Ann Arbor District Library Archives: <https://aadl.org/node/81358>

⁵ Ann Arbor District Library Archives: <https://aadl.org/node/345143>

⁶ Ann Arbor District Library Archives: <https://aadl.org/node/81358>

than 10 years of committees, reports, and attempted bussing programs focused on school desegregation⁷, district officials decided against redrawing school boundaries as this would lead to more black students attending the predominately white Clinton Elementary School, just north of the adjacent I-94 freeway. Instead, the District opened Bryant Elementary School with 35% Black student enrollment, which increased to 42% by 1975, and 50% by 1985. These percentages generally followed the racial composition of the Bryant community and far exceeded the district's overall Black student enrollment of 17.5% in 1985. State guidelines passed by the Department of Education in 1977 defined schools with racial minority enrollment 15% above or below the racial group's representation across the whole district as "racially isolated", and defined schools with 50% or higher enrollment as "racially impacted"⁸. Bryant Elementary was one of eight Ann Arbor schools identified as racially isolated, one of only two schools identified as racially impacted, and the school with the lowest average income (see figure 2)⁹. This situation prompted a federal judge to call the I-94 division between Clinton and Bryant elementary schools a "Mason-Dixon line" that would create a dual school system in Ann Arbor. Currently, Bryant Elementary School serves a disproportionately high number of Ann Arbor's Black and BIPOC students, a modern-day outcome of Ann Arbor's history of racial segregation in schools and low-income neighborhoods.

As the City of Ann Arbor (and hundreds of others across the country) look to achieve their rigorous decarbonization goals (A²ZERO¹⁰ in Ann Arbor), it is imperative that communities such as Bryant be centered in the identification, implementation, and evaluation of solutions. That is why this grant application was designed with residents (see letter of support) and focuses on the solutions residents identified as critical to advancing their goals of improving health, reducing energy burden, addressing the climate crisis, securing intergenerational wealth, improving quality of life, and demonstrating what facing a history of segregation head on looks like.

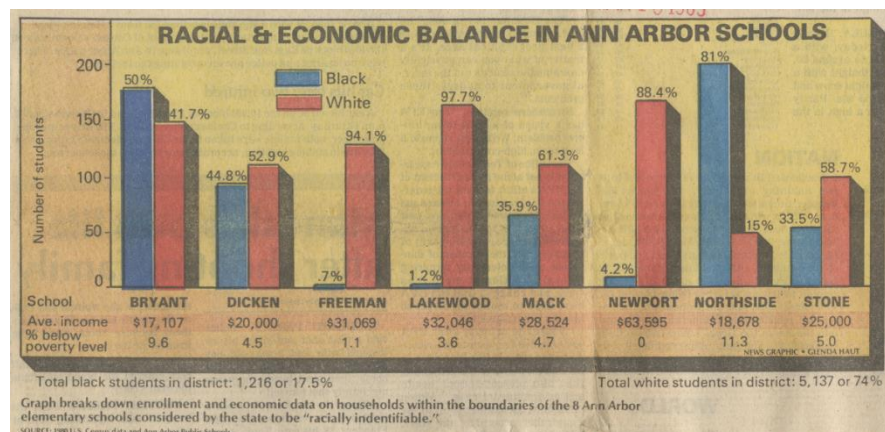


Figure 2: Elementary School Enrollment in Ann Arbor Public Schools in 1977.

c. Project Goals

The project team, led by the residents of Bryant via over three years' of sustained engagement, have established five goals for this project:

1. Create an appliance replacement fund to support transitioning in-home appliances from fossil gas (e.g., furnace, air conditioner, and water heater) to heat pumps and air handlers able to connect to a neighborhood networked geothermal system designed for North Bryant, thereby lowering neighborhood greenhouse gas (GHG) emissions by 30% while reducing indoor air contaminants by at least 50% in this neighborhood;

⁷ Ann Arbor District Library Archives: https://aadl.org/aa_news_19850310-school_desegregation_in_ann_arbor

⁸ Ann Arbor District Library Archives: https://aadl.org/aa_news_19850310-despite_racial_imbalance

⁹ Ann Arbor District Library Archives: https://aadl.org/aa_news_19850310-integration_still_eludes_city_schools

¹⁰ See A²ZERO, Ann Arbor's Carbon Neutrality plan at www.a2zero.org

2. Create an energy efficiency fund to help finance deep energy efficiency improvements that lower energy consumption and associated energy costs by a minimum of 20% throughout Bryant;
3. Stack CPRG funding with other state, local, and private dollars to make North Bryant America's first carbon neutral existing neighborhood and South Bryant the second;
4. Eliminate energy burden in the entire neighborhood; and
5. Inspire other neighborhoods, especially EJScreen Disadvantaged neighborhood, to begin their decarbonization journey by hosting unique, neighborhood-designed engagements and by inviting them to engage/observe every aspect of project design and deployment in Bryant.

A secondary goal of this project is to support a large investor-owned natural gas utility with understanding the viability of providing geothermal in lieu of natural gas as a new utility business model (see letter of support). The integration of networked geothermal and thermal energy networks into the business model of a traditional natural gas company could be transformational for the entire industry – leading to a significant shift in how our region heats and cools homes and businesses. This in turn would drastically reduce regional greenhouse gas emissions, significantly improve indoor air quality, make notable improvements in public health and safety and be a major step forward in President Biden's goal of a carbon neutral economy by 2050.

d. Description of GHG Reduction Measures

This project will fund four (4) activities as outlined in Figure 3, including: A resident advisory council, a zero-emissions appliance replacement fund, an energy efficiency fund, and resident-led community engagement centered on neighborhood decarbonization opportunities.

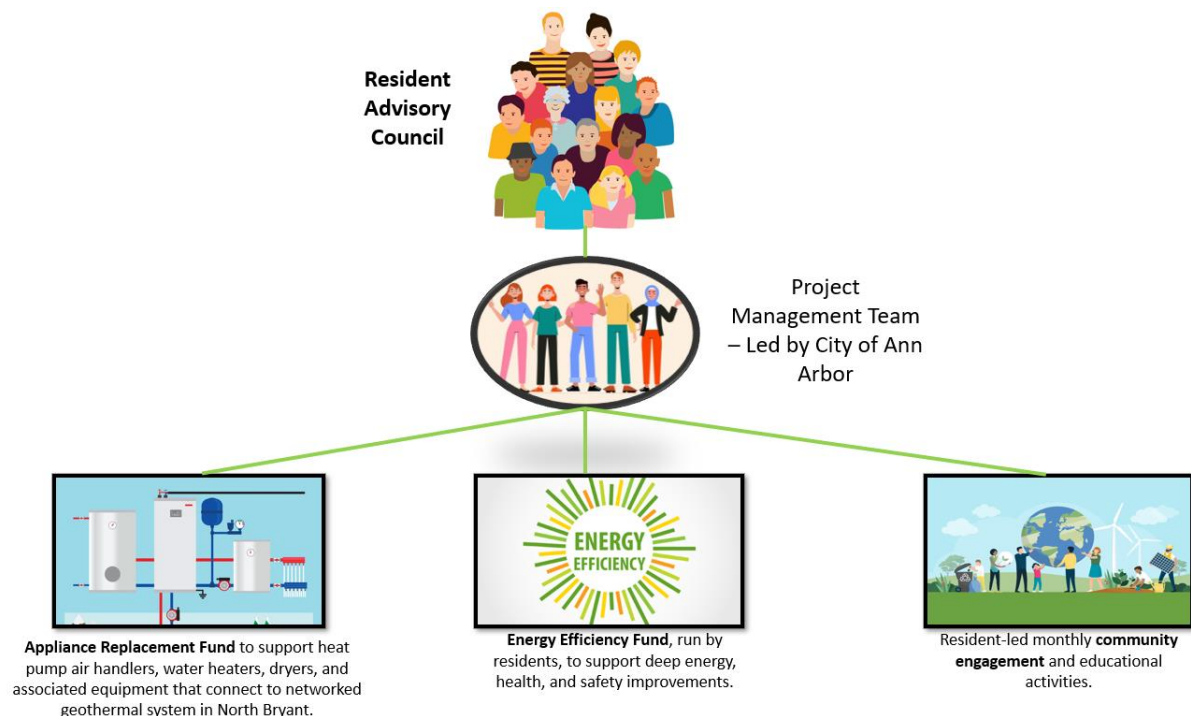
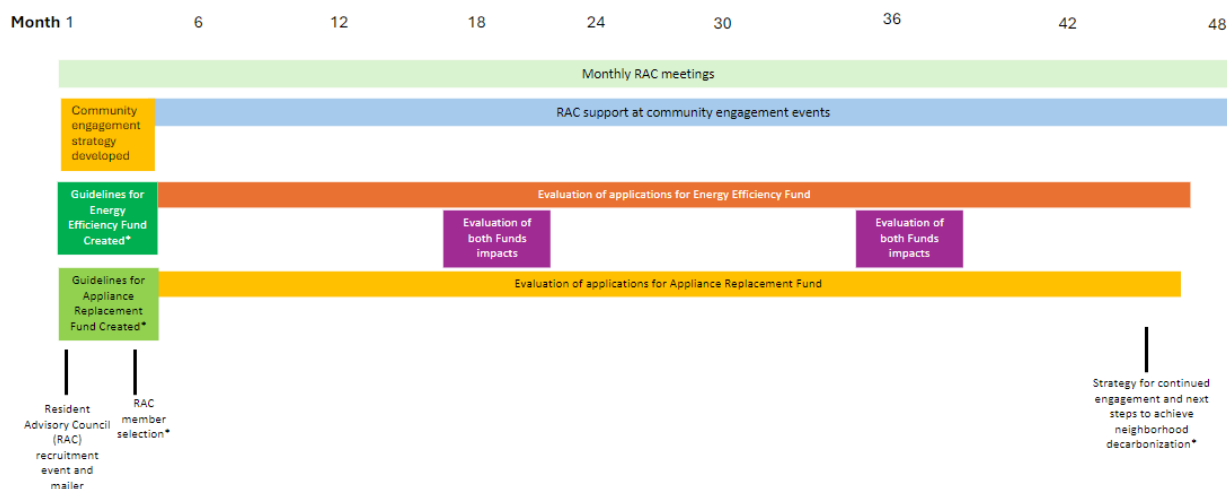


Figure 3: Summary of the four measures associated with this grant application.

Measure One: Resident Advisory Council

The Resident Advisory Council (RAC) will be composed of four (4) individuals from North Bryant and four (4) individuals from South Bryant, along with staff from the Bryant Community Center and will serve as the overall project advisory board. The RAC will create, with support from the Project Management Team, the guidelines and application materials for the Energy Efficiency Fund and for the Appliance Replacement Fund, oversee and make funding recommendations for both Funds, help create the community engagement strategy for the full project, and support implementation of the engagement strategy – including participating in public engagement activities. The RAC will be an instrumental partner in grounding all elements of the workplan in the needs and lived experience of residents.



*Key Milestones include creation of the RAC, creation of a community engagement strategy, creation of guidelines and application materials for both the Energy Efficiency Fund and the Appliance Replacement Fund, and creation of a strategy identifying next steps to fully decarbonize the Bryant neighborhood.

Greenhouse Gas Reduction: This measure will not directly reduce GHG emissions but is instrumental in ensuring that the actions that do, are supported by the community and therefore, get implemented.

Alignment with Priority Climate Action Plan(s): Ann Arbor is covered by two PCAPs— one from the State of Michigan and one from the Southeast Michigan Council of Governments (SEMCOG). Both PCAPs emphasize the importance of working directly with stakeholders, especially historically marginalized communities, to design and implement climate solutions. As such, this action is in direct alignment with the procedural justice and distributional justice recommendations in our two governing PCAPs.

Risks: The greatest risk associated with this action is having too much interest in the RAC making it challenging to select members. To mitigate this risk, the City will create a short application for interested RAC members, helping us more fully understand why folk are interested in participating. We will evaluate applications based on their responses and ensure we have a demographically and geographically diverse set of applicants to recommend as RAC members. Each RAC member will be appointed for a 2-year term allowing for some consistency amongst the RAC but also an opportunity for more people to serve over the 4-year project duration.

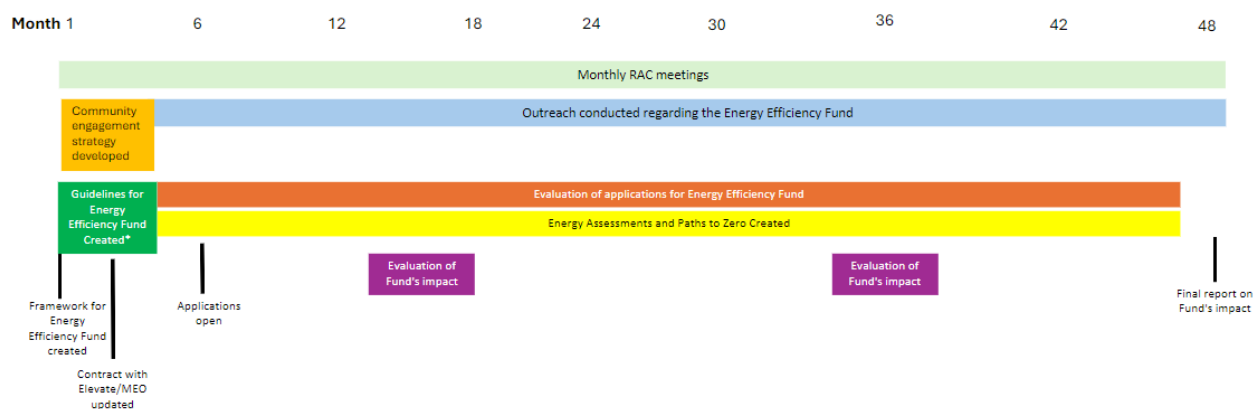
Cost: \$5,000 annual stipends will be provided for RAC member's service for a total budget of \$200,000.

Measure Two: Energy Efficiency Fund

For this measure, an Energy Efficiency Fund will be created to support as-needed energy efficiency upgrades for homes in both the North and South Bryant neighborhoods. Through the multiple years of engagement already done in Bryant, we know that many homes lack proper insulation, have broken windows (many with broken seals and warped frames), lack air sealing, and have extremely poor indoor air quality. As such, the Fund will prioritize making repairs that would be deemed essential due to their ability to immediately address health and safety concerns. Repairs will be prioritized after residents receive a free home energy assessment offered through existing City initiatives (e.g. A²ZERO Home Energy Advisor and Home Energy Rating Disclosure). These assessments provide a customized “path to zero” outlining actionable steps residents can take on their decarbonization journey. The project team will use these “paths to zero” to help identify which energy efficiency measures are eligible for funding support.



The City of Ann Arbor already has a contract with Elevate to design and administer a local energy rebate fund. This contract was awarded after a competitive RFP process. If awarded this CPRG grant, the City will amend this contract and make Elevate the fiscal agent for the Energy Efficiency Fund. In this way, the City will be able to leverage an existing program design to rapidly and efficiently allocate funding for projects, meaning we’ll be able to move into project implementation rapidly.



*Key Milestones contracting with Elevate to administer the Energy Efficiency Fund, creation of guidelines and application materials for the Energy Efficiency Fund, and creation of annual reports highlighting the impact and suggested revisions to the Energy Efficiency Fund.

Greenhouse Gas Reduction: The Energy Efficiency Fund is estimated to reduce emissions by 2,267 MT CO₂e from 2025 – 2030, and by 8,491 MT CO₂e from 2025 – 2050.

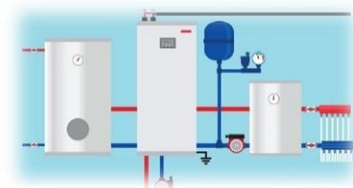
Alignment with Priority Climate Action Plan(s): Both the State of Michigan and the Southeast Michigan Council of Governments (SEMCOG) PCAPs identify essential repairs, weatherization, and energy efficiency improvements as priority work. As such, this measure is in full alignment with two of our governing PCAPs. Specifically the State of Michigan’s PCAP identifies Action: ID4: Reduce household fossil energy use through home repairs, electrical upgrades for building and vehicle electrification, weatherization, and other energy waste reduction investments with an emphasis on ensuring equitable access (page 74); and the SEMCOG PCAP identifies the action of “decarbonizing buildings and industry” (page 20).

Risks: The greatest risk associated with this measure is getting residents to complete a home energy assessment to help inform which energy efficiency actions to fund. To address this risk, the City has begun recruiting and conducting energy assessments in the Bryant neighborhood, with roughly 100 assessments completed to-date. The City will continue to offer these assessments, free of charge, to residents in Bryant while we wait to hear about the CPRG award. By doing this we will build a queue of potential applicants for the Energy Efficiency Fund from day one, making it more likely that these early adopters receive improvements and then share their experience with neighbors...thereby helping to build momentum (and recruit others) for the program.

Cost: This project estimates up to \$7,500 in energy efficiency funding support available for 550 housing units in Bryant, for a total cost of \$4,125,000.

Measure Three: Appliance Replacement Fund

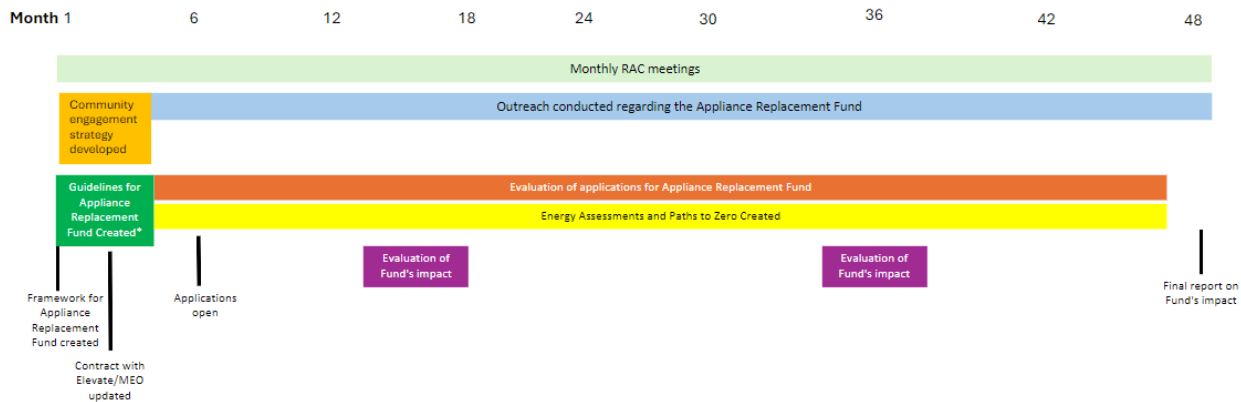
Two of the largest barriers to switching to sustainable appliances are the large upfront cost delta between the sustainable version and the traditional fossil gas version, and the increased monthly expenses associated with switching to an all-electric appliance (electric rates in Ann Arbor's service territory are the highest in the Midwest). To overcome these barriers, we will create a sustainable Appliance Replacement Fund, which households will be eligible to access after they have made energy efficiency improvements identified in their path to zero.



From three years of direct engagement in Bryant, we know that most homes suffer extremely high energy burden, very poor indoor air quality, have 100amp electrical service, and extremely space constrained utility closets. These conditions make it necessary to support the transition to all electric appliances (to improve indoor air quality and reduce GHG emissions) but challenging to implement in practice. To help alleviate these challenges, the Appliance Replacement Fund will prioritize investments that:

- Replace fossil gas furnaces with residential air handlers that can connect to the “in-design” networked geothermal system (see call out box on page 2);
- Replace fossil gas water heaters with heat pump water heaters that can connect to the “in design” networked geothermal system;
- Upgrade electric service panels to ensure homes are prepared for full electrification; and
- Replace fossil gas clothes dryers with heat pump dual unit washer and dryers that free-up space in constrained utility closets where the air handler units and associated equipment needed to connect to the networked geothermal system can be installed.

The City of Ann Arbor already has a contract with Elevate to design and administer a local energy rebate fund. Elevate was selected after a competitive RFP process. If awarded this CPRG grant, the City will amend this contract and make Elevate the fiscal agent for the Appliance Replacement Fund. In this way, the City will be able to leverage an existing program design to rapidly and efficiently allocate funding for projects, meaning we'll be able to move into project implementation rapidly. In addition, multiple contractors have already been identified for each GHG reduction measure noted above via a competitive bidding process currently underway to implement some customized home improvements in roughly 25 households. This means that the local marketplace is aware of the City's work and primed to implement solutions on a timescale commiserate with this grant application.



*Key Milestones contracting with Elevate to administer the Appliance Replacement Fund, creation of guidelines and application materials for the Appliance Replacement Fund, and creation of annual reports highlighting the impact and suggested revisions to the Appliance Replacement Fund.

Greenhouse Gas Reduction: The Appliance Replacement Fund is estimated to reduce emissions by 1,821 MT CO₂e from 2025 – 2030, and by 13,974 MT CO₂e from 2025 – 2050.

Alignment with Priority Climate Action Plan(s): The SEMCOG and Michigan PCAP's identify fuel switching from fossil gas to renewable energy sources as priority areas for investment (page 70 of State's plan; page 20 of SEMCOG's). To help meet this goal, the Appliance Replacement Fund will provide funding to support the transition from fossil gas furnaces, dryers, and hot water heaters to heat pumps and air handlers that are tied to an "in-design" networked geothermal system. These improvements will eliminate the majority of fossil fuel combustion in the homes, reducing GHG emissions, creating a healthier in-home environment, improving resident comfort, and reducing utility bills through more efficient appliances. In addition to appliance replacement, the Fund will also support the upgrading of electrical panels from 100-amp service to 200-amp service (page 74 of State's PCAP). This upgrade is necessary to support home electrification as most homes in Bryant only have 100-amp panels, which cannot handle more electric appliances. In addition to fuel switching, both PCAPs call out the need to transition to sustainable sources of heating, leaning into the viability of networked geothermal. The City of Ann Arbor is currently designing a networked geothermal solution for the North Bryant neighborhood, and, through extensive community conversations, we've discovered that the major barrier to transitioning the neighborhood to a networked geothermal solution, is the high upfront cost of installing residential air handlers and associated equipment. This measure will reduce those barriers and support the State and SEMCOG's PCAPs.

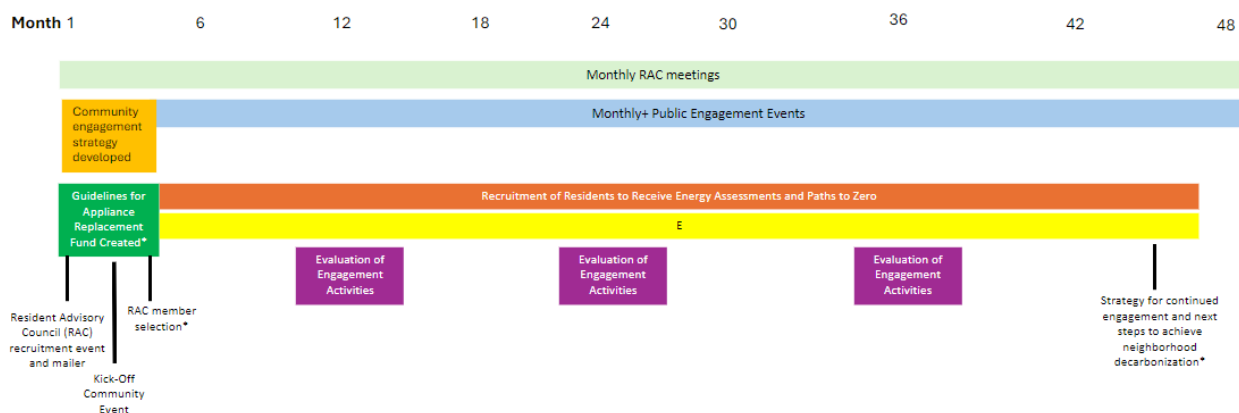
Risks: The primary risk from this measure is the potential to increase energy expenditures for residents. As many members of the community are already energy burdened and because electric rates in Ann Arbor are the highest in the Midwest, this is a very real risk. To address this, applicants to the Appliance Replacement Fund will first have to have a completed energy assessment and undertake energy efficiency improvements before they are eligible for appliance replacement (unless an appliance is at end of life). Additionally, the Appliance Replacement Fund will focus on improvements that can connect to the "in-design" networked geothermal system – a much more efficient and cost-effective way to heat and cool homes than traditional fossil gas appliances. A secondary risk is the size of the air handlers and equipment and whether they will fit in the small footprint of the homes in Bryant. To address this risk, the Appliance Replacement Fund will support transitioning from side-by-side washer and dryer units (what are currently installed in all Bryant homes reviewed) with a joint heat pump washer/dryer unit. In this way, the residents will get extremely efficient appliances that lower energy bills AND free up space in their utility closets for the air handlers and associated equipment. A tertiary risk is limited electrical capacity in the project neighborhood to support the transition to all-electric homes. To alleviate this risk, the project team has

been working with the investor-owned utility (DTE, see letter of support) to do a capacity study. Additionally, by moving to ground source heat pumps, there will be a lower draw on the grid than air source heat pumps as demonstrated by a recent Department of Energy report¹¹, making the swap a net-benefit to the grid as a whole. The final risk identified relates to the electrical infrastructure of the home/unit. In some instances, the electrical service panel might not be able to accommodate a transition to all-electric. To alleviate this issue, electrical service upgrades are budgeted as part of this measure.

Cost: The team collected quotes to support the above work and estimates roughly \$20,000 would be needed to support implementation of this measure per home. Assuming 275 homes are prepared to make the improvements identified above, the cost of this measure is \$5,500,000.

Measure Four: Sustained Community Engagement

While community engagement is not explicitly identified as a unique measure in SEMCOG or the State's PCAP, every successful program requires community engagement. Building on the extensive community engagement that has been conducted in Bryant to-date, the project team has found one of the most effective ways to help residents get excited about the work is for them to see successful examples of it in their community. Therefore, the project team will focus on taking action with early adopters and highlighting this action for others to see and experience. The project team will also engage through existing community events and host new events to generate greater interest in the project. The project team has found that by integrating information on project work into already existing, highly attended community events, we can engage with more people in a more comfortable setting. While at these events, the project team is also able to more widely promote upcoming events that are more specific to the project, directly reaching more residents than we otherwise would be able to. This approach has also allowed the team to reach a more diverse group of residents and build trusting relationships with key community stakeholders – relationships that will help make the project a success.



*Key Milestones include creation of the RAC, creation of a community engagement strategy, and creation of a strategy identifying next steps to fully decarbonize the Bryant neighborhood.

Greenhouse Gas Reduction: This action will not directly reduce greenhouse gas emissions but is instrumental in ensuring that the actions that do, are supported by the community and get implemented.

¹¹ U.S. Department of Energy Report: <https://www.osti.gov/biblio/2224191>

Alignment with Priority Climate Action Plan(s): The City of Ann Arbor is covered by two PCAPs– one from the State and one from the Southeast Michigan Council of Governments (SEMCOG). Both PCAPs emphasize the importance of working directly with stakeholders, especially historically marginalized communities, to design and implement climate solutions. As such, this action is in direct alignment with the procedural justice and distributional justice recommendations in our two governing PCAPs.

Risks: The greatest risk associated with this action is maintaining public interest and engagement in the project, especially given its long duration. To address this risk, the project will look to the Resident Advisory Committee and early adopters to become project Ambassadors. This will entail leaning into these resident’s stories, using them and their homes as examples of the types of improvements that the project can support and the real-world benefit of making improvements, and as key spokespeople for the project.

Cost: \$3,000 a year for 4-years was budgeted for community engagement activities.

e. Demonstration of Funding Need

CPRG funding support will be a critical catalyst in moving this project from desired into a tangible, community designed and executable concept. Without support from CPRG, the project partners will continue spending valuable time and effort trying to cobble together funding to make necessary health, safety, quality of life, and energy saving improvements in the Bryant neighborhood (a EJScreen Disadvantaged neighborhood). This is time and effort that could be spent implementing resident identified solutions and working to scale our initiative to other parts of the City and region. Meanwhile, the residents of Bryant, 75% of which are low-income and suffering from energy burden, will continue to pay extremely high energy costs, suffer poor indoor air quality, and be on the outside of market-based solutions to support a clean energy transition. But funding this project will allow EPA to show how efficient, beneficial electrification solutions administered through public/private partnerships can be a viable pathway to ensuring economically challenged communities are centered in climate solutions.

As noted in Table 1, the project team has been doing extensive fundraising for this project. As of today, the team has secured funding to *design* a networked geothermal system, but no funding to *build* the system. The City and Community Action Network have also secured a MI-HOPE grant to fund roughly \$25,000 worth of improvements in 50 homes in the North Bryant neighborhood. However, during this work, over half the homes were found to have water drainage issues in the basement, with remediation costing between \$15,000 to \$20,000– almost the entire budget per home. This has meant that very little funding has gone to energy efficiency improvements desperately needed to reduce energy burden, let alone beginning work on fuel switching. Moreover, this funding was only to support 50 of the 262 homes in the North Bryant neighborhood and no funding has been secured to-date to support the 306 units in South Bryant (Forest Hills Cooperative). Therefore, funding from EPA will be transformational for this project – allowing in-home repairs and retrofits to be available to all residents. Simply put, the design is in place to fully transition a community that is low-income and marginalized into the nation’s first carbon neutral existing neighborhood, setting a precedence for communities across the county – all it needs is the funding to make this vision a reality.

Table 1: Funding Pursued Successfully and Unsuccessfully for This Project.

Grant Pursued (unsuccessfully or unknown result)	Grants Secured
DOE Weatherization Expansion and Innovation (\$1,999,995) To expand weatherization services to include solar, energy storage, and heat pumps	DOE Energy Efficiency and Conservation Block Grant (\$180,000) To make the Bryant Community Center a living, learning lab of sustainability in action
DOE Grid Resilience Infrastructure Partnership (\$38,000,000) To create a neighborhood microgrid in Bryant and two other neighborhoods	McKnight Foundation (\$150,000) To design a community engagement strategy for the Bryant decarbonization project and hire engagement lead from neighborhood.
DOE SolveIT (\$200,000) To create a non-grid tied microgrid in Bryant	DOE Community Geothermal (\$563,250) To design a networked geothermal system in North Bryant
DOE BuildingsUp (\$200,000) To install solar and energy storage systems in Bryant	Builders Initiative (\$200,000) To support home improvements in Bryant
Michigan Public Service Commission Electrification and Renewables Grant (\$3,100,000) To install solar and energy storage systems in Bryant	Michigan Housing Opportunities Promoting Energy-Efficiency (MI-HOPE) (\$1,250,000) To support health and safety home improvements in Bryant
ICLEI Climate Action Fund (\$1,000,000) To fund home improvements in Bryant	Partners for Places (\$200,000) To create an Aging in Place efficiently program
EAS-E Prize (\$50,000) To create an HVAC mobile app capable of doing load calculations for appliance replacement	
Partners for Places (\$200,000) To support Aging in Place improvements in homes	
EPA Environmental Justice Collaborative Problem Solving Cooperative Agreement (\$1,000,000) Funding to support home improvements in Bryant and to scale program across the City	
Michigan Community Center Grant (\$2,500,000) To make the Bryant Community Center a fully decarbonized building and living laboratory of sustainability in action	

f. Transformative Impact

Imagine having 12-15% of your income immediately freed up every month and available to fund other priorities. Imagine not having to decide if you'll pay your utility bill this month or buy desperately needed clothing for your growing kids. Imagine no longer wondering if the air in your home is toxic and explains why your mother has asthma and you can't seem to fight this lingering cough. These are just some of the potentially transformative impacts this project is designed to manifest.

For far too long, neighborhoods like Bryant have been intentionally underinvested in. This grant will change that narrative and instead, make Bryant the center of the climate movement. By working directly with residents to design this application and the identified measures, we are flipping the script in terms of who holds the expertise needed to decarbonize society. And why the technologies we are proposing to implement are critically important and will help reduce GHG emissions immediately, just as important is HOW we are implementing those solutions. This is a key element of why this project is unique and will be successful – because it was designed by the residents, for the residents, and with decision making

remaining with the residents. This is transformational governance and an example of procedural justice in action.

In terms of the technologies being deployed, the greatest potential lies in the market transformation that deploying networked geothermal holds for decarbonizing heating and cooling – especially in cold climates. Networked geothermal systems are much more efficient than traditional heating and cooling options, with some reaching efficiencies of over 500%. The technology is viable. Communities in Europe and Canada are increasingly turning to networked geothermal for heating and cooling as are campuses across the United States. For these communities, they are seeing benefits of reduced utility costs and GHG emissions. But the communities who stand to benefit the most from this technology are not. To date, networked geothermal is nearly non-existent in communities considered low-income and disadvantaged – communities that are disproportionately energy burdened and suffering from the impacts of climate change. Even though the reduced operating costs of networked geothermal create shorter payback periods, the upfront cost is high for both the installation of the system and for the in-building retrofits that need to take place, making moving forward on these projects difficult. Therefore, this project, in conjunction with other funding, is planning to build a networked geothermal system that will connect residents that are low-income to clean, affordable, safe, and healthy heating and cooling. There will be three crucial impacts by realizing the goals of this project (figure 4):

1. A frontline neighborhood will be transitioned to carbon neutrality. The residents in the neighborhood, many of which are low-income and energy burdened, will experience reduced energy bills, elimination of energy burden, and a healthier indoor and outdoor environment.
2. An investor-owned utility will understand the viability of providing geothermal in lieu of natural gas as a new utility business model. The integration of networked geothermal and thermal energy networks into the business model of a traditional fossil gas company could be transformational for the entire industry – leading to a significant shift in how our region, and potentially beyond, heats and cools our homes and businesses.
3. A model will be created for how to make an entire neighborhood carbon neutral, including a greater understanding of the costs and benefits of this work and how it can scale across the country.

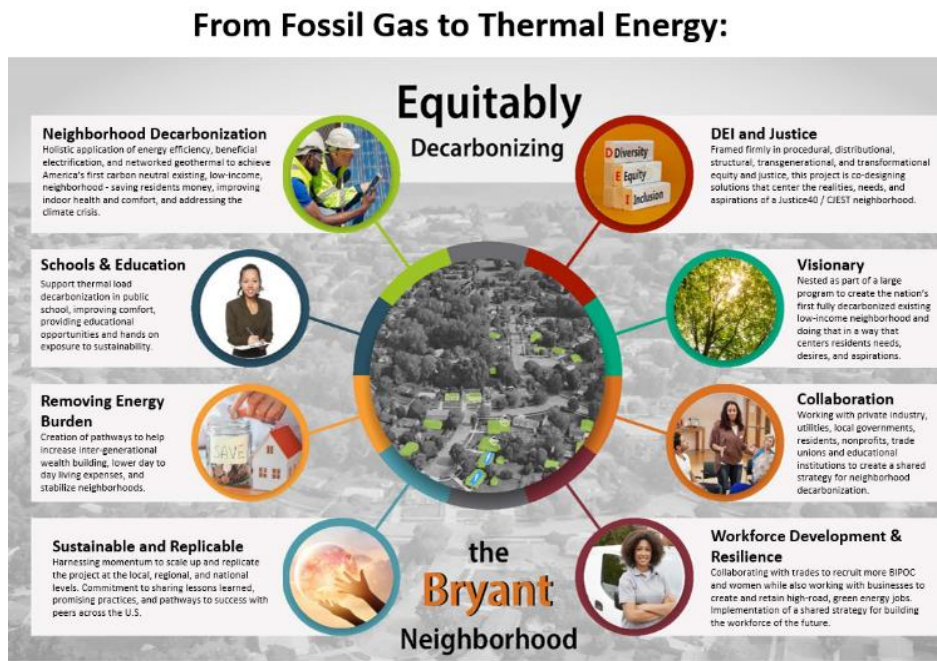


Figure 4: Multiple prongs of the From Fossil Gas to Thermal Energy proposed project.

2. IMPACT OF GHG REDUCTION MEASURES

a. Magnitude of GHG Reductions from 2025 through 2030

Of the four activities included in this proposal, two activities will lead to direct GHG reductions: the Energy Efficiency Fund, and the Appliance Replacement Fund. The Energy Efficiency Fund will enable the following measures that will reduce GHG emissions: improved insulation and air sealing; and broken or damaged window replacement. The Appliance Replacement Fund will enable the following measures that will reduce GHG emissions: replace fossil gas furnaces with residential air handles that connect to a geothermal system; replace fossil gas water heaters with heat pump water heaters that connect to a geothermal system; and replace fossil gas clothes dryers with a heat pump dual unit.

The estimated metric tons of CO₂-equivalent (MT CO₂e) emission reductions resulting from each measure are listed in Table 2. The short-term durability of these GHG reductions is extremely high given the long lifespan of the appliances and their connection to an “in-design” networked geothermal system.

In the single-family homes of the North Bryant neighborhood, implementing weatherization and transitioning to heat pump-based HVAC, water heaters, and wash-dryer systems represent a 31% reduction in whole-home emissions. In the multi-family units in Forest Hills Cooperative (South Bryant), implementing weatherization and replacing windows are estimated to reduce emissions by 10% per unit.

Table 2: Magnitude of GHG Reductions for Four Measures Between 2025-2030.

	Magnitude of GHG Reductions, 2025 - 2030				Durability
	MT CO ₂	MT CH ₄	MT N ₂ O	MT CO ₂ e	Years
Energy Efficiency Fund Total	2,265	0.033	0.0032	2,267	
Weatherization	2,154	0.031	0.0030	2,156	25+
Window Replacement	111	0.0018	0.00017	111	15 - 30
Appliance Replacement Fund	1,818	0.065	0.0063	1,821	
HVAC Geothermal Systems	1,556	0.044	0.0042	1,558	20+
Heat Pump Water Heater	55	0.013	0.0013	56	10 - 15
Heat Pump Dryer	207	0.0078	0.00076	207	15 - 20
Total GHG Reductions	4,083	0.10	0.0095	4,088	

b. Magnitude of GHG Reductions from 2025 through 2050

Because all GHG reduction measures included in the Energy Efficiency Fund and Appliance Replacement Fund will be implemented prior to 2030, the actions included in both the short-term and long-term analyses are the same. The estimated metric tons of CO₂-equivalent emission reductions resulting from each measure are listed in Table 3.

The GHG reductions enabled by this funding have high long-term durability. The buildings included in this project were built around 1971, and it is anticipated that these buildings will remain in use at least for the next 25 years. In addition, Forest Hills Cooperative (South Bryant) is established as a member-controlled community, and it is expected that it will continue to operate as a cooperative for at least the next 25 years. The lifetime of the installed equipment is expected to last at least from 10 – 30 years, with the to-be built networked geothermal system estimated to last over 50 years. In addition, once fossil-fuel consuming appliances are transitioned to electric alternatives with supporting electrical upgrades, it is assumed that electric appliances will continue to be installed into the future. While equipment will need to be replaced at the end of its useful life, the GHG reductions from this project will be permanent.

Table 3: Magnitude of GHG Reductions for Four Measures Between 2025-2050.

	Magnitude of GHG Reductions, 2025 – 2050				Durability
	MT CO ₂	MT CH ₄	MT N ₂ O	MT CO ₂ e	Years
Energy Efficiency Fund Total	8,848	0.14	0.014	8,491	
Weatherization	7,979	0.13	0.013	7,986	25+
Window Replacement	505	0.0090	0.00087	505	15 - 30
Appliance Replacement Fund	13,957	0.32	0.031	13,974	
HVAC Geothermal Systems	10,571	0.23	0.022	10,584	20+
Heat Pump Water Heater	1,952	0.058	0.0056	1,955	10 - 15
Heat Pump Dryer	1,434	0.034	0.0033	1,434	15 - 20
Total GHG Reductions	22,441	0.46	0.045	22,466	

In the single-family homes of North Bryant, weatherization and electrification measures are estimated to reduce whole-home emissions by 68% in the 2025 – 2050 timeframe. Units that receive weatherization and window replacements in the Forest Hills Cooperative (South Bryant) are expected to see a 16% reduction in emissions during this timeframe.

c. Cost Effectiveness of GHG Reductions

This project plans to use \$9,837,000 in funding to implement GHG reduction measures that are estimated to achieve 4,088 MT CO₂e emission reductions in the 2025 – 2030 timeframe, resulting in a cost-effectiveness of \$2,406 per MT CO₂e. A summary of costs and cost intensities for both time frames is provided in Table 4. While this figure appears high, it does not factor in the impact of other improvements the project team is fundraising for, including the installation of onsite solar systems at each residence or full connection to a networked geothermal system. Cost effectiveness also does not consider the value of health improvements due to a reduction in criteria air pollutants or a reduction in energy burden experienced by residents. However, these are real, tangible improvements that are co-benefits of the proposed measures. Finally, the CPRG represents a unique opportunity to fund truly hard to decarbonize sectors – including low-income residential housing. The project team chose to intentionally bring this project forward because it is life-altering for participants, but also because these types of improvements are hard, if not impossible, to fund through traditional funding streams. Unless we are willing to take a chance and invest in communities like Bryant, we are in great risk of continuing our status quo investments in which those with resources continue to get more resources and those without are left behind. We hope this CPRG grant application will help change that narrative and demonstrate what is possible when we focus on those that have borne the historical and current impacts of climate change and socio-economic disparity.

Table 4: Cost effectiveness of proposed GHG reduction measures

	Budgeted Cost	2025 – 2030: \$/MT CO ₂ e	2025 – 2050: \$/MT CO ₂ e
Energy Efficiency Fund Total	\$4,124,000	\$1,819 / MT CO ₂ e	\$486 / MT CO ₂ e
Appliance Replacement Fund	\$5,500,000	\$3,020 / MT CO ₂ e	\$394 / MT CO ₂ e
Non-Reduction Measures	\$1,712,000	-	-
Total GHG Reductions	\$9,837,000	\$2,406 / MT CO₂e	\$438 / MT CO₂e

d. Documentation of GHG Reduction Assumptions

Please see **Appendix A: Documentation of GHG Reduction Assumptions** for more information.

3. ENVIRONMENTAL RESULTS – OUTPUTS, OUTCOMES, AND PERFORMANCE MEASURES

a. Expected Outputs and Outcomes

Measure	Outputs	Intermediate Outcomes (4 years)	Long-term Outcomes (5+ years)	Performance Measure
Resident Advisory Council	Monthly meetings of RAC with notes 10 RAC members engaged per year Community Engagement Strategy	10 residents serving as project ambassadors and helping recruit folk into program	20 residents serving as project ambassadors and helping recruit folk into the program	Number of RAC members
Energy Efficiency Fund	Fund created 500 homes receive weatherization / insulation or air sealing 115 homes receive replacement windows for those warped or severely damaged	Reduction in cumulative metric tons of GHG emissions of 2,267 between 2025 and 2030 20% reduction in home emissions in North Bryant 10% reduction in home emissions in South Bryant Criteria air pollutant reduction 50% reduction in energy burden 20% improvement in efficiency	Reduction in cumulative metric tons of GHG emissions of 8,491 between 2025 and 2050 20% reduction in emissions in North Bryant 15% reduction in emissions in South Bryant Improved indoor air quality and reduction in criteria air pollutants Elimination of energy burden for program participants	Pre and post energy assessment
Appliance Replacement Fund	Fund created 300 homes retrofit 200 air handlers and equipment installed and ready to connect to geothermal system 200 heat pump water heaters installed 220 heat pump washer/dryer units installed 100 electrical panel upgrades	Reduction in cumulative metric tons of GHG emissions of 1,821 between 2025 and 2030 10% reduction in home emissions in North Bryant 10% reduction in home emissions in South Bryant Criteria air pollutant reduction	Reduction in cumulative metric tons of GHG emissions of 13,974 between 2025 and 2050 40% reduction in home emissions in North Bryant 10% reduction in home emissions in South Bryant Improved indoor air quality and reduction in criteria air pollutants	Pre and post energy assessment
Community Engagement	60 engagement events 400 individuals engaged in project	300 residents attend events and/or provide input.	400 resident attend events and/or provide input	Attendance at events
Other	Progress Reports Final Report	Established procedure for expanding the work to new communities.	Every census tract currently labeled as low access to opportunity or very low access to opportunity has improved at least one full classification.	Changes in local opportunity index scores

b. Performance Measures and Plan

The project team will primarily track GHG emission reductions, energy cost savings, energy use reductions, alleviation of energy burden, and resident satisfaction for each of the GHG reduction measures. For GHG emission reductions, energy cost savings, energy use reductions, and a reduction in energy burden, the team will use the results from pre- and post-energy assessments to determine if goals were met. These energy assessments were developed with the residents of Bryant and provide details on the equipment within each home as well as results for energy consumption, load profile, energy mix and use by fuel type, and GHG footprint. If residents are comfortable providing utility bill data, that will be used to track cost savings. If not, the team will use the change in energy use data compared to local utility rates to provide an estimate of financial cost savings/impacts. The numbers for each of those categories will be reported before work takes place and after to determine the progress towards achieving the expected outcomes for each GHG reduction measure. The project team will use a shared database to track the retrofits as they take place to determine the progress towards achieving the expected outputs.

Additionally, the project team will work with the Resident Advisory Council (RAC) to determine how best to measure resident satisfaction. Initially, the project team plans to track resident comfort, sense of safety, and overall level of satisfaction through pre- and post-surveys that are distributed to residents participating in the program. This is subject to change based on what the RAC determines will work best to accurately evaluate resident satisfaction. At a minimum, we will track attendance at public events and demographic information to ensure we are engaging with all residents in the neighborhood.

c. Authorities, Implementation Timeline, and Milestones

The RAC will be responsible for providing the guiding vision for the project across all the GHG reduction measures. They will provide ongoing oversight and targeted guidance via monthly meetings. The City of Ann Arbor will be responsible for day-to-day management and coordination of the work, regularly reporting back to the RAC to ensure the work is in-line with their strategic vision. The City performs this role across many grants and has the full authority to do so. Advisory councils have also been convened in a variety of different ways by the City, making this an easy precedent for the City to follow.

The Energy Efficiency Fund and the Appliance Replacement Fund will be managed by Elevate/MEO via a contract with the City of Ann Arbor. The City recently launched a local residential rebate program and conducted a competitive request for proposals process to identify the firm that would be our rebate administrator. Elevate/MEO were selected from this competitive process and are currently working with the City to design the rebate administration program. Given this, the City proposes modifying its contact with Elevate/MEO to include administration of the Energy Efficiency Fund and the Appliance Replacement Fund, thereby streamlining program administration. What is different, however, is that the City and the RAC will be instrumental partners in helping to design the application process and review applications for both Funds. In this way, Elevate/MEO will be the Fund administrators, but the residents will guide the decision-making process and be key stakeholders in helping determine which projects get funded. Funding decisions will be guided based on results from the energy assessment reports, which identify energy efficiency opportunities as well as appliance replacement opportunities and optimal timing for each. Before applications are formally submitted, Community Action Network (CAN) will work with residents to schedule their energy assessments. Based on the results from this assessment, CAN and Elevate will be available to work with residents to identify contractors to secure quotes from. Template statements of work will be developed so that quotes can be easily and consistently generated by local contractors. Once quotes are secured, CAN will be available to discuss quotes with residents, helping them decide which contractor to work with. Once the resident has decided, they will fill out an application to either the Energy

Efficiency Fund or the Appliance Replacement Fund. This application will be reviewed by the RAC and Elevate/MEO and a decision regarding award made. Once an award decision has been made, the resident will proceed with contracting with the selected contractor and, upon completion of work, receive their award from the Fund administrator to pay the contractor for service delivery. A full process map, from the perspective of the resident, is provided in Figure 4. Elevate/MEO, CAN, and the City have the authority to carry out this work.

Community engagement activities will be managed by the RAC, with logistical support from the City of Ann Arbor and CAN. The RAC will be responsible for planning, promoting, and running events best suited to engaging residents in the neighborhood. Throughout the project, the City of Ann Arbor and CAN will help as needed to ensure the vision of the RAC and the goals established by the residents are met. In addition to the stakeholders mentioned above, throughout the project, IMEG, Midwest Geothermal Energy Association, International Ground Source Heat Pump Association, Ann Arbor Public Schools, Washtenaw County, and DTE will provide technical support with measure implementation. These team members will assist with the technical side of design and installation, especially those related to the future networked geothermal system, and will attend and present at community engagement events to help educate members of the community while enabling community feedback to be incorporated into the overall project design. A full project timeline is provided in Figure 5.

4. LOW-INCOME AND DISADVANTAGED COMMUNITIES

a. Community Benefits

The geographic scope of this project encapsulates two EJScreen Census block groups, 261614056001 (North Bryant) and 261614056002 (South Bryant), which are directly next to each other and border Interstate-94 and the City's capped landfill. South Bryant qualifies as a disadvantaged community under the established criterion, as it is at or above the 90th state percentile for particulate matter 2.5, diesel particulate matter, air toxics cancer risk, traffic proximity, hazardous waste proximity, and wastewater discharge. Being directly adjacent, North Bryant does not rank in the 90th percentile in the criterion but does rank in the 80th percentile in several categories. However, through extensive community engagement in this area, we know that three quarters of households in the neighborhood are considered low-income, over a third are energy burdened, and 38% of the homes have a family member with a respiratory illness compared to the state average of 20%. Relatedly, both block groups rank in the 96th percentile for asthma on EJScreen. These two block groups are intrinsically connected, both geographically and socially, to each other and share many of the same impacts that we unfortunately see in communities that have been consistently underinvested in. With that in mind, we will focus on block group 261614056002 (South Bryant) for the purposes of the direct and indirect benefits as it qualifies under the evaluation criterion for CPRG.

This project focuses on providing building retrofits that include replacing fossil gas appliances with renewably powered electric ones, installing insulation, replacing windows, and making other efficiency improvements to eliminate energy burden, improve indoor air quality, and enhance resident health. For the replacement of gas appliances with more efficient electric ones, multiple studies have demonstrated the negative health impacts of gas appliances in the household, both in terms of indoor air pollution as well as outdoor air pollution. A commonly cited health impact is the increase in respiratory health impacts, such as asthma, which is borne out in these block groups as they both rank in the 96th percentile for asthma in EJScreen. Furthermore, as most of the residents in both block groups are considered low-income, paying for utility bills can become difficult, with many being considered energy burdened. Speaking with residents, some are paying over 15% of their income on utility bills, making them severely energy burdened.



Figure 6: Process map from the vantage of the resident.

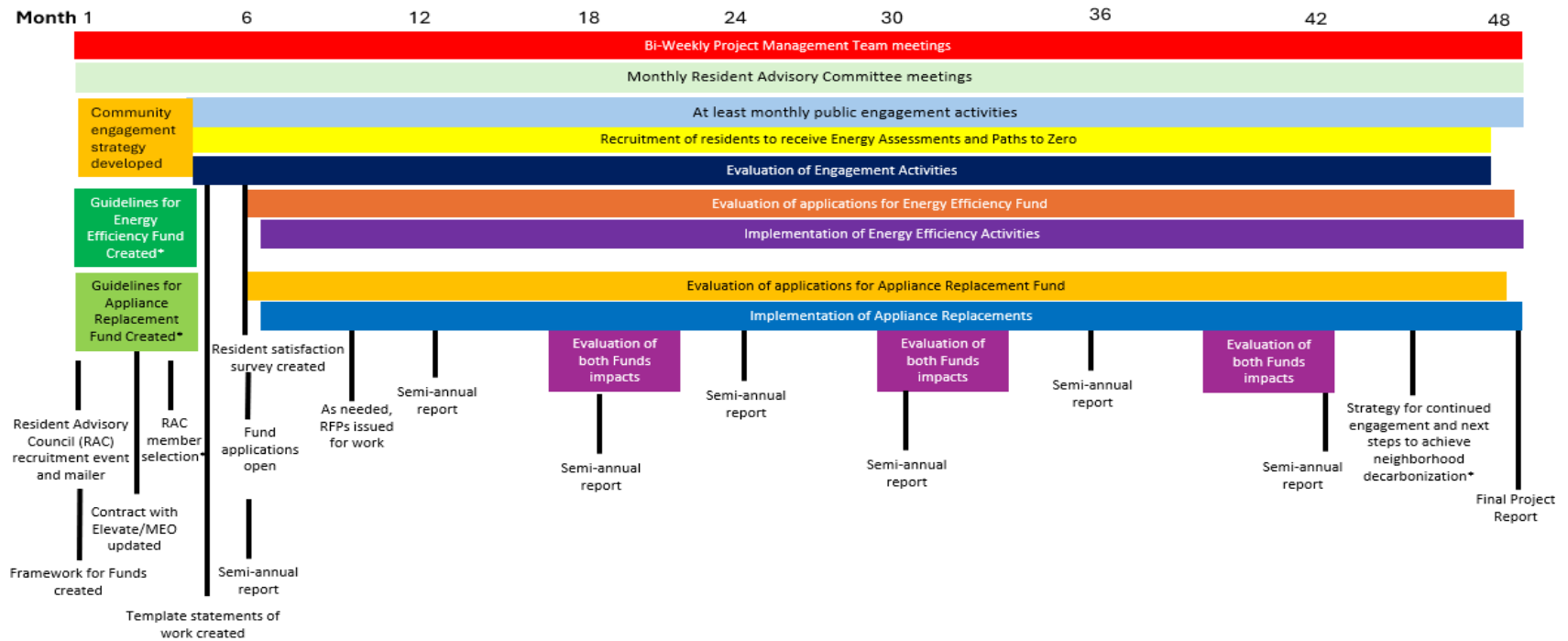


Figure 5: Full project timeline.

To address the health, financial, and climate considerations of using fossil gas appliances, the project will be replacing appliances with beneficially electric ones. These appliances will reduce the amount of dangerous NO_x, CO, and PM 2.5 in the indoor and outdoor environment, resulting in healthier living situations as well as reducing GHG emissions. A potential drawback is the fact electric rates in the project's service territory are higher than gas rates. This shows up predominately in the case of air source heat pumps where even though they are more efficient, the operating cost can still increase for residents. Therefore, the project team will be focusing on energy efficiency first and electrification second, emphasizing appliance replacements that can tap into a future networked geothermal system. This approach will avoid bill increases as the energy efficiency improvements will offset the potential cost increases associated with electrification and geothermal will be more efficient and have a lower operating cost than the existing infrastructure while still realizing the health and climate benefits.

The project will also focus on improving the energy efficiency of the homes, primarily through adding insulation and air sealing. Improving insulation and air sealing are often seen as one of the biggest gains in efficiency per dollar spent. Through assessments conducted in homes to date, many are lacking in insulation with some having none at all. The addition of insulation will have a primary benefit for residents and a secondary benefit for the overall project. For residents, they will see decreased energy costs through having a more efficient home, while also realizing health benefits by preventing poor outdoor air quality from infiltrating the indoor space. It will take less energy to heat and cool homes, resulting in money saved every month. For the project as a whole, this will mean the ground source heat pumps installed will be sized correctly, saving money on each heat pump, and allowing for a smaller bore field due to the efficiency gains. These savings will make the project more feasible, and savings will be able to be invested back into the project to improve residents' quality of life.

Lastly, the team will be replacing windows. While window replacements are not inherently the most cost-effective measure for energy efficiency, after engagement with community members, it was discovered many windows in the buildings in block group South Bryant have significant levels of disrepair. Many of the windows have broken seals and warped frames, meaning they no longer provide any level of energy efficiency. And in some cases, they are unable to lock, creating significant safety concerns. Therefore, upgrading the windows will provide multiple benefits to residents. There will be energy efficiency and quality gains as the new windows will actually seal out the outside air, resulting in cost savings on energy bills and a more comfortable living situation in terms of temperature regulation and reduced noise pollution as the homes are right off a major highway. Additionally, the window replacements will increase safety and security in their homes by allowing the windows to lock.

To assess, quantify, and report the benefits and disbenefit of these measures, the project team will track every installation both before and after using our existing energy assessment. The assessment compiles all the information on the home to determine energy consumption, load profiles, energy mix by fuel type, and CO₂ footprint, while also touching on health and safety. The assessment will be conducted pre- and post-upgrades to assess the decrease in energy use and impact, which can be translated into GHG reductions and health impacts. Additionally, through the project, the team will be working with residents to create a Resident Advisory Council, who will determine what their metrics are for success are and how to best obtain resident input.

b. Community Engagement

This project is building upon extensive community engagement work that has taken place in block group 261614056001 (North Bryant) over the past three years. During this time, the project team, which includes Community Action Network (CAN), a community-based organization directly embedded in the

neighborhood, has co-developed an energy assessment with residents that focuses on health and safety, energy efficiency, beneficial electrification, and renewable energy. Using separate grant funding, the project team has conducted the assessment in 100+ homes, began home retrofits on 15+ homes, and has funding to do partial work on around 35 more homes. Crucially, this funding is capped on the amount that can be spent per home. Given around half of the homes experience health and safety issues (primarily crawlspace flooding) that require significant financial resources to address, current funding is not able to cover all the retrofits that need to take place. Additionally, during recent engagements with residents, it was determined that at this time, air source heat pumps are not a viable decarbonization option as the higher electric rates compared to gas rates mean that air source heat pumps could have a higher operating cost for heating than gas options. This is a non-starter for residents, many of which are already energy burdened. This led the project team to explore geothermal options, resulting in the existing design for a networked geothermal system that this proposal, in part, is meant to help bring to fruition.

During more than 3 years of existing engagement in North Bryant (i.e., charettes, door to door canvassing, hosting public events, sponsoring existing events, working at food distribution sites and neighborhood clean-ups, sponsoring summer youth programs, conducting tree plantings), the project team identified many lessons on how to best work with the community to gather input, implement solutions, and evaluate programmatic impact as well as unintended consequences. Based on these lessons, CAN, with support from the City, created an outreach and engagement strategy that consists of continual and sustained engagement activities (at least one event per month) that ties to thematic and place-based priorities. These engagements have helped garner critical input for this proposal while simultaneously paving the way for implementation success. And it's these engagements that led the residents of North Bryant to identify the goal of making their neighborhood the first carbon neutral existing neighborhood in America.

While these engagements focused on North Bryant (block group 261614056001), the geographical proximity and interconnectedness between North Bryant and South Bryant (block group 261614056002) meant that many residents from South Bryant have joined events, engagements, and provided feedback about their neighborhoods strengths and needs as it relates to becoming more climate resilient and sustainable. Because of limited capacity and the unique nature of housing in South Bryant (cooperatives), the project team has not been able, to-date, to fully integrate the South Bryant neighborhood into the work underway in North Bryant. However, the plan for this project is to change that dynamic. More explicitly, the project team is proposing to work directly with residents and community leaders in South Bryant to begin collaboratively identifying what the key opportunities are to advance sustainability, affordability, climate action, and equity in their neighborhood. This will be done by directly engaging with the Resident Advisory Council to create a new, strategic, and targeted outreach and engagement strategy that identifies existing and new events that members of the project team could attend or host to build deeper trust with South Bryant residents. These engagements will also provide a forum to learn more about the needs and opportunities within South Bryant and provide opportunities for North Bryant residents to share their experiences with their neighbors to the south. The engagement strategy will be a living document, continually refined and adjusted as the impact and efficacy of events are evaluated. In this way, the project team will stay nimble and follow the evolving needs of residents as it relates to learning about, engaging with, and leading efforts to make their neighborhood more sustainable.

Throughout the project, the project team will use the work done in North Bryant (block group 261614056001) to engage residents in South Bryant (block group 261614056002) about what sustainability in action looks like and the real world benefits it provides. During the project teams existing community engagement, we have consistently seen that many sustainability technologies are new to residents, and the easiest way to get people ready to embrace these technologies is to share with them

what these technologies look like and the benefits they provide in a real world setting. Since some work in homes in North Bryant has begun, there will be multiple opportunities and events in North Bryant that residents in South Bryant will be able to attend and see what sustainability technologies are viable today, how they work, how they look in a home, and the benefits they provide. The project team has piloted this engagement method with success and in April, the project team will host a design charrette for the in-design networked geothermal system in North Bryant, with residents in South Bryant invited to attend. And we've already received multiple confirmations! This event is the exact type of engagement we plan to do more of – creating spaces for residents to share their experiences with one another, strategize on what opportunities they see in their homes and in their neighborhoods, and get more involved in the work to make this region a pinnacle of equitable climate action.

Additionally, the project team will work with members of the community to establish a Resident Advisory Council. The purpose of the Council will be to ensure there is consistent feedback and leadership from residents on the project throughout the life of the grant and beyond. The RAC will work with residents to gather feedback and provide input on the decision-making process, engagement approaches, program efficacy, and opportunities for refinement. Full control of how the RAC operates will be determined by residents; the project team will help with organization and logistics. RAC members will receive a stipend for their service and will be instrumental leaders in ensuring the project is a success.

5. JOB QUALITY

The City of Ann Arbor requires all contractors to comply with nondiscrimination provisions of the Elliot-Larsen Civil Rights Act and further comply with additional nondiscrimination provisions of Chapter 112 of the Ann Arbor City Code. Additionally, all contractors must comply with living wage provisions as laid out in Chapter 23 in the City Code. Outside of City Code, through work on existing grants, the City of Ann Arbor and Community Action Network have experience with Davis-Bacon Act and Build America, Buy America compliance and reporting and will continue to comply as part of this grant.

Through previous project work, including the ongoing district geothermal planning grant, the project team has built strong relationships with Local U.A. 190 – Plumbers, Pipefitters, Service Technicians, and Gas Distribution Workers as well as the International Brotherhood of Electrical Workers Local 252 who are leading local efforts to support green jobs development. Both are collaborators on this project, with U.A. 190 continuing to lead development of a local workforce development strategy, in tandem with local installers, trade allies, Ann Arbor Public Schools, Washtenaw Community College, the City, and Bryant residents. While workforce development is not the central goal of this project, the project partners are deeply committed to growing and diversifying the green jobs marketplace necessary to support a transition to carbon neutrality (e.g., geothermal drillers, electricians, geothermal installers, plumbers, EV technicians, energy efficiency experts). As such, U.A. 190 and Local 252 have agreed to join monthly project management meetings to ensure that the needs of this project are integrated into the workforce development efforts underway through a separately funded initiative and to help ensure that training and reskilling opportunities are directly targeted at Bryant residents.

6. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

Our (project) team is composed of entities with over 100 years combined experience working on community-centered decarbonization design and implementation. This expert coalition is focused on creating pathways to equitably and efficiently decarbonize communities, leveraging the power of stacked solutions such as geothermal deployment plus energy efficiency, beneficial electrification, and onsite solar and energy storage to find the most cost-effective solutions to achieving local clean energy and climate

goals while eliminating energy burden and significantly improving public health. All project team members share an unwavering commitment to equitable decarbonization with specific expertise related to inclusive public engagement, planning, zoning, local regulations, energy systems, energy system design, community decarbonization tactics, high-road workforce development, and geothermal deployment in urban settings. This project team is ready to implement a transformational efficiency and beneficial electrification plan that, when paired with other improvements, demonstrates how to decarbonize existing low-income neighborhoods while creating good paying, family sustaining jobs, improving public health, and stabilizing neighborhoods.

a. Past Performance

Below is a list of 5 federal grants that the City of Ann Arbor has recently received, all of which have been completed according to the federal grant requirements (all COVID-19 related funding has been omitted):

- Aging in Place Efficiently – \$200,000 from Partners for Places and Ann Arbor Area Community Foundation. 2020 philanthropic grant to Office of Sustainability and Innovations to launch a program to help income qualified older adults stay in their homes for longer by making aging in place improvements in tandem with home energy efficiency improvements. Contact: Ashley Quintana (ashley@fundernetwork.org).
- District Geothermal Design and Deployment to Equitably Decarbonize Low Income Neighborhoods in Ann Arbor – \$563,250 from U.S. Department of Energy. Award No. DE-EE0010665. CDFA: 81.087. Grant to design a district geothermal system in the North Bryant neighborhood and create a holistic workforce development strategy. Contact: Arlene Anderson, 202-586-3818. (arelene.anderson@ee.doe.gov).
- Model Regional Resilience Network with Resilient Infrastructure – \$1,000,000 from the U.S. Environmental Protection Agency. Agreement being finalized so no agreement number yet. CDFA: 66.312. Grant to co-develop a living regional resilience network that allows for the continual investment in the adaptive capacity and enhancement of local social cohesion for the region's frontline and most vulnerable populations. Contact: Olivia Davidson, 312-886-0266 (Davidson.Olivia@epa.gov).
- Fleet Electrification - \$270,000 from Diesel Emissions Reduction Act as passed through from the American Lung Association. Grant was for purchase of electric refuse truck which just arrived in Ann Arbor. Contact: Angela Tin, 217-241-9027 (angela.tin@lung.org)
- Allen Creek Berm Opening – \$2,016,738 from the U.S. Department of Homeland Security. This 2020 Emergency Management Performance Grant supported the opening of the Allen Creek trail and helped mitigate significant flooding in the City. Contact: Kelly Rosser, 517-582-8114 (RosserK@michigan.gov).

b. Reporting Requirements

The City of Ann Arbor fully complied with all reporting requirements for the grants listed above. In all cases, this included regular progress reporting (for Partners for Places this was biannual whereas all others were quarterly) and final report completion. All financial documentation and proof of expenditures were submitted on time and in the required formats. Notes were made in reports about alignment and variance from expected outputs and outcomes with final materials being made publicly available through the City's website, project reports, and presentations to relevant Boards and Commissions. For a complete list of the City of Ann Arbor's recent grants and compliance with reporting, please see our [Single Audit report](#).

a. Staff Expertise

Staff from the City of Ann Arbor (Dr. Missy Stults, Joe Lange, and Jordan Larson) and Community Action Network (Derrick Miller, Krystal Steward, and Nimsi Paavo) have developed meaningful relationships with frontline residents, building on the already strong relationships CAN has from being embedded in the community. By working directly with residents, the team co-developed a decarbonization assessment, tested it, and have begun making upgrades (e.g., insulation, appliance replacement, solar, and more). To conduct this work, staff have managed grants from multiple agencies. Similarly, Washtenaw County (Mary Braun) has a plan to support community wide carbon neutrality by 2035, prioritizing public engagement in all planning efforts and has recently supported efforts underway in the Bryant Neighborhood through a grant application from the County's Office of Community and Economic Development to the Weatherization Assistance Program to decarbonize 30 local homes. Staff from IMEG (Adam McMillen), Midwest Geothermal Energy Association (Kortney Lull), International Ground Source Heat Pump Association (Jeff Hammond), Ann Arbor Public Schools (Jason Bing), and Arbor Consultants (Chuck Hookham) have decades of experience in designing and implementing decarbonization technologies. Staff from DTE Energy (Stephen Harvey) have deep expertise on the business development and decarbonization pathways for a major utility. Using this experience, staff will be able to provide energy data and help determine what rate options will be available for residents connecting to the district geothermal system and connect the program to utility rebates and incentives. More details about the skills and expertise of the core team members can be found in the attached resumes.

Project Team Members roles and responsibilities are briefly outlined below.

- The City of Ann Arbor's Office of Sustainability and Innovations (OSI) is the keeper of the community's climate and equity plan and programs ([A²ZERO](#)). A2 OSI works with more than [100 community collaborators](#) to achieve a just transition to community-wide carbon neutrality by 2030 through the creation and implementation of programs and policies such as green rental housing, aging in place efficiently, and incentives to support beneficial electrification, deep energy waste reduction, and solar energy adoption. OSI will serve as the overall project lead.
- Community Action Network (CAN) is a local community-based organization that operates a series of deeply trusted and highly leveraged community service centers in the county that provide critical family and youth sustaining services. CAN will lead public engagement initiatives out of the Bryant Community Center (BCC) located in the Bryant neighborhood. BCC provides social, emotional, educational, and physical support services for the residents of Bryant. Bryant has been working with the City of Ann Arbor and residents to make the Bryant neighborhood the nation's first fully decarbonized existing low-income neighborhood. CAN will serve as the community engagement lead for outreach in the North Bryant neighborhood.
- Forest Hills Cooperative, an affordable housing cooperative, provides 1, 2, and 3-bedroom homes for residents across a wide range of backgrounds. They are a vibrant community that is excited about the City's work on sustainability but also worried that they may not be able to afford the high upfront costs that come with becoming carbon neutral. Forest Hills Cooperative will serve as the community engagement lead in the South Bryant neighborhood.
- Elevate is a nation 501(c)(3) that works to create a just and equitable world where everyone has clean and affordable heat, power, and water—no matter who they are or where they live. Elevate currently serves as the City's rebate administrator and will expand this role to include administration of rebates through the Energy Efficiency and Appliance Replacement Funds.
- Washtenaw County is developing a plan to achieve organizational carbon neutrality by 2030 and supporting community wide carbon neutrality by 2035. The County has prioritized public engagement in all recent planning efforts and has recently supported efforts underway in the Bryant Neighborhood. Washtenaw County will be a member of the project management team.

- The Ann Arbor Public Schools is in the process of establishing its district-wide sustainability framework and operates the Bryant Elementary School located in the geographical area of focus. AAPS will be a key member of the project management team.
- The local gas utility, DTE Energy, operates natural gas infrastructure in the City of Ann Arbor and is looking for ways to meet its organizational goal of full decarbonization by 2050. DTE will serve on the project management team, provide energy data, and participate in public meetings.
- The International Ground Source Heat Pump Association (IGSHPA) seeks to advance ground source heat pump technology as a key piece of achieving a sustainable and decarbonized future by undertaking workforce development, public education, and supporting industry partnerships. IGSHPA will serve on the project management team and assist in in-home heat pump design.
- Arbor Consultants is a local consulting firm specializing in engineering design and construction management, including utility-scale renewable energy and air source and ground source thermal systems design and conversion. Arbor Consultants is in the Bryant school district and has supported much of the work to-date in North Bryant. Arbor Consultants will assist with analysis and data gathering tasks and be a member of the project management team.

7. BUDGET

a. Budget Detail

Below is the summary budget for this project. More details are available in Appendix B and attachment “Budgetcals_CityofAnnArbor”.

<i>Budget By Year</i>					
CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	TOTAL
	\$0	\$0	\$0	\$0	\$0
TOTAL FRINGE BENEFITS	\$0	\$0	\$0	\$0	\$0
TOTAL TRAVEL	\$0	\$0	\$0	\$0	\$0
TOTAL EQUIPMENT	\$0	\$0	\$0	\$0	\$0
TOTAL SUPPLIES	\$3,000	\$3,000	\$3,000	\$3,000	\$12,000
TOTAL CONTRACTUAL	\$0	\$0	\$0	\$0	\$0
TOTAL OTHER	\$1,292,500	\$2,942,500	\$3,377,500	\$2,212,500	\$9,825,000
TOTAL DIRECT	\$1,295,500	\$2,945,500	\$3,380,500	\$2,215,500	\$9,837,000
TOTAL INDIRECT	\$0	\$0	\$0	\$0	0
TOTAL	\$1,295,500	\$2,945,500	\$3,380,500	\$2,215,500	\$9,837,000

<i>BUDGET BY MEASURE</i>		
	Total Cost	% of Total
Resident Advisory Council	\$200,000	2%
Energy Efficiency Fund	\$4,125,000	42%
Appliance Replacement Fund	\$5,500,000	56%
Sustained Public Engagement	\$12,000	0%
Total	\$9,837,000	100%

b. Expenditure of Awarded Funds

The City of Ann Arbor uses the New World ERP financial management program to manage the full city budget, inclusive of grants. This program allows for the separation of the City’s budget into specific pools based on funding source. This means that every City grant is placed into a unique account (called OOMG)

and given a unique series of grant codes for easy tracking of expenditures by grant, based on type (i.e., equipment versus community engagement materials). No two grants have the same codes meaning that funds cannot be commingled. This process allows for the easy tracking of specific grant expenses and rapid reporting. If awarded this grant, the City will place grant funds into an account unique to this project (i.e., set up only for this grant), and give the grant a unique set of billing codes that can only be used for authorized expenditures (per the grant agreement). This account will be a non-interest-bearing account. Moreover, the City does biannual reviews of grants to ensure that funds are being expended in a timely and appropriate manner. These frameworks will help ensure financial project success.

c. Reasonableness of Costs

Nearly all the funding (97%) requested will go directly to making improvements in low-income residential homes - improvements that will lower greenhouse gas emissions, reduce energy burden and lower monthly bills, improve indoor air quality and occupant comfort, and bring this neighborhood one step closer to being the first fully carbon neutral existing neighborhood in the Country. The budget for this project was developed based on quotes received for work in the neighborhood and estimates offered by industry experts. All quotes assumed the payment of David-Bacon wages and full compliance with the City's non-discrimination and conflict of interest policies. Once awarded, all work will be competitively bid to ensure residents receive the best pricing possible. More details about the budget can be found in Appendix B and in the attached "Budgetcals_CityofAnnArbor" spreadsheet.