



TEAM INTRODUCTION: It is our intent to bring the best team together to provide world-class engineering expertise to the Community Energy Innovation Prize Application. For each assignment to be undertaken, we have put together a team of seasoned specialists with extensive experience in the required domain, including the most renowned experts, to address any specific issue. Our team includes:

- **Team Lead:** EXP U.S. Services Inc. (EXP)
- **Research Member:** New Building Institute (NBI)
- **Implementation Member:** Community Housing Partners (CHP)

We are proud of our track record of delivering complex, high-stakes projects on time, within budget, and to the satisfaction of all stakeholders. We have identified an opportunity to leverage our collective building science expertise along with recent advancements in weatherization and heat pump technology to solve the challenge of decarbonizing multifamily housing with gas furnaces and through-wall air conditioners while improving savings in energy use and energy cost. Harris Gardens Apartments located in Harrisonburg, VA provides such an opportunity to deliver the many benefits of upgrades to a disadvantaged community by fully electrifying 199 housing units.

BUILDING UPGRADE INNOVATION CONCEPT: We will perform a field demonstration of comprehensive weatherization, combined with multiple innovative mechanical systems, to electrify and decarbonize a challenging type of multifamily housing in a mixed-humid climate. Monitoring systems will be installed prior to renovation work to collect baseline data on the project's energy consumption and air quality. DOE-approved energy modeling software will be used to determine the most impactful and cost-effective envelope upgrades. Comprehensive envelope upgrades will be achieved using all available funding sources, such as the Weatherization

Assistance Program (WAP), Weatherization Deferral Readiness (WDR) Program, and utility programs. ACCA-approved heat load and equipment selection calculations will be combined with in-house developed moisture load calculations to identify the optimum combination of mechanical systems for each type of dwelling unit. We take a holistic view of upgrades and thus include elements such as grid integration and workforce development. Mechanical equipment will be deployed with grid-integration capabilities (such as CTA-2045 capable heat pump water heaters or OpenADR2.0b compliant smart thermostats). This field demonstration will be deployed in climate zone 4A in Harrisonburg, VA. We will use innovative mechanical systems and have budgeted for these systems, including:

- **Space Conditioning:** Variable-speed, cold-climate, air-source, through-wall heat pumps with cooling capacities down to 1/3 ton.
- **Ventilation:** Heat pump integrated supply ventilation and energy recovery ventilators.
- **Dehumidification:** Heat pump integrated dehumidification with hot gas reheating.
- **Water Heating:** 120-gallon unitary heat pump water heaters, with two units, ganged together to serve about 12 dwelling units (a "distributed-central" approach).

PARTNERSHIP: The EXP Team has experience managing programs involving multiple Federal, state and county stakeholders, tenant agencies, and jurisdictions, which we consistently apply to our stakeholder management process. We excel at securing funding from multiple sources, navigating government programs, and maximizing resources through partnerships. Through collaborations with CBO partners such as the Climate Action Alliance of the Valley (CAAV), we revitalize communities, foster stability for the residents, and promote a healthier planet for future generations.

