

CPRG IMPLEMENTATION GRANTS COMPETITION

COVER PAGE FOR APPLICATION

APPLICANT INFORMATION

Organization: Metropolitan Washington Council of Governments (COG)

Primary Contact: Jeffrey King, Director, Climate, Energy, and Air Programs

Phone Number: (202) 962-3238

Email Address: jking@mwkog.org

TYPE OF APPLICATION ☒ Individual Applicant ☐ Lead Applicant for a Coalition

FUNDING REQUESTED: \$97,206,820

APPLICATION TITLE: Regional Action for Climate and Equity (RACE) to Clean Energy for All

BRIEF DESCRIPTION OF GHG MEASURES: This application covers three measures including:

- 1. Scale existing programs that provide energy efficiency and electrification upgrades, and solar panels to residential buildings.** This measure funnels money into existing programs that provide proven benefits to single-family homes, townhomes, and 2-4 unit residences. Funds will be prioritized to first serve low-income residents in low-income, disadvantaged communities (LIDACs) as identified through EJScreen and the Climate and Economic Justice Screening Tool (CEJST), then serve other low-income residents across communities not in LIDAC Census blocks and tracts, and finally serve other residents in EJScreen and CEJST LIDAC Census blocks and tracts that are not low-income. At least 40% of the benefits will go to low-income residents in LIDACs. CPRG funding will allow these programs, many of which cannot meet current demand let alone the wider potential need, to reach substantially more homes over the next five years by accelerating the pace of clean energy deployment across the region.
- 2. Electrify municipal light-duty fleets and provide supporting charging infrastructure.** In line with the Priority Climate Action Plan: Washington-Arlington-Alexandria-DC-VA-MD-WV Metropolitan Statistical Area and many of the existing climate plans and goals within the region, these funds will speed up the rate of electrification for fleets that serve critical public functions (e.g., first responders, shuttling elderly populations), particularly in LIDACs. They will also provide the needed charging infrastructure to support fleet conversion away from fossil fuels.
- 3. Expand existing workforce development programs and initiatives to support the larger workforce needed to upgrade residential buildings and maintain EVs and charging infrastructure.** This key enabling measure will expand the reach of existing programs and training to ensure that the workforce needed to create expedited and permanent GHG reductions through measures 1 and 2 is available. This measure will also strengthen the pipeline of qualified workers to support measures 1 and 2 and ensure they have high-quality jobs available to them at the end of their training/apprenticeships. It will also expand opportunities for quality jobs for LIDAC residents in the region and workers who are in a primarily fossil fuel-based sector to transition to work with electrified equipment and clean energy solutions.

These measures were identified and developed in close coordination with other regional and state CPRG applicants to avoid overlaps with the CPRG implementation grant applications from Maryland, the

District of Columbia, and Virginia. Accordingly, this application does not seek funds for the same climate action measure in the same geographic location. More specifically, within this application, COG is not seeking funding to support measures that are covered within the Maryland-DC Coalition CPRG Tier B application (Maryland and District of Columbia Clean Buildings Accelerator) or the other coalition application COG is leading (Virginia Initiative for Building Efficiency: VIBE) with Richmond Regional Planning Commission (PlanRVA) and the Hampton Roads Regional Planning District Commission. VIBE addresses commercial and larger multifamily as well as municipal buildings. Accordingly, this COG RACE individual application excludes any funding requests for commercial or multifamily (larger than 4 units) buildings in Maryland, Washington DC, and Virginia.

SECTORS:

- | | |
|--|--|
| <input type="checkbox"/> Industry | <input checked="" type="checkbox"/> Commercial and Residential Buildings |
| <input checked="" type="checkbox"/> Electricity Generation | <input type="checkbox"/> Agriculture/Natural and Working Lands |
| <input checked="" type="checkbox"/> Transportation | <input type="checkbox"/> Waste and Materials Management |
| <input type="checkbox"/> Other | |

EXPECTED TOTAL CUMULATIVE GHG EMISSION REDUCTIONS

Estimated cumulative GHG reductions 2025-2030 from CPRG funding (metric tons CO₂e): 25,454

Estimated cumulative GHG reductions 2025-2050 from CPRG funding (metric tons CO₂e): 102,659

LOCATIONS: Measures will be implemented in:

- District of Columbia
- Charles County, Maryland
- Frederick County, Maryland
- Montgomery County, Maryland
- Prince George's County, Maryland
- City of Gaithersburg, Maryland
- City of Rockville, Maryland
- City of Takoma Park, Maryland
- Arlington County, Virginia
- Culpeper County, Virginia
- Fairfax County, Virginia
- Fauquier County, Virginia
- Loudoun County, Virginia
- Prince William County, Virginia
- Spotsylvania County, Virginia
- Stafford County, Virginia
- Warren County, Virginia
- City of Alexandria, Virginia
- City of Falls Church, Virginia
- City of Fairfax, Virginia
- City of Fredericksburg, Virginia
- City of Manassas, Virginia
- City of Manassas Park, Virginia

APPLICABLE PRIORITY CLIMATE ACTION PLAN(S) (PCAP) REFERENCES

PCAP Lead Organization(s): Metropolitan Washington Council of Governments (COG, sub granted CPRG planning funds by the District of Columbia Department of Energy and Environment to develop a PCAP for the Washington-Arlington-Alexandria, DC-VA-MD-WV)

PCAP Title(s): COG: Priority Climate Action Plan: Washington-Arlington-Alexandria-DC-VA-MD-WV Metropolitan Statistical Area

PCAP Website link(s) (if applicable): <https://www.COG.org/documents/2024/03/01/priority-climate-action-plan/>

List of GHG reduction measures and PCAP page reference for each measure:

Measure	PCAP Title(s) and Page Numbers
Accelerate the deployment of energy efficiency solutions and decarbonization of residential, institutional, municipal, and commercial buildings	Priority Climate Action Plan: Washington-Arlington-Alexandria-DC-VA-MD-WV Metropolitan Statistical Area, pages 23-26
Accelerate the deployment of clean and renewable energy	Priority Climate Action Plan: Washington-Arlington-Alexandria-DC-VA-MD-WV Metropolitan Statistical Area, pages 27-30
Accelerate the deployment of low- and zero-emission transportation, fuels, and vehicles	Priority Climate Action Plan: Washington-Arlington-Alexandria-DC-VA-MD-WV Metropolitan Statistical Area, pages 38-41
Build the clean energy workforce	Priority Climate Action Plan: Washington-Arlington-Alexandria-DC-VA-MD-WV Metropolitan Statistical Area, page 51

Workplan Outline for General Competition

1 OVERALL PROJECT SUMMARY AND APPROACH

In the Washington DC metropolitan statistical area (MSA), two of the most persistent and predominant sources of greenhouse gas (GHG) emissions are residential buildings and on-road transportation. In 2020, residential buildings energy and electricity use accounted for more than 20% of the region's total GHG emissions (compared to 16% nationally) and on-road transportation emissions accounted for more than 30% of the region's emissions. GHG emissions from residential buildings are projected to increase 31% between 2020 and 2050 based on a growing population (expected to increase 25.3% 2020 - 2050).¹ During the same time, on-road transportation GHG emissions are projected to continue to remain a large share of regional emissions, still remaining at over 20% of the MSA's GHG emissions by 2050.

To address these emissions and underlying trends, the Metropolitan Washington Council of Governments (COG) and its local government members and partners have set aggressive climate goals.² These communities and organizations have put programs in place that benefit LIDACs in the region and have concretely identified their future needs to attain their goals. However, despite existing efforts, the region faces three main challenges to meeting COG's 2030 goal of 50% reduction in GHG emissions from 2005 levels, while also curbing emissions growth from an increasing population. Together, these challenges create a compelling need for Climate Pollution Reduction Grants (CPRG) funding:

1. **Oversubscribed/under-resourced existing programs that provide weatherization, energy efficiency, electrification, and solar solutions for LIDAC residential buildings.** Programs in the region, such as the federal Weatherization Assistance Program (WAP), Prince George's County's Clean Energy Program (over 30% of the County's population lives in Census blocks or tracts identified as LIDACs) and the Solarize NOVA (Northern Virginia) program (which promotes residential solar installations and will target these for already weatherized, low-income homes), are working to fill chronic gaps in residential clean energy deployments. But these and other programs in the region have far too few resources to meet current backlogs, let alone the wider need. For example, Maryland's WAP program received an historic \$46 million in Infrastructure, Investment, and Jobs Act funding, many times its normal allocation; but this funding is projected to serve only about 4,300 households, less than 5% of the state's income-eligible families.
2. **Large unmet need for electrified fleets that serve critical community services, particularly in LIDACs, but county and city budget shortfalls struggle to overcome higher upfront costs.** COG members have immediate needs to electrify over 400 vehicles that provide community services, such as shuttling elderly populations, transporting health department workers across the region, and piloting the use of electric vehicles for first responders. However, significant budget shortfalls are slowing the pace of adoption and the charging infrastructure to support them.
3. **Shortages of skilled workers to support residential energy upgrades and solar installations and maintenance, and electric vehicles and charger maintenance.** Along with obtaining and installing equipment, to realize permanent GHG reductions and co-benefits such as reduced energy burden, a trained and robust local workforce that can effectively identify, install, and maintain equipment in homes and maintain and service electric vehicles (EVs) and chargers is essential. For example, evidence from regional programs, such as Montgomery County's Electrify MC program, suggests that

¹ COG. Cooperative Forecasts: Employment, Population, and Household Forecasts by Transportation Analysis Zone. November 2023. <https://www.COG.org/documents/2023/11/03/cooperative-forecasts-employment-population-and-household-forecasts-by-transportation-analysis-zone-cooperative-forecast-demographics-housing-population/>

² See COG: Priority Climate Action Plan: Washington-Arlington-Alexandria-DC-VA-MD-WV Metropolitan Statistical Area Appendix B: Metropolitan Washington Climate and Energy Plans and Targets.

local vendors are facing recent staffing challenges for energy auditors, a critical first step for home upgrades.

COG has shaped this application to address these key challenges by bundling proven program design strategies and a number of ready-to-implement projects under the umbrella of a **Regional Action for Climate and Equity (RACE) to Clean Energy for All** program. The RACE to Clean Energy for All program will collectively provide community benefits, demonstrate leadership by example, and fill substantial existing funding gaps in pursuit of reducing GHG emissions. The three components to the RACE to Clean Energy for All program are as follows:

Measure 1: Scale existing programs that provide energy efficiency and electrification upgrades and solar panels to residential buildings. This measure funnels money into existing programs that provide proven benefits to single-family homes, townhomes, and 2-4 unit buildings. At least 40% of the benefits will go to low-income residents in LIDACs. Funds will be prioritized to first serve low-income residents in LIDACs as identified through EJScreen and the CEJST, then serve other low-income residents across communities, and finally serve other residents in LIDACs that are not low-income. CPRG funding will allow these programs, many of which cannot meet current demand, let alone the wider potential market, to reach substantially more homes over the next five years at an accelerated pace.

Measure 2: Electrify municipal light-duty fleets and provide supporting charging infrastructure. In line with many of the existing climate plans and goals within the region, these funds will speed up the rate at which municipal fleets that serve critical public functions (e.g., first responders, shuttling elderly populations), particularly in LIDACs, will be electrified. It will also provide the needed charging infrastructure to support this fleet conversion away from fossil fuels.

Measure 3: Expand existing workforce development programs and initiatives to support a larger workforce to upgrade residential homes and maintain EVs and charging infrastructure. This key enabling measure will expand the reach of existing programs and training to ensure that the workforce needed to create expedited and permanent GHG reductions through Measures 1 and 2 is available. This measure will also strengthen the pipeline of qualified workers to support Measures 1 and 2 and ensure they have high-quality jobs available to them at the end of their training/apprenticeships. It will also expand opportunities for quality jobs for LIDAC residents in the region and workers who are in a primarily fossil fuel-based sector to transition to work with electrified equipment and solutions.

a. Description of GHG Reduction Measures

Measure 1: Scale existing programs that provide energy efficiency and electrification upgrades and solar panels to residential buildings.

Through this measure, COG will subgrant funds to various counties, cities, and regional organizations to fund expansions to several existing programs serving LIDACs in the greater Washington, DC area related to residential (single-family homes, town homes, and 2-4 unit buildings) energy efficiency, weatherization, solar power installation, and electrification of fossil fuel-based appliances and systems. CPRG funded expenditures will be focused on providing first benefits to low-income residences in LIDAC Census blocks and tracts as identified using CEJST and EJScreen. As a part of the subgranting process, COG will ensure that, for any programs being run with existing private sector partners, those private sector partners were selected through a competitive process that complied with the applicable procurement provisions in 2 CFR § 200.317 through 200.327.

Table 1 summarizes the programs which will be expanded through additional funding, their geographic coverage, how those funds will be expended, and the resulting number of LIDAC homes reached. Each program is described in greater detail in the attached *Program Descriptions_MWCOG Individual*.

Metropolitan Washington Council of Governments
Climate Pollution Reduction Grant – Regional Action for Climate and Equity (RACE) to Clean Energy for All
Workplan Attachment

Table 1. Existing Residential Programs that will be Expanded with CPRG Funding

Program Name	Geographic Coverage	Program Type	Intended Funding Use	Target Participation (# of homes)
Weatherization Assistance Expansion	District of Columbia	Residential energy efficiency	Staff time, program administration, and incentives	400
Emergency HVAC Repair -- All-Electric Pilot	District of Columbia	Residential electrification	Labor and administrative costs to replace a gas HVAC for electric, including any panel upgrade costs; temporary equipment that gets reused across houses; outreach and community engagement to support pilot design roll-out	30
Clean Energy Program	Prince George's County, MD	Residential energy efficiency, electrification, and solar	Equipment for HVAC, air sealing and insulation, water heater, efficient lighting, energy auditing, labor costs for installations, administrative costs, program staffing, community outreach, education. Mostly weatherization, with some funding to install solar panels on low-income homes	1,160
Power Saver Retrofit Program	Frederick County, MD	Residential energy efficiency and electrification	Equipment for HVAC improvements, water heater replacements, air sealing, and insulation	28
Takoma Park Home Weatherization/Solar Installation Program	City of Takoma Park, MD	Residential energy efficiency	Door-knocking staff costs, weatherization/efficiency grants	15
Healthy, Efficient, Electrified, Climate-Adapted Pilot (HEECAP) Program	Montgomery County, MD	Residential energy efficiency and electrification	Repairs, electrification updates, workforce training, materials for climate resilience measures, labor costs of partners	250
Electrify MC Program	Montgomery County, MD	Residential electrification	Direct electrification incentives for homeowners; labor and administrative costs for help desk	80
Homeowner Energy Efficiency Program	Montgomery County, MD	Residential electrification	Equipment costs and labor costs for installation of efficient electric appliances and systems	90
Capital Area Solar Switch	Montgomery County, MD	Residential solar	Funding to install solar panels on low-income homes	25
Housing and Community Assistance Program - Sun Power Grant Program expansion	City of Rockville, MD	Residential solar	Community assistance grants for solar on Rockville Housing Enterprises low-to-moderate income homes and other low-income households	200
WAP Extension	Charles County, MD	Residential energy efficiency	Staff time, program administration, and incentives for weatherization and home repair	60

Solarize NOVA	Northern Virginia	Residential solar	Direct incentives and program administration	1,000
Green Home Choice	Arlington County, VA	Residential energy efficiency and electrification	Direct incentives and program administration	220
HomeWise	Fairfax County, VA	Residential energy efficiency and electrification	Direct incentives and program administration	500
Home Rehabilitation Loan Program	City of Alexandria, VA	Residential energy efficiency and electrification	Design and implementation of HVAC upgrades and energy efficiency upgrades	25

Potential Risks for Measure 1

This GHG reduction measure was intentionally developed to bolster existing programs and therefore minimize risk of implementation delays. By building on existing programs, this measure will capitalize on the existing infrastructure, expertise, and resources, thereby accelerating and streamlining the implementation process and maximizing efficiency. However, even with proven programs and successes, risks may still exist. These risks and how they will be managed are outlined in Table 2 below.

Table 2. Potential Risks and Solutions for Measure 1

Potential Risk	Mitigation Approach
Limited workforce capacity (e.g., auditors, contractors)	Grow and connect the clean energy workforce in the region through additional funds sought in GHG Reduction Measure 3. Workforce development will mitigate the risk of an underdeveloped workforce, preventing the successful implementation of this measure.
Equipment supply chain	Forecast and anticipate demand based on residential program equipment needs; work with contractors and equipment dealers to expand the supply chain.
Delays in utility interconnections and permit issuances for residential upgrades	Continue discussions and communications with local utilities and Public Service Commissions. Encourage participation in the SolSmart program to expedite permitting.
Garnering interest and participation	Target outreach and engagement strategies across multiple channels (see approaches in Section 4b).
Building readiness issues, such as water damage, mold, or asbestos delaying work and leading to emergency repairs and weatherization delays	Prioritize homes for upgrades with immediate opportunities while working with homes that need non-energy work in parallel to create healthier homes; maintain engagement and carry homes with non-energy issues through a weatherization readiness pathway.

PCAP Priority Reduction Measure: This measure aligns directly with the Washington DC MSA PCAP Measure: *Accelerate the deployment of energy efficiency solutions and decarbonization of residential, institutional, municipal, and commercial buildings.* This measure was selected as a priority for this application because, as demonstrated through this application, there is a clear funding need to support and expand the reach of already proven and successful programs that address one of the largest sources of GHG emissions in the Washington DC region and provide benefits directly to LIDACs. This measure will achieve all goals of the CPRG program because:

- With direct infusions of funds into existing programs that have existing needs, immediate, lasting GHG benefits (e.g., solar panels have lifetimes of 25 years) will be realized. The programs already

work in concert with other existing funding and technical assistance sources and their incentives levels have been right-sized to maximize GHG benefits across these different sources.

- Funds are targeted at low-income residences in LIDAC census blocks and tracts as identified using CEJST and EIScreen, and then secondarily to other residences that fall within these census blocks and tracts. This will ensure that benefits such as reduced energy burden and increased air quality are realized in LIDAC homes and in surrounding communities.
- The measure includes piloting concepts focused on transitioning away from fossil fuels, and lessons from these concepts can be shared and then scaled at low cost across the Washington DC region and across the country.

Measure 2: Electrify municipal light-duty fleets and provide supporting charging infrastructure.

This GHG reduction measure will accelerate the electrification of fleet vehicles for several COG county and city government members. COG will work with local governments to enter into agreements for COG to do cooperative purchasing of EVs and charging infrastructure on behalf of each government with input provided by local jurisdictions. This is a procurement arrangement COG has used multiple times previously with its members.

COG Cooperative Purchasing Program

COG initiated its Cooperative Purchasing Program in 1971 with the basic objective of reducing costs through economies of scale created through volume buying. By taking advantage of the combined purchasing power of participating jurisdictions, volume buying saves jurisdictions and their taxpayers money. The program also promotes sharing information among area purchasing officials and encourages continuing education for procurement professionals throughout the region. Through the Chief Purchasing Officers Committee, participating agencies, school boards, authorities, and commissions cooperatively bid on more than 20 different purchases, resulting in larger volume and better unit pricing.

Currently, regional cooperative purchasing opportunities are available for bottled water, water and wastewater treatment chemicals, medical supplies, gasoline and diesel fuel, office furniture, banking services, electrical supplies, public safety equipment, software and training, and more. Members also have the opportunity to use the Rider Clause to join existing local or regional awards and avoid the need to do in-house bidding. As new local electric vehicle supply equipment (EVSE) contracts become available, COG members will have opportunities to leverage those contracts via the COG Rider Clause.

COG will competitively contract and purchase vehicles and purchase chargers and have them installed on behalf of each local government. Vehicles and chargers will ultimately be owned and maintained by each county or city. The vehicles targeted for conversion to electric with CPRG funds through this measure specifically serve LIDAC residents via departments and services such as housing, health, environmental protection, senior center transportation, and first responders. A total of 443 vehicles will be converted, including 80 Passenger Cars, 230 SUVs, 36 Pickup Trucks, and 97 Vans (including 74 Cargo Vans, 14 Passenger Vans, and 9 Accessible Passenger Vans with lifts). Funding for EV chargers is also requested to enable the conversion and use of the procure vehicles. With this application, 151 dual head Level 2 chargers could be procured and installed, providing 302 ports for municipal use.

Potential Risks: The most relevant risks to this program include supply chain issues and workforce capacity for maintenance. Supply chain issues may lead to difficulties in supplying vehicles and charging infrastructure, and an undeveloped workforce would lack the capacity to install and maintain charging infrastructure and provide service to EVs. GHG Reduction Measure 3: Workforce Development will mitigate the risk of an underdeveloped workforce preventing the successful implementation of this

measure. Increased production and availability of EVs will mitigate supply chain risks. The number of EV models available has increased 500% since 2021,³ and many car manufacturers have set targets to increase the number of EVs they produce.⁴ Another risk is the availability of and capacity of electricity to serve charging stations installed. While part of this challenge can be addressed through off-peak charging practices, this cannot always be done. Therefore, communication and coordination with local utilities will be essential as more charging equipment comes online in the region.

PCAP Priority Reduction Measure: This measure aligns directly with the Washington DC MSA PCAP Measure: *Accelerate the deployment of low- and zero-emission transportation, fuels, and vehicles.*

As the federally mandated Metropolitan Planning Organization for the National Capital Region, the Transportation Planning Board (TPB), as a part of COG, is responsible for producing the region's Metropolitan Transportation Plan and Transportation Improvement Program. In June 2022, the TPB adopted a Resolution on the Adoption of On-Road Transportation Greenhouse Gas Reduction Goals and Strategies (TPB Resolution R18-2022). As part of that resolution, the TPB adopted a set of priority strategies to reduce GHG emissions from on-road transportation including:

- Convert private and public sector light-, medium-, and heavy-duty vehicles, and public transit buses to clean fuels, by 2030.
- Deploy a robust region-wide EV charging network (or refueling stations for alternative fuels) for light, medium, and heavy-duty vehicles.

Multiple COG members have set aggressive goals for fleet electrification. For example:

- Arlington County aims to electrify their fleet by 2050.
- The City of Rockville aims to reduce gasoline and diesel consumption by 20% in the City's on-road fleet vehicles between FY 2023 and FY 2028 and adopted a Clean Fleet Resolution that pledged to electrify the City fleet by replacing internal combustion engine (ICE) leased vehicles with electric versions on their 5-year replacement schedule and replacing medium- and heavy-duty purchased vehicles as soon as funding and practical models become available.
- Prince George's County aims for 50% of vehicle purchases to be low-or no-emissions by 2025.
- The City of Alexandria set a goal to electrify 25% of City fleet vehicles by 2024.
- Montgomery County aims to transition to a zero-emissions fleet by 2035.
- Frederick County plans to electrify 20% of their fleet by 2036.
- Loudoun County aims to transition 123 fleet vehicles to EVs by 2026.
- Fairfax County aims to transition to a zero-emission fleet by 2035.

Some jurisdictions are significantly behind on achieving those goals due to other County budget priorities, the need to get different departments comfortable with the use of EVs (e.g., police force, field staff, inspectors), and lack of accessible charging infrastructure. Therefore, through this application, COG is also seeking funding for EV chargers to support the quantity of EVs that will be procured with CPRG

³ Bloomberg.Com. 2024. "The Long-Range EV Boom Has Arrived," March 6, 2024. <https://www.bloomberg.com/news/articles/2024-03-06/tesla-helped-spur-a-long-range-electric-vehicle-boom>.

⁴ Motavalli, Jim. 2021. "Every Automaker's EV Plans Through 2035 And Beyond." Forbes Wheels. July 27, 2021. <https://www.forbes.com/wheels/news/automaker-ev-plans/>.

funds. In fact, the National Renewable Energy Laboratory estimates that the U.S. will need 28 million EV charging ports to support the projected 33 million EVs that will be in use by 2030.⁵

Through this measure, COG will directly meet the intent of the TPB resolutions and help COG members achieve their goals. This measure will also achieve all goals of the CPRG program because:

- It will reduce emissions from on-road transportation sources, which make up a significant source of all GHG emissions in the MSA.
- EVs will replace fossil fuel internal combustion engine vehicles that travel through LIDACs, reducing the emissions of criteria air pollutants in LIDACs and improving local air quality.
- By public officials and government staff using EVs, local governments will lead by example and demonstrate commitment to climate goals. This will also serve to increase confidence of consumers and encourage residents to switch from fossil fuel vehicles to electric.
- With the installation of chargers, some will be made available for public use, increasing the availability of charging infrastructure accessible in the region to further facilitate the use of EVs.

Measure 3: Expand existing workforce development programs and initiatives to support a larger workforce to upgrade residential homes and maintain EVs and charging infrastructure.

This GHG reduction measure will support workforce development in the clean energy, HVAC, and EV sectors. Partnering with several non-profit organizations, COG plans to capitalize on existing workforce development programs to expand the skills and knowledge of contractors in the local area. Programs will be focused on skills such as building energy performance, heat pump installation, solar system installations and maintenance, electric vehicle and charger maintenance, and more. Partners include Emerald Cities, Electrify DC, the DC Sustainable Energy Utility (DCSEU), and local community colleges. These organizations are already making a difference in Washington, DC and around the country. Through this grant, COG will be able to leverage the technical knowledge, community contacts, and experience of each program, creating a dedicated accelerator program to support Measures 1 and 2. Brief summaries of COG's partners' work are included below.

Electrify DC: Electrify DC aims to streamline and democratize the process of decarbonizing homes, fostering collaboration among various stakeholders. Its programs include:

1. Building for the Future (BFF): Training and certifying professionals crucial for home decarbonization.
2. Real Estate Agents Leading Electrification: Educating real estate professionals on electrification.
3. Healthy Homes Fair: Hosting consumer-oriented electrification events.
4. Demonstration Sites: Partnering with homeowners to showcase electrification possibilities in different neighborhoods.

Expanding funding would enable Electrify DC to launch and grow the BFF program, akin to its efforts with realtors. By engaging and educating professionals and contractors, the initiative aims to accelerate electrification efforts and influence decision-making. This local approach could serve as a model for nationwide residential decarbonization efforts.

Emerald Cities: Emerald Cities Collaborative (ECC) is a national non-profit network of organizations working together to advance a sustainable environment while creating sustainable, just and inclusive economies with opportunities for all. ECC develops energy, green infrastructure and other sustainable development projects that not only contribute to the resilience of our metropolitan regions but also

⁵ "Building the 2030 National Charging Network." n.d. Accessed March 19, 2024. <https://www.nrel.gov/news/program/2023/building-the-2030-national-charging-network.html>

ensure an equity stake for low-income communities of color in the green economy. This CPRG funding would enable ECC to fund two programs:

1. **Contractor Incubator:** This initiative assists local minority and women-owned businesses in the Metropolitan Washington region. Through a tailored curriculum and personalized mentorship, contractors receive coaching, technical assistance, and access to resources. Partnerships with local colleges and organizations provide workforce training and development opportunities.
2. **Architecture Construction Engineering Students (ACES) Pathway:** ACES engages middle and high school students from Title 1 Schools, exposing them to clean energy careers in architecture, engineering, and construction. The program offers hands-on learning, internships, and dual enrollment opportunities, addressing workforce diversity challenges and preparing students for immediate employment.

These programs aim to bridge the gap in clean energy career awareness, education, and workforce readiness, ensuring equitable access to opportunities for all.

Montgomery College: Montgomery College (MC) is a public, accredited community college offering a wide range of associate degree, certificate, and continuing education programs. With nearly 50,000 students annually, MC is committed to providing quality education at an affordable price since its founding in 1946. Operating across three campuses, workforce development facilities, community engagement centers, and satellite sites, MC boasts a diverse student body from 155 countries.

The MC Gudelsky Institute for Technology Education (GITE) provides training in Automotive Technology and Building Trades for underserved communities. In Fall 2023, 71.4% of credit students identified as Black, Hispanic, Indigenous, or People of Color, with 21% receiving a Federal Pell Grant. These programs prepare students for industry recognized certifications, including Automotive Service Excellence exams and clean energy HVAC equipment installation. The Automotive program offers 330 hours of instruction, including training on EVs, contributing to workforce expansion and supporting clean energy initiatives.

MC's Solar training, a North American Board of Certified Energy Practitioners (NABCEP) registered program, offers courses in Solar PV Design and Installation and Advanced Solar PV. Completion of the Solar PV course qualifies students for the NABCEP Solar PV Associate exam, a nationally recognized credential. The program is open to all, with basic electrical training provided to enhance understanding of solar systems. Grant funding will help scale these programs, providing training on EV service and repair, electric HVAC equipment, etc. Equipment purchases will support hands-on learning, facilitating the transition to clean technologies and contributing to the County's goal of zero emissions by 2035.

Prince George's Community College Sustainable Energy and Workforce Development Program (SEWDP) and TeamBuilders Academy (TBA): SEWDP, in partnership with TBA, is a premiere job readiness, certification, and placement program serving Prince George's County residents. The customized cohort-based approach provides participants in-classroom, virtual training, and experiential learning activities that include interactive instruction for varying learning styles. The course format includes in-classroom education, hand-outs, interactive role play, virtual, and hands-on instruction. Participants are required to attend all sessions, participate in-classroom, virtual, and lab instruction, and take certification exams to earn industry recognized credentials. Upon successful completion, students are matched with local employers for a variety of employment opportunities, i.e., internships, contractual, full-time, part-time employment.

SEWDP provides training in solar PV, hybrid/electric vehicle, energy efficiency, and other energy training. TBA construction training program is a pre-apprenticeship model designed to increase a skilled talent pipeline for the construction and renewable energy sectors. The program will develop

participants with job readiness skills to earn credentials that align with academic or workforce development programs at Prince George’s Community College (PGCC), ultimately leading to enhanced employability within the construction and/or trades related companies within the region.

Potential Risks: The most relevant risks are having sufficient contractors available to complete the programs, the rapid upscaling of programs and the availability of faculty/teachers to design and implement the curriculums.

PCAP Priority Reduction Measure: This measure aligns directly with the Washington DC MSA PCAP Measure: *Build the clean energy workforce*. This measure was identified as a priority due to contractor shortages, as identified in Measures 1 and 2. This measure will support and enable the successful implementation of Measures 1 and 2.

b. Demonstration of Funding Need

The RACE to Clean Energy for All program demonstrates a strong need for funding and the ability to leverage other funding streams to amplify climate action and provide benefits to LIDACs and broader communities. Many of the programs described in **Measure 1** have been well-established for years and are facing cuts due to county and city budget shortfalls or have had to suspend operations because of these budgetary constraints. These programs have been proven to fill critical assistance gaps, already work with other existing funding streams, and have demonstrated strong interest from residential customers and organizations that directly serve residential customers. To accelerate action, these programs also need additional funds to reach LIDACs, which often requires additional direct engagement from trusted messengers, such as door-to-door campaigns.

Similarly, for **Measure 2**, goals and targets to electrify government fleets and procure chargers have been in place for years, but funds have not been available to procure these vehicles in quantities that move the needle as a result of budget shortfalls and competing priorities. For **Measure 3**, many existing programs have clear, stated needs to hire additional faculty, build new curriculum to target evolving technologies, and connect trainees and students directly with employers quickly. These programs are often funded through non-profits and county or city funds, which are already stretched thin.

COG acknowledges that there are additional funding sources coming through the Inflation Reduction Act (IRA) and the Infrastructure, Investment, and Jobs Act (IIJA) that will help address some funding needs, but these do not go far enough. These funding sources, as well as others considered as a part of this application, the measures funding sources are relevant to, and the status of those sources, are listed below. COG and its local government partners are aware of and will adhere to restrictions around comingling various sources of federal funding.

- **EPA Solar for All (relevant for Measure 1, not announced/awarded):** Solar for All has immense potential to be a transformative program. However, funding levels are not sufficient to meet all needs in LIDACs. For example, the potential Solar for All grant for Virginia would fund only a few thousand projects in the NOVA region, estimated at less than 1% of income-eligible households. CPRG will enable the combined effort to serve more LIDAC homes, and to provide balance-of-cost funding for projects that exceed Solar for All limits.
- **IRS Home Solar Income Tax Credits (relevant for Measure 1, available).** Tax credits do not address the challenge of finding the upfront capital for solar installations, which is particularly challenging for low-income households. Many low-income households also may not have enough tax liability to benefit from tax credits.

- **DOE WAP program.** The IJA provided a historic level of WAP funding; but even this amount is only enough to serve a tiny fraction of income-eligible households. For example, Maryland’s \$46 million in IJA WAP funds will serve less than 5% of eligible households.
- **DOE Rebate Programs (relevant for Measure 1, not available).** DOE HOMES and HEEHR rebates have cost caps such that they often do not cover the full cost of projects. States can also decide how to design and target these rebates, and these program designs are not yet finalized. CPRG funds will enable the combined program efforts to fund full project costs in LIDACs, which will increase total participation levels.
- **IRS Home Efficiency Tax Credits (relevant for Measure 1, available).** Tax credits do not address the challenge of finding the upfront capital for energy efficiency installations, which is particularly challenging for low-income households. Many low-income households also do not have enough tax liability to benefit from tax credits.
- **DOE Energy Efficiency and Conservation Block Grant Program (EECBG) (relevant for Measures 1 and 2, available).** Even for larger population jurisdictions, EECBG funds can be limited in terms of impactful GHG reductions. For example, Prince George’s County is putting \$300,000 from its \$681,200 in total EECBG grant funds into its Clean Energy Program, and this will result in only 30 homes (assuming a \$10,000 grant) potentially receiving solar installations. Montgomery County is putting most of its EECBG funds (about \$614,000) into the Montgomery County Homeowner Energy Efficiency Program, which will only serve 30 homes (assuming \$20,000 per home).
- **Utility Rebate Programs (relevant for Measures 1, available).** Utility rebates typically cover a limited set of measures and provide incentives that cover a minor percentage of total costs. CPRG funds will enable projects to include more measures and will add funding such that project economics become much more favorable. The combined results will increase total participation and emission reductions.
- **State Rebate Programs (relevant for Measure 1, available).** CPRG funds will complement and expand the impact of Maryland Energy Administration rebates of \$1,000 for solar PV and \$3,000 for geothermal heating and cooling. This program is oversubscribed, and its incentives cover only a small fraction of costs. CPRG funds will increase total available funding and the number of projects.
- **Direct pay for EVs and chargers⁶ (relevant for Measure 2, available).** IRS tax incentives have cost caps such that they cover only a fraction of vehicle costs. CPRG funds, combined with IRS Direct Pay funds, will enable the purchase of more vehicles among all COG member participants. The combined results will increase total emission reductions.
- **Rockville Minority, Female, or Veteran-Owned Businesses Program.** The goal of the City of Rockville’s minority, female, disabled or Veteran-owned (MFD-V) business outreach program is to increase opportunities for MFD-V businesses to interact with city procurement and to compete effectively in solicitations for city goods and services. The city conducts one-on-one technical consultations with businesses to talk about public procurement and the City of Rockville specifically. The city does not offer specific grant funding.
- **Maryland Women’s Business Center (MWBC):** MWBC offers resources to women- and minority-owned businesses that lead to access to capital, profitability, job growth, and overall economic development. MWBC trainings and workshops are funded in part through a Cooperative Agreement with the U.S. Small Business Administration. However, MWBC does not offer direct financial assistance or initial workforce development and support for achieving necessary degrees and

⁶ IRS 45W Commercial Clean Vehicles Credit and IRS 30C Alternative Fuel Vehicle Refueling Property Credit.

certifications to begin their careers. MWBC is supported by Montgomery County, Fredrick County, City of Frederick, Prince George’s County, and the City of Rockville, among others.

c. Transformative Impact

The GHG reduction measures in this application have the potential to significantly accelerate GHG emission reductions in the metropolitan Washington region through rapidly increased adoption of clean technologies that will offer a multitude of benefits to LIDACs and other residents and governments. Through these funds:

- Over 6,925 kW of rooftop solar will be installed, providing direct and local clean energy to 1,385 LIDAC homes for the next 25 years.
- Over 2,690 low-income households will receive weatherization, efficiency, or electrification upgrades, extending and expanding the reach of over 12 local programs in 9 localities.
- Over 440 vehicles will be electrified in government fleets, and over 300 charging ports will be provided, helping jurisdictions serve their communities while reducing air and noise pollution, providing visibility and trust in the technology and familiarity with it for municipal staff.

This program will also create and enhance innovative pilots to prove and expand the use of efficient electric heating and cooling technologies, particularly in LIDACs, the results of which can be easily replicated and scaled across the region and country. Beyond the immediate impacts from technologies installed with CPRG funds, this effort will help condition regional markets for these technologies through awareness building, technical knowledge development, and supply chain maturation. Further, this application will support building a robust workforce through providing additional training and building a pipeline from certified and trained potential employees directly to employers. Finally, in its last year the RACE team will develop a succession plan that will examine options for sustaining RACE programs’ service offerings and incentives. This plan will examine, for example, utility programs, state agency programs such as those funded by Regional Greenhouse Gas Initiative, and financing programs developed with Greenhouse Gas Reduction Fund grants.

2 IMPACT OF GHG REDUCTION MEASURES

a. Magnitude of GHG Reductions from 2025 through 2030

Estimated cumulative GHG reductions proportioned to this CPRG application funding request for 2025 to 2030 from each measure and for the RACE to Clean Energy for All program are:

- Measure 1: 19,003 metric tons CO₂e
- Measure 2: 6,350 metric tons CO₂e
- RACE to Clean Energy for All: 25,454 metric tons CO₂e

For Measure 1, existing program monitoring and evaluation work will ensure the achievement of and durability of short-term emissions reductions through 2030. For Measure 2, local governments will work through a competitive procurement and contracting process to ensure uptime and proper maintenance of chargers such that there is a high level of assurance they will be available to support the growing electric fleet and the GHG benefits of EVs can be continually realized. Measure 3 supports the reductions that will be achieved through Measures 1 and 2, and a trained and available workforce will support the overall maintenance of equipment to ensure it is operating properly over time and maximizing GHG benefits.

Beyond the immediate impacts from technologies installed with CPRG funds, this effort will help condition regional markets for these technologies through awareness building, technical knowledge development, and supply chain maturation. These reductions will be realized by technologies that have

typical service lives in the 15- to 25-year range. Backed by supplier warranties and service networks, these installations can be expected to perform reliability through their service lifetimes. Moreover, it is highly likely that they will be replaced by comparable equipment of equal or better performance, which means that impacts are likely to be sustained for the longer term. Further, this application will support building a robust workforce through providing additional training and building a pipeline from certified and trained potential employees directly to employers.

b. Magnitude of GHG Reductions from 2025 through 2050

Estimated cumulative GHG reductions, proportioned to this CPRG application funding request for 2025 to 2050 from each measure and for the RACE to Clean Energy for All program are:

- Measure 1: 86,398 metric tons CO₂e
- Measure 2: 16,028 metric tons CO₂e
- Race to Clean Energy for All: 102,659 metric tons CO₂e

The discussion above on the durability of GHG reductions in the short-term also applies to the long-term GHG reduction. In addition, for Measure 1 it is important to consider the slow turnover time of building stock and equipment. In general, building equipment (e.g., heat pumps, windows, insulation) has a lifetime of 15 to 25 years. Replacing equipment tends to happen with “like for like” replacements, especially in emergency situations. Therefore, getting into buildings in an expedited timeframe through programs such as those included in this application will have both short-term and lasting benefits by cutting through longer turnover cycles and accelerating GHG reductions. Transitioning to electrified equipment in Measures 1 and 2 will also shift the paradigm for “like for like” replacement and help transform the market, consumer, and vendor standards, which will ensure the durability and permanence of GHG reductions. While replacement timeframes for vehicles tend to be shorter than building, a similar case can be made in that once an EV is used and chargers are accessible, that technology will continue to be used over time. Tangible demonstrations of the use of EVs, especially in situations where there is still uncertainty like for first responders, will also help amplify the potential GHG reduction benefits seen over time. Beyond reducing direct emissions from on-site fuel combustion for homes and mobile combustion from internal combustion engine vehicles, the shift to electrified technologies in residential homes and vehicles will be able to leverage an increasingly clean electricity grid over time, with power sector decarbonization policies in place in all three regions (VA, MD, and Washington, DC). Measure 3 supports the reductions that will be achieved through Measures 1 and 2, and a trained and available workforce will support the overall maintenance of equipment to ensure it is operating properly over time and maximizing GHG benefits.

c. Cost Effectiveness of GHG Reductions

The cost effectiveness (calculated as requested CPRG implementation grant dollars divided by the quantified GHG emission reductions for the period of 2025-2030 calculated in the CPRG funding request) for each measure and for the RACE to Clean Energy for All program overall are presented in Table 3.

Table 3. Cost effectiveness of GHG reduction measures

Measure	Cost Effectiveness (\$/metric ton CO₂e)
1	\$3,617
2	\$3,508
3	N/A
RACE to Clean Energy for All	\$3,819

There are several factors that will affect the cost effectiveness of the RACE program over time, and the estimates above only represent raw program and incentive cost, which miss many benefits and are distinct from the more conventional marginal abatement cost curve type of cost-effectiveness metric for GHG reduction strategies. For example, this calculation misses two critical elements – the lasting benefits of more efficient and low-carbon long-lifetime equipment and the financial benefits that will be realized by program participants. Additional cost uncertainties for program implementation are discussed in the Budget Narrative Appendix.

Simply considering a longer-term framing of the cost-effectiveness of the RACE program would result in a \$/metric CO₂e of \$947 (assuming CPRG funding and the resulting GHG reductions from 2025-2050). As supply chains continue to expand for equipment because of nationally transforming markets, it is expected that equipment costs will decline over time. Further, households will see increased financial benefits through reduced energy bills that help offset upfront capital costs and reduce payback periods. Looking beyond just the project and program financials in the short and long-term, many other societal economic benefits will be realized through RACE that are not captured in the CPRG cost-effectiveness calculations. For example, reduced health care costs due to improved indoor and outdoor air quality (see Section 3a, Expected Outputs and Outcomes) and increased resiliency from rooftop solar systems due to reduced impacts from outages. Finally, the GHG reductions estimated for these programs are based on estimated changes in energy consumption patterns and the associated reductions in direct emissions from combustion or changes in emissions from the electricity grid based on changes in electricity consumption. A broader lifecycle approach to emission reductions was not considered.

d. Documentation of GHG Reduction Assumptions

Additional information on GHG reduction calculations, assumptions, approaches and cost effectiveness calculations are available in the Technical Appendix below and in the attached spreadsheet entitled *GHGcalcs_MWCOG Individual*. GHG reduction estimates for the RACE program take a bottom-up approach to calculating GHG reductions and cost estimates based on the existing programs that are requesting funding to be extended and/or expanded. No direct GHG emission reductions are associated with Measure 3, but the workforce development measure is critical to the successful implementation and lasting impact of Measure 1 and 2.

For Measure 1, reductions were largely set up and calculated in the GHG calculations spreadsheet leveraging information from EIA Residential Energy Consumption Survey (RECS), NREL's Residential Efficiency Measures Database, and past performance data for energy savings from the current programs to determine the potential change in energy consumption by fuel type. Data from the EPA AVOIDed Emissions and geneRation Tool (AVERT) tool, emission factors for fossil fuels from the EPA GHG Emission Factors Hub and the 2020 National Emissions Inventory, and electricity grid emission factor projections from EIA's 2023 Annual Energy Outlook (AEO) were combined with equipment useful life assumptions to determine emission reductions annually from 2025 to 2050.

For Measure 2, GHG reductions were estimated assuming that all vehicles are operational in 2026 and replacing a counterfactual scenario (reference case) where those new vehicles were instead in-kind ICEVs. Based on data collected on the vehicle type and average vehicle miles traveled, the avoided fuel consumption from ICEVs was estimated. Using AFLEET efficiency assumptions, equivalent kWh electricity consumption was determined that would be needed to charge EV traveling similar distances. Mobile combustion GHG emission factors from EPA were used to estimate the GHG reductions from the reference scenario ICEVs, and electricity grid emission factor projections from EIA's 2023 AEO were used to determine the GHG emissions from the grid used to charge the vehicles.

3 ENVIRONMENTAL RESULTS – OUTPUTS, OUTCOMES, AND PERFORMANCE MEASURES

a. Expected Outputs and Outcomes

In addition to the expected outcomes and outputs outlined in Table 4 below, COG will provide annual program reports and CPRG bi-annual progress reports and a final report to EPA. These reports will be based on quarterly reporting that program administrators will provide to COG.

Table 4. Expected Outputs and Outcomes from the RACE to Clean Energy for All

Measure	Outputs	Outcomes
1	<ul style="list-style-type: none"> 6,925 kW of distributed solar installed on 1,385 homes in LIDAC census blocks and tracts Weatherization, energy efficiency and/or electrification within 2,693 homes in LIDACs 16 programs provided with funding for increased staffing and administrative support 	<ul style="list-style-type: none"> Cumulative GHG emissions reductions portioned to CPRG funding of 19,003 MTCO₂e 2025 - 2030 and 86,398 MTCO₂e 2025 - 2050 Annual reduction of 1,080 MT of particulate matter (PM_{2.5} and PM₁₀), nitrogen oxides (NO_x), sulfur dioxide (SO₂), volatile organic compounds (VOCs), ammonia (NH₃), carbon monoxide (CO), and lead compounds Lower energy demand Reduced energy bills for LIDAC homes Increased staff and program capacity
2	<ul style="list-style-type: none"> 443 EVs procured 302 ports at 151 Level 2 charging stations installed 	<ul style="list-style-type: none"> Cumulative GHG emissions reduction portioned to CPRG funding of 6,350 MTCO₂e 2025 - 2030 and 16,028 MTCO₂e 2025 - 2050. Annual reduction of 12.53 MT of particulate matter (PM_{2.5}), nitrogen oxides (NO_x), and carbon monoxide (CO).
3	<ul style="list-style-type: none"> Number of courses offered Number of additional hours of curriculum developed 	<ul style="list-style-type: none"> Increase pipeline into training programs Increased number of connections from trained workforce pipeline to high-quality jobs

b. Performance Measures and Plan

The programs in this grant application are largely expansions of existing programs, which have their own metrics and reporting requirements. COG will gather updates and report on progress of all activities on a bi-annual basis. Performance measures may at minimum include the following but may be developed to include additional information once the grant period begins.

Measure 1

- Number of homes weatherized
- kW of solar installed
- Number of HVAC systems electrified
- Share of projects located in LIDAC census tracts and blocks
- Expenditure tracking

Measure 2

- Number of EVs purchased
- Number of internal combustion engine cars retired
- Number of EV chargers installed
- Expenditure tracking

Measure 3

- Number of hours of training completed
- Number of students or contractors who complete the training
- Job placement rate
- Outreach metrics
- Expenditure tracking

COG will provide a tracking form template for this program and will require partners to report on progress quarterly. The subgranted partners for each program will be responsible for tracking and collecting the requested program activity data. In addition to the items above, COG will oversee subrecipients and ensure they are conducting oversight on their selected contractors and vendors.

Partners will report supporting activity data from which GHG reductions can be calculated, including changes in home energy consumption after weatherization, efficiency, and/or electrification upgrades are completed; rooftop solar system size for each one installed; the vehicle miles traveled and/or electricity consumption data for the EVs; and when each EV enters into service. Using emission factors for the grid in each year (historical data from EIA or EPA eGRID factors, as available) and pollutant contents for mobile and stationary fuels, GHG emissions will be estimated based on the CPRG funding activity levels in each year of the program. COG will compile these reports for submission to EPA.

c. Authorities, Implementation Timeline, and Milestones

Measure 1

COG will subgrant funds directly to program administrators who will work with existing program partners as outlined in the list below. Program administrators and partners will be responsible for using the funds appropriately and regularly reporting to COG for the CPRG grant. Partners will continue to play the roles they do now in terms of program implementation, marketing, and community engagement, and more. Because these are all existing programs, there is no additional authority needed to be obtained for this measure.

- **Weatherization Assistance Expansion for Electrification Readiness** - District of Columbia, with support from one or more subrecipient(s) to be determined
- **Emergency Mechanical Systems Replacement / Emergency HVAC Repair** -- All-Electric Pilot - District of Columbia and the DC SEU and VEIC (as the SEU implementer)
- **Clean Energy Program** - Prince George's County, MD, with support from utilities via the EmPower MD Home Performance with the ENERGY STAR Program and PGCC
- **PowerSaver Retrofit Program** - Frederick County, MD Division of Energy & Environment Power Saver Retrofits (PSR) program has an executed agreement with local non-profit Centro Hispano. Through this agreement Centro Hispano provides program outreach and program assistance services that are vital in reaching non-English proficient Frederick County residents
- **Takoma Park Home Weatherization/Solar Installation Program** - Takoma Park, MD with support from Edge Energy and Building Change
- **HEECAP** - Montgomery County, with support from competitively selected non-profit grant awardees to be announced May 2024
- **Electrify MC** - Montgomery County, with support from Elysian Energy (competitively selected vendor), Montgomery Energy Connection community partners
- **Homeowner Energy Efficiency Program** - Montgomery County, with competitively selected contract support from Habitat for Humanity Metro Maryland and Efficient Home LLC
- **Capital Area Solar Switch** - Montgomery County, with support from Solar United Neighbors of Maryland, regional city and county staff, competitively selected solar installation companies, and Montgomery Energy Connection community partners
- **Housing and Community Assistance Program - Sun Power Grant Program** - Rockville, MD, with support from Rockville Housing Enterprises, Solar United Neighbors of Maryland, and Montgomery Energy Connection community partners, and Neighborhood and Civic Associations
- **Weatherization Assistance Program** - Charles County, MD and St. Mary's Housing Authority will lead the work, with support from one or more subrecipient(s)
- **Solarize NOVA** – Northern Virginia Regional Commission (NVRC) with support from Community Housing Partners (CHP) and Local Energy Alliance Program (LEAP)
- **Green Home Choice** - Arlington County with support from faith-based organizations such as InterFaith Power and Light and Faith Alliance for Climate Solutions; economic-and-community

representatives such as our Ethiopian Business District; communications and routine events conducted at Arlington County Community Centers located in and serving LIDAC census tracts; and other active organizations such as Arlington NAACP (National Association for the Advancement of Colored People), the Civic Federation, and the Columbia Pike Organization

- **HomeWise** - Fairfax County in collaboration with selected referral and marketing firms and a growing network of community groups
- **Home Rehabilitation Loan Program** – The City of Alexandria, VA will administer this program with support from one or more subrecipient(s) to be determined

Measure 2

For this measure COG will work directly with local government fleet managers and procurement offices to procure and install EVs and charging stations. Specifically, COG will undergo a pooled procurement and request for funding proposal (RFP) process to obtain EVs and chargers on behalf of local governments through a memorandum of understanding (MOU) process that has been used by COG in the past to procure in this manner. Local governments will own the vehicles and be responsible for overall maintenance and use and support regular reporting to COG. No additional or new authority is needed for this measure as the ability to procure for direct government operations and facilities already exists. COG will work with partners to ensure all federal procurement requirements are followed.

Measure 3

COG will subgrant funds directly to program administrators for these workforce development programs, who will be responsible for using the funds appropriately and regularly reporting to COG for the CPRG grant. Program administrators will continue to play the roles they do now in terms of program implementation, marketing, community engagement, and more. Because these build off existing structures and programs, there is no additional authority needed to be obtained for this measure. Table 5 summarizes the programs being funded and the organization responsible for managing each.

Table 5. Measure 3 programs and responsible organizations

Program Name	Responsible Organization
Building for the Future	Electrify DC
Contractor Incubator	Emerald Cities
ACES Pathway	Emerald Cities
Automotive Technology and Building Trades Training	MC GITE
Solar Training Program	MC GITE
TeamBuilders Academy and SEWDP	Prince George's Community College

Table 6 summarizes the parties, roles, and responsibilities for implementing each GHG reduction measure and their respective authority to carry out the measure.

Table 6. Implementation Milestones, Tasks, and Timeline

Measure	Task	Implementer	Milestone(s)	Timeline
All	1. Grant Set Up	COG	Completed workplan, performance management plan, reporting templates and systems, quality management plan and quality assurance performance plan	Q3-4 2024
	2. Subgrant Establishment	COG and Subgrantees	Established subgrants with partners, finalized reporting templates and	Q3-4 2024

	and Agreements		procedures, signed MOUs for pooled procurement and technical specifications provided by the county/city for EVs and EVSE	
	3. Grant Administration	COG	Continual grant administration and management and management of subgrants	Throughout the 5-year grant period
	4. Regular Reporting	COG and Subgrantees	Submitted subgrantee reports to COG, biannual and final reports to EPA	Bi-annually starting Q1 2025
	5. Grant Close Out	COG and Subgrantees	Final grant report	Last 3 months of grant period
1	1. Program Ramp Up	Subgrantees	Ramp up existing programs with CPRG funding (e.g., modify contracts, procure support, hire new staff)	Q4 2024- Q1 2025
	2. Program Reporting	Subgrantees	Report to COG	Quarterly starting Q4 2024
1	3. Spend Evaluation and Allocation	COG and Subgrantees	Annual review of program expenditures and redistribution among partners if needed while ensuring prioritization for LIDACs (i.e., if there is more or less need/uptake for different programs)	Annually
2	1. EV and Charger Procurement	COG	RFP/procurement development for EVs and charging infrastructure (compliant with federal and EPA competitive procurement requirements)	Q1 2025
	2. Equipment Purchase	COG and partners	Finalize purchases of EVs and chargers	Q2 2025
	3. Charger Installation	Procured vendor	Charger installation	Q3 2025 – Q4 2026
	4. Maintenance and reporting	Subgrantees (all) and procured vendor	Maintain EVs and chargers and reports on usage	Ongoing
3	1. Program Ramp Up	Subgrantees	Ramp up existing programs with CPRG funding (e.g., new hires, new training courses)	Q4 2024- Q1 2025
	2. Program Reporting	Subgrantees and partners	Report to COG	Quarterly starting Q4 2024

4 LOW-INCOME AND DISADVANTAGED COMMUNITIES

The programs described in this grant application all target LIDACs. To identify communities meeting the CPRG LIDAC definition, COG used EPA’s CEJST and EJScreen (see attachment *Areas_MWCOG Individual*). In the metropolitan Washington region, about 25% of the population is disadvantaged across LIDAC Census blocks. The percentage of disadvantaged population varies across different states: 47% of the population in DC, 28% in West Virginia, 23% in Maryland, and 21% in Virginia. Reducing GHG emissions presents a large opportunity to advance equity, environmental justice, health, and economic outcomes in LIDACs. Through strategic interventions in sectors such as buildings, clean energy, and transportation, communities can experience tangible benefits, including improved air quality, enhanced energy efficiency, and increased resilience. In addition, the programs in Measure 1 and Measure 2 will lead to

reductions in co-pollutants, as summarized in Table 7 below. Additional detail on the reduction estimates is provided in the Technical Appendix.

Table 7. Annual CAPs and HAPs Emission Reductions (MT)

Pollutants	Measure 1	Measure 2	Total
SO ₂	12.53	-	12.53
NO _x	708.94	1.23	710.17
PM _{2.5}	51.91	0.05	51.96
PM ₁₀	58.03	-	58.03
CO	238.33	11.25	249.58
VOCs	33.39	-	33.39
NH ₃	83.60	-	83.60
Lead Compounds	0.05	-	0.05
Total	1,186.80	12.53	1,199.33

Substantial opportunity also exists to enhance the clean energy workforce through tailored trainings, internships, and job placements by both leveraging existing programs and developing new ones. By prioritizing outreach, education, and workforce development initiatives tailored to the needs of LIDACs, climate action programs can effectively mitigate emissions while promoting social equity and building more sustainable and resilient communities.

a. Community Benefits

The RACE program endeavors to enhance local air quality, leading to improved public health and economic benefits. By curbing the combustion of fossil fuels in residential buildings and power plants, RACE seeks to mitigate pollutants such as particulate matter, ozone, nitrogen oxides, carbon monoxide, and air toxics. These pollutants are associated with adverse health outcomes, including premature mortality, cardiovascular diseases, respiratory issues, and other health disparities, particularly affecting vulnerable populations in LIDACs. Moreover, RACE anticipates not only outdoor but also indoor air quality improvements, acknowledging that indoor pollutant levels can be significantly higher due to fuel combustion for heating, cooking, and other activities. This comprehensive approach aims to reduce public health costs and alleviate financial burdens on families and businesses already struggling economically.

Additionally, the program emphasizes the creation and expansion of green energy jobs, offering training opportunities for auditors, construction workers, contractors, and other building trades. Electrify DC and ECC will be working to education contractors on energy efficiency, electrification, and rooftop solar options to support widespread adoption of these technologies. They will be developing specific courses and educational materials to provide support to programs in Measures 1 and 2. ECC will work to rapidly scale their existing program, the Contractor Incubator and Architecture Construction Engineering Students (ACES) Engineering Pathway Program. To complement the contractor training, PGCC and The MC Gudelsky Institute for Technology Education will train individuals, largely from underserved communities, in the construction and automotive industries. Specific curriculum enhancements will be developed to support programs in Measures 1 and 2 in solar design and installation, electric HVAC equipment, and EV and EVSE installation and maintenance. These four initiatives will work in concert to address workforce needs and provide pathways to economic stability, particularly in underserved communities.

While reducing energy costs is a primary goal of the RACE program, it acknowledges potential challenges, such as increased rents following retrofits, which could render housing units unaffordable

for low-income households. Efforts will be made to ensure that revitalization projects do not lead to gentrification, and benefits primarily accrue to the original occupants, maintaining affordability in multifamily properties. Furthermore, the program recognizes temporary challenges during construction, such as noise, dust, and utility interruptions, as well as potential lease termination or tenant relocation. Strategies will be implemented to mitigate these disruptions and ensure minimal inconvenience to affected businesses and residents.

To ensure accountability and effectiveness, the RACE program will establish a robust monitoring and reporting mechanism. It will track energy savings, greenhouse gas emission reductions, and co-pollutant impacts throughout the grant period. These efforts will be documented in the RACE CRM and reported regularly through program dashboards and annual reports to stakeholders, including the EPA CPRG bi-annual and final reports. This continuous assessment aims to optimize outcomes and address any emerging challenges promptly.

b. Community Engagement

Input from LIDACs, and community-based organizations (CBOs) and non-profit organizations has been integrated into the RACE application based on information and input collected during the development of COG's PCAP, and based on continued discussions with stakeholders about LIDAC needs during the development of this application. CBOs and other LIDAC representative organizations are detailed within the PCAP. Key priorities identified during the engagement process included implementing energy efficiency electrification projects and promoting local employment. The existing programs being expanded through this CPRG grant will continue and expand their LIDAC outreach efforts throughout the implementation process. Specific planned engagement efforts for the proposed programs are highlighted in Table 8 below.

Table 8. LIDAC Engagement by Program

Program	Municipality	Engagement Effort
Weatherization Assistance Expansion for Electrification Readiness	District of Columbia	Department of Energy and Environment (DOEE) will leverage ongoing LIDAC engagement conducted by Brick and Story LLC under its CPRG planning grant to invite feedback on the implementation of these and other proposed GHG reduction measures. DOEE will also conduct engagement and outreach in tandem with other programs that provide utility assistance to low-income households and/or serve residential buildings. Finally, DOEE will conduct customer satisfaction surveys, review feedback, and modify the program as needed.
Emergency HVAC electrification pilot	District of Columbia	Engagement efforts will target LIDACs and include a range of activities including mailing information to residents; pop-ups at community events; advertising via local community partners, email distribution lists and community centers; and applications both in-person and online via DOEE's energy assistance centers.
Home Weatherization /Solar Program	City of Takoma Park, MD	There are opportunities for expanded direct outreach at events, support for a website, and door-knocking campaigns with CPRG funding.
Clean Energy Program	Prince George's County, MD	The program will continue to partner with county agencies, utilities, and private entities to engage communities, especially LIDAC. Advertisement of the program offering will continue to occur via county newsletters, social media, website, and in-person and online outreach events.

Metropolitan Washington Council of Governments
Climate Pollution Reduction Grant – Regional Action for Climate and Equity (RACE) to Clean Energy for All
Workplan Attachment

Capital Area Solar Switch	Montgomery County, MD	The County will work directly with Housing Opportunities Commission, Montgomery Housing Partnership, and non-profit housing support services providers to schedule in-person presentations for residents who own their own homes.
Power Saver Retrofits	Frederick County, MD	Meaningful outreach through affirmative advertisement within the LIDAC census tracts. Within the identified LIDAC census tracts we plan to reach out to local non-profits, send targeted mailings, organizing meetings with residents/community groups, and translating PSR program flyers into languages other than English within the identified census tracts.
Solarize NOVA	Northern VA	Outreach approach utilizes a multi-channel strategy, collaborating with governmental, community, and advocacy partners.
RACE	Arlington County, VA	Outreach will leverage established relationships with organizations that serve LIDAC communities, including economic-and-community representatives (such as Ethiopian Business District, Arlington NAACP, the Civic Federation, and the Columbia Pike Organizations) and through faith-based organizations. The RACE Program will be elevated via communications and routine events conducted at community centers located in and serving LIDAC census tracts.
HomeWise	Fairfax County	This program will build on existing relationships with county agencies and community partners, including the Redevelopment and Housing Authority, County Public Schools and Libraries, One Fairfax, LEAP and FACETS (community safety net organization).
Home Rehabilitation Loan Program	City of Alexandria, VA	The program is advertised through city e-news, the city website, churches, civic association, homeowners associations, etc. Alexandria will be reviewing housing programs during the Fall 2024 Housing Master Plan update and will conduct widespread engagement, with targeted outreach in LIDAC census tracts.
Workforce development	Various	<ul style="list-style-type: none"> • Electrify DC will work to engage and inform all home renovation professionals, including the smaller, mostly BIPOC, operations, currently not aware of the programs like those of DC SEU or ECC, about electrification basics, government incentives, health impacts, available trainings, and business opportunity of decarbonizing the homes they are working on. • Montgomery College and Prince George's Community College will continue to engage students through campus advertising. • ECC will expand its outreach and communication with local government agencies and schools in the COG territory by developing webinars on workforce education and training.

5 JOB QUALITY

The RACE to Clean Energy for All programs will bolster economies in the Washington, DC area and support the creation of good jobs. For all programs, COG will adhere to strong labor practices to promote completion of high-quality projects that support regional economic resilience with strong employment opportunities for workers.

COG will apply rigorous labor standards in administering this grant, including wages at or above the prevailing rate and local hire provisions and demonstration of proactive diversity, equity, and inclusion (DEI) practices. COG frequently undertakes projects using state and federal grants with standards that

meet requirements of Davis Bacon, MBE/DBE, and other strong labor standards, and will apply such practices under this grant as well. COG will also work to adhere to the federal [Good Jobs Principles](#) and will encourage its members implementing programs under the RACE initiative to do the same. Further, COG's partners/subgrantees at the City and County levels also have in place prevailing wage and wage requirements laws that would apply for any work conducted or jobs gained through the RACE to Clean Energy for All.⁷

Jobs will be generated primarily in the building energy services sector, which includes HVAC installers, plumbers, electricians, insulation installers, energy auditors, and consulting engineers. Additional jobs will be generated in the supply chains for products and materials installed in projects, such as HVAC, water heating, and cooking equipment, insulation materials, and windows. Further, RACE has the potential to generate supplemental job positions in outreach and engagement, administration, and tracking of program outcomes. See section 4a and the attachment *Program Descriptions_MWCOG Individual* for addition information on the training and outreach programs that comprise Measure 3 of the RACE program. By their nature, these are active, local positions with positive equity, workforce, and economic impacts. While COG is not obligated to hire, COG will work with existing workforce and training partners in the design and execution of a successful workforce development program. COG will also leverage its ongoing collaborations with colleges and universities to provide training, internship, and job placement opportunities for students. COG will also encourage hiring of local workers and/or workers from historically-underserved communities.

These practices will promote effective and efficient delivery of high-quality projects that support economic resilience with significant employment opportunities with high labor standards and DEI outcomes. Occupations in the clean energy and energy efficiency sectors have been shown to earn higher and more equitable wages compared to all jobs nationwide.⁸ Workers who benefit from the workforce development programs funded as part of Measure 3 will have better access to jobs in these fields. Such practices will reduce the likelihood of potential challenges such as work stoppages or accidents, while ensuring a reliable supply of skilled labor while minimizing disruptions. The overall impact will support on-time and on-budget delivery.

6 PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

a. Past Performance

COG has vast organizational experience with grant and contract management. Between FY20-23, COG managed between 40-60 contracts and grants annually. Total contract revenue associated with federal, state, and local contracts and grants managed by COG is more than \$40+ million. COG's Contracting, Finance, and Accounting Departments have decades of experience managing all aspects of grants and contracts, including handling competitive procurements, contract awards, financial accounting and reporting, invoicing and payments, and auditing. Contracts and grants managed by COG related to climate action implementation include cooperative procurement for local and regional climate plan development and implementation, EV procurement and planning, enhanced mobility transportation services, climate resilience and energy vulnerability studies for critical infrastructure, and feasibility assessments for combined heat and power, solar, microgrids.

⁷ As an example, Montgomery County's laws may be found here: <https://www.montgomerycountymd.gov/PRO/DBRC/prevailing-wage-law.html> and <https://www.montgomerycountymd.gov/PRO/DBRC/wage-requirements-law.html>.

⁸ [2019.04 metro Clean-Energy-Jobs Report Muro-Tomer-Shivaran-Kane updated.pdf \(brookings.edu\)](#)

Metropolitan Washington Council of Governments
Climate Pollution Reduction Grant – Regional Action for Climate and Equity (RACE) to Clean Energy for All
Workplan Attachment

Project 1: Enhanced Mobility of Seniors and Individuals with Disabilities			
Assistance Agreement #, Listing # and Funding Agency	DC-2022-002-00 (FY21) 1473-2024-1 (FY23)	49 U.S.C. 5310	Department of Transportation, Federal Transit Administration (FTA)
Description:	COG serves as direct recipient of more than \$34 million in federal funds for more than 100 projects improving transportation access through suballocations to nonprofits, local governments, and private companies since 2013. Handle contracts with subrecipients. Determine project eligibility, procure vehicles/monitor use.		
Funder Contact:	Kelly Tyler, Transportation Program Specialist, kelly.tyler@dot.gov		
Project 2: Military Installation Resilience Review (MIRR) Naval Support Activity Washington Joint base Anacostia-Bolling/Fort McNair			
Assistance Agreement #, Listing # and Funding Agency	MIR1230-21-01	12.003	Department of Defense, Office of Local Defense Community Cooperation (DOD OLDCC)
Description:	COG was the lead contractor managing a MIRR project in the District of Columbia, supporting Joint Base Anacostia-Bolling, Naval Research Laboratory, Washington Navy Yard, and Ft. McNair. The planning project focused on identifying risks or vulnerabilities on the installations that could be mitigated through directed investments in the community. Final report - Building Resilience Together: Community-Military Collaboration in Washington, DC Value: \$756,059		
Funder Contact:	Jennifer Hirsch, DoD OLDCC, Hirsch, jennifer.l.hirsch3.civ@mail.mil		
Project 3: Diesel Emission Reduction Act Locomotive Engine Repower Project			
Assistance Agreement #, Listing # and Funding Agency	2019-1914-AQD-G001	66.039	District DOEE, U.S. EPA
Description:	COG is the lead implementer managing all aspects of partnership with Amtrak to replace legacy high-polluting diesel engines with new clean Tier 4 engines for two locomotives operating at the Union Station Terminal/Ivy City Maintenance Facility in Washington, DC. Value: \$3,470,800		
Funder Contact:	Joseph Jakuta, District DOEE, Joseph.Jakuta@dc.gov		
Project 4: Regional Blue-Green Infrastructure Community Engagement and Planning Project			
Assistance Agreement #, Listing # and Funding Agency	22RCPG117-01	97.111	Washington DC, Homeland Security and Emergency Management Agency (DCHSEMA), Federal Emergency Management Agency (FEMA)
Description:	COG is the Lead Contractor managing all aspects of the project to develop and deploy a model community engagement and blue-green infrastructure planning framework that can be replicated and scaled across metropolitan Washington. The project will develop feasibility studies for the implementation of blue-green infrastructure projects in the sub watersheds of the Anacostia River including Arundel Canal, Oxon Run, and Watts Branch and develop a community engagement plan. Value: \$1,430,113		
Funder Contact:	Kenya Troutman, DCHSEMA, kenya.troutman@dc.gov		
Project 5: Urban Area Security Initiative (UASI Program)			
Assistance Agreement #, Listing # and Funding Agency	UASI117	97.067	DCHSEMA, U.S. Department of Homeland Security (DHS)

Description:	COG is the lead contractor for numerous UASI Program projects, including topics such as bomb squad robotics equipment and training, situational awareness software and management, Metro rail response kits, NCR radio equipment and interoperability and more. Value: \$8,449,377
Funder Contact:	Charles Madden, DCHSEMA, charles.madden@dc.gov

b. Reporting Requirements

Project 1: Thus far, COG has submitted acceptable and timely quarterly reports and deliverables, as required.

Project 2: The project kicked off January 2021 and the final report was published April 2023. COG submitted acceptable and timely interim and final reports.

Project 3: COG has submitted the requisite periodic reports for the project. The project kicked off in August 2019 and anticipate project completion is December 2024.

Project 4: COG submitted acceptable and timely interim and final reports. The project kicked off May 1, 2023, and the anticipated project completion is June 2025.

Project 5: These UASI projects cover FY2020-2023. COG submitted acceptable and timely interim and final reports.

c. Staff Expertise

COG is experienced in managing climate planning projects to ensure effective expenditure of project funds. The COG Climate, Energy, and Air Programs Director has more than 30 years of experience working with contracting and accounting department staff and management to ensure effective and timely tracking of all project budgets and transactions. COG's Executive, Contracts, Purchasing, Accounting, Legal, and Finance departments also have dedicated staff to support all contract projects managed by COG.

COG staff have the experience and expertise to successfully achieve the proposed project's goals and GHG reduction measures. As leaders of a well-established organization serving the region for 67 years, *Clark Mercer*, COG's Executive Director, and *Kanti Srikanth*, COG's Deputy Director for Metropolitan Planning, will ensure the team has the resources needed to manage the project.

Jeffrey King is the Director of COG's Department of Environmental Program's Climate, Energy, and Air Programs. He has more than 34 years of experience as an environmental program manager with a proven track record managing programs and projects to reduce emissions of air pollutants and greenhouse gases. He has managed more than \$50 million in environmental projects, including solar energy projects for the U.S. Department of Energy and emission reduction programs for the U.S. Environmental Protection Agency. He works with COG's contracting, legal, and accounting staff on all aspects of project procurement, contracting, and progress and financial tracking and reporting.

Maia Davis, Senior Environmental Planner, serves as COG's lead climate planning staff, and provides technical services to COG members. She supported development of a net-zero high school in Northern Virginia through technical assistance from Oak Ridge National Laboratories for a geothermal feasibility study to inform school designs. *Leah Boggs*, Senior Environmental Planner, leads COG's Built Environment and Energy Advisory Committee, working closely with area sustainability, energy, buildings, and fleet managers on efforts to adopt low and no-emission solutions for government operations and the community. She managed COG's Fleets for the Future project which supported regional and local efforts to develop a cooperative procurement program for EVs.

Robert Christopher, Environmental Planner, and *Erin Morrow*, Transportation Engineer, collaborate to support the region’s adoption of electric vehicles. Mr. Christopher manages the region’s Electric Vehicle Deployment Workgroup and is the lead staff for COG’s Environmental Justice Subcommittee. Ms. Morrow is leading efforts to develop a regional electric vehicle infrastructure Implementation plan and supports a variety of transportation climate mitigation strategy initiatives for the region’s Transportation Planning Board (TPB). *Alissa Boggs*, Environmental Planner, serves as a lead technical staff and grant/plan coordinator for local and regional climate planning and implementation projects.

COG staff resumes may be found in the resume/bio attachments to this application (entitled *MWCOG_bio_MWCOG Individual*). Along with COG staff’s credentials, COG is also providing credentials and experience for staff and, in some instances, descriptions of organizational experience, representing each of its partners (local governments, community colleges, and non-profits) needed to execute the vision for the RACE to Clean Energy for All. These staff and organizations bring extensive experience in running residential programs, managing fleets, procurement, engaging with local communities, workforce development, and holistic and inclusive climate action. They understand their local context and stakeholders and will be essential partners with COG.

7 BUDGET

a. Budget Detail

The total proposed budget for the RACE to Clean Energy for All is \$97,206,820. The breakdown of this budget is summarized in Table 9 below. Each budget category is further described below the table; no costs are included for the Travel, Supplies, or Contractual categories. Budget details are provided in the Budget Narrative Appendix and additional information about the budget assumptions and supporting information are available in the Technical Appendix.

Table 9. Budget Summary for the RACE to Clean Energy for All

COST-TYPE	CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Direct Costs	PERSONNEL	\$471,833	\$485,987	\$500,567	\$515,584	\$531,052	\$2,505,023
	FRINGE BENEFITS	\$105,643	\$108,813	\$112,077	\$115,439	\$118,902	\$560,875
	TRAVEL	\$0	\$0	\$0	\$0	\$0	\$0
	EQUIPMENT	\$21,180,088	\$0	\$0	\$0	\$0	\$21,180,088
	SUPPLIES	\$0	\$0	\$0	\$0	\$0	\$0
	CONTRACTUAL	\$0	\$0	\$0	\$0	\$0	\$0
	OTHER	\$14,238,301	\$14,238,301	\$14,238,301	\$14,238,301	\$14,238,301	\$71,791,505
	TOTAL DIRECT	\$35,995,865	\$14,833,101	\$14,850,945	\$14,869,324	\$14,888,255	\$95,437,490
Indirect Costs	TOTAL INDIRECT	\$333,261	\$343,259	\$353,557	\$364,164	\$375,089	\$1,769,329
Total Funding		\$36,329,126	\$15,176,360	\$15,204,502	\$15,233,488	\$15,263,344	\$97,206,820

Personnel

COG has budgeted for the positions included below included in Table Budget-2, for a total cost of \$2,505,023. This table also includes all required information, including the annual salary, leave costs, percentage of time assigned to the RACE program, and total costs for the budget period.

Fringe Benefits

COG applies a rate of 22.39% for fringe benefits to salary and leave, resulting in a cost of \$560,875.

Equipment

Equipment costs include the purchase of EVs and charging stations for a total cost of \$21,180,088.

Other

Other costs total \$71,191,505 and include subawards to localities, community colleges, and regional implementation partners (NVRC, Electrify DC, and ECC) for program staff and incentive budgets.

Indirect Charges

COG applies an indirect rate of 57.71% to salary and wages. This equates to \$1,769,329 for the five-year CPRG grant period.

b. Expenditure of Awarded Funds

COG complies with the Office of Management and Budget's (OMB) Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards regulations, located at 2 Code of Federal Regulations (CFR) Part 200 and the EPA adopted the regulations at 2 CFR 200 and promulgated additional regulations specific to EPA (together the Uniform Grants Guidance). COG's approach, procedures and controls for ensuring that awarded grant funds will be expended in a timely and efficient manner within the five-year grant period include efforts around Deltek Time & Expense and Costpoint for project and financial management; financial forecasting; and contracts support. See the Budget Narrative Appendix for details on the specific procedures and controls in these three areas.

c. Reasonableness of Costs

The COG Climate, Energy, and Air Programs Director has more than 30 years of experience working with contracting and accounting department staff and management to ensure effective and timely tracking of all project budgets and transactions. As demonstrated in Section 6, Past Performance, COG has ample experience managing federal grants. Further, COG frequently works with its members and with organizations through the region on cooperative purchasing and works collaboratively through ridership contracts. COG understands the staff time and oversight it takes to manage a program such as the RACE to Clean Energy for All and ensure compliance with and administration of a federal grant. COG staff time included will go to establishing, managing, and monitoring subgrants with partners, negotiating and conducting cooperative purchasing, and administering the grant and reporting to EPA.

Other costs for Measure 1 are going toward existing programs that operate and connect with communities locally. These other costs for Measure 1 were provided directly to COG by program administrations. As a result, the costs reflect each program administrator's understanding of community needs, local costs and workforce availability; how to set incentive levels to work with other funding streams that incentivize residential consumers enough to take action to reduce energy consumption and decarbonize their homes; and what it takes to reach consumers.

Equipment costs for Measure 2 reflect current market prices for various electric vehicle types and dual head level 2 chargers. Due to existing limited supplies for EVs, negotiations for lower costs per vehicle may not be feasible, but COG will make every effort during cooperative purchasing to do so and procure additional vehicles. Also, in relation to the equipment costs for Measure 2, the stability and level of federal direct pay options for each local government for vehicles and chargers is uncertain (e.g., if a County or City will not be able to staff or support filing taxes and forms). COG has assumed and is aiming to purchase all vehicles and chargers in year 1 of the grant, so while direct pay is factored into the budget calculations, COG acknowledges that the availability of direct pay the availability of each local government to access it may be uncertain.

Other costs for Measure 3 are going towards expanding existing networks and programming for workforce development organizations and colleges in the region. These other costs were provided directly to COG by program administrators. As a result, the costs reflect each program administrator's understanding of staffing costs and time to develop a curriculum and run a course; what it takes to conduct outreach to contractors to participate in the trainings; and what it takes to develop a pipeline of students from high school to the courses, and then to connect them with employers.

CPRG IMPLEMENTATION GRANTS COMPETITION BUDGET NARRATIVE

NOFO SECTION 7A. BUDGET DETAIL

The total proposed budget for the RACE program is \$97,206,820. The breakdown of this budget is summarized in Table Budget-1 below. Detailed information about how each budget category cost was developed is provided below the table. The Metropolitan Washington Council of Governments (COG) understands that any funds disbursed under the CPRG are subject to Davis Bacon Prevailing Wage requirements and to Build America, Buy America. COG is committed to complying with these requirements as they are applicable to awarded funds. Additional detail on the budget is provided in the attachment *Budgetcalcs_MWCOG Individual*.

Table Budget-1. Budget Summary for the RACE Program

COST-TYPE	CATEGORY	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
Direct Costs	PERSONNEL	\$471,833	\$485,987	\$500,567	\$515,584	\$531,052	\$2,505,023
	FRINGE BENEFITS	\$105,643	\$108,813	\$112,077	\$115,439	\$118,902	\$560,875
	TRAVEL	\$0	\$0	\$0	\$0	\$0	\$0
	EQUIPMENT	\$21,180,088	\$0	\$0	\$0	\$0	\$21,180,088
	SUPPLIES	\$0	\$0	\$0	\$0	\$0	\$0
	CONTRACTUAL	\$0	\$0	\$0	\$0	\$0	\$0
	OTHER	\$14,238,301	\$14,238,301	\$14,238,301	\$14,238,301	\$14,238,301	\$71,791,505
	TOTAL DIRECT	\$35,995,865	\$14,833,101	\$14,850,945	\$14,869,324	\$14,888,255	\$95,437,490
Indirect Costs	TOTAL INDIRECT	\$333,261	\$343,259	\$353,557	\$364,164	\$375,089	\$1,769,329
Total Funding		\$36,329,126	\$15,176,360	\$15,204,502	\$15,233,488	\$15,263,344	\$97,206,820

Personnel. COG has budgeted for the positions included below included in Table Budget-2, for a total cost of \$2,505,023. This table also includes all required information, including the annual salary, leave costs, percentage of time assigned to the RACE program, and total costs for the budget period.

Table Budget-2. COG Personnel and Supporting Budget Information for the RACE Program

Title	# of Staff	Annual Salary					% of Time for RACE	Leave Costs (18.7%)	Total Cost
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5			
Program Director	1	\$150,000	\$154,500	\$159,135	\$163,909	\$168,826	25%	\$37,230	\$236,323
Senior Program Adviser	2	\$120,000	\$123,600	\$127,308	\$131,127	\$135,061	1 - 100% 2 – 50%	\$178,706	\$1,134,350
Program Specialist	1	\$110,000	\$113,300	\$116,699	\$120,200	\$123,806	100%	\$109,209	\$693,214
Program Coordinator	1	\$70,000	\$72,100	\$74,263	\$76,491	\$78,786	100%	\$69,497	\$441,136

Annual salaries by position are based on 2,000 hours worked per year at set unloaded hourly rates (in year 1 this is \$75/hour for the Program Director, \$60/hour for the Senior Program Adviser, \$55/hour for the Program Specialist, and \$35/hour for the Program Coordinator) and an assumed 3% annual increase. COG applies a rate of 18.7% to salary to cover leave (sick and vacation) for employees.

Fringe Benefits. COG applies a rate of 22.39% for fringe benefits to salary and leave, resulting in a cost of \$560,875.

Travel. Travel costs are not included.

Equipment. Equipment costs include the purchase of EVs and vehicle charging stations for Measure 2 at a total cost of \$21,180,088. This includes:

- 80 Passenger Cars at an estimated average cost of \$33,500 per vehicle
- 280 SUVs at an estimated average cost of \$50,427 per vehicle
- 36 Pickup Trucks at an estimated average cost of \$57,922 per vehicle
- 14 Passenger Vans at an estimated average cost of \$61,403 per vehicle
- 74 Cargo Vans at an estimated average cost of \$54,486 per vehicle
- 9 Accessible Passenger Vans with lifts at an average estimated cost of \$108,889 per vehicle
- 151 Level 2 dual headed chargers (302 ports) at a cost of \$6,000 per port.⁹
 - [NREL](#) notes an average installation cost of \$2,500 per port for L2 public chargers and an average equipment cost of \$3,500 per port. This source does not provide an itemized listing of installation costs.

It is assumed that each vehicle will also receive up to \$7,500 of direct pay as a result of the IRS 45W Commercial Clean Vehicles Credit. Due to the location requirements for charging stations to qualify for the 30% IRS 30C Alternative Fuel Vehicle Refueling Property Credit, it was assumed that half of chargers would be located in qualifying locations and receive the credit.

Actual budgets for the vehicle categories above differ by locality based on the model of the vehicle requested, and some used industry average costs for the vehicle types requested. Common models requested included Nissan Leaf (Passenger Car), Chevrolet Blazer and Equinox (SUV), Ford F-150 Lightning and Chevrolet Silverado (Pickup Truck), Ford E-Transit Passenger Van/Paratransit Van (Passenger Van/Accessible), Ford E-Transit Cargo Van (Cargo Van). When not provided by a locality, vehicle purchase prices were compiled through market research on the MSRP for the specific or similar models. Additional information about the budget assumptions and supporting information are available in the Technical Appendix Spreadsheet [*GHGcalcs_MWCOG Individual*].

Supplies. Supply costs are not included.

Contractual. Contractor costs are not included.

Other. Other costs total \$71,191,505 and include subawards to localities, MC GITE, Prince George's Community College, and regional implementation partners (NVRC, Electrify DC, and Emerald Cities) for program staff and incentive budgets by market focus area.

Localities

- Prince George's Clean Energy Program extension and expansion total budget: \$11,400,000
 - 160 rooftop solar systems installed on low-income households by 2030 at an average incentive level of \$15,000, plus staffing costs of \$375,000 to support the program
 - 1,000 low-income households undergo weatherization improvements by 2030 at an average incentive level of \$7,500 and a program administrative cost of 15%
- City of Takoma Park solar and weatherization programs extension and expansion total budget: \$190,000
 - 5 rooftop solar systems installed on low-income households by 2030 at an average incentive level of \$10,000

⁹ Brennan Borlaug, Shawn Salisbury, Mindy Gerdes, Matteo Muratori, Levelized Cost of Charging Electric Vehicles in the United States, Joule, Volume 4, Issue 7, 2020, Pages 1470-1485, ISSN 2542-4351, <https://doi.org/10.1016/j.joule.2020.05.013>.

- 10 low-income households undergo weatherization improvements by 2030 at an average incentive level of \$5,000
 - \$40,000 in costs for program administration and outreach
- Montgomery County programs extension and expansion total budget: \$10,000,000
 - Capital Area Solar Switch: 20 rooftop solar systems installed on low-income households by 2030 at an average incentive level of \$25,000
 - Homeowner Energy Efficiency Program: 90 low-income households undergo weatherization and home repair and safety improvements by 2030 at an average incentive level of \$55,556
 - HEECAP: 250 low-income households receive upgrades by 2030 at an average incentive level of \$16,000
 - Electrify MC: 80 households are electrified by 2030 at an average incentive level of \$5,000 and \$100,000 in program administration cost for help desk staffing
- City of Rockville Housing and Community Assistance – solar assistance Sun Power grant program extension and expansion total budget: \$3,000,000
 - 200 rooftop solar systems installed on low-income households by 2030 at an average incentive level of \$15,000
- Frederick County PSR program extension and expansion total budget: \$500,000
 - 28 low-income households receive upgrades by 2030 at an average incentive level of \$11,250
 - \$185,000 in administrative cost
- Charles County WAP extension and expansion total budget: \$500,000
 - 60 low-income households receive upgrades by 2030 at an average incentive level of \$8,333
- Arlington County Green Home Choice Program extension and expansion total budget: \$7,090,960
 - 220 low-income households receive upgrades by 2030 at an average incentive level of \$22,000
 - \$2,250,960 in administration costs, including outreach efforts
- City of Alexandria Home Rehabilitation Energy Efficiency Loan Program extension and expansion total budget: \$625,000
 - 25 low-income households receive upgrades by 2030 at an average incentive level of \$25,000
- Fairfax County HomeWise program extension and expansion total budget: \$4,697,800
 - 500 low-income households receive upgrades by 2030 at an average incentive level of \$8,300
 - 13.2% program administrative cost
- Washington, DC weatherization and emergency HVAC repair programs total budget: \$4,500,000
 - 30 low-income households undergo all-electric HVAC emergency replacements at an average incentive level of \$16,667
 - 400 low-income households undergo weatherization improvements at an average incentive level of \$8,804
 - \$478,570 in program administrative costs

Organizations

- NVRC Solarize NOVA program expansion total budget: \$23,125,000

- 1,000 rooftop solar systems installed on low-income households (that have already been weatherized) by 2030 at an average incentive level of \$18,500
 - 25% administrative cost
- Electrify DC's Build for the Future total budget: \$2,163,359
 - Personnel full time equivalent (FTE) total costs \$1,394,250: Project Director at 20%, Project Manager at 50%, Communications and Content Manager at 50%, Engagement and Events Manager at 15%, Graphic and Data Visualization Manager at 20%, Education Specialist at 30%
 - Contractor total costs \$465,000: Education consultant, Software engineer, Videographer, flyering services
 - Travel and training total costs \$75,000: Travel across the region and to showcase innovative work and approach
 - Equipment total cost \$7,440: web hosting, course management and members spaces
 - Supplies total cost \$25,000: Education materials, FAQ One-pagers at engagement meetings, materials for the home tours, and printing
 - 10% overhead costs
 - By engaging and educating contractors and giving them the tools to educate their clients, target of reaching 50,000 homeowners
- Emerald Cities total budget: \$2,000,000
 - \$1,250,000 for the Contractor Incubator program: activities include outreach and recruitment; developing a 3-hr training series on Green Building Standards, Access to Capital, Bonding and Insurance, Worker Safety, Labor Compliance, Local Hire, Project Labor Agreements, Public Contract Law, and Business Certification; and recruit and train subject matter experts
 - \$750,000 for the ACES Engineering Pathway program
- MC GITE total budget: \$1,399,386
 - Personnel total costs \$962,631: The project will provide a salary of \$432,631 over five years for a full-time Project Manager, anticipated hiring in project month three, salary in year one will be \$84,847 (prorated), with 3% COLA increases in years two-five. Funds will also provide \$500,000, or \$100,000 per year for five years, for non-credit faculty members to teach courses, and \$30,000 for curriculum development in Year 1 (30 hours @ \$100/hour)
 - Fringe benefits total cost \$193,997: Fringe is valued at 7.65% to cover the standard payroll taxes/worker's compensation costs and 36% to cover associated full-time employee health insurance and retirement.
 - Equipment total cost \$106,500: Six HVAC variant refrigerant flow mini split units at \$2,750/unit, One EV trainer at \$50,000, One Automotive lift at \$10,000, One Electric Vehicle at \$30,000 per vehicle
 - Supplies total cost \$9,040: Textbooks for classes will total \$5,040 and a Lift Table for use with the EV will total \$4,000.
 - Indirect costs at 10% total \$127,218
- Prince George's Community College's Sustainable Energy Workforce Development TBA program total cost: \$50,000
 - Funding will support marketing and outreach campaign utilizing all media platforms, curriculum enhancements, and equipment/lab upgrades

Indirect Charges. COG applies an indirect rate of 57.71% to salary and wages. This equates to \$1,769,329 for the five-year CPRG grant period.

NOFO SECTION 7B. EXPENDITURE OF AWARDED FUNDS

COG complies with the OMB Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards regulations, located at 2 CFR 200 and the EPA adopted the regulations at 2 CFR 200 and promulgated additional regulations specific to EPA (together the Uniform Grants Guidance). COG's approach, procedures and controls for ensuring that awarded grant funds will be expended in a timely and efficient manner within the five-year grant period including:

- **Deltek Time & Expense and Costpoint**—Time & Expense is COG's electronic timesheet system, and Costpoint is COG's integrated project and financial management system. Each of our contracts or grants has a unique charge code, as well as subsets for tasks/subtasks; all labor (COG, contractor, and subgrantee) and other direct costs are tracked by their unique code. Using these numbers, staff record hours worked on a daily basis and sign, certify, and submit timesheets to supervisors for approval on a weekly basis. Costpoint incorporates this information, along with direct costs and other relevant costs for each project, and provides access to customized reports that will be used to track and control labor hours, labor costs, travel, and other direct costs. Management staff will use these data to analyze financial performance by comparing actual project costs to the proposed budget.
- **Financial Forecasting**—Our Program Director will conduct financial forecasting with COG's financial group, which reviews all grant expenditures on a quarterly basis for accuracy and completeness. This forecasting includes an assessment of the need for financial adjustments owing to anticipated or unexpected factors, allowing for budget reallocations as needed.
- **Contracts Support**—COG's contracts team and legal counsel will assist our Project Director in establishing budgets and billing and payment schedules, terms and conditions, and insurance requirements including those for subawards and contractors. As sub grantees and contractors submit invoices, the Program Director will review and approve them, focusing on each invoice's consistency with the work conducted and its reasonableness in light of the assigned responsibilities and timeframe of work. Our Contracts group also will work with the Program Director to ensure that EPA receives regular financial progress updates in a timely manner.

NOFO SECTION 7C. REASONABLENESS OF COSTS

COG's costs for the RACE program are based on federally accepted or established costs, COG fair and reasonable salaries and benefits, and benchmarking to existing similar programs. Additional information is provided below on the reasonableness of costs for each cost category, building on this section in the workplan narrative.

Personnel. The salaries included for program staff for the RACE program are commensurate with salaries for existing staff of equal position and seniority. COG's Office of Human Resources is responsible for administering COG's overall compensation system as prescribed by the Board of Directors of COG. The Executive Director through its designee, the Director of Human Resources, is authorized to determine the appropriate grade in which each position or category of positions shall be classified. COG's pay structure is reviewed each year through a market-based salary survey. Any changes to the pay structure on a given year is subject to budgetary and COG Board of Director's approval. Employee's pay is also affected by the following: 1) Introductory increase may be granted following successful completion of introductory period; 2) Annual merit increases may be awarded within each grade ranging from zero (0%) to four (4.0%) percent based on the employee's performance evaluation score; 3) An employee may also be considered for other incentives such as bonus and outstanding performance awards. Further information on COG's pay structure may be found here: <https://www.mwcog.org/about-us/human-resources/pay-and-benefits/>.

Fringe Benefits. COG applies a rate of 22.39% for fringe benefits to salary and leave. This covers the costs of benefits for COG employees (not including leave). More information about COG's benefits may be found at: <https://www.mwcog.org/about-us/human-resources/pay-and-benefits/>.

Indirect Charges. COG applies an indirect rate of 57.71% to salary and wages. This indirect rate was established between COG and the U.S. Department of Transportation Federal Transit Administration on February 15, 2024 for the period July 1, 2024 through June 30, 2025. COG shall furnish supporting paperwork for this indirect rate upon request from EPA and prior to grant award.

Other. As these subawards are largely building off existing programs, localities understand the incentive levels needed for home energy upgrades and rooftop solar installations and have set appropriate levels for the coverage of their programs. COG worked to ensure an equitable distribution of asks across the region and to maintain a clear focus on programs with pathways to reach low-income households, especially those located in LIDAC Census blocks and tracts.

Program administration and implementation: COG reviewed data on program budgets and associated administration and implementation from ESource, which compiles budget percentages as reported by utility programs, and other state and local program budgets (e.g., NYC Accelerator, MassSAVES, NYSEDA programs) to ensure proposed administrative budgets to expand existing local programs was reasonable. In general program administration and implementation budgets were seen to be 10% to 25% of incentive budgets, with a higher percentage of administrative and implementation budget associated with targeting LIDACs and more targeted concierge services. This percentage generally includes program staff from the administering agency, marketing funds, and contractor costs.

DESCRIPTIONS OF COST UNCERTAINTIES

For Measure 1, total costs for solar are based on assumptions provided by program partners, including from the Solarize NOVA program. As shown in the GHG calculations file attached to this application (*GHGcalcs_MWCOG Individual*), the assumed cost for a residential rooftop system is \$3/watt, with an average system size of 5 kW. An additional \$3,500 is assumed for basic roof repairs, and 25% is assumed for administrative costs, bringing the total cost to \$23,125 per rooftop. The program incentive levels included for solar installation in Measure 1 range from \$10,000 per home to up to \$250,000 per home. Out of a total estimated cost of \$32,028,125 (\$23,125 per home x 1,385 homes), the requested CPRG funding would cover about 92% of that (\$29,450,000).

The total cost assumption for each program varies based on the difficulties that may be encountered in signing up low-income households located in LIDACs, and ensuring their rooftop and home are in the right state of repair to host a solar system. Additionally, other incentives may be available depending on the location, such as Renewable Energy Credits, or upcoming funding from Solar for All awards (which are not known at this time). Federal incentives are also available in the form of tax credits; it is assumed that most low-income households participating in these programs may not have sufficient tax liability to take full advantage of that credit, leading to a greater need in this particular segment for higher incentive levels to help cover the cost of the project.

The other components of Measure 1 are residential programs focused on weatherization, energy efficiency, and electrification in low-income households. The average total cost for these types of interventions can vary widely depending on how many upgrades are being undertaken at each home (e.g., just weatherization, or building envelope improvements plus full space and water heating electrification). Some participating localities provided past program information to help estimate the total cost for various upgrades, which range from \$7,500 for weatherization to \$90,000 for whole-home renovations and safety and health repairs. Within that, there is still significant variability – program cost

data from recent years is heavily influenced by impacts to equipment and labor costs during the economic recovery from the COVID-19 pandemic, which exacerbated supply chain shortages. Average total project costs were applied to programs based on the general types of upgrades they provide (details can be seen in the GHG calculations file attached to this application), although there's uncertainty based on the mix of upgrades that will happen under each program – incentives will vary depending on the combination of activities each home applies for. Across 2,693 homes expected to participate in these programs by 2030, the total cost would be around \$41 million. The requested CPRG funding would cover about 88% of that, with the remainder provided by other state and utility program incentives, and potential use of federal tax incentives for clean technologies such as heat pumps.

Going forward, the availability and level of additional incentives for these projects is uncertain and may change. There is also uncertainty in the cost of various technologies – for example, while \$3/watt is used for this analysis for solar systems based on projects in the region, changes in panel availability and production cost could impact that. Much of the past performance data in recent years is in a post-COVID world where IRA and IIJA programs are still being stood up, and supply chains have led to equipment price spikes. These constraints will ease and change by 2030 and beyond, potentially altering the cost and scope of GHG reductions from these programs. Additionally, while this application includes workforce development programs to help develop a trained workforce to support the implementation of Measure 1, the cost of labor could vary by project and contractor within the region.

Equipment costs for Measure 2 reflect current market prices for various electric vehicle types and dual head level 2 chargers. Due to existing limited supplies for EVs, negotiations for lower costs per vehicle may not be feasible, but COG will make every effort during cooperative purchasing to do so and procure additional vehicles. Also, in relation to the equipment costs for Measure 2, the stability and level of federal direct pay options for each local government for vehicles and chargers is uncertain (e.g., if a County or City will not be able to staff or support filing taxes and forms). COG has assumed and is aiming to purchase all vehicles and chargers in year 1 of the grant, so while direct pay is factored into the budget calculations, COG acknowledges that the availability of direct pay the availability of each local government to access it may be uncertain.

NOFO SECTION 2c. COST EFFECTIVENESS OF GHG REDUCTIONS

Per the guidelines in the NOFO for calculating costs, GHG reductions, and the cost effectiveness metric for the CPRG grant application, total costs were estimated for the interventions being incentivized.

Total cumulative GHG reductions for the programs in Measures 1 and 2 are estimated to be 26,995 MTCO₂e 2025-2030 (see Technical Appendix). Based on the NOFO formula, the magnitude of GHG reductions is pro-rated at 25,454 MTCO₂e.

Quantified GHG reductions from CPRG funding = [(Requested CPRG funding)/(Total funding to implement measure)] x (Total estimated GHG reductions of measure)

The NOFO then provides the following formula to then estimate cost effectiveness:

Cost effectiveness of GHG reductions = (Requested CPRG funding) / (Sum of Quantified GHG reductions from CPRG funding from 2025-2030)

which is calculated as \$3,819/MTCO₂e 2025-2030 and \$947/MTCO₂e 2025-2050 including all program measures. The cost-effectiveness metrics for the RACE program are summarized below for 2025-2030:

- Measure 1: \$3,617
- Measure 2: \$3,508
- Total: \$3,819

There are several factors that will affect the cost effectiveness of the RACE program over time, and the estimates only represent raw program and incentive cost, which miss many benefits and is distinct from the more conventional marginal abatement cost curve type of cost-effectiveness metric for GHG reduction strategies. For example, this calculation misses two critical elements – the lasting benefits of more efficient and low-carbon long-lifetime equipment and the financial benefits that will be realized by program participants.

Simply considering a longer-term framing of the cost-effectiveness of the RACE program would result in a \$/metric CO₂e of \$947 (assuming CPRG funding and the resulting GHG reductions from 2025-2050). As supply chains continue to expand for equipment because of nationally transforming markets, it is expected that equipment costs will decline over time. Further, households will see increased financial benefits through reduced energy bills that help offset upfront capital costs and reduce payback periods. Looking beyond just the project and program financials in the short and long-term, many other societal economic benefits will be realized through RACE that are not captured in the CPRG cost-effectiveness calculations. For example, reduced health care costs due to improved indoor and outdoor air quality (see Section 3a, Expected Outputs and Outcomes) and increased resiliency from rooftop solar systems due to reduced impacts from outages.

Finally, the GHG reductions estimated for these programs are based on estimated changes in energy consumption patterns and the associated reductions in direct emissions from combustion or changes in emissions from the electricity grid based on changes in electricity consumption. This is discussed more in the Technical Appendix, but worth noting here as it relates to the cost effectiveness metric that a broader lifecycle approach to emission reductions was not considered.

CPRG IMPLEMENTATION GRANTS COMPETITION TECHNICAL APPENDIX

This appendix describes the tools, approach, and assumptions for modeling the GHG reductions for RACE to Clean Energy for All. The *GHGcalcs_MWCOG Individual* attachment contains all the information described here.

In addition to the GHG estimates described below, co-pollutant impacts were estimated across both Measure 1 and Measure 2 using EPA's AVOIDed Emissions and geneRation Tool (AVERT). AVERT was run for the MidAtlantic region, 2022, with inputs for the annual MW of rooftop solar added, the number of EVs purchased, and the kWh of electricity reduced from the building efficiency programs. The outputs taken were only for the change in grid emissions. In addition to AVERT, avoided criteria pollutant emissions from ICEV exhaust were calculated for CO, NOx, and PM_{2.5} using factors from EPA MOVES3 ([summarized](#) by the Bureau of Transportation Statistics). See the 'Conversions and Lookups' tab in the *GHGcalcs_MWCOG Individual* attachment for the emission factors used. The annual reductions can be found in Table 7 in the Workplan narrative.

Measure 1: Scale existing programs that provide energy efficiency and electrification upgrades and solar panels to residential buildings.

GHG REDUCTION ESTIMATE METHOD AND MODELS/TOOLS USED

GHG reduction estimates for the RACE to Clean Energy for All program take a bottom-up approach to calculating GHG reductions and cost estimates based on the existing programs that are requesting funding to be extended and/or expanded. Reductions were largely set up and calculated in the *GHGcalcs_MWCOG Individual* attachment, leveraging information from EIA Residential Energy Consumption Survey (RECS), NREL's Residential Efficiency Measures Database, and past performance data for energy savings from the current programs to determine the potential change in energy consumption by fuel type. Data from AVERT, emission factors for fossil fuels from the EPA GHG Emission Factors Hub, the 2020 National Emissions Inventory, and electricity grid emission factor projections from EIA's 2023 Annual Energy Outlook (AEO) were combined with equipment useful life assumptions to determine GHG reductions annually from 2025 to 2050. AR5 GWP values are used for GHG estimates.

MEASURE IMPLEMENTATION ASSUMPTIONS

Participation. Expected program participation numbers (number of households) were provided by the localities and are reported in the 'Measure 1' tab in *GHGcalcs_MWCOG Individual* attachment. In summary, the 5 solar programs expect to install solar on 1,385 rooftops. The installation is assumed to occur in equal amounts over the five-year grant period from 2025-2029. For the 12 residential efficiency and electrification programs, localities expect 2,693 homes to receive upgrades.

Lifetime. It is assumed that the solar systems have a lifetime of 25 years, and the efficiency and electrification upgrades a lifetime of 20 years (largely based on average HVAC equipment lifetimes, per NREL's [Residential Efficiency Measures Database](#)).

Grid Emission Factors. The electricity emission factors use CO₂ factors from the AEO 2023 Reference Case, which captures the impacts of IRA clean technology tax credits in addition to existing power sector decarbonization policies in MD, DC, and VA (e.g., Renewable Portfolio Standards, RGGI). CH₄ and N₂O grid emission factors were taken from EPA eGRID 2022 data for the two relevant regions (SRVC and RFCE) and held flat over time due to a lack of better data projections for those GHGs. While using a flat

CO₂ emission factor as well for the baseline would increase the GHG reduction estimates for programs reducing electricity consumption (e.g., rooftop solar and weatherization), that would not be aligned with existing policies that are impacting the generation mix today – where planned fossil retirement decisions are already being made through 2030, and regional interconnection queues are full of renewable resources. As such, a projection with declining grid emission factors was used to better reflect the starting point, or reference projection, for these programs to more accurately estimate the GHG reductions that could reasonable be realized by 2030.

Capital Costs. Total costs for solar are based on assumptions provided by program partners, including from the Solarize NOVA program. As shown in the ‘Measure 1’ tab of *GHGcalcs_MWCOG Individual* attachment, the assumed cost for a residential rooftop system is \$3/watt, with an average system size of 5 kW. An additional \$3,500 is assumed for basic roof repairs, and 25% is assumed for administrative costs, bringing the total cost to \$23,125 per rooftop. The program incentive levels included for solar installation range from \$10,000 to \$25,000 per home. Out of a total estimated cost of \$32,028,125 (\$23,125 per home x 1,385 homes), the requested CPRG funding would cover about 92% of that (\$29,450,000).

The total cost assumption for each program varies based on the difficulties that may be encountered in signing up low-income households located in LIDACs, and ensuring their rooftop and home are in the right state of repair to host a solar system. Additionally, other incentives may be available depending on the location, such as Renewable Energy Credits, or upcoming funding from Solar for All awards (which are not known at this time). Federal incentives are also available in the form of tax credits; it is assumed that most low-income households participating in these programs may not have sufficient tax liability to take full advantage of that credit, leading to a greater need in this particular segment for higher incentive levels to help cover the cost of the project.

The other components of Measure 1 are residential programs focused on weatherization, energy efficiency, and electrification in low-income households. The average total cost for these types of interventions can vary widely depending on how many upgrades are being undertaken at each home (e.g., just weatherization, or building envelope improvements plus full space and water heating electrification). Some participating localities provided past program information to help estimate the total cost for various upgrades, which range from \$7,500 for weatherization to \$90,000 for whole-home renovations and safety and health repairs. Within that, there is still significant variability – program cost data from recent years is heavily influenced by impacts to equipment and labor costs during the economic recovery from the COVID-19 pandemic, which exacerbated supply chain shortages. Average total project costs were applied to programs based on the general types of upgrades they provide, although there’s uncertainty based on the mix of upgrades that will happen under each program – incentives will vary depending on the combination of activities each home applies for. Across 2,693 homes expected to participate in these programs by 2030, the total cost would be around \$41 million. The requested CPRG funding would cover about 88% of that, with the remainder provided by other state and utility program incentives, and potential use of federal tax incentives for clean technologies such as heat pumps.

GHG REDUCTION ESTIMATE ASSUMPTIONS

For rooftop solar with a system size assumption of 5 kW and 1,385 systems expected to be installed, the average annual installed capacity would be 1.39 MW. This was input in EPA’s AVERT to determine the avoided MWh of electricity grid generation (1,690 MWh). This annual avoided generation was projected for the 5-years until the full amount of solar was installed, reaching a total of 8,450 MWh avoided. The electricity grid emissions factor was then applied to estimate the GHG reductions from the grid,

resulting in 7,356 MTCO₂e cumulatively reduced 2025-2030 and 30,680 MTCO₂e cumulatively reduced 2025-2050.

For the home efficiency and electrification programs, the baseline was estimated using RECS data for the average annual fuel consumption by fuel type (electricity, natural gas, propane, fuel oil) in a home using data for the MidAtlantic region. Energy reductions were applied to the total home energy consumption for most programs on a percentage basis using inputs provided by the program administrators. For example, Prince George's County specified that for an applicant to receive \$7,500 for weatherization, a minimum savings of 15% must be attained, and past grant recipients achieved an estimated average of 17% annual energy savings (based on Beacon Audit Report). For a more comprehensive efficiency and electrification program, savings could be as high as 35%, as provided for Montgomery County's Homeowner Energy Efficiency Program (based on Beacon Audit Reports). Most weatherization and efficiency programs averaged 15-20%, while those incentivizing electrification assumed 25-35% savings.

These percentages were applied to the annual average energy consumption data from RECS. Savings were assumed to be split equally across the five-year grant period. As these are existing programs, many have applicant pools and outreach systems in place to leverage, so there likely will not be a delayed ramp-up period for participation. As such, annual energy consumption savings were assumed in equal amounts 2025-2029, starting at 10,811 MMBtu in 2025 and reaching a total of 54,056 MMBtu in annual energy reductions by 2030 for the participating homes. Given the assumed measure lifetime of 20 years, the savings start phasing out in 2045; no assumptions are made as to the future replacement of the equipment, as that would not be covered by the scope of the CPRG funding, although it is likely that any electrified equipment will be replaced in-kind, continuing the transformative impact of the programs.

For one program, a slightly different approach was applied to estimate the annual energy change – DC's Emergency HVAC Repair – All-Electric Pilot program. Since this is a new pilot and focused just on HVAC electrification, the annual energy change was calculated by looking at the reductions from replacing a natural gas residential furnace with an air source heat pump (ASHP). Only the change in heating load was estimated, assuming a similar load for air conditioning. The reference assumption is that the HVAC system would otherwise be replaced with an in-kind gas furnace with an AFUE of 80% (based on the [NREL Residential Efficiency Measures Database](#)). The average annual energy consumption for space heating from natural gas for a home in VA and MD was taken from RECS to establish the baseline. GHG emissions were calculated using the 80% efficiency assumption and EPA emission factors for stationary combustion of natural gas (2024 GHG Emission Factors Hub). For the ASHP, a coefficient of performance of 3.5 was assumed to convert the prior natural gas load to the lower energy input required for the ASHP. The increase in electricity and decrease in natural gas were then applied to the baseline annual RECS data in place of a percent reduction in overall energy use the way the other programs were modeled.

GHG reductions for the resulting change in energy consumption were then estimated using emission factors for CO₂, CH₄, and N₂O from EPA's GHG Emission Factors Hub for stationary combustion of natural gas, propane, and fuel oil. Electricity emission factor projections were used based on AEO's 2023 Reference Case. Annual GHG emission reductions by fuel can be found in the 'Measure 1' tab in the *GHGcalcs_MWCOG Individual* attachment.

REFERENCE CASE SCENARIO

The reference scenario for rooftop solar was that this expansion would not happen. Any impacts from distributed solar in AEO's 2023 Reference Case would be captured in the grid emissions factor.

The reference scenario for the other home programs was similar – that these homes would not

otherwise be able to undergo weatherization, efficiency, and electrification upgrades by 2030 absent the CPRG funding to extend and expand current programs for low-income households. In other words, the annual baseline energy consumption in participation homes would be assumed constant through 2030, rather than realizing the program energy reductions.

MEASURE-SPECIFIC ACTIVITY DATA

The relevant activity data can be found in the ‘Measure 1’ tab in the *GHGcalcs_MWCOG Individual* attachment, including the number of homes participating in the program, baseline energy consumption by fuel type (MMBtu) and expected change by program.

GHG EMISSIONS REDUCED

Table Technical-1. Cumulative GHG Reduction Summary Metrics for the RACE Program

Metrics	2025-2030	2025-2050
Total Estimated GHG Reductions (MTCO ₂ e)	20,142	91,575
Total Funding to Implement (\$)	72,860,625	
COG Staffing Costs (\$)	3,162,665	
Requested CPRG Funding (\$)	68,741,425	
Magnitude of GHG Reductions from CPRG Funding (2a, 2b) (MTCO ₂ e)	19,003	86,398
Cost Effectiveness of GHG Reductions (2c) (MTCO ₂ e)	3,617	796

Table Technical-2. CAPs and HAPs Reduction Summary for the RACE Program

Pollutant Emission Reductions (MT)	Annual	2025-2030
SO ₂	12.53	75.21
NOx	708.94	4,253.66
PM _{2.5}	51.91	311.46
PM ₁₀	58.03	348.18
CO	238.33	1,429.98
VOCs	33.39	200.36
NH ₃	83.60	501.60
Lead Compounds	0.05	0.32

See ‘Measure 1’ tab in *GHGcalcs_MWCOG Individual* attachment for the estimate of GHG emissions for ICEVs and BEVs by vehicle category and municipality.

2a, 2b NOFO formula: Quantified GHG reductions from CPRG funding = [(Requested CPRG funding)/(Total funding to implement measure)] x (Total estimated GHG reductions of measure)

2c NOFO formula: Cost effectiveness of GHG reductions = (Requested CPRG funding) / (Sum of Quantified GHG reductions from CPRG funding from 2025-2030)

Cost effectiveness of GHG reductions = (Requested CPRG funding) / (Sum of Quantified GHG reductions from CPRG funding from 2025-2030)

Measure 2: Electrify municipal light-duty fleets and provide supporting charging infrastructure

GHG REDUCTION ESTIMATE METHOD AND MODELS/TOOLS USED

This measure estimates the GHG reductions from replacing 443 ICEVs with battery electric vehicles (BEVs). Reductions are largely set up and calculated in the *GHGcalcs_MWCOG Individual* attachment leveraging information provided by the localities requesting BEVs for their fleets, along with assumptions from AFLEET, EPA’s GHG Emissions Factor Hub, EPA MOVES3 ([summarized](#) by the Bureau of Transportation Statistics), eGRID, and EIA’s 2023 Annual Energy Outlook (AEO) Reference Case.

MEASURE IMPLEMENTATION ASSUMPTIONS

Participation. All 443 light-duty vehicles were assumed operational in municipal fleets beginning in 2026, with procurements occurring in early 2025.

Lifetime. An average lifetime of 12 years was assumed for the light-duty vehicles.

Capital Costs. The purchase of EVs and vehicle charging stations comprise the cost component for Measure 2. Municipalities provided data on the requested quantity and type of BEV, as well as estimated cost information. Actual budgets for the vehicle categories differ by locality based on the model of the vehicle requested, and some used industry average costs for the vehicle types requested. Common models requested included Nissan Leaf (Passenger Car), Chevrolet Blazer and Equinox (SUV), Ford F-150 Lightning and Chevrolet Silverado (Pickup Truck), Ford E-Transit Passenger Van/Paratransit Van (Passenger Van/Accessible), Ford E-Transit Cargo Van (Cargo Van). When not provided by a locality, vehicle purchase prices were compiled through market research on the MSRP for the specific or similar models. This information can be found in the ‘Measure 2’ tab of the *GHGcalcs_MWCOG Individual* attachment.

Table Technical-3. Equipment Purchases and Costs by Vehicle Type

Vehicle Type	Quantity	Cost - Total	CRPG Funding Request	Avg Cost for Vehicle Type
Passenger Car	80	\$2,680,000	\$2,080,000	\$33,500
SUV	230	\$11,598,211	\$10,335,304	\$50,427
Pickup	36	\$2,085,200	\$1,890,200	\$57,922
Passenger Van	14	\$859,648	\$784,648	\$61,403
Passenger Van - accessible	9	\$980,000	\$862,500	\$108,889
Cargo Van	74	\$4,031,936	\$3,619,436	\$ 54,486
Total	443	\$22,234,994	\$19,572,087	

It is assumed that each vehicle will also receive up to \$7,500 of direct pay as a result of the IRS 45W Commercial Clean Vehicles Credit, with the difference in purchase price between ICEV and BEV models being at least that amount. Due to the location requirements for charging stations to qualify for the 30% IRS 30C Alternative Fuel Vehicle Refueling Property Credit, it was assumed that half of chargers would be located in qualifying locations and receive the credit.

The difference between total cost and the requested CPRG funding is the commercial clean vehicle rebate and some local funding that was already secured (for Frederick County and the City of Rockville).

Grid Emission Factors. The electricity emission factors assumed use CO₂ factors from the AEO 2023 Reference Case, which captures the impacts of IRA clean technology tax credits in addition to existing

power sector decarbonization policies in MD, DC, and VA (e.g., Renewable Portfolio Standards, RGGI). Such a projection with declining grid emission factors was used to better reflect the starting point, or reference projection, for these programs to more accurately estimate the GHG reductions that could reasonable be realized by 2030. A long-term outlook to 2050 using a static grid emissions factor is not realistic and limits the ability to show the interaction between the measures and to demonstrate the ability for BEVs to leverage an increasingly low-carbon regional grid to charge.

GHG REDUCTION ESTIMATE ASSUMPTIONS AND REFERENCE CASE SCENARIO

The reference scenario assumed that instead of BEVs, vehicles are replaced in-kind with gasoline or diesel ICEVs. Localities provided data on the vehicle type they are looking to purchase and average vehicle miles traveled of their current fleet. A generic vehicle type and fuel type assumption was then made for the reference scenario (e.g., passenger cars and SUVs run on gasoline) and AFLEET mpg assumptions were used to estimate the fuel consumption. Similarly, using BEV model preferences provided by the localities, the VMT assumptions, and AFLEET efficiency assumptions (kWh/mile), the kWh electricity consumption was determined that would be needed to charge the vehicles. Mobile combustion GHG emission factors from EPA were used to estimate the avoided GHG emissions from the reference scenario ICEVs, and electricity grid CO₂ emission factor projections from EIA's 2023 AEO were used alongside CH₄ and N₂O factors from eGRID to determine the GHG emissions from the grid used to charge the vehicles.

For charging stations, no additional GHG reductions were estimated, but they are assumed to be critical supporting infrastructure in order to realize the GHG reductions for the BEVs. A ratio of 1.5 vehicles to charging ports was used to determine that 301 ports, or 151 dual-port charging stations, will be needed.

Equation 1 below estimates the GHG reductions over the lifetime of the 443 vehicles if they were all replaced in-kind, with another ICEV. Emissions for each vehicle were summed across the entire vehicle fleet to find the cumulative ICEV emissions that would be avoided by switching to an EV instead of an in-kind replacement with another gasoline or diesel vehicle.

$$GHG = \sum [(F \times EF_{CO_2}) + (V \times EF_{CH_4} \times GWP_{CH_4}) + (V \times EF_{N_2O} \times GWP_{N_2O})] \times Y \quad (1)$$

Variables Included in Equation 1

ID	Variable	Value
GHG	GHG emissions reductions per vehicle, MTCO ₂ e	N/A
F	Annual fuel consumption, either gasoline or diesel	Various values, units of gallons
EF_{CO2}	CO ₂ emission factor for gasoline or diesel	Gasoline: 0.00878 MTCO ₂ /gal Diesel: 0.01021 MTCO ₂ /gal
V	Annual vehicle miles traveled (VMT)	Various values; units of miles
EF_{CH4}, EF_{N2O}	Emission factors for CH ₄ and N ₂ O, respectively	Varies by fuel and vehicle type; units of MT/mi
GWP_{CH4}, GWP_{N2O}	IPCC AR5 global warming potential for CH ₄ and N ₂ O	CH ₄ : 28; N ₂ O: 265
Y	Number of years in analysis timeframe	2025-2030: 5 (2026-2030, inclusive) 2025-2050: Vehicle lifetime (12 years)

Equation 2 estimates the increase in grid GHG emissions from charging the BEVs. Emissions for each vehicle were then summed across the entire vehicle fleet to find the cumulative increase in emissions from electricity consumption.

$$GHG = \sum \eta_{EV} \times V \times EF_{AEO,j} \quad (2)$$

Variables Included in Equation 2

ID	Variable	Value
GHG	Electricity GHG emissions, MTCO ₂ e	N/A
j	Year of electricity consumption	2026-2037, inclusive
η_{EV}	EV energy efficiency, sourced from AFLEET 2023	Various values; units of kWh/mi
V	Annual VMT	Various values; units of miles
EF_{AEO,j}	Electricity emission factor in year j derived from AEO 2023 Reference Case for PJME and PJMD regions for CO ₂ and eGRID 2022 for CH ₄ and N ₂ O for RFCE and SRVC	Various values; units of MTCO ₂ e/kWh

The increase in emissions from electricity consumption by the BEVs was then subtracted from the reference ICEV GHG emissions to find the GHG reductions from procuring EVs instead of ICEVs.

MEASURE-SPECIFIC ACTIVITY DATA

The relevant activity data can be found in the ‘Measure 2’ tab in the *GHGcalcs_MWCOG Individual* attachment, including the number of vehicles, total VMT, fuel consumption (gasoline, diesel, electricity) by vehicle type and municipality for each year.

GHG EMISSIONS REDUCED

Table Technical-4. Cumulative GHG Reduction Summary Metrics for the RACE Program

Summary Metrics	2025-2030	2025-2050
Total Estimated GHG Reductions (MTCO ₂ e)	6,853	17,299
Total Funding to Implement (\$)	24,040,994	-
COG Staffing Costs (\$)	1,094,768	
Requested CPRG Funding (\$)	22,274,856	-
Magnitude of GHG Reductions from CPRG Funding (2a, 2b) (MTCO ₂ e)	6,350	16,028
Cost Effectiveness of GHG Reductions (2c) (MTCO ₂ e)	3,508	1,390

Table Technical-5. CAPs and HAPs Reduction Summary for the RACE Program

Criteria Air Pollutant Reductions (MT)	Annual	2025-2030
CO	11.25	56.25
NOx	1.23	6.16
PM _{2.5}	0.05	0.25

See ‘Measure 2’ tab in *GHGcalcs_MWCOG Individual* attachment for the estimate of GHG emissions for ICEVs and BEVs by vehicle category and municipality.

2a, 2b NOFO formula: Quantified GHG reductions from CPRG funding = [(Requested CPRG funding)/(Total funding to implement measure)] x (Total estimated GHG reductions of measure)

2c NOFO formula: Cost effectiveness of GHG reductions = (Requested CPRG funding) / (Sum of Quantified GHG reductions from CPRG funding from 2025-2030)