MISSOURI
DEPARTMENT OF
NATURAL RESOURCES
Air Pollution Control Program

Missouri Plan
For
Environmental Improvement Grants

Developed by the
Missouri Department of Natural Resources

February 27, 2024

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Acronyms and Abbreviations

Acronym or Abbreviation	Definition
Alternative Fuels Corridors	AFCs
ARPA	American Rescue Plan Act
BIL	Bipartisan Infrastructure Law
CCAP	Comprehensive Climate Action Plan
CH_4	Methane
CMAQ	Congestion and Mitigation and Air Quality Improvement
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
CPRG	Climate Pollution Reduction Grant
CSB	Clean School Bus Program
department	Missouri Department of Natural Resources
DERA	Diesel Emissions Reduction Act
DOE	Division of Energy
EIERA	Missouri's Environmental Improvement and Energy Resources Authority
EPA	Environmental Protection Agency
EV	Electric Vehicle
EWGW	East-West Gateway Council of Governments
F-gases	Fluorinated Gases
FLAP	Federal Lands Access Program
GGRF	Greenhouse Gas Reduction Fund
GHG	Greenhouse Gas
GVWRs	Gross Vehicle Weight Ratings
HOV	High-Occupancy Vehicle
HFCs	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
ITC	Business Energy Investment Tax Credit
kWh	Kilowatt Hour
LED	Light-Emitting Diode
LFG	Landfill Gas
LIDAC	Low-Income/Disadvantaged Communities
LIHEAP	Low-Income Home Energy Assistance Program
LIWAP	Low-Income Weatherization Assistance Program
MARC	Mid America Regional Council
MDC	Missouri Department of Conservation
MMT	Million Metric Tons
MO	Missouri

MODOT	Missouri Department of Transportation
MPOs	Municipal Planning Organizations
NACD	National Association of Conservation
NEVI	National Electric Vehicle Infrastructure
NFF	National Forest Foundation
NF_3	Nitrogen Trifluoride
N_2O	Nitrous Oxide
NRCS	Natural Resources Conservation Service
PACE	Property Assessed Clean Energy
PCAP	Priority Climate Action Plan
PFCs	Perfluorocarbons
PHEV	Plug-In Hybrid Electric Vehicle
PTC	Renewable Electricity Production Tax Credit
QAPP	Quality Assurance Project Plan
RAISE	Rebuilding American Infrastructure with Sustainability and Equity
RCPP	Regional Conservation Partnership Program
SF_6	Sulfur Hexafluoride
SRCC	Solar Rating and Certification Corporation
SRF	State Revolving Fund
TA	Transportation Alternatives
US	United States
USDA	United States Department of Agriculture
VMT	Vehicle Miles Traveled
WIFIA	Water Infrastructure Finance and Innovation Act
WAP	Weatherization Assistance Program

Introduction
Missouri Plan for Environmental Improvement Grants

The federal government has made $5 billion available to states, cities, and tribes to plan for and implement environmental improvement projects in their jurisdictions. The Missouri Department of Natural Resources (department) received a grant from the U.S. Environmental Protection Agency (EPA) to develop plans required for Missouri to compete for this federal grant funding. The department coordinated with Missouri citizens, other state agencies, local governments, nonprofits, utilities, industries, and numerous other stakeholders across the State to develop the Missouri Plan for Environmental Improvement Grants (plan). This plan qualifies Missouri for federal funding to support investment in Missouri communities to reduce air pollution, create high-quality jobs, spur economic growth, and enhance the quality of life for all Missourians. This plan satisfies the EPA grant requirement for the department to develop a Priority Climate Action Plan (PCAP). This project is funded wholly or in part by the EPA under assistance agreement 96702701 to the department. The contents of this plan do not necessarily reflect the views and policies of the EPA, nor does the EPA endorse trade names or recommend the use of commercial products mentioned in this plan.

The purpose of this plan is to ensure that all Missouri communities and municipalities, regardless of size, have an opportunity to implement projects identified herein through the implementation phase of the federal grant program with $4.3 billion available nationwide that Missouri can compete for. Throughout the development of this plan, the department engaged with stakeholders to collect greenhouse gas (GHG) emissions reduction project ideas for inclusion in this plan. This plan describes the results of this engagement and project descriptions that are of interest to these stakeholder entities. For the purposes of this plan, emissions reduction measures and project categories should be considered broadly applicable to any area of the state.

Additionally, agencies in both the Kansas City and St. Louis areas, the Mid-America Regional Council (MARC) and the East-West Gateway Council of Governments (EWGW), respectively, received their own Climate Pollution Reduction Grant (CPRG) Planning grants. These organizations have also been key collaborators in the development of this plan. For this reason, and to further ensure there is no confusion about whether a community at the edges of these areas is covered by this plan, the Missouri portion of both metropolitan statistical areas are also considered covered by this plan, and emissions reduction measures included herein should be considered applicable to these areas as well. The PCAPs developed by MARC and by EWGW, and the emission reduction measures included in those PCAPs are also hereby incorporated by reference into this plan upon their release.

This plan is organized into the following sections:

1. GHG Emissions Inventory
2. Priority Emission Reduction Measures
3. Low-Income/Disadvantaged Community (LIDAC) Benefits Analysis
4. Review of Authority
5. Intersection with Other Funding Availability
6. Coordination and Outreach

Greenhouse Gas Emissions Inventory

The department has developed a statewide inventory of major sources of GHG emissions within the state. This inventory was prepared using state-level GHG inventories prepared by the EPA.[1] Detailed methodology and quality assurance procedures for preparation of this inventory are contained in the department's quality assurance project plan developed for this grant.

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The state inventory includes the following sectors and gases:

Sectors	***Greenhouse Gases (across all sectors)***
1. Transportation 2. Electrical Power Generation 3. Industry 4. Agriculture 5. Commercial 6. Residential	carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), fluorinated gases (F-gases) including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3)

Transportation

The transportation sector generates the second largest share of greenhouse gas emissions in Missouri. These emissions come primarily from the burning of fossil fuels in cars, trucks, ships, trains and planes. Road travel accounts for 75 percent of transport emissions, the largest sources of transportation-related greenhouse gas emissions being passenger cars, medium- and heavy-duty trucks, and light-duty trucks, including sport utility vehicles, pickup trucks, and minivans. Over 90 percent of the fuel used for transportation is petroleum based which includes primarily gasoline and diesel. Burning these fuels releases carbon dioxide into the atmosphere. Additionally, aviation related emissions are released from the 32 airports in Missouri, which include the Kansas City and Lambert - St. Louis International Airports. Rail travel and freight also contribute, but only approximately 1 percent of CO_2 emissions from the transportation sector. In 2021, the transportation sector accounted for 38 percent of GHG emissions in Missouri.

Electrical Power Generation

Electricity production generates the largest share of greenhouse gas emissions in Missouri. These emissions are due primarily to the combustion of coal and natural gas in the state's largest power plants. Missouri has reduced carbon emissions from the power sector by over 25 percent since 2005 despite being one of the highest users of coal for electricity generation in the country. The state's two largest utilities, Ameren and Evergy, have been making strides to cut carbon and transition their energy generation to cleaner sources. Ameren[2] has goal for net zero carbon emissions by 2050 and a commitment to expand their wind and solar portfolio. Evergy[3] aims to achieve net zero carbon emissions by 2045 according to the goal stated in their most recent integrated resource plan.

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[1] https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals

[2] Ameren Missouri's Future Is in Clean Energy (nrdc.org)

[3] evergy-2021-irp-overview.pdf

Industrial Sources

Greenhouse gas emissions from industrial sources in Missouri primarily come from burning fossil fuels for energy, as well as from certain chemical reactions necessary to produce goods from raw materials. In 2021 greenhouse gas emissions from industrial sources accounted for almost 17 percent of all emissions. Although manufacturing has declined in the state since the late 20th century, it remains an important contributor to Missouri's economy, accounting for more than one-tenth of the state's gross product and for a comparable proportion of the state's workforce. The sector is led by the production of aerospace and transportation equipment, followed by processed foods, fabricated metals and machinery, chemicals, plastics and rubber, and the printing and publishing industry. Geographically, manufacturing employment is concentrated in the metropolitan areas of St. Louis, Kansas City, Springfield, St. Joseph, Columbia and Joplin. The large plants tend to be located near the major urban centers, while midsize cities and towns attract smaller-scale industries.

Agriculture

Greenhouse gas emissions from agriculture come from livestock such as cows, soils and crop production. In other sectors, carbon dioxide emissions make the largest portion of greenhouse gas emissions; however, the emissions profile for agriculture differs in that it consists predominantly of nitrous oxide and methane with carbon dioxide accounting for a smaller part. There are 95,000 farms in Missouri, which is the second most in the United States. More than 90 percent of Missouri farms are family-owned, and the nearly 28 million total acres devoted to agriculture in Missouri cover two-thirds of the state. Soybeans and corn are the dominant crops in Missouri and are located mostly in the northern half of the state and in the southeast. Cotton and rice are predominant crops in some southeastern counties. Hay is the most widely produced crop. Missouri is one of the leading livestock states in the nation. Cow-calf production fits in with crop production on many farms across the state, but beef operations are of major importance in the central, southwest, and south-central areas. Hog production is also widespread, but especially concentrated in the north-central and west-central areas. Broilers and turkeys are dominant in the southwestern counties.

Residential and Commercial Sources

The residential and commercial sectors include all homes and commercial businesses (excluding agricultural and industrial activities). Greenhouse gas emissions from this sector come from direct emissions including fossil fuel combustion for heating and cooking needs, management of waste and wastewater, and leaks from refrigerants in homes and businesses. The residential and commercial sectors in Missouri made up approximately 15 percent of greenhouse gas emissions in 2021. Emissions from natural gas consumption represents 80 percent of the direct fossil fuel CO_2 emissions from the residential and commercial sector in 2021. Coal and wood consumption is a minor component of energy use in both of these sectors. Common commercial heating systems include furnaces and boilers, providing heat with warm air or water. These are usually electric and or natural gas fueled systems. Other sources of greenhouse gas emissions include organic waste sent to landfills, wastewater treatment plants and anaerobic digestion at biogas facilities. Commercial and residential greenhouse gas emissions are greatest in Missouri's largest urban areas, which have the highest population density and business activity.

Table 1 and Figures 1, 2 and 3 detail total GHG emissions in million metric tons (MMT) of carbon dioxide equivalents (CO_2e) for all economic sectors. Table 2 and Figures 4, 5 and 6 detail emissions of specific

GHGs across all sectors. Detailed emissions broken down per sector are provided in Tables 1 and 2 of Appendix A – Missouri Greenhouse Gas Emissions Inventory.

Table 1: State of Missouri Greenhouse Gas Emissions by Economic Sector (MMT CO_2e)

Sector/Source	2005	2021
Transportation	43.6	38.06
Electric Power Industry	80.36	61.4
Industry	18.49	16.8
Agriculture	24.06	23.23
Commercial	7.07	7.88
Residential	7.37	7.13
Totals	**180.9**	**154.51**

Figure 1: State of MO GHG Emissions (MMT CO_2e)

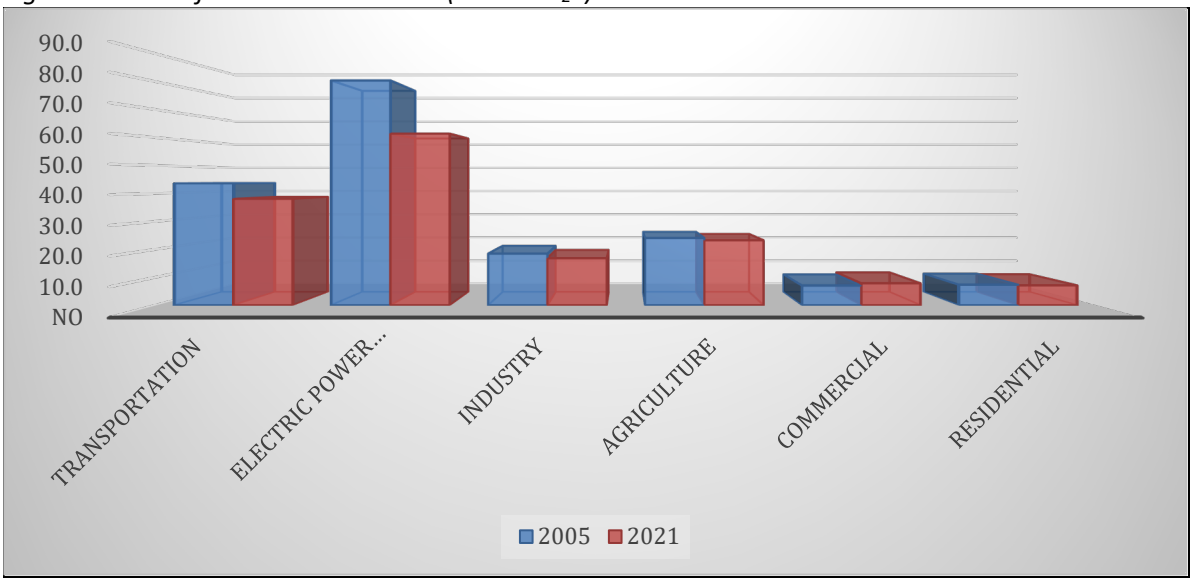


Figure 2: State of MO GHG Emissions (MMT CO_2e) – 2005 and 2021

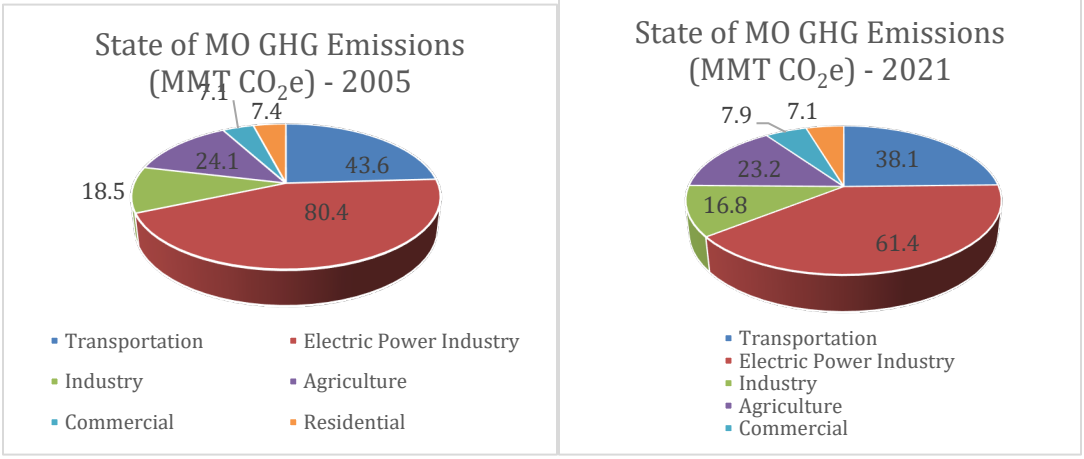


Table 2: State of Missouri Trends Greenhouse Gas Emissions and Sinks (MMT CO_2e)

Gas Type	2005	2021
CO_2	149.35	123.5
CH_4	14.40	13.92
N_2O	13.97	14.02
HFCs, PFCs, SF_6 and NF_3	3.22	3.05
HFCs	2.25	2.76
PFCs	0.36	0.11
SF_6	0.61	0.18
NF_3	-	-
Totals	**184.15**	**157.6**

Figure 3: State of MO Trends in GHG Emissions (MMT)

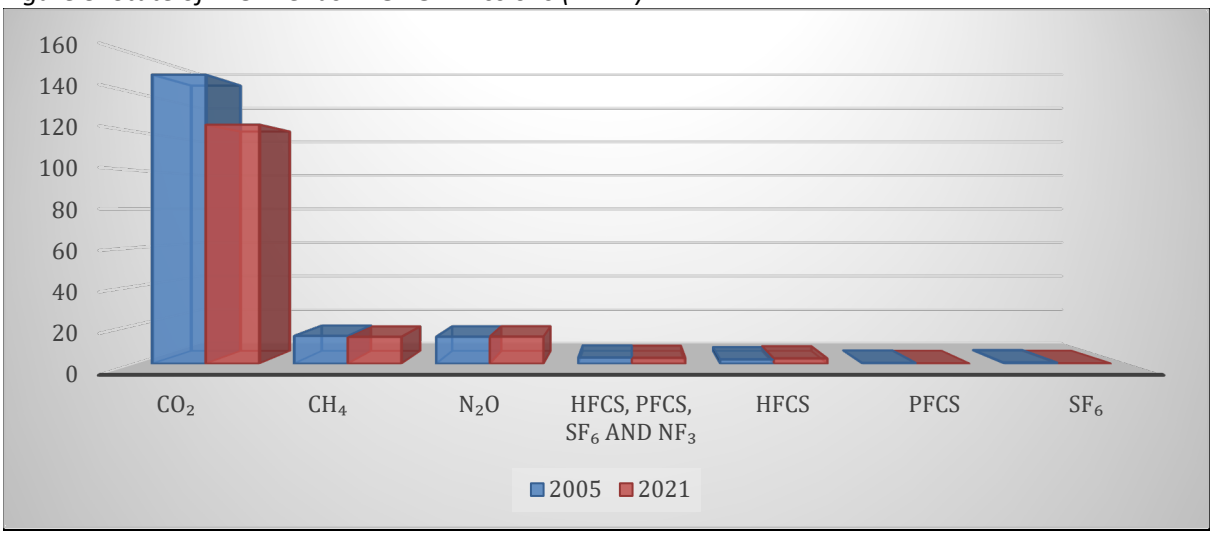


Figure 4: State of MO Trends in GHG Emissions (MMT) - 2005

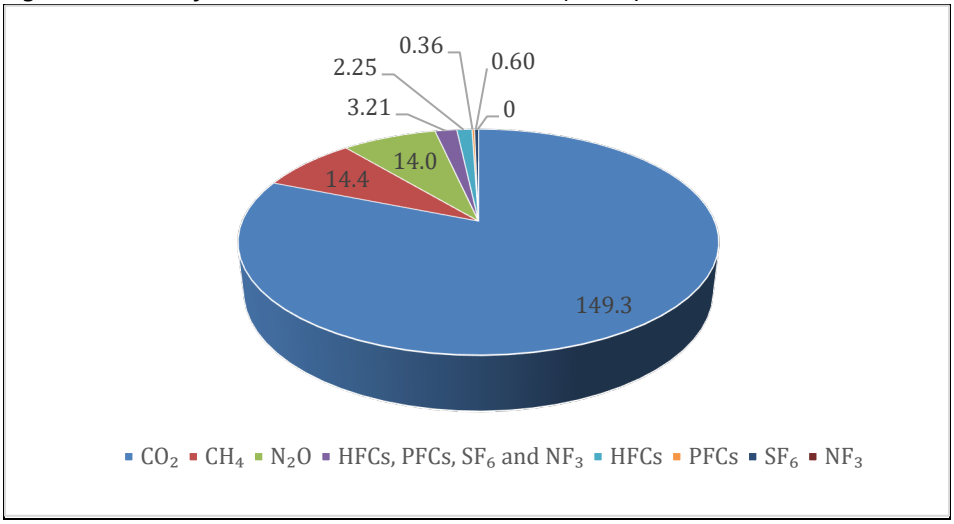
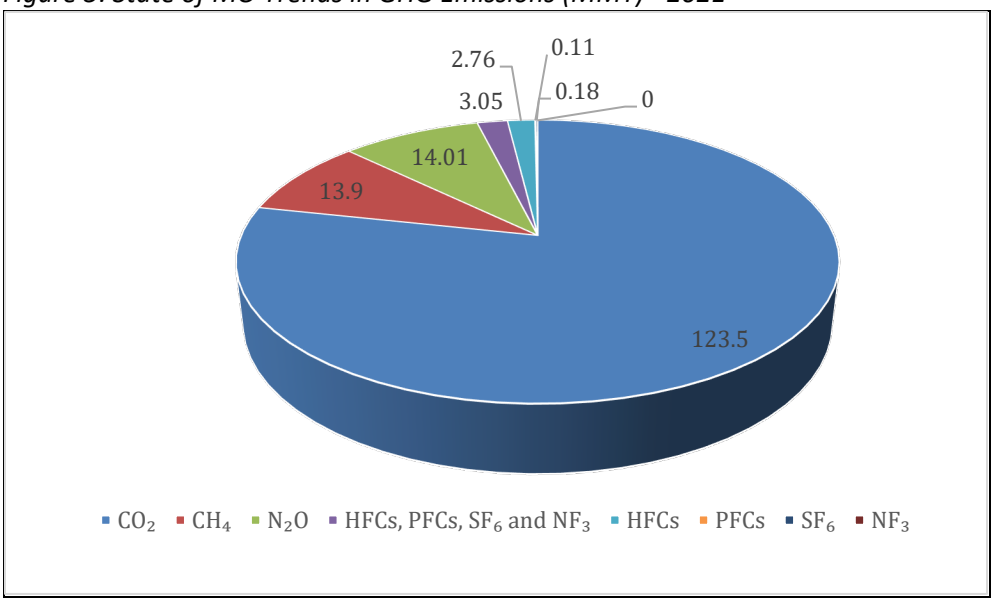


Figure 5: State of MO Trends in GHG Emissions (MMT) - 2021



Priority Emission Reduction Measures

The measures in this section are identified as "priority measures" for the purposes of pursuing funding through CPRG implementation grants. This list is not exhaustive of all possible emissions reduction measures. Instead, the selected priority measures included in this plan meet the following criteria:

- The measure is implementation ready, meaning that the design work for the policy, program, or project is complete enough that a full scope of work and budget can be included in a CPRG implementation grant application; and
- The measure can be completed in the near term, meaning that all funds will be expended, and the project completed, within the five-year performance period for the CPRG implementation grants.

Each priority measure is described below including additional details about the following information:

- Key implementing agency or agencies;
- Implementation schedule and milestones;
- Geographic scope;
- Metrics for tracking progress;
- Cost estimates for implementation;
- Co-benefits;
- Impacts on low-income and disadvantaged communities;
- Intersection with other funding availability; and
- Workforce needs.

In general, this plan is intended to broadly cover any projects that are implementation-ready across the state and that either reduce GHG emissions or absorb GHG emissions out of the atmosphere. These priority projects are those where the primary barrier is the cost of implementation, making them ideal candidates for inclusion in a future grant application under the CPRG implementation phase or another funding opportunity.

The following sections include broad project categories that are covered by Missouri's plan. The Department and municipal governments across the state conducted extensive outreach to solicit input and project ideas for inclusion in this plan. A summary of all these project ideas are included in Appendix B. However, not being included in the list of project ideas does not exclude the project from coverage under this plan. As long as a project is covered by one of the following sectors, or if it is specifically listed in Appendix B, the projects are considered covered by this plan.

Energy Efficiency

Weatherization and Pre-Weatherization Programs

Weatherization provides building upgrades to improve energy efficiency related to heating, cooling, and electrical systems. Upgrades include a variety of projects such as air sealing, adding insulation or ventilation, replacement of doors or windows with higher-efficiency doors or windows, as well as other measures to prevent a loss of energy. Missouri's existing Low-Income Weatherization Assistance Program (LIWAP) provides grant funds to local community action agencies and nonprofits to provide weatherization services for low-income communities. This program is funded through a Department of Energy grant and administered by the Department of Natural Resources Division of Energy. Building

structural deficiencies are oftentimes a hurdle for weatherization programs, as a dwelling cannot be effectively weatherized without also addressing these deficiencies. These additional expenses are oftentimes not eligible expenses under LIWAP. However, CPRG funding could not only be used to expand the existing LIWAP funding, but also to provide additional funding to address the conditions of a home that would cause it to be deferred from LIWAP, often called "pre-weatherization." Likewise, this whole-house approach is particularly impactful for low-income and disadvantaged communities, where historical disinvestment often results in housing with a range of health, safety and energy needs.

Most weatherization and pre-weatherization projects can be implemented quickly once identified and funds become available. Final inspections can determine project completion and grant fund recipients can submit reports to track progress. State legislative approval of these projects is not required and the Missouri Office of Administration, which manages state-owned buildings, is authorized to approve and oversee weatherization upgrades at state properties. The local and state workforces should be sufficient to complete projects, and apprenticeship programs are available for training additional weatherization technicians and energy auditors in some areas.

Estimated Emissions Reduction	One metric ton of CO_2 emissions per home annually.[4]
Implementing Agency	Missouri Department of Natural Resources Division of Energy, other local agencies where such programs exist
Cost Estimate for Implementation	Varies by community per number of homes/buildings weatherized
Geographic Scope	Statewide, focused on LIDAC communities
Benefits	Lower energy costs related to heating and cooling; structural improvements related to safety; expansion of a program targeting low-income communities can reach

Commercial and Residential Building Electrification Upgrades

The electrification of buildings involves transitioning from traditional fossil fuel-based systems to using electricity for various energy needs within a structure. This includes heating, cooling, cooking, and powering appliances. This shift contributes to a more sustainable approach to meeting the energy demands of buildings aligning with efforts to reduce greenhouse gas emissions. The electrification of buildings and appliances reduces direct emissions for end-use fossil fuel consumption. One primary electrification strategy is encouraging replacement of fuel oil, piped gas, propane, and wood fueled heating with electric heat pumps. Offering financial assistance and funding for low- and moderate-income residents can encourage the replacement of appliances and equipment fueled by fossil fuels with electric versions.

Commercial and residential properties can also switch to more energy-efficient lighting such as light-emitting diode (LED) bulbs, which consume less electricity, have a longer lifespan and emit less heat. This simple upgrade can result in significant energy savings and reduced utility bills for both residential and commercial spaces. Low-income residents and business owners can benefit from reduced energy costs and increased property values from these upgrades. The Missouri Division of Energy provides low

[4] USDOE, Weatherization Assistance Program factsheet (https://www1.eere.energy.gov/wip/pdfs/wap_factsheet.pdf)

interest loans for building electrification through the Energy Loan Program, however CPRG funds could supplement these loans or provide 100 percent funding of similar projects for entities that are not eligible for the Loan Program.

Electric upgrades to residential and commercial properties can generally be implemented within months of identification as funds become available and can be completed within a five-year timeframe. Final inspections can determine completion of projects and grant fund recipients can submit reports to track progress. State legislative approval of these projects is not needed and the Missouri Office of Administration, which manages state-owned buildings, is authorized to approve and oversee electric upgrades at state properties. Local and state workforce should be sufficient to complete projects and apprenticeship programs are available for training additional weatherization techs and energy auditors.

Estimated Emissions Reduction	Assuming the electricity were to come from clean sources, electrifying space and water heating in residential and commercial buildings where it is feasible could reduce those buildings' 2016 heating emissions by 20 percent[5].
Implementing Agency	Missouri Department of Natural Resources Division of Energy
Cost Estimate for Implementation	Varies by project and building
Geographic Scope	Statewide, focused on LIDAC communities
Benefits	Reduced energy costs, increased property value. Expanding services also expands job and apprenticeship opportunities to deliver those services.

Renewable Energy

Residential Solar

Installing residential solar panels is an effective way to reduce greenhouse gas emissions by generating clean, renewable energy from the sun. This helps decrease reliance on fossil fuels, mitigating the environmental impact associated with traditional energy production. Residential solar panels can decrease household electric bills by reducing the need to purchase electricity from the grid. Excess energy produced during sunny periods can be fed back into the grid, earning credits or reducing future bills through net metering. Over time, this can lead to significant cost savings, which is of special benefit to Missouri's low-income renters and homeowners. Additionally, solar installations are often seen as desirable features, appealing to environmentally conscious buyers and as renewable energy gains importance, homes with solar panels may be perceived as more valuable in the real estate market. The Inflation Reduction Act's Greenhouse Gas Reduction Fund (GGRF), Solar For All grant program was released in June 2023 and if Missouri receives a portion of the grant, these funds could also be used to provide solar energy to low-income Missouri homeowners. Federal tax credits are also available that make residential solar installation more affordable for homeowners.

[5] How global business could mitigate climate change | McKinsey

Commercial Solar

Installing solar panels on commercial properties is an effective way to reduce greenhouse gas emissions, by generating clean, renewable energy from the sun to energize small and large-scale commercial properties. Solar panels decrease the reliance on fossil fuels similar to residential solar panels, however the mitigating environmental impact can be greater depending on the size and scope of the commercial enterprise. Excess energy produced by commercial solar panels can also be fed back into the grid, earning credits or reducing future bills through net metering. The cost savings can be passed along to customers and employees or reinvested in the business, thus positively impacting residents, business owners and workers in the communities where the commercial solar investment is made. This can be especially beneficial to the residents of low-income communities if the reduced cost of business is passed down to local consumers and employees. Federal tax credits are also available that make commercial solar installation more affordable for businesses.

Industrial Solar

Like residential and commercial solar panels, industrial solar projects reduce greenhouse gas emissions by generating clean, renewable energy from the sun, to help power industrial operations and feed to the grid. The decrease in reliance on traditional fossil fuels helps mitigate the environmental impacts of large-scale energy production, which is the largest contributor of greenhouse gases in Missouri. Industrial solar panel facilities and solar "farms" offer several benefits to industrial operations. They can help reduce energy costs by generating on-site renewable power, providing a stable and predictable energy source. Additionally, solar energy can enhance energy independence, thus avoiding the volatility of utility price fluctuations. Installing solar panels reduces the environmental footprint of industrial activities, perhaps making future expansions easier from a permitting perspective and by fostering positive public perception. Industrial operations and the power systems that fuel them are often located in low-income areas, therefore any investment in solar infrastructure will benefit the local communities through improved air quality and associated health benefits.

Residential and commercial solar projects can generally be initiated within months of identification as funds become available and can be completed within a five-year timeframe. Industrial- and utility-scale solar projects can take longer due to the scope of construction and number of panels installed. Final inspections can determine completion of projects and grant fund recipients can submit reports to track progress. State legislative approval of residential and commercial solar is not needed and the Missouri Office of Administration, which manages state-owned buildings, is authorized to approve and oversee solar panel installation at state properties. Industrial- and utility-scale solar installation may require approval by the Missouri Public Service Commission and may be subject to environmental permitting laws and regulations. Missouri has over 140 solar companies, including 21 manufacturers and 48 installers. Additional projects funded through CPRG will offer growth to these businesses and additional workforce training demand for the industry.

Estimated Emissions Reduction	According to the Intergovernmental Panel on Climate Change (IPCC), the carbon footprint of rooftop solar panels is roughly 12 times less than natural gas and 20 times less than coal, in terms of CO_2 emissions per kilowatt hour (kWh) of electricity generated[6]. Emissions reductions for specific project can be estimated using EPAs Avoided Emissions and Generation Tool – AVERT Web Edition
Implementing Agency	Missouri Department of Natural Resources
Cost Estimate for Implementation	Varies by community, number of homes served and size of system
Geographic Scope	Statewide, residential solar particularly focused in LIDAC communities
Benefits	Increased property values, reduced energy costs, community investment, business, and workforce growth

Resiliency in Local Energy – Coalition Measure

Missouri will support deployment of renewable energy and storage systems for local government buildings to reduce energy costs and provide resilience in case of an electric grid outage. This support will include additional incentives to complement newly available "direct pay" options for local governments to receive energy tax credits and technical assistance for such projects. Missouri will select projects on either a competitive or first come basis, to be determined. This measure is intended to be utilized by any sub-state government actor, including without limitation cities, counties, and school districts within Missouri.

This measure intends to leverage the complementary funding available through elective pay (sometimes called direct pay) of certain clean energy tax credits. These tax credits only cover up to 30% of the projects contemplated under this measure, which may be insufficient for some local government buildings to achieve a return on investment through cost-savings from energy bills. In addition to directly supporting projects through technical assistance and deployment of renewable energy and storage systems, this measure will also serve to educate local governments on the available tax credits and provide technical assistance to local governments in designing such systems. As a result, this measure will catalyze widespread adoption of renewable energy and storage systems by local governments. The following additional funding sources were identified as available for the purpose of installing solar plus storage projects but are not believed to be duplicative due to different program foci: Department of Energy "Energy Efficiency and Conservation Block Grant", EPA "Greenhouse Gas Reduction Fund", and Federal Emergency Management Agency "Building Resilient Infrastructure and Communities."

For this measure, the state intends to use the following metrics to track progress: number of facilities installing renewable energy and storage, number of kilowatts of installed renewable energy, number of kilowatts of battery power installed, number of kilowatt hours battery capacity installed, the expected lifespan of projects, and number of performance years to quantify lifetime pollution reductions.

[6] Solar.com, Solar Learning Center: What is the Carbon Footprint of Solar Panels? | Solar.com

A local resilient energy program would be open to all communities in the state and funding could be prioritized to LIDAC areas in the state. Implementation of this measure will reduce local government energy costs allowing these agencies to divert funding they were spending on energy to provide additional services to communities. Implementing this measure will reduce emissions of pollutants from power plants, resulting in improved health outcomes. Because LIDAC communities frequently bear a disproportionate burden of environmental harms and adverse health outcomes from pollution, such communities will receive the greatest health benefits from implementation of this measure.

Estimated Emissions Reduction	**Near-term cumulative GHG emission reductions (2025 - 2030):** < = 0.7 x (funding allocated to measure excluding administrative ÷ 817,154) x 237x 5 > mt CO2e[7] **Long-term cumulative GHG emission reductions (2025 - 2050):** < = 0.7 x (funding allocated to measure excluding administrative ÷ 817,154) x 237 x 25 > mt CO2e
Implementing Agency	Missouri Department of Natural Resources
Cost Estimate for Implementation	Approximately $300,000 per building.
Geographic Scope	Statewide, residential solar particularly focused in LIDAC communities
Benefits	Reduced energy costs freeing up public funds for other needs, community investment, business, and workforce growth

Energy Storage

Energy storage is a key element necessary to transition energy generation away from fossil fuels, which can be dispatched on demand. This ensures that energy can be stored when it is plentiful, and then released to the grid, when load is high, and energy generation is more scarce. This is particularly critical to pair with wind and solar generation, since these generation sources are intermittent and dependent on the availability of wind and sunlight. Curtailment of renewable generation is also growing as more and more wind and solar power are added to the grid. However, energy storage solutions can reduce curtailment by storing energy, thus decreasing the need for dispatchable fossil-fuel generation and thus lowering CO_2 emissions.

There are numerous forms of energy storage and innovation continues to offer new opportunities in this sector. Utility scale batteries, pumped hydroelectric energy, and other solutions are available to help address the growing need for large scale energy storage solutions. Innovations and deployment in this sector will be critical to the successful continued transition away from fossil-fuel energy generation going forward.

[7] The emissions reduction estimates are based on a case evaluation using the National Renewable Energy Lab's PVWatts and ReOpt Tools. For the evaluated case, a 387 kW rooftop solar installation with 60 kW battery power and 153 kWH battery capacity were assumed.

Estimated Emissions Reduction	Depends on the size and type of the storage technology and capacity of fossil fuel generation system being replaced.
Implementing Agency	Missouri Department of Natural Resources
Cost Estimate for Implementation	Varies based on size and type of the storage technology and the capacity of generation system being replaced.
Geographic Scope	Statewide, focused on areas with strategic interconnection to the grid
Benefits	Reduces reliance on dispatchable fossil-fuel generation, which lowers traditional air pollutants, can help stabilize the grid, and with long term storage, it can help offer some relief during climate-related energy shortages

Electric Conversions

Fleet Replacements and Upgrades

The electrification of fleet vehicles is a vital strategy for businesses and organizations to reduce greenhouse gas emissions and promote a cleaner, more sustainable transportation system. Fleet electrification can encompass a wide range of vehicles, from passenger cars and trucks to buses and delivery vehicles. In addition to reducing carbon emissions, fleet electrification can also help to reduce reliance on fossil fuels and promote a cleaner, more sustainable transportation system. Electric vehicles (EVs) and plug-in hybrid-electric vehicles (PHEVs) use electricity, which can be generated from a variety of sources, including renewables such as solar or wind power.

The adoption of EVs can also help to improve air quality and public health. Traditional vehicles emit a variety of pollutants, including particulate matter, nitrogen oxides, and volatile organic compounds, which can have negative impacts on air quality and public health. Low-income and minority communities living near ports, warehouses, and highways are the most affected populations. The adoption of electric vehicles promises major improvements in air quality and corresponding improvements in health impacts from air pollution on these vulnerable populations.

Programs and infrastructure to encourage the use of EV or hybrid vehicle ownership are greatly needed and can be supported by CPRG funds. Projects under this category could include rebates to low- and moderate-income residents to purchase EVs, replacing public and private sector fleet vehicles with EVs, and implementing pilot programs for demonstration of fleet electrification benefits analysis.

Funds were allocated for the deployment of electric school buses and ferries, and port electrification in the 2021 Bipartisan Infrastructure Law (BIL). The electric vehicle tax credit can also offset the cost of new and used EVs. In 2024, the IRS is expected to allow customers to transfer the credit to the dealer to lower the price by the credit amount, effectively allowing all eligible consumers to benefit from the tax break.

Fleet and personal vehicle electrification through the purchase of new and replacement of aging vehicles can generally be implemented within months of identification and as funds become available and can easily be completed within a five-year timeframe. However, vehicle availability could hinder these projects depending on the number of vehicles intended to be replaced. As EV production in the US

increases this should become less of an issue. Receipts of purchase can demonstrate project success and grant fund recipients can submit reports for progress tracking. State legislative approval of fleet upgrade and replacement is not needed and the Missouri Office of Administration, which manages state fleet vehicles, is authorized to approve and oversee replacements and upgrades of state vehicles.

Estimated Emissions Reduction	Based on national average emissions for all EVs and the sources of electricity available in Missouri: All Electric: 3.76 tons CO_2e per year; PHEV: 3.13 tons CO_2e per year; and Hybrid: 2.85 tons CO_2e per year.[8] Over their lifetime, electric cars produce 52 percent less GHG emissions than gas cars, and electric trucks produce 57 percent less than gas trucks[9]. Specific fleet replacements can also be determined using EPA's Avoided Emissions and Generation Tool – AVERT.
Implementing Agency	Missouri Departments of Natural Resources and other Missouri State Agencies
Cost Estimate for Implementation	Varies based on fleet size and make/model of vehicles replaced.
Geographic Scope	Statewide
Benefits	Lower maintenance costs for EVs with fewer moving parts and no oil changes necessary, lower volatility of fuel costs, smooth and quiet driving experience, additional tax benefits and high-occupancy vehicle (HOV) lane access, reduced air pollution from mobile sources.

Electric Vehicle Charging Infrastructure

Charging the growing number of electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) in use requires a robust network of stations for both consumers and fleets. For most drivers, this starts with charging at home or at fleet facilities. Installing charging stations at workplaces and public destinations may help bolster market acceptance by offering more flexible charging opportunities at commonly visited locations. Increasing the number of EV charging stations in Missouri reduces transportation related GHG emissions and improves air quality for the state's residents. Increased charging stations increases the viability of owning and operating EV's in the state, which in turn increases the percentage of vehicle miles traveled (VMT). Currently nearly 72 percent of public EV charge ports are in the top fifth wealthiest areas of the country, resulting in "charging deserts" in low-income and disadvantaged communities. The lack of EV infrastructure along with the high purchase costs of EVs creates barriers to residents of these communities from EV ownership, leaving them disproportionately burdened with poor air quality and fuel price fluctuations of traditional gasoline and diesel-powered vehicles.

Grant funding can reverse this trend and provide charging infrastructure in underserved areas of Missouri. Proposed projects in this source category include providing funds for businesses to install charging stations in parking lots and provide incentives to encourage residents to install charging stations at home; funding the installation of charging stations for fleet vehicles and for visitors of state

[8] US DOE Energy Efficiency & Renewable Energy Alternative Fuels Data Center: Alternative Fuels Data Center: Emissions from Electric Vehicles (energy.gov)

[9] Green Energy Consumers Alliance: Lifecycle Emissions of Electric Cars vs. Gasoline (greenenergyconsumers.org)

parks, historic sites and conservation areas. Additional sources of funds for these projects may come from grant programs apportioned to the Missouri Department of Transportation such as the National Electric Vehicle Infrastructure (NEVI) formula program, which can be used to develop electric vehicle charging infrastructure along Missouri's interstate highways.

Electric vehicle charging station installation can generally be initiated within months of project identification as funds become available and can be completed within a five-year timeframe. Project management can determine project success and grant fund recipients can submit reports for progress tracking. State legislative approval of private charging stations is not needed and the Missouri Departments of Conservation and Natural Resources, who manage state conservation areas and state parks, are authorized to approve and oversee the installation of charging stations in these areas. State and local workforce is sufficient for EV installations as local licensed electricians are qualified to install residential and commercial EV charging stations.

Estimated Emissions Reduction	Increasing residential and public EV charging stations will encourage the purchase of EVs by the public, resulting in GHG reductions from the replacement of gasoline and diesel-fueled vehicles
Implementing Agency	Missouri Departments of Natural Resources and other Missouri State Agencies
Cost Estimate for Implementation	The cost of a single port EV charging unit ranges from $300 - $1,500 for Level 1, $400 - $6,500 for Level 2, and $10,000 - $40,000 for DC fast charging. Installation costs vary greatly from site to site with a ballpark cost range of $0 - $3,000 for Level 1, $600 - $12,700 for Level 2, and $4,000 - $51,000 for DC fast charging[10]
Geographic Scope	Statewide
Benefits	Relieve range anxiety and increase buyer confidence for EV owners, increase commercial property values, added revenue for commercial entities offering EV charging, development of a new and innovative workforce

Land Use

Urban greening

Urban greening refers to strategies that increase trees, parks, gardens, agriculture, forests, and other green and natural spaces in urban areas. Green infrastructure uses vegetation, soils, and natural processes to manage and create healthier urban environments. Examples include tree planting, rain barrels and rain gardens, green street design with permeable pavements, ecosystem restoration and green roofs. Urban greening is an important climate adaptation strategy as urban green areas contribute significantly to global carbon sequestration.

[10] US Department of Energy report: Costs Associated With Non-Residential Electric Vehicle Supply Equipment, November 2015 Costs Associated With Non-Residential Electric Vehicle Supply Equipment (energy.gov)

Additional funds for these types of projects could possibly come from community non-profits and city budgets. Kansas City, St. Louis, and the City of Bellefontaine received grants awards from the United States Forest Service through the Investing in America agenda. Funds are being provided for parks revitalization and urban tree canopy projects in these cities. Urban Greening projects can be initiated within months of identification as funds become available and can be completed within the five-year timeframe. Project management can determine project success and completion and grant fund recipients can submit reports for progress tracking. State legislative approval of municipal urban greening projects is not required, and the Missouri Departments of Conservation and Natural Resources manage state conservation areas and state parks and are authorized to approve and oversee the urban greening projects in these areas. Localized planning, construction and landscaping workforces in Missouri are sufficient to complete these types of projects which will economically benefit the communities in which they are carried out.

Estimated Emissions Reduction	A mature tree will absorb more than 48 pounds of CO_2 from the atmosphere per year[11]. Tools such as i-Tree Tools - Calculate the benefits of trees! (itreetools.org) can be used to estimate GHG emissions reductions for specific projects.
Implementing Agency	Missouri Department of Natural Resources, local municipalities, other state agencies
Cost Estimate for Implementation	Varies based on location and scope of project
Geographic Scope	Statewide
Benefits	Urban greening reduces urban heat islands by lowering surface and air temperatures, decreasing the risk of heat-related illness. Shade from trees and green roofs can also lower building energy costs by decreasing the load on air conditioners in warmer months. Trees remove harmful pollution, which can cause eye irritation and asthma. Accessible parks are associated with greater physical activity, relaxation, social interaction and improved quality of life in communities, especially in low-income and disadvantaged communities. Trees and greenery often increase property values

Afforestation

Afforestation involves planting trees in areas that have not recently had any tree cover, in order to create a forest. The type of land planted could include areas that have turned into desert, places that have long been used for grazing, dis-used agricultural fields, or industrial areas. Afforestation is considered to be one of the most "natural" and technologically simple ways to reduce carbon dioxide emissions because as a tree grows, it naturally sequesters CO_2 into itself and the soil it grows in. Opportunities for CPRG projects include nursery operations, tree disbursement, tree planting and forest management. Other sources of funding for afforestation projects are the United States Department of

[11] USDA, The Power of One Tree – the Very Air We Breathe. The Power of One Tree - The Very Air We Breathe | USDA

Agriculture's (USDA) Community Forest and Open Space Conservation Grant Program, which pays up to 50 percent of project costs with a 50 percent non-federal match for the acquisition of community forests owned by local governments, tribal governments, and qualified nonprofit entities areas with public access. Additional funds may come from community non-profits, city and county budgets and other grant opportunities through the National Forest Foundation or United States Forest Service.

Afforestation and reforestation projects can be initiated within months of identification as funds become available and can be completed within the five-year timeframe although trees will continue to grow for decades. Project management can determine project success and grant fund recipients can submit reports for progress tracking. State legislative approval of private land afforestation and reforestation is not required and the Missouri Departments of Conservation and Natural Resources, who manage state conservation areas and state parks, are authorized to approve and oversee the afforestation and reforestation projects in these areas. Localized planning, construction and landscaping workforces in Missouri are sufficient to complete these types of projects, which will economically benefit the communities in which they are carried out.

Estimated Emissions Reduction	A mature tree will absorb more than 48 pounds of CO_2 from the atmosphere per year[12]. Forests typically have 100 - 200 trees per acre, therefore one acre of planted mature forest can sequester approximately 2.4 - 4.8 tons CO_2 per year. Tools such as i-Tree Tools - Calculate the benefits of trees! (itreetools.org) can be used toestimate GHG emissions reductions for specific projects
Implementing Agency	Missouri Departments of Natural Resources and Conservation, other local governments, and non-profits
Cost Estimate for Implementation	Depending on site conditions, reforestation costs can range from $100 to $450 per acre[13] and up to $600 per acre for afforestation.[14]
Geographic Scope	Statewide
Benefits	Increase soil quality**,** ecosystem restoration, job creation, habitat for wildlife, windbreaks, and improve water quality, provide shade for people or livestock, recreation areas

Prairie Restoration

Prairie restoration is a conservation effort to restore prairie lands that were destroyed due to industrial, agricultural, commercial, or residential development. The primary aim is to return areas and ecosystems to their previous state before their depletion. Prairie ecosystems are particularly effective at carbon sequestration because their root systems run surprisingly deep. Long-term management methods of prairie restorations including burning, grazing, mowing and haying; all are used to maintain floral diversity, remove woody or invasive species and reduce weed growth.

[12] USDA, The Power of One Tree – the Very Air We Breathe. The Power of One Tree - The Very Air We Breathe | USDA

[13] Is Reforestation a Profitable Investment? An Economic Analysis | NC State Extension Publications (ncsu.edu)

[14] Can We Restore 350 Million Hectares by 2030? | World Resources Institute (wri.org)

Native tallgrass prairie once covered one-third of the state of Missouri, amounting to about 15 million acres. Today, Missouri has about 17 million grassland acres, but only 0.5 percent of that is native prairie. The rest have been converted to crop production or were seeded to nonnative forage grasses to support the cattle industry. In addition, invasive trees and human development have fragmented Missouri's native prairie remnants, making them evermore precious and rare.

Prairie restoration projects managed by the Missouri Department of Conservation are underway. These efforts present an opportunity for further development or expansion under the CPRG program. Tree removal, invasive species control, prescribed fire, and grassland restoration are examples of eligible projects for CPRG funding. Some of these projects may be eligible for other grant funding or be supported by local non-profits or municipalities.

Prairie restoration can be initiated within months of identification as funds become available and can be completed within a five-year timeframe although plants will continue to thrive for decades. Project management can determine project success and grant fund recipients can submit reports for progress tracking. State legislative approval of private prairie land restoration is not required and the Missouri Departments of Conservation and Natural Resources, who manage state conservation areas and state parks, are authorized to approve and oversee prairie restoration projects in these areas. Localized planning, conservation, and landscaping workforces in Missouri are sufficient to complete these types of projects, which will economically benefit the communities in which they are carried out.

Estimated Emissions Reduction	Various studies of the potential for tallgrass prairie carbon storage have shown that the storage rates vary between .30 and 1.7 metric tons per acre per year[15]
Implementing Agency	Missouri Departments of Natural Resources and Conservation
Cost Estimate for Implementation	Varies based on location and scope of project. The estimated cost to restore a crop field to conservation prairie is $1,506 per acre, based on 2013 prices[16].
Geographic Scope	Statewide, lands that were once prairie
Benefits	Prairie restoration results in better hunting, supports native pollinators, increases ecological diversity expands habitats for native animals and insects and helps reduce erosion and runoff due to heavy rain

Waste Management

Landfill and Solid Waste

Landfills are the third largest source of anthropogenic methane emissions. Solid waste contributes directly to greenhouse gas emissions through the generation of methane from the anaerobic decay of

[15] Carbon Sequestration – Tallgrass Ontario

[16] The Nature Conservancy, January 1, 2017: Restoring your Crop Field to Conservation Prairie, Restoration-Guide-Crop-to-Conservation-Prairie.pdf (nature.org)

waste in landfills, and the emission of nitrous oxide from our solid waste combustion facilities. A sustainable materials management approach focuses on using and reusing resources efficiently and sustainably from extraction to end of life. It aims to generally minimize material use and all associated environmental impacts. Using landfill gas (LFG) to generate energy and reduce methane emissions produces positive outcomes for local communities and the environment. Given that all landfills generate methane, it makes sense to use the gas for the beneficial purpose of energy generation rather than emitting it to the atmosphere. It is estimated that an LFG energy project will capture roughly 60 to 90 percent of the methane emitted from the landfill, depending on system design and effectiveness.

Grant funds can be used to enact the following elements of sustainable materials management to decrease landfill methane emissions: reduce food loss and waste; increase recycling; facilitate reuse of products, such as food and beverage containers; separate collection of organic waste and incentivize alternative uses; install methane capture systems; apply biologically active cover to landfill and invest in waste-to-energy systems. These projects can help low-income communities by creating partnerships among citizens, nonprofit organization and local governments and industry in sustainable community planning, increasing local economic resilience, and creating jobs.

The Missouri Department of Natural Resources offers several waste-related grants and other financial assistance to help encourage recycling and support community-based waste reduction, reuse, composting and recycling projects in Missouri. These financial assistance opportunities are available to local governments, small and large businesses, schools, sheltered workshops and individuals. Further, various resources are available to provide financing or incentives for landfill gas (LFG) energy projects, including federal tax credits and exemptions, production incentives, loans, and grants. Waste management projects can be initiated within months of identification as funds become available and can be completed within a five-year timeframe. Project management can determine project success and grant fund recipients can submit reports for progress tracking. State legislative approval for waste management projects is not required. Localized planning, construction and landfill professionals in Missouri are sufficient to complete these types of projects, which will economically benefit the communities in which they are carried out.

Estimated Emissions Reduction	On average in the United States each landfill with a landfill methane capture facility avoided the release of approximately 580,000 tons of CO_2e[17]. Tools such as the EPA's Waste Reduction Model (WARM) may be used to estimate emissions reduction from recycling and other waste diversion projects.
Implementing Agency	Missouri Departments of Natural Resources and Conservation
Cost Estimate for Implementation	Average cost per ton of methane reduced: $2,900[18]
Geographic Scope	Statewide
Benefits	Energy cost savings that can be passes to the consumer or banked for future facility upgrades and expansions

[17] Landfills have a huge greenhouse gas problem. Here's what we can do about it. | Ensia
[18] Benefits and costs of mitigating methane emissions | Climate & Clean Air Coalition (ccacoalition.org)

Food Waste

It is estimated that roughly one third of the food intended for human consumption in the United States is lost or wasted. When food is discarded, all inputs used in producing, processing, transporting, preparing, and storing the discarded food are also wasted. Production, transportation, and handling of food generate significant carbon dioxide emissions and when food ends up in landfills, it generates methane, an even more potent greenhouse gas.

The EPA estimates that each year, food loss and waste embody the CO_{2e} emissions equal to the annual CO_2 emissions of 42 coal-fired power plants. This estimate does not include the significant methane emissions from food waste rotting in landfills. The EPA's data shows that food waste is the single most common material landfilled and incinerated in the United States.

Possible projects for CPRG funding opportunities to mitigate GHG emissions from food waste include educating and empowering Americans to change their behaviors everywhere that they eat; supporting research and awareness campaigns to reduce consumer food waste; facilitating food surplus donation by farmers, businesses, schools and individuals; and building demand for compost. Grants are available through the EPA and USDA that provide funds for education and research in the area of food waste reduction. The Missouri Department of Natural Resources also offers several waste-related grants and other financial assistance to help encourage recycling and support community-based waste reduction, reuse, composting and recycling projects in Missouri. These financial assistance opportunities are available to local governments, small and large businesses, schools, sheltered workshops and individuals. Food waste reduction projects can be initiated within months of identification as funds become available and can be completed within a five-year timeframe. Project management can determine project success and grant fund recipients can submit reports for progress tracking. State legislative approval for waste management projects is not required. Missouri community action groups and educators can in implement these types of projects which may require localized training and outreach efforts.

Estimated Emissions Reduction	For every 1,000 tons (907 metric tons) of food waste landfilled, an estimated 34 metric tons of fugitive methane emissions (838 MMT CO_2e) are released[19] Tools such as the EPA's Waste Reduction Model (WARM) may be used to estimate emissions reduction from recycling and other waste diversion projects.
Implementing Agency	Local community action agencies, non-profit groups and municipalities
Cost Estimate for Implementation	Cost is dependent on location and scope of project
Geographic Scope	Statewide
Benefits	Reducing and preventing food waste can increase food security, foster productivity and economic efficiency, and promote resource and energy conservation. It also enhances climate adaptation by decreasing the impact of weather and climate related shocks to the supply chain

[19] USEPA document: Food Waste Management Quantifying Methane Emissions from Landfilled Food Waste, October 2023, Quantifying Methane Emissions from Landfilled Food Waste (epa.gov)

Wastewater Treatment

Wastewater facilities release greenhouse gases during the treatment process. Most significantly, methane is emitted during the handling and treatment of municipal wastewater through the anaerobic decomposition of organic material. Additionally, energy-intensive treatment methods and the use of fossil fuels can result in the release of carbon dioxide emissions. Options for GHG mitigation include retiring lagoons and latrines through consolidation of treatment at larger plants and upgrading wastewater treatment secondary and tertiary anaerobic treatment with biogas recovery and utilization. Methane capture and use has the potential to decrease energy usage produced by traditional fossil fuels by providing a local source of energy through methane that supports energy independence. The long-term cost savings of gas capture systems can be economically beneficial to municipalities and be passed down to consumers, perhaps benefiting low-income residents through lower water bills. The Renewable Electricity Production Tax Credit (PTC) could offset costs of these systems and additional financing could be provided by the Water Infrastructure Finance and Innovation Act (WIFIA).

Wastewater Treatment projects can be initiated within months of completing the permitting process as funds become available and can be completed within a five-year timeframe. Project management can determine project success and grant fund recipients can submit reports for progress tracking. State legislative approval for waste management projects is not required, however upgrades meeting certain criteria are required to undergo permitting review with the Missouri Department of Natural Resources. Localized planning, construction and wastewater professionals in Missouri are sufficient to complete these types of projects, which will economically benefit the communities in which they are carried out.

Estimated Emissions Reduction	Depends on the scope of consolidation of systems and flows managed. Methane capture would be similar to landfill gas capture systems
Implementing Agency	Missouri Department of Natural Resources
Cost Estimate for Implementation	Average cost per ton of methane reduced: $3,240[20]
Geographic Scope	Statewide, focused on municipalities and rural and suburban areas where consolidating systems is most beneficial
Benefits	Consolidation provides reliable wastewater treatment for rural and isolated areas. Energy cost savings that can be passed to the consumer or banked for future facility upgrades and expansions.

Sustainable Agriculture Practices

Greenhouse gas emissions from the agricultural industry in Missouri result from complex natural processes that are difficult to measure. Methane can be reduced from livestock and crop production through anaerobic digestion of animal and crop waste. Nitrous oxide emissions which result mostly from agricultural fertilizer application to soils and from manure management can be reduced through

[20] Benefits and costs of mitigating methane emissions | Climate & Clean Air Coalition (ccacoalition.org)

sustainable and organic farming practices. Planting additional crops outside of the primary growing season, known as cover cropping, and utilizing cultivation methods that cause less disturbances to soil can reduce carbon emissions. Other ways to reduce greenhouse gases from agriculture is through energy conservation and fuel switching such as converting farming equipment to electric or other clean fuels. Farms may also be excellent sites for renewable energy production such as wind turbines, solar panels, and geothermal systems, due to the amount of available land.

Estimated Emissions Reduction	See the Waste Management, Renewable Energy, Electric Conversions, and Land Use Priority Measures for details on estimated emissions reductions
Implementing Agency	Missouri Departments of Natural Resources, Agriculture or Economic Development
Cost Estimate for Implementation	Cost is dependent on location and scope of project
Geographic Scope	Statewide, focused on municipalities and rural and suburban areas where consolidating systems is most beneficial
Benefits	Sustainable agriculture practices increase biodiversity and support healthy ecosystems and resilient food systems. Sustainable livestock practices reduce environmental degradation and public health risks while improving animal welfare. These practices can lead to long-term cost savings by reducing the need for chemical inputs and expensive machinery. Relying less on harmful chemicals contributes to cleaner air and water resources

Decarbonization in Cement Manufacturing

Missouri is one of the largest cement producers in the country. Cement is the glue that, when mixed with sand, aggregate, and water, produces concrete. Many aspects of modern civilization are made possible because of concrete, an indispensable material that is one of the most used substances on earth. Demand for cement and concrete is likely to continue to increase due to the expanding need for infrastructure construction, including to provide a strong foundation to withstand the severe weather events that are predicted due to changes in climate.

Ninety percent of emissions from cement making are from the kiln where limestone and silica are heated to high temperatures to chemically create the material, called clinker, necessary in making cement. Sixty percent of the on-site emissions associated with this step are process emissions–coming from the chemical decomposition of limestone in the kiln. The rest come from the combustion of fossil fuels to reach the high temperatures required for the process.

To help tackle the challenge of decarbonizing the cement industry, experts are making great strides in developing next-generation cement/concrete formulations and production routes, utilize low-carbon fuels and implementing carbon-capture technologies. However, even these readily deployable methods have yet to reach their full potential. Missouri is considering joining the **States Supporting Cement Innovation Coalition** to help address barriers slowing the uptake of low carbon cement and concrete. Missouri will work in collaboration with a coalition of other states to catalyze deployment and

innovation of low carbon cement and concrete. The coalition goals target and mitigate barriers to currently deployable emissions reduction measures such as the substitution of cement with supplementary cementing materials (SCMs) and low carbon cement mixes, as well as methods to use less clinker in cement, use less cement in concrete, improve plant energy efficiency, use alternative and/or renewable fuel sources for heat, capture emissions at cement plants, and utilize different source materials and chemical reactions to produce innovative ultra-low carbon cement. Potential elements of the coalition include: (1) procurement assistance and coordination for state departments of transportation and producers, (2) plant evaluations and grants for plant upgrades, (3) type III Environmental Product Declaration (EPDs) assistance, (4) demonstration and pilot projects, (5) specifications support, and (6) funding acquisition assistance.

Many of Missouri's cement manufacturers are in or near low-income communities therefore emissions reductions at these facilities will directly benefit disadvantaged Missourians through cleaner air and healthier environments. Support for the industry will positively affect these communities through job growth and training opportunities and economic support. Cement decarbonization projects can be initiated soon following completion of the permitting process as funds become available and can be completed within a five-year timeframe. Many low-carbon cements can be used immediately for any project in place of ordinary Portland cement.

Project management can determine project success and grant fund recipients can submit reports for progress tracking. Potential metrics to track the success of this measure include the number of procurement commitments; establishment of production and procurement targets; collaborative events with producers, states agencies and technical experts; plant upgrades, decrease in plants' energy use, increase production and purchase of low carbon blended cements and advanced mix designs, demonstration projects, updated specifications (preference for performance based specifications), and federal funding for low carbon cement/ concrete projects acquired. State legislative approval for cement decarbonization is not required, however coordination with cement and concrete industry is important to ensure a market for low-carbon cement products and design manuals may need to be updated. Localized planning and cement manufacturing and construction professionals in Missouri are sufficient to complete cement decarbonization projects.

Estimated Emissions Reduction	Low carbon cement can reduce CO_2 emissions by up to 40% compared with ordinary Portland Cement.[21]
Implementing Agency	Missouri Departments of Natural Resources, Economic Development and/or Transportation
Cost Estimate for Implementation	Cost is dependent on location and scope of project
Geographic Scope	Statewide, and specifically communities in which cement producers are located and large concrete projects are implemented

[21] How low-carbon cement can benefit emerging economies and the planet - ClimateWorks Foundation

Benefits	These efforts will benefit Missouri by supporting a strong cement industry that is positioned to thrive as cement buyers demand increasingly lower-carbon cement. Supporting coordination between Missouri's cement producers and cement consumers will help meet US demand with local production. Innovation will yield the creation of manufacturing jobs that will ensure low- and middle-income communities and communities of color have increased access to high quality, good paying career opportunities. This enhanced economic benefit is coupled with tangible environmental and public health benefits that come from implementing production methods that result in lower emissions of carbon dioxide and co-pollutants.

Other Priority Measures Included in MARC and EWGW Plans

The Mid America Regional Council (MARC) and East-West Gateway Council of Governments are each developing PCAPS for the Kansas City and St. Louis metropolitan areas, respectively. These plans may include measures that are not detailed in this plan; however, Missouri is incorporating those plans into this plan by reference upon their release. This will ensure any projects included in the metropolitan area PCAPs are eligible projects for implementation for all Missouri entities.

Low-Income and Disadvantaged Community Benefit Analysis

Implementing the measures included in this plan present opportunities to provide significant benefits to low-income and disadvantaged communities (LIDACs). Many of the emissions reduction measures included in this plan may have co-benefits localized to the area where the measure is implemented. Benefits related to reductions in criteria air pollutants such as a reduction of ground-level ozone or fine particulate matter ($PM_{2.5}$) concentrations in populated areas can have a quantifiable impact on the health of communities. Other less quantifiable localized benefits, such as city beautification or an increased engagement of the community in air pollution topics, may also be attributable to specific emissions reduction measures implemented through CPRG. These co-benefits vary on a case-by-case basis and depend on the specifics of each project location.

However, the broader effects of greenhouse gas emissions are well understood and, by their nature, are not typically localized to the area surrounding a source of emissions. Extreme weather events such as increased tornado activity, droughts and floods, and the increased likelihood of excessively high or low outdoor temperatures, are all possible global-scale effects of greenhouse gas emissions. Many of these disproportionately affect low-income and disadvantaged communities that oftentimes do not have the economic flexibility to avoid or plan for unexpected extreme weather and may be un- or under-insured when damage to property occurs. Extreme heat, for example, is estimated to put nearly a quarter of the US population[22] at serious risk, with lack of quality housing, unavailable transportation modes, and financial hardship being the main identified risk factors.

The effects of extreme weather and a changing climate are not limited to human health. The Missouri Department of Agriculture estimated in 2021 that the agriculture industry contributed $93.7 billion to the state's economy.[23] Heat waves, droughts, and other extreme weather events can also negatively affect these industries by decreasing crop yields, killing plants and livestock, and decreasing soil health. Low-income, rural communities that are supported by the agriculture industry are at risk of losing the livelihoods of residents in addition to the risks to human health from extreme weather. Furthermore, increases in food prices that result from the effects of extreme seasonal weather on the agricultural industry disproportionately affect low-income Americans.

Broadly, implementation of the emissions reduction measures contained in this plan will reduce GHG emissions. While the authority of this plan only applies to the State of Missouri, all CPRG plans must support EPA's overall program goal of reducing greenhouse gas emissions across the entire country. As one plan among many, the measures in this plan will have a net positive effect in reducing greenhouse gas emissions and their impact on LIDAC communities simply by virtue of the global nature of greenhouse gas emissions.

However, this plan also represents an opportunity to provide many more benefits to communities, some which are described in greater detail in sections that follow. The most important of these potential

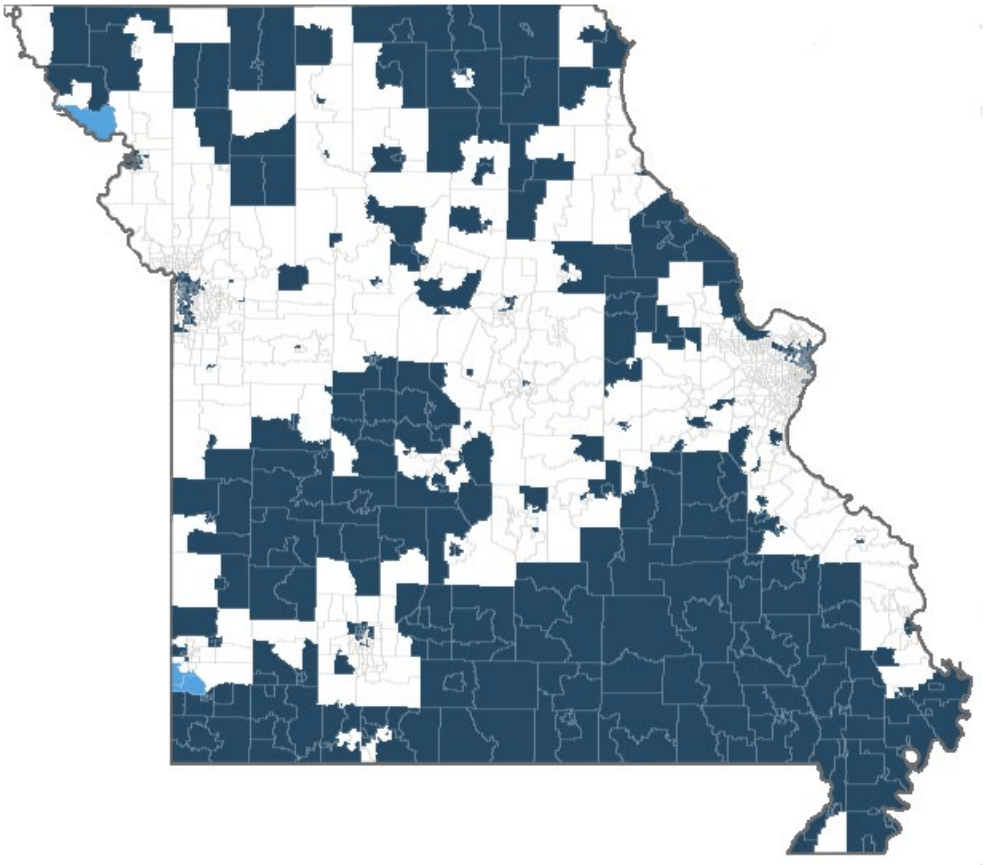
[22] U.S. Census Bureau, Community Resilience Estimates for Heat (https://www.census.gov/library/stories/2023/07/almost-a-quarter-of-population-vulnerable-to-rising-heat.html)
[23] MO Dept of Agriculture (https://agriculture.mo.gov/economicimpact/)

benefits is the opportunity to help the most vulnerable communities adapt to a changing climate and build resiliency against its most severe impacts. These benefits must be systemic in nature, and though the specificity needed is beyond the scope of this plan, it is the responsibility of the department, as well as any other applicant organization using this plan, to ensure that these communities remain at the forefront.

Identification of and Engagement with LIDACs

Census tracts which meet EPA's criteria defining LIDACs were identified using the Climate and Economic Justice Screening Tool[24] and are identified in Figure 5. A detailed list of census tract ID by County is available in Appendix D. In Missouri, these communities are spread widely across the state, some are located in rural areas as well as in larger metropolitan areas such as St. Louis, Kansas City, Columbia, and Springfield. The PCAPs prepared by MARC and by EWGW will have more detailed information about LIDAC communities in the Kansas City and St. Louis metropolitan areas, respectively. The following benefits analysis is intended as a broad overview of the entire state of Missouri.

Figure 7: EPA IRA Disadvantaged Communities EPA - IRA Disadvantaged Communities identified as Dark Blue in the Map



[24] Explore the map - Climate & Economic Justice Screening Tool (geoplatform.gov)

Because LIDAC communities are located throughout the state and in both rural and urban areas, the department's approach for meaningful engagement with these communities is encompassed by the general approach for outreach throughout the state. Engagement and outreach activities include providing the resources listed in the Coordination and Outreach section of this plan. The department specifically reached out to municipalities, non-profit groups, other state government agencies, and residents of the state to inform Missouri communities about these efforts and solicit project ideas for inclusion in this plan.

Impact of Plan Implementation on LIDACs

Projects under each priority measure will have intended benefits, and potentially some unintended drawbacks for the communities in which they are implemented. For inclusion in Missouri's Implementation Grant application, each project will be evaluated for the impacts to Missouri's low-income and disadvantaged communities. A summary of benefits and drawbacks anticipated for each priority measure follows.

Anticipated Benefits and Drawbacks of Priority Measures for LIDACs

Weatherization and Pre-Weatherization Programs

Pre-weatherization addresses structural conditions in a home that cause it to be deferred from the Missouri Division of Energy's (DOE) Weatherization Assistance Program (WAP) because the conditions render weatherization measures unsafe or ineffective. Many of these homes are owned by low-income individuals and located in LIDACs. The Missouri Division of Energy identifies properties that are low on the priority list for weatherization because of poor condition. The properties that do not qualify for the WAP can be targeted by CPRG funds to provide the improvements necessary to qualify for weatherization. Home pre-weatherization and weatherization will reduce GHG emissions due to the resulting improvements in energy efficiency and reduction in energy required to heat and cool the properties. These projects will also lower energy costs for residents and the work performed will provide quality jobs and development of practical, transferable work skills within these communities.

As homes are improved, it is possible that property values will be reassessed, and property tax liability will increase. Eco-gentrification is also a possibility when investment in low-income areas increase the desirability of the area. Caution must be taken to avoid landlords increasing rents for current residents which will offset the saving realized from electrification upgrades. The economic benefit of increased employment opportunities will only stay within these communities if local residents are able to be hired for the work performed. Training and apprenticeship programs should be supported and possibly also funded by CPRG.

Commercial and Residential Building Electrification

Residential building and home energy upgrades directly benefit low-income residents by reducing energy consumption, resulting in decreased electric bills. Replacing aging appliances with more energy efficient new appliances allows homeowners and renters to cook healthy meals, clean dishes and clothes, and heat and cool their homes and apartments reliably and economically.

As homes are improved, it is possible that property values will be reassessed, and property tax liability will increase. Eco-gentrification is also a possibility when investment in low-income areas increase the

desirability of the area. Caution must be taken to avoid landlords increasing rents for current residents which will offset the saving realized from electrification upgrades. The economic benefit of increased employment opportunities will only stay within these communities if local residents are able to be hired for the work performed. Training and apprenticeship programs should be supported and possibly also funded by CPRG.

Renewable Electric Generation

Providing funds for renewable electric generation such as residential solar panels will benefit low-income homeowners and renters by reducing energy costs, providing a sustainable power source, and creating job opportunities in the renewable energy sector. This can contribute to economic empowerment and environmental sustainability for residents. Homeowners may benefit from increased value of their properties providing a valuable investment and wealth building opportunity. High upfront costs can be a substantial financial barrier to residential solar adoption for low-income families and a significant portion are not able to benefit from the 30 percent federal tax credit.

As homes are improved, it is possible that property values will be reassessed, and property tax liability will increase. Eco-gentrification is also a possibility when investment in low-income areas increase the desirability of the area. Caution must be taken to avoid landlords increasing rents for current residents which will offset the saving realized from electrification upgrades.

Commercial and industrial solar projects in low-income communities can benefit local residents by reducing energy costs for local businesses, enabling them to allocate resources to improved employee wages and expanded hiring, property upgrades, increased security and other investments in the community and business. Additionally, these installations may create job opportunities in the community, fostering economic development and workforce training. In order to realize these benefits, it is important that the workforce investments and jobs created be offered to and set up in the communities that receive CPRG funds.

Electric Vehicle Infrastructure and Public Transportation

Electric Vehicle (EV) programs can benefit low-income and disadvantaged communities by providing increased access to electric vehicles for drivers who may not otherwise be able to afford these vehicles. It is imperative that charging infrastructure be widely available in order to increase the consideration of residents of all communities of purchasing an EV. Over time, lower operating costs for EVs contribute to more affordable and sustainable mobility options for residents in these communities. Increasing public transportation options reduces individual transportation costs for residents who may not own a personal vehicle. Pedestrian areas and bike lanes and trails also offer alternative transportation options and encourage active lifestyles and recreation. All additional modes of transportation improve access to jobs, education and essential services, enhancing overall economic opportunities and quality of life for residents of LIDACs. In order for low-income Missourians to benefit from EV programs and charging infrastructure, it is important to address unintended financial hardships such as high personal property taxes, licensing fees, and insurance for low-income EV owners. These are often the barriers to maintaining legal driving status among all low-income drivers and can be much more burdensome with EVs due to the higher cost and value of these vehicles.

Urban Greening, Afforestation and Prairie Management

Urban greening projects can offer low-income urban residents many physical and social benefits. Improving and expanding green spaces in urban areas results in residents spending more time interacting with the outdoors and engaging in recreational activities like biking, running, and walking. These spaces may also serve as meeting grounds, encouraging stronger social ties and social cohesion within a community, providing a host of social and emotional benefits. Through these physical and social benefits, urban greening can decrease stress, balance emotional states and increase perceived levels of safety and well-being. However, without appropriate foresight and planning, green space's impact on property values can drive up housing prices and push out low-income residents. This phenomenon, known as eco-gentrification, can lead to a situation where eventually only the relatively wealthy benefit from the designation of new urban green spaces.

Afforestation and prairie management can similarly benefit low-income residents in more rural areas by providing recreational areas for walking, hiking, and hunting. Exposure to nature has been linked to a host of benefits, including improved attention, lower stress, better mood, and reduced risk of psychiatric disorders. Low-income property owners will further benefit from increases in property values that result from increased tree growth and well managed agricultural and wildlife areas. As with efforts to improve green spaces in urban areas, rural areas must also be protected against rising rents and the risk of eco-gentrification.

Waste Management

Programs focused on reducing food waste in Missouri can benefit low-income families by reducing food costs. On average, households could save about $370 per person annually or nearly $1,500 for a family of four by optimizing personal food resources. Furthermore, safe and wholesome food that is often thrown away by restaurants, schools, and businesses could help feed hungry people and reduce food insecurity. Well-fed children have consistent school attendance and tend to perform better at school. Adults with access to secure and healthy meals also take fewer sick days and are more productive at work and home. Holding community outreach and educational events to engage with communities on this issue will have a positive impact by offering a venue to discuss food insecurity issues and empowering community members to participate in solutions to this widespread problem.

Residents on fixed incomes in low-income and disadvantaged communities are disproportionally impacted by rising rates of waste services and trash pickup. Any program addressing waste management should be careful not to result in local increases to rates for waste management and trash services.

Review of Authority

The department has reviewed existing statutory and regulatory authority to implement each priority measure continued in this plan. This plan is non-regulatory in nature and the measures contained herein constitute a list of voluntary actions available to Missouri communities for CPRG Implementation. No new regulatory authority is given by CPRG nor is new authority sought by this plan for CPRG Implementation. The department must seek appropriations authority by the state legislature to spend any CPRG funds awarded, a process which is completed on a yearly cycle based on the state fiscal year. The department has the existing authority to apply for, administer, and subaward federal grants, as described in RSMo 643.060.(2), which is sufficient legal authority for the voluntary implementation of CPRG projects by Missouri communities and other stakeholders.

Intersection with Other Funding Availability

Many of the priority measures included in this plan expand upon or complement existing programs. The department has explored federal and non-federal funding sources to determine whether these sources could fund each priority measure and whether such funding is sufficient to fully implement the measure. This section describes additional available funding programs that can be considered for each project covered by this plan.

Other Funding Sources and Programs Available

Funding for Vehicle Electrification EV Infrastructure and Other Transporting Projects

1) The National Electric Vehicle Infrastructure (NEVI) formula program is a program included in the Bipartisan Infrastructure Law (BIL). The BIL dedicates $5 billion to this program, apportioned to State Departments of Transportation through a standard formula. Through this program, the Missouri Department of Transportation (MODOT) will use nearly $100 million to develop electric vehicle charging infrastructure along Missouri's interstate highways. A plan describing MODOT's NEVI implementation is updated annually as part of this program. [25]

   Per the Joint Office of Energy and Transportation, states must use NEVI funds to install charging equipment only along designated Alternative Fuels Corridors (AFC) until the Joint Office has certified that the State's AFCs meet a minimum standard of four 100 kW charging ports located no further than 50 miles along each corridor. Additionally, these charging stations must be located within one driving mile of the highway corridor, unless an exception is granted on a case-by-case basis.

   Missouri's NEVI efforts may overlap with emissions reduction measures included in this plan for EV charging infrastructure. However, while NEVI is limited exclusively to AFCs and has comparatively high standards for charging rate, CPRG measures related to EV charging can encompass the full range of charging equipment and locations away from the interstate highway system. Additionally, CPRG implementation could include costs not considered eligible through NEVI, but which may still be required in order for charging equipment to be installed at a site, such as line extensions or other utility upgrade costs.

2) The Alternative Fuel Vehicle Refueling Property Tax Credit is a federal corporate tax credit available to businesses and individuals that place qualified refueling property into service during the tax year. The credit for qualified refueling property subject to depreciation equals 6 percent with a maximum credit of $100,000 for each single item of property. Businesses meeting prevailing wage and apprenticeship requirements may be eligible for a 30percent credit with the same $100,000 limit. For qualifying property not subject to depreciation, the credit equals 30 percent of the cost with a maximum amount of $1,000 per item. For property placed in service before January 1, 2023, (including personal property), the credit is 30 percent of the cost of qualified refueling property with a maximum total credit allowed of $30,000 for depreciable property and $1,000 for all other property.

[25] MoDOT's NEVI webpage and plan (modot.org/nevi)

3) The Qualified Commercial Clean Vehicle Tax Credit is a federal corporate tax credit available to businesses and tax-exempt organization that buy a qualified commercial clean vehicle. The maximum credit is $7,500 for qualified vehicles with gross vehicle weight ratings (GVWRs) of under 14,000 pounds and $40,000 for all other vehicles. Eligible vehicles must be made by a qualified manufacturer for use in business (not for resale) primarily in the United States. The vehicle must be a plug-in electric vehicle that draws significant propulsion from an electric motor with a battery capacity of at least 7 kilowatt hours if the gross vehicle weight rating (GVWR) is under 14,000 pounds; 15 kilowatt hours if the GVWR is 14,000 pounds or more; or a fuel cell motor vehicle.

4) The Plug-In Electric Drive Vehicle Tax Credit is a federal personal tax credit administered by the US Internal Revenue Service and available to commercial, industrial, residential and agricultural sectors. This tax credit of up to $7,500 is available for eligible electric vehicle technologies including passenger electric vehicles and plug-in hybrid vehicles.

5) The Previously-Owned Clean Vehicle Tax Credit is a federal personal tax credit available through 2032 for the purchase of pre-owned passenger electric vehicles. The incentive amount is the lesser of 30percent of the cost or $4,000. The vehicle must be purchased through a dealer, have a gross vehicle weight of less than 14,000 pounds, be at least 2 years old and have a sales price of no more than $25,000.

6) The Alternative Fuel Vehicle Refueling Property Tax Credit is a federal personal tax credit available to residential, multifamily residential and low-income sectors for level-2 electric vehicle service equipment. The incentive amount is $30 with a maximum of $1,000.

7) The Congestion and Mitigation and Air Quality Improvement (CMAQ) program is available to states, tribes, localities, transportation providers and nonprofit groups. This program provides a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. CMAQ funds are apportioned to each state and administered through state DOTs or MPOs. Funding is available for transportation projects that reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards including electric vehicles and charging stations, diesel engine replacements and retrofits, transit improvements, bicycle and pedestrian facilities, shared micro mobility projects including shared scooter systems, and more. In addition to improving air quality and reducing congestion, CMAQ projects can improve equitable access to transportation services, improve safety, and promote application of new and emerging technologies.

8) The Charging and Fueling Infrastructure Discretionary Grant Program created under BIL is a competitive grant program to strategically deploy publicly accessible electric vehicle charging infrastructure as well as hydrogen, propane, and natural gas fueling infrastructure along designated Alternative Fuel Corridors or in other publicly accessible locations. This program is available to states, tribes, localities, municipal planning organizations (MPOs), and U.S. Territories (corridor and community projects). Additional eligible entities for community-based projects include housing authorities, parks authorities, public stadium authorities, public development authorities, and other state or local authorities with ownership of publicly accessible transportation facilities. Eligible EV activities include light, medium, and heavy-duty vehicle charging, public transportation charging, commercial charging, and infrastructure planning. Local governments can use this program to complement state efforts initiated under NEVI.

9) The Federal Lands Access Program (FLAP) provides funds for projects on Federal Lands Access Transportation Facilities that are located on or adjacent to, or that provide access to, federal lands. Projects are typically located within 10 miles of the federal land boundary and funds are distributed by formula among states that have federal lands. State DOTs, tribes, and local governments interested in EV infrastructure can apply through their state for FLAP funding for charging infrastructure and transportation planning. Eligible EV activities include light duty vehicle charging, public transportation charging, commercial charging infrastructure planning, workforce development, and vehicle acquisition.

10) The Grants for Buses and Bus Facilities Formula Program provides funding to states and transit agencies through a statutory formula. The statute also includes two discretionary programs through which rural entities can receive funding for EV bus infrastructure and EV fleet acquisition: the Grants for Buses and Bus Facilities Discretionary Program and the LowNo Emissions Bus Discretionary Program. Rural applications to both competitive programs must be submitted by a state, either individually or as part of a consolidated statewide application. Eligible EV activities are public transportation charging and vehicle acquisition.

11) The Rebuilding American Infrastructure with Sustainability and Equity (RAISE) discretionary grant program provides an opportunity for USDOT to invest in road, rail, transit, and port projects that achieve national objectives. The eligibility requirements of RAISE allow project sponsors at the state and local levels to obtain funding for multimodal, multi-jurisdictional projects that are more difficult to support through traditional USDOT programs. For federal FY2021, RAISE increased program focus on zero-emission vehicle infrastructure, including EV charging. Eligible EV activities include LDV charging, infrastructure planning, commercial charging, and public transportation charging

12) The Transportation Alternatives (TA) Set-Aside from the Surface Transportation Block Grant Program provides funding for a variety of generally smaller-scale transportation projects such as pedestrian and bicycle facilities; construction of turnouts, overlooks, and viewing areas; community improvements such as historic preservation and vegetation management; environmental mitigation related to storm water and habitat connectivity; recreational trails; safe routes to school projects; and vulnerable road user safety assessments.

13) The EPA's Diesel Emissions Reduction Act (DERA) Program funds grants and rebates that protect human health and improve air quality by reducing harmful emissions from diesel engines. The program can be used to replace heavy-duty diesel vehicles and equipment with electric vehicles and chargers. DERA has multiple grant programs for different types of applicants and projects including National Grants, Tribal and Insular Area Grants, State Grants, and School Bus Rebates. In 2021, EPA additionally offered a $7 million funding opportunity for electric school bus rebates in underserved communities funded by the American Rescue Plan Act (ARPA) of 2021. Eligible EV activities include commercial charging, public transportation charging, and vehicle acquisition—specifically, the replacement or retrofit of heavy-duty diesel vehicles, engines, and equipment with lower emissions technology, such as EVs and their charging infrastructure. Commercial and public transportation charging equipment is only eligible in combination with vehicle acquisition projects.

14) EPA's Clean School Bus Program (CSB) created under BIL provides $5 billion over 5 years, from FY2022 to FY2026, to replace existing school buses with clean and zero-emission models. The EPA made available up to $965 million in 2022 for zero-emission and low-emission school bus rebates as

the first funding opportunity. Applicants in the 2022 CSB Rebates Program could request funding for the replacement of up to 25 school buses. In addition, 2022 CSB Rebate recipients can use funds for charging infrastructure for up to $20,000 per bus in high-priority school districts and up to $13,000 per bus for all other eligible school districts. EPA anticipates running both a grant and rebate competition in FY2023.

State of Missouri Incentives for Renewables and Efficiency

1) The Show Me Green Sales Tax Holiday for energy efficient appliances is a 100 percent sales tax exemption on sales prices up to $1,500 for Clothes Washers, Dishwashers, Refrigerators/Freezers, Water Heaters, Furnaces, Air Conditioners, and Commercial Refrigeration Equipment. Appliances must be Energy Star certified.

2) The Missouri Clean Energy District is a financing mechanism that offers an affordable financing option for energy-efficient upgrades, which help home and business owners increase efficiency, comfort, and savings. Property Assessed Clean Energy (PACE) financing can pay for new heating and cooling systems, lighting improvements, solar panels, water pumps, insulation, and more for almost any property – homes, commercial, industrial, and agricultural. State and local governments sponsor PACE financing to create jobs, promote economic development, and protect the environment. The cost of the energy saving improvement is then repaid through an assessment on the owner's annual property tax bill. Assessments are tied by a lien to the specific property. If the property is later sold, the assessment and lien stay with the property and become the obligation of the new owner, but the cost-saving benefits of the energy improvements also transfer to the new owner. Properly designed energy saving projects will allow property owners to save more on yearly energy costs than their property tax increase therefore, PACE financing can help property owners achieve a net positive cash flow or economic benefit.

3) Show Me PACE offers a broad range of benefits to commercial building owners, as well as energy efficiency/renewable energy contractors. Commercial, industrial, agriculture, multi-family residential, nonprofit and public (governmental) properties are eligible for this program. PACE financing is all private capital, with no taxpayer funds. The financing is repaid with an annual assessment on the property. Show Me PACE lenders offer 100 percent upfront financing for eligible improvements through fixed-rate loans for up to 20 years. A key requirement is that the benefits of the project – such as energy savings and reduction in operating and maintenance expenses – must exceed the cost of the measures. Eligible renewable technologies include solar, wind and biomass projects, geothermal heat pumps, daylighting, geothermal direct-use, and other distributed generation technologies. Eligible efficiency technologies include equipment insulation, lighting, furnaces, boilers, heat pumps, air conditioners, heat recovery, energy management, systems/building controls, caulking/weather-stripping, building insulation, as well as windows and doors.

4) Set the PACE St. Louis provides commercial PACE for businesses located in the City of St. Louis. The Set the PACE program connects participants with capital providers offering private funding for energy efficiency and renewable energy projects. The Set the PACE St. Louis program was developed in 2012. After passing an Ordinance and creating the Clean Energy Development Board, the City's Office of Sustainability and St. Louis Development Corporation launched the program in 2013 as an

innovative financing tool designed to support sustainability projects on building in the City of St. Louis.

5) The Missouri Energy Savings Program (MOESP), the official St. Louis County PACE Clean Energy Development Board, provides commercial PACE. MOESP is an Open-Market Commercial PACE program, which connects businesses with multiple capital providers willing to fund energy efficiency projects and renewable energy systems at St. Louis County-based facilities. The program provides funding for both retrofits and new construction. St. Louis County established the MOESP in December 2011, under Ordinance No. 69056. The ordinance established a Clean Energy Development District and associated Board to administer a PACE program within St. Louis County.

6) Missouri Division of Energy Programs
   - Missouri Energy Loan Program - The Missouri Department of Natural Resources offers low-interest loans to communities for qualifying energy-saving investments and energy efficiency and renewable energy projects. Eligible recipients include public schools and higher education institutions; public and nonprofit hospitals, schools, and libraries; and local government facilities. Loans can be used for a variety of equipment to reduce energy use such as lighting systems, renewable energy, ventilation and air conditioning systems, as well as building shell improvements like insulation.
   - Grid Resilience Formula Funding - The Bipartisan Infrastructure Law (BIL) provides formula-based funds to states to improve electric grid resilience against disruptive events. Utility pole management, power line relocation, replacement of power line conductors, and microgrids are all eligible for funding. Additionally, the training, recruitment, retention, and reskilling of workers to perform the work required for eligible measures are also eligible for funding. The Department of Natural Resources received around $13 million for the first two years of the program and is working to finalize the program materials for public release.
   - Residential Weatherization Assistance - The Department of Natural Resources administers funds to a network of eighteen local weatherization agencies to provide services and education to eligible clients. Allocations to these agencies are based on the percentage of the state's total low-income households within each service area. The program has weatherized more than 193,000 homes since 1977.
   - State Energy Program - The Bipartisan Infrastructure Law included a one-time supplement to the annual funding for the State Energy Program (SEP). SEP funding can be used with no required matching funds for broad topics related to energy education, workforce development, electric vehicles, energy efficiency, and other activities related to energy. Because this additional funding is not guaranteed or recurring, the department is considering how to use it most effectively to fill gaps between other funding sources including CPRG.
   - Energy Efficiency and Conservation Block Grant Program - The department plans to pass the majority of the funding to local governments for projects in line with the eligible federal project categories with the general goal of increasing energy efficiency, energy conservation, and emissions reduction. Projects could include strategy development, building energy audits, financial incentives for energy efficiency, transportation energy efficiency projects, the reduction and/or capture of landfill gasses, and onsite renewable generation, among other project types. The department will focus on local governments that did not already qualify for direct federal funding; with a preference for anticipated benefits to disadvantaged communities and small-to-medium size communities.
   - Home Energy Rebates Program - The Inflation Reduction Act created two Home Energy Rebates Programs. In Missouri, $75.8 million will support whole-home energy efficiency improvements

under the Home Efficiency Rebates Program based on achieved and/or modeled savings. An additional $75.4 million will support high-efficiency residential electric measures (e.g., heat pumps) under the Home Electrification & Appliance Rebates Program in low-to-medium income households. The programs are not yet available to Missourians, as the state still needs to apply for the funds and establish the programs.

7) The Inflation Reduction Act's Greenhouse Gas Reduction Fund (GGRF) released the Solar for All grant competition in June 2023. This grant opportunity is intended to expand the number of low-income and disadvantaged communities primed for residential solar investment. It will award up to 60 grants to states, territories, tribal governments, municipalities, and eligible nonprofits to create and expand low-income solar programs that provide financing and technical assistance, such as workforce development, to enable low-income and disadvantaged communities to deploy and benefit from residential solar. Missouri's Environmental Improvement and Energy Resources Authority (EIERA) has applied to receive a portion of the $7 billion Solar For All grant to create drivers and catalyze financing which will increase the adoption of solar among low-income and disadvantaged communities across all regions statewide.

Federal Incentives for Renewables and Efficiency

1) The Energy-Efficient New Homes Tax Credit for Home Builders is a corporate tax credit for the construction sector. Comprehensive whole-building measures that improve energy efficiency are eligible for various amounts up to $5,000. The Inflation Reduction Act of 2022 established new eligibility criteria for this tax credit, different tax credit values, and opportunities for bonus credits for multifamily units. Single-family homes and manufactured homes that meet the applicable Energy Star requirements can receive a tax credit of $2,500. Single-family homes and manufactured homes that are certified as a zero energy ready homes under the Zero Energy Ready Home Program of the U.S. Department of Energy, can receive a tax credit of $5,000. Multifamily homes that meet the applicable Energy Star Multifamily New Construction Program requirements can receive a tax credit of $500 per unit. Multifamily homes that meet the applicable Energy Star Multifamily New Construction Program requirements and pay prevailing wages to the laborers and mechanics employed to construct the building can receive a higher tax credit of $2,500 per unit. Multifamily homes that are certified as a zero-energy ready home under the Zero Energy Ready Home Program of the U.S. Department of Energy, can receive a tax credit of $1,000 per unit. Multifamily homes that are certified as a zero-energy ready home under the Zero Energy Ready Home Program of the U.S. Department of Energy, and pay prevailing wages to the laborers and mechanics employed to construct the building, can receive a higher tax credit of $5,000 per unit.

2) The Renewable Electricity Production Tax Credit (PTC) is a per kilowatt hour (kWh) federal tax credit included under Section 45 of the U.S. tax code for electricity generated by qualified renewable energy resources. The PTC provides a corporate tax credit of up to 1.3 cents per kWh for electricity generated from landfill gas (LFG), open-loop biomass, municipal solid waste resources, and small irrigation power facilities, or up to 2.6 cents per kWh for electricity generated from wind, closed-loop biomass and geothermal resources. The credit is good for 10 years after the equipment is placed in service.

3) The Business Energy Investment Tax Credit (ITC) is a federal corporate tax credit available to the commercial, industrial, investor-owned utility, cooperative utilities, and agricultural sectors. Eligible renewable and other technologies include solar water heat, space heat, geothermal electric, solar

thermal electric, solar thermal process heat, solar photovoltaics, wind, geothermal heat pumps, municipal solid waste, combined heat and power, fuel cells using renewable and non-renewable fuels, tidal, geothermal direct-use, micro turbines, micro grid controllers and interconnection property. The incentive amount consists of the base credit of 6 - 30percent depending on project status and labor factors, a 10percent additional domestic content bonus, a 10percent additional energy community bonus, a 10percent additional low-income community bonus and a 20percent additional low-income residential building or low-income economic benefit bonus.

4) The Low Income Home Energy Assistance Program (LIHEAP) is a federal grant program administered by the US Department of Health and Human Services available to tribal governments and low income residents. LIHEAP provides federally funded assistance to reduce the costs associated with home energy bills, energy crises, weatherization, and minor energy-related home repairs. Incentive amounts vary.

5) The Residential Energy Efficiency Tax Credit is a federal personal tax credit administrated by the US Internal Revenue Service. These federal income tax credits are available through 2032 providing up to $3,200 annually to lower the cost of energy efficient home upgrades by up to 30 percent. Improvements such as installing heat pumps, heat pump water heaters, insulation, doors and windows, as well as electrical panel upgrades, home energy audits, and more, are covered by the tax credits and can help families save money on their monthly energy bills for years to come. In addition to the energy efficiency credits, homeowners can also take advantage of the modified and extended Residential Clean Energy credit, which provides a 30 percent income tax credit for clean energy equipment, such as rooftop solar, wind energy, geothermal heat pumps and battery storage through 2032, stepping down to 22 percent for 2033 and 2034.

6) The US Department of Energy – Loan Guarantee Program is a federal loan program. This loan program is available to commercial, industrial, local governments, nonprofit, schools, state governments, and the agricultural and institutional sectors. Eligible technologies include geothermal electric, solar thermal electric, solar thermal process heat, solar photovoltaics, wind, biomass, hydroelectric, fuel cells using renewable and non-renewable fuels, landfill gas, tidal, wave, ocean thermal, and daylighting. Full repayment is required over a period not to exceed the lesser of 30 years or 90percent of the projected useful life of the physical asset to be financed.

7) The Energy-Efficient Commercial Buildings Tax Deduction is a federal corporate tax deduction administered by the US Internal Revenue Service available to commercial and construction sectors and state and federal governments. Eligible efficiency technologies include equipment insulation, water heaters, lighting, lighting controls/sensors, chillers, furnaces, boilers, heat pumps, air conditioners, caulking/weather-stripping, duct/air sealing, building insulation, windows, siding, roofs, comprehensive measures, and tankless water heaters. The incentive amount is $.030 - $1.80 per square foot, depending on technology and amount of energy reduction. Buildings must be certified as meeting specific energy reduction targets as a result of improvements in interior lighting, building envelope, or heating, cooling, ventilation or hot water systems.

8) The Residential Renewable Energy Tax Credit is a federal personal tax credit administered by the US Internal Revenue Service. This tax credit is available to residential sectors and eligible renewables and other technologies include solar water heat, solar photovoltaics, biomass, geothermal heat pumps, wind, and fuel cells using renewable fuels. The incentive amount varies. The solar water heating property must be certified by Solar Rating and Certification Corporation (SRCC) or a

comparable entity endorsed by the state where the system is installed. At least half the energy used to heat the dwelling's water must be from solar. Excess credit generally may be carried forward to next tax year.

9) The USDA – High Energy Cost Grant Program is a federal grant program administered by USDA Rural Utilities Service. This is an ongoing grant program for the improvement of energy generation, transmission, and distribution facilities in rural communities. Eligibility is limited to projects in communities that have average home energy costs at least 275 percent above the national average. Retail power suppliers serving rural areas are eligible to apply for grant funding, including non-profits (cooperatives and limited dividend or mutual associations), commercial entities, state and local governments entities, and tribal governments. Eligible projects include:
    - Electric generation, transmission, and distribution facilities;
    - Natural gas or petroleum storage or distribution facilities;
    - Renewable energy facilities used for on-grid or off-grid electric power generation, water or space heating, or process heating and power;
    - Backup or emergency power generation or energy storage equipment; and
    - Weatherization of residential and community property, or other energy efficiency or conservation programs.

    This grant program is not limited to renewable energy or energy conservation and efficiency measures, but these measures are eligible for this grant program.

10) The Fannie Mae Green Financing – Loan Program is a federal loan program that provides mortgage financing to apartment buildings and cooperatives (with 5 or more units) to finance energy and water efficiency property improvements. Its green financing programs include Green Rewards, and preferential pricing for loans secured by a property with an eligible Green Building Certification. Eligible renewables include solar photovoltaics and low-flow water fixtures. Eligible efficiency technologies include clothes washers, dishwashers, dehumidifiers, water heaters, lighting, furnaces, boilers, heat pumps, air conditioner, caulking/weather stripping, duct/air sealing, building insulation, windows, roofs, comprehensive/whole building measures, insulation, and tankless water heaters. The interest rate benefit varies on these types of loans.

11) The USDA – Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program is a federal loan program administered by the US Department of Agriculture and available to commercial, construction, industrial, investor-owned utility, agricultural and institutional sectors, municipal and cooperative utilities, state, local, federal and tribal governments. Eligible renewables and technologies include biomass, municipal solid waste, landfill gas renewable and biofuels. Entities are eligible for a maximum loan amount up to 80percent of project costs or $250 million.

12) The USDA – Rural Energy for America Program, Energy Audit and Renewable Energy Development Assistance Program is a federal grant program available to local, state, federal governments, schools and the agricultural and institutional sectors. This grant program provides assistance to agricultural producers and rural small businesses for energy audits and renewable energy technical assistance including renewable energy site assessments. Eligible project costs for eligible applicants includes salaries directly related to the project, travel expenses directly related to conducting energy audits or renewable energy development assistance, office supplies, administrative expenses up to a maximum of 5 percent of the grant, which include but are not limited to utilities, office space, operation expenses of office and other project related equipment.

Funding for Urban Agriculture, Composting and Food Waste

1) Composting and Food Waste Reduction Cooperative Agreements are available to assist local and municipal governments with projects that develop and test strategies for planning and implementing municipal compost plans and food waste reduction plans. Implementation activities will increase access to compost for agricultural producers, improve soil quality and encourages innovative, scalable waste management plans that reduce and divert food waste from landfills.

2) The Community Food Projects Competitive Grant Program addresses the disparities in access to healthy foods experienced by low-income communities. These grants are available to private nonprofit entities to address food insecurity and might be a good fit for projects focused on reducing food waste.

3) The National Association of Conservation Districts (NACD) Urban and Community Conservation Grant Initiative is designed to enhance districts' urban agriculture conservation technical assistance activities in developed and developing areas of both urban and rural communities. Through these grants, conservation districts increased their capacity related to urban technical assistance and small-scale conservation, while addressing community needs in both rural and urban contexts. Grantees have successfully partnered with a multitude of organizations to support community farming and gardening programs. Opportunities for grantees include expanded outreach capacities to current and underrepresented clients, planned operations to extend growing seasons and projects to reduce food waste and encouraging composting.

Funding for Natural Land Conservation, Afforestation and Prairie Restoration

1) The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) in Missouri provides technical and financial assistance for qualifying farmers and landowners through the Regional Conservation Partnership Program (RCPP). The conservation-focused projects funded by RCPP overlap the goals of CPRG by increasing avenues for carbon sequestration. Notable RCPP projects and associated Missouri counties with projects are:
    - **Program Restoring & Improving Monarch Ecosystems (PRIME)** (*Andrew, Atchison, Benton, Buchanan, Caldwell, Carroll, Cass, Clay, Clinton, Daviess, DeKalb, Gentry, Grundy, Harrison, Henry, Holt, Jackson, Johnson, Lafayette, Livingston, Mercer, Nodaway, Pettis, Platte, Ray, Saline, and Worth counties*): This project aims to increase monarch and pollinator habitat in northwest Missouri through land management practices, with emphasis on prescribed burning and short-term land rental payments. PRIME will target lands currently enrolled in and expiring from Conservation Reserve Program (CRP), enhancing monarch habitat by maintaining and restoring diverse native plant communities. Pheasants Forever and Quail Forever are the lead partners on this project.
    - **Grassland Bird and Grazing Lands Enhancement Initiative** (*Adair, Andrew, Atchison, Barton, Bates, Benton, Caldwell, Carroll, Cass, Cedar, Dade, Daviess, Dekalb, Gentry, Grundy, Harrison, Henry, Holt, Jasper, Johnson, Lawrence, Livingston, Mercer, Nodaway, Pettis, St. Clair, Sullivan, Vernon, and Worth counties*): This project assists landowners to incorporate native warm-season forages on privately owned grazing operations and other lands capable of supporting Northern Bobwhite Quail and Greater Prairie Chicken habitat. The Missouri Department of Conservation is the lead partner on this project.
    - **Sand Prairie Restoration Partnership Program** (*Butler, Dunklin, Mississippi, New Madrid, Pemiscot, Scott, and Stoddard counties*): This project focuses on the restoration and protection

of sand prairie communities on private land through voluntary perpetual easements. Perpetual easements will help protect this critically endangered native community, providing essential habitat for multiple threatened and endangered species. The Missouri Department of Conservation is the lead partner on this project.

- **Precision Farm Data & Strategic Buffer Project** (*Chariton, Lafayette, Linn, Macon, Pettis, Randolph, and Saline counties*): This project focuses on utilizing on-farm yield data to identify non-profitable or marginal cropland acres to strategically establish field borders, pollinator habitat, wetlands and more to maximize profitability while improving water quality and wildlife habitat. The Missouri Department of Conservation is the lead partner on this project.
- **Restoring Glade and Woodland Communities for Threatened Species in the Ozarks of Southeast Missouri** (*Bollinger, Butler, Carter, Iron, Madison, Oregon, Perry, Reynolds, Ripley, Shannon, St. Francois, St. Genevieve, and Wayne counties*): This project focuses on the restoration of glade, woodland, and forest habitats on private land for at-risk species such as the Indiana Bat, Gray Bat, Mead's Milkweed, Hine's Emerald Dragonfly, Ozark Hellbender, and the Grotto Sculpin. Practices that protect subsurface water quality will be implemented in the Karst area of Perry County to protect the Grotto Sculpin. The Missouri Department of Conservation is the lead partner on this project.

  James River Headwaters

The RCPP promotes coordination of NRCS conservation activities with partners that offer value-added contributions to expand their collective ability to address on-farm, watershed, and regional natural resource concerns. Through RCPP, NRCS seeks to co-invest with partners to implement projects that demonstrate innovative solutions to conservation challenges and provide measurable improvements and outcomes tied to the resource concerns they seek to address.
Individuals and entities are eligible to participate in RCPP.

2) The Missouri Department of Conservation (MDC) offers communities and partners a number of grant and cost-share options to assist with everything from green development to wildlife habitat to enhancing outdoor recreation opportunities.
   - The MDC's Community Conservation Cost-Share Program promotes sustainable development practices and the establishment of natural resource conservation practices in municipal and developing areas. Cost-share is authorized for activities such as native grass and pollinator plantings, forest and woodland management, invasive species control, and aquatic resource management. In addition, other practices eligible for cost-share include urban green space planning, engineered drawings, and training of staff on conservation-related programs.
   - The Community Forestry Cost-Share is designed to assist Missouri communities with improving their community forest. This cost-share program encourages communities to have a sustainable, balanced, and comprehensive community forestry program based on a current tree inventory and managed with the guidance of a community forestry professional. The Community Forestry Cost-Share is designed to promote community forest benefits through the proper management and care of trees. Cost-share opportunities available under the Community Forestry Cost-Share include: municipal tree ordinance development, development of a written community tree management plan, a community readiness plan for addressing exotic insect disease outbreaks,; community tree inventories, management of ash (Fraxinus sp.) trees, training of city employees and volunteers to improve community forestry, purchase of tree-care education materials, development and/or distribution of tree-care-related educational materials, removal of critical-risk trees, pruning, tree planting, and other opportunities to further community forestry.

- The Land Conservation Partnership Grant is a competitive, matching grant to help communities acquire land or easements and provide opportunities for land conservation or outdoor recreation access. The Land Conservation Partnership Grant has four partnership opportunities:
  - The **Outdoor Recreation Infrastructure Program** is a reimbursement-based grant program for enhancing public access and opportunities for citizen engagement in conservation-related outdoor recreation through the development of outdoor recreation infrastructure. Examples of possible projects include a community trail system that connects urban residents to natural habitats, an outdoor pavilion, an outdoor community archery range, or a public fishing dock.
  - The **Conservation Land Acquisition Program** provides financial assistance to local governments and non-profit organizations for acquiring lands through fee title to be held and managed by the partner. The purposes of the grant are to: provide public access to lands, which allow citizens to discover and connect to nature and participate in related outdoor recreation activities, and to enhance long-term conservation of wildlife species, habitats, and ecosystem services through protection of lands having important conservation value.
  - The **Conservation Easement Assistance Program** provides financial assistance to land trusts and local governments for acquiring conservation easements on privately-owned land having especially high conservation value. The primary purpose of the grant is to provide long-term habitat protection of land that has especially high conservation value for wildlife, water quality, outdoor recreation, and/or other ecosystem services. Projects selected for funding will be eligible for 100percent MDC reimbursement of the costs associated with establishing a donated conservation easement (e.g., drafting, closing costs, stewardship fees, etc.). The program currently does not pay landowners for the value of the conservation easement but is being reviewed to assess the feasibility of doing so for especially important tracts.
  - The **Land Conservation Innovations Program** is an open-ended solicitation of ideas for partnership to advance land conservation in Missouri. The program critically selects projects while maintaining flexibility in the types of projects partners can submit. Funding will be based on available funds, viability of the proposal, and the extent to which the project advances MDC's land conservation goals. This program seeks innovative ways to advance protection of important tracts and landscapes across the state, or for building organizational/collaborative capacity that will ultimately lead to these protections. Examples include funding for training that Missouri land trusts could attend to bring them closer to accreditation, funding a partner position geared towards orchestrating land conservation opportunities in a priority landscape, or conducting landowner outreach.

3) Through its on-the-ground conservation programs, the National Forest Foundation (NFF) supports action-oriented projects that directly enhance the health and well-being of America's National Forests and Grasslands and that engage the public in stewardship. Nonprofit organizations dedicated to addressing natural resource issues on National Forests and Grasslands can apply for support to complete projects through three distinct grant programs.

   Additionally, the NFF provides funding opportunities that address specific strategic initiatives aligned with our mission and goals. The following grant programs are open invitation to nonprofits, universities and tribes, state and local governments and business.
   - The Matching Awards Program is focused on community engagement and stewardship activities that connect people to forests:

- The Community Capacity and Land Stewardship program is focused on increasing the capacity of organizations implementing large-scale restoration projects; and
- Ski Conservation and Forest Stewardship funds focus on on-the-ground conservation and restoration projects that improve forest health and outdoor experiences.

4) The Community Forest and Open Space Conservation Program of the US Forest Service offers a unique opportunity for communities to acquire and conserve forests that provide public access and recreational opportunities, protect vital water supplies and wildlife habitat, serve as demonstration sites for private forest landowners, and provide economic benefits from timber and non-timber products.

Funding for Waste Management and Water Treatment

1) The Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) program is a federal credit program administered by EPA for eligible water and wastewater infrastructure projects. Eligible borrows are local, state and tribal government entities; partnerships and joint ventures; corporations and trusts; and clean water and drinking water state revolving fund (SRF) programs. The WIFIA program can fund development and implementation activities for edible projects under Missouri's clean water SRF and enhanced energy efficiency projects at drinking water and wastewater facilities.

2) The EPA's Landfill Methane Outreach Program provides information on various resources that are available to provide financing or incentives for landfill gas (LFG) energy projects, including tax credits and exemptions, production incentives, loans, and grants.

3) The Renewable Electricity Production Tax Credit (PTC) is a per kilowatt hour (kWh) federal tax credit included under Section 45 of the U.S. tax code for electricity generated by qualified renewable energy resources. The PTC provides a corporate tax credit of up to 1.3 cents per kWh for electricity generated from landfill gas (LFG), open-loop biomass, municipal solid waste resources, and small irrigation power facilities, or up to 2.6 cents per kWh for electricity generated from wind, closed-loop biomass and geothermal resources. The credit is good for 10 years after the equipment is placed in service.

Coordination and Outreach

The department conducted extensive intergovernmental coordination and public outreach in the development of this plan. This section describes the framework the department used to support robust and meaningful engagement strategies to ensure comprehensive stakeholder representation and overcome obstacles to engagement, including linguistic, cultural, institutional, geographic, and other barriers.

Identification of Stakeholders

The department identified stakeholders representative of the entities, groups, and individuals who may be impacted by implementation of this plan. Stakeholders included, without limitation:

- Other state agencies;
- Metropolitan planning organizations;
- Economic development organizations;
- Environmental advocates;
- Industrial associations;
- Automotive associations;
- Utilities;
- Agricultural associations;
- Waste management organizations;
- Industrial organizations;
- Consumer advocates;
- Local elected officials;
- Community-based organizations;
- Chambers of commerce;
- Other interested organizations; and
- Residents of Missouri

To identify stakeholders, the department contacted local elected officials, community organizations, and advocacy organizations known to be interested in clean energy infrastructure and practices.

Interagency and Intergovernmental Coordination

The department reached out to executive agencies within Missouri to assist in soliciting project ideas from their direct stakeholders and interested parties. The department provided an email to the agencies, sharing information regarding the program and website links to the project idea submission form. The form collects key information on proposed projects from stakeholders.

The following table lists the delegated points of contact from each Missouri State Agency that was included in the department's outreach efforts:

Table 4: Missouri State Agency and Program Contact

Agency	Department Points of Contact
Department of Agriculture	Chris Klenklen, Deputy Director

Agency	Department Points of Contact
Department of Transportation	Llans Taylor, Planning and Programming Coordinator
Department of Conservation	Matt Vitello, P.E., Policy Coordinator
Department of Economic Development	Gloria Nobel, Regional Engagement Team
DNR Division of Energy	Wesley Fitzgibbons, Associate Engineer
DNR Division of State Parks	Lindsey Latham, Grants Section Chief
Public Service Commission	Alex Antal, Policy Advisor
Department of Higher Education and Workforce Development (DHEWD)	Alicia Erickson, Senior Associate Research Analyst Postsecondary Policy
Office of Administration Facilities Management Design and Construction FMDC	Brian Yansen, Director

Outreach Plan

The department's general outreach and public engagement included a combination of online and electronic communication and in-person and webinar presentations. The following material, events, and activities encompass the CPRG outreach efforts to date.

Existing Online resources:

- State CPRG webpage: Climate Pollution Reduction Grants (CPRG) Program | Missouri Department of Natural Resources (mo.gov);
- CPRG Stakeholder Group webpage: Climate Pollution Reduction Grants (CPRG) Stakeholder Group | Missouri Department of Natural Resources (mo.gov)
- Missouri CPRG Community Engagement Survey: Missouri Climate Pollution Reduction Grant (CPRG) Community Engagement Survey (surveymonkey.com)
- Missouri CPRG Project Idea Submission form: Missouri Climate Pollution Reduction Grant Project Idea Submission MO 780-3038 | Missouri Department of Natural Resources

Communication efforts:

- Interested parties and stakeholders email list;
- Contacts listed including email: CPRGTeam@dnr.mo.gov
- Missouri CPRG Community Kickoff Presentation: climate-pollution-reduction-grant-presentation-1-community-kickoff.pptx (live.com)
- Missouri CPRG Sector Details Workshop Presentation: climate-pollution-reduction-grant-presentation-2-sector-detail-workshop.pptx (live.com)

CPRG Sub-grants:

- Funding provided for community meetings across the state with options for in-person, livestream, and video conference participation;
- Targeted outreach to known community-based organizations;
- Email deliveries and flyers; and
- Disseminate information about how to provide input to attendees.

Public Participation on Proposed Plan:

The department made the draft version of this plan available for public review and comment prior to finalizing it, specifically –

- Notice of the availability of the draft plan was posted on the department's website by January 9, 2024.
- The department opened a public comment period for the draft plan on January 9, 2024 after posting it on the website. The public comment period closed on February 7, 2024. Appendix E of this final plan includes all comments and new project ideas submitted during the public comment period. It also includes an explanation of the changes the department made to the draft plan prior to finalizing it.
- After posting the draft plan, the department sent an email announcement to notify the public of the availability of the draft plan and the corresponding public review and comment period. Email recipients included all individuals who have signed up to receive email updates for air program public notices, and anyone signed up to receive updates on Missouri's CPRG activities.
- The department also hosted a public meeting on January 25, 2024 to present a summary of the draft plan and offer interested stakeholders an opportunity to ask questions about the draft plan prior to finalizing it.

The department's CPRG Webpages: Climate Pollution Reduction Grants (CPRG) Program | Missouri Department of Natural Resources (mo.gov) provide details on the this program and direct links to EPA's website with complete program information. The webpages housed sections calling for project ideas to include in this plan using the Missouri CPRG Project Idea Form. The webpage also included a survey link to gather and analyze stakeholder input for consideration in the development of the plans under this grant program.

All interested parties are welcome to subscribe to receive updates on the department's progress under this and/or join the department's stakeholder group dedicated to this grant program. All meetings for the stakeholder group are posted to the webpage and the department sends electronic invitations to participants. Accommodations for hearing- and speech-impaired individuals are available for these meetings, and translation or interpretation services are provided upon request. Links to the Kansas City Region Climate Action Plan and OneSTL Regional Climate Action are also provided, as the Mid-America Regional Council and East-West Gateway Council of Governments are the lead agencies for CPRG for the Kansas City and St. Louis areas, respectively.

Outreach by Regional Planning Groups in the Kansas City and St. Louis Areas

The Kansas City Regional Climate Action Plan webpage (Climate Action Plan – Net Zero Kansas City Region by 2050 (kcmetroclimateplan.org)) includes information on how Kansas City communities can participate in developing project ideas for CPRG implementation funding. Through Workshops and Community Coalition Meetings hosted by MARC, Kansas City area residents have the opportunity to provide input and receive education on how this grant program can benefit their communities. The public can stay informed through the website, the latest newsletters or by contacting MARC. The KC Regional Climate Action Plan provides more detail on all community engagement efforts in the Kansas City area.

The OneSTL Regional Climate Action plan webpage (OneSTL - Regional Climate Action) lists many opportunities for public engagement including:

- Six regional working groups which meet on a regular basis to implement strategies reducing GHG emissions:
  - Water and Green Infrastructure;
  - Materials and Recycling;
  - Transit Oriented Development;
  - Energy and Emissions;
  - Biodiversity; and
  - Food Access
- OneSTL Network provides members a structure for communication and collaboration, including regular updates. Membership in this network is free of charge;
- The OneSTL Network Newsletter: OneSTL - Newsletters; and
- Social media presence on Facebook, LinkedIn, Instagram and YouTube.

EWGW provides opportunities to all members of the St. Louis community, including low-income and disadvantaged residents, to engage in CPRG planning and education. Contact information is listed on the OneSTL website including address, phone, fax and email.

Public Outreach by Subgrantees

The department extended the opportunity to apply for planning sub-grants to all eligible Missouri entities. Local governments and municipalities were informed of the opening of applications by an email bulletin, which was sent to subscribers of the Air Program Advisory Forum, Air Public Notices, CRPG Program, Electric Vehicle Infrastructure Workgroup, Missouri Clean Diesel Program and Volkswagen Trust mailing lists. The announcement and accompanying information and application forms were also posted on the department's website. Sub-grants were awarded to five municipalities and community groups for the purpose of conducting a minimum of three outreach meetings to help solicit project ideas to include in this plan. Subgrantees agreed to use presentations provided by the department to inform and educate the public about opportunities available under the CPRG program and to disburse the project idea submission form to meeting attendees. Target groups for outreach events were marginalized, underserved, and overburdened residents in each community. Subgrantees were directed to seek out and involve these groups to the extent possible. The following is a list of the subgrantees that received awards of up to $10,000:

Table 5: Planning Subgrantees

Award #	Applicant/Entity	Award Amount
CPRG24-HARR-01	Harry S Truman Coordinating Council	$10,000.00
CPRG24-COLU-02	City of Columbia	$6,960.00
CPRG24-HIGG-03	City of Higginsville	$1,120.00
CPRG24-MERA-04	Meramec Regional Planning Commission	$10,000.00
CPRG24-SOUT-05	Southwest Missouri Council of Governments	$10,000.00

To receive reimbursement for eligible activities, subgrantees submitted a final report describing meeting outcomes, including summaries of any project proposals from meeting attendees. The final reports for all sub-grantees are included in Appendix C. Eligible activities were restricted to those activities directly related to public engagement for the CPRG planning grant, including:

- Staffing and contractual costs necessary to public engagement;
- Planning and implementing meetings, workshops, and convenings to foster engagement;
- Outreach and education for stakeholders and members of the public;
- Evaluation and metrics-tracking activities;
- Supplies (e.g. office supplies, software, printing, etc.);
- Incidental costs related to the above activities, including but not limited to travel, membership fees, and indirect costs;
- Other allowable activities as necessary to complete the required engagement; and/or
- Light refreshment served only with prior approval.

Table 6: Summary of the reported outcomes for subgrantees

Sub-grantee	1st meeting	2nd meeting	3rd meeting	4th meeting	Total number of attendees
Harry S Truman C.C.	November 2, 2023 12:00 pm	November 13, 2023 9:15 am	November 14, 2023 9:00 am	November 16, 2023 10:30 am	75
City of Columbia	November 2, 2023 1:30 pm	November 3, 2023 5:30 pm	November 9, 2023 5:30 pm	N/A	75
City of Higginsville	November 6, 2023 6:00 pm	November 20, 2023 6:00 pm	December 5, 2023 6:00 pm	N/A	81
Meramec Regional Planning Commission	November 14, 2023 2:00 pm	November 15, 2023 10:00 am	November 30, 2023 3:00 pm	N/A	20
Southwest Missouri Council of Governments	November 15, 2023 10:00 am	November 15, 2023 5:30 pm	November 29, 2023 10:00 am	Virtual/Video Recording	56

Strategies for Linguistic, Cultural, Institutional, and Geographic Barriers to Participation

Stakeholder meetings and other outreach activities held by the department were offered both in person and virtually, allowing for flexibility in attendance for individuals across the state. Likewise, subgrantees are required to hold a minimum of three outreach meetings with at least one with an in-person option. The sub-grantee recipients are located in various communities around the state covering a wide geographic area. Subgrantees were encouraged to engage low-income and disadvantaged communities

and support participation by those communities through convenient scheduling of meeting times and locations.

The department's CPRG website states that accommodations for hearing- and speech-impaired individuals is available for all meetings, and translation or interpretation services are provided upon request at no additional charge. The department's CRPG Grant Kickoff Webinar and CPRG Funding Kickoff Webinar were recorded and posted to the CPRG website along with the agenda and all meeting materials.

Outreach Events and Meetings

The department held the following outreach events to encourage public participation in the CPRG planning process and to solicit project ideas:

Table 7: CPRG Outreach Events

Event	Date Time/Location	Purpose	Audience	Materials
CPRG Grant Kickoff Webinar	August 14, 2023 1:00-2:30 PM Virtual via WebEx	To provide an overview of the program and discuss upcoming subgrant and public participation opportunities	Anyone interested in the CPRG program	Agenda, video recordings and meeting materials available on the state's CPRG Webpage[26]
CPRG Funding Kickoff Webinar	September 28, 2023 2:00-4:00 PM Virtual via WebEx	To provide an overview of the application process for subgrants	Eligible municipalities	
State of Missouri Executive Agency Outreach meeting	November 9, 2023 2:00-3:00 PM Virtual via WebEx	Establish contacts to help reach agency stakeholders for the gathering of project ideas	Directors and representatives of MO state agencies interested in CPRG program	Outreach email with link to project submission form
CPRG meeting with Division of Energy	November 20, 2023 2:00-3:00 PM APCP Conference Room, Jefferson City, MO	To discuss project ideas and collaboration opportunities with the MO Division of Energy	Emily Wilber, Director, Division of Energy and Wesley Fitzgibbons, Associate Engineer	

[26] Climate Pollution Reduction Grants (CPRG) Program | Missouri Department of Natural Resources (mo.gov)

Event	Date Time/Location	Purpose	Audience	Materials
In addition, the CPRG planning team has held several meetings and phone calls with Missouri Department of Natural Resources Programs, State of Missouri executive departments, Mid America Regional Council (MARC), East-West Gateway Council of Governments, local municipalities, non-profit organizations and consultants.				

Appendix A: Missouri Greenhouse Gas Emissions Inventory

Table 1. Missouri GHG emissions in MMT CO_2e by Sector[27]

Sector/Source	2005	2021
Transportation	43.6	38.1
CO_2 from Fossil Fuel Combustion	41.0	37.0
Substitution of Ozone Depleting Substances	1.5	0.6
Mobile Combustion	0.7	0.3
Non-Energy Use of Fuels	0.3	0.2
Electric Power Industry	80.4	61.4
CO_2 from Fossil Fuel Combustion	79.0	60.2
Stationary Combustion	1.0	1.0
Incineration of Waste	0.0	NO
Electrical Equipment	0.3	0.1
Other Process Uses of Carbonates	0.0	0.0
Industry	18.5	16.8
CO_2 from Fossil Fuel Combustion	10.1	6.5
Natural Gas Systems	1.4	1.2
Non-Energy Use of Fuels	1.0	0.3
Petroleum Systems	0.0	+
Coal Mining	0.0	+
Iron and Steel Production	0.1	+
Cement Production	2.5	4.4
Substitution of Ozone Depleting Substances	0.2	0.6
Petrochemical Production	NO	NO

[27] Data were obtained from EPA's State-level GHG inventories file State-GHG_Trends_Emissions__Sinks_Economic_Sector_08312023.xlsx, which was accessed on December 18, 2023. This data set is available at <https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals>.
NO = Not occurring
Symbols:
"-" indicates that the value has not be estimated at this time or is not applicable to the state
"+" indicates that the value does not exceed 0.005 MMT CO_2e

Sector/Source	2005	2021
Lime Production	0.5	2.2
Ammonia Production	NO	NO
Nitric Acid Production	0.7	0.3
Abandoned Oil and Gas Wells	0.0	0.0
Wastewater Treatment	0.2	0.2
Urea Consumption for Non-Agricultural Purposes	0.1	0.1
Mobile Combustion	0.2	0.1
Abandoned Underground Coal Mines	NO	NO
Adipic Acid Production	NO	NO
Carbon Dioxide Consumption	0.0	0.1
Electronics Industry	0.0	+
N_2O from Product Uses	0.1	0.1
Stationary Combustion	0.0	0.0
Other Process Uses of Carbonates	0.0	0.0
Fluorochemical Production	NO	NO
Aluminum Production	0.8	0.4
Soda Ash Production	NO	NO
Ferroalloy Production	NO	NO
Titanium Dioxide Production	NO	NO
Caprolactam, Glyoxal, and Glyoxylic Acid Production	NO	NO
Glass Production	0.1	0.0
Magnesium Production and Processing	0.3	0.0
Zinc Production	NO	NO
Phosphoric Acid Production	NO	NO
Lead Production	0.1	0.1
Landfills (Industrial)	0.2	0.3
Carbide Production and Consumption	+	+
Agriculture	24.1	23.2
N_2O from Agricultural Soil Management[1,2]	10.7	11.6
Enteric Fermentation	7.9	7.5
Manure Management	1.6	1.9

Sector/Source	2005	2021
CO_2 from Fossil Fuel Combustion	1.9	1.1
Rice Cultivation	1.3	0.9
Urea Fertilization	0.1	0.2
Liming	0.5	NO
Mobile Combustion	0.1	0.0
Field Burning of Agricultural Residues[1,2]	0.0	0.0
Stationary Combustion	+	+
Commercial	7.1	7.9
CO_2 from Fossil Fuel Combustion	4.3	4.5
Landfills (Municipal)	1.5	1.7
Substitution of Ozone Depleting Substances	0.4	1.0
Wastewater Treatment	0.6	0.6
Composting	0.1	0.1
Stationary Combustion	0.0	0.0
Anaerobic Digestion at Biogas Facilities	+	+
Residential	7.4	7.1
CO_2 from Fossil Fuel Combustion	7.0	6.3
Substitution of Ozone Depleting Substances	0.2	0.6
Stationary Combustion	0.2	0.2
Total Emissions (Sources)	180.9	154.5
Land-Use, Land-Use Change, and Forestry (LULUCF) Sector Net Total	(20.5)	(16.4)
Net Emissions (Sources and Sinks)	160.5	138.1

Table 2. Missouri GHG emissions in MMT CO_2e by Gas Type[28]

Gas/Source	2005	2021
CO_2	107.5	123.5
Fossil Fuel Combustion	102.2	115.7
Electric Power Sector	48.1	60.2
Transportation	33.4	37.0
Industrial	8.6	7.7
Residential	7.5	6.3
Commercial	4.5	4.5
Non-Energy Use of Fuels	1.1	0.4
Natural Gas Systems	+	0.0
Cement Production	2.2	4.4
Lime Production	0.4	2.2
Other Process Uses of Carbonates	0.1	0.1
Glass Production	0.1	0.0
Soda Ash Production	NO	NO
Carbon Dioxide Consumption	0.0	0.1
Incineration of Waste	NO	NO
Titanium Dioxide Production	NO	NO
Aluminum Production	0.4	0.3
Iron and Steel Production & Metallurgical Coke Production	0.3	+
Ferroalloy Production	NO	NO
Ammonia Production	NO	NO

[28] Data were obtained from EPA's State-level GHG inventories file State-GHG_Trends_Emissions__Sinks_By_Gas_08312023.xlsx, which was accessed on December 18, 2023. This data set is available at <https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals>.

NO = Not occurring
Symbols:
"-" indicates that the value has not be estimated at this time or is not applicable to the state
"+" indicates that the value does not exceed 0.005 MMT CO_2e

Gas/Source	2005	2021
Urea Consumption for Non-Agricultural Purposes	0.1	0.1
Phosphoric Acid Production	NO	NO
Petrochemical Production	NO	NO
Carbide Production and Consumption	+	+
Lead Production	0.1	0.1
Zinc Production	NO	NO
Petroleum Systems	+	+
Abandoned Oil and Gas Wells	+	+
Magnesium Production and Processing	+	NO
Coal Mining	+	+
Liming	0.4	NO
Urea Fertilization	0.2	0.2
Substitution of Ozone Depleting Substances	+	+
International Bunker Fuels[29]	0.8	0.6
Wood Biomass, Ethanol, and Biodiesel Consumption[30]	1.7	4.3
CH_4	15.2	13.9
Stationary Combustion	0.2	0.2
Mobile Combustion	0.1	+
Coal Mining	0.1	+
Abandoned Underground Coal Mines	NO	NO
Natural Gas Systems	2.0	1.1
Petroleum Systems	0.0	+
Abandoned Oil and Gas Wells	0.0	+
Petrochemical Production	NO	NO
Carbide Production and Consumption	NO	NO

[29] Emissions from international bunker fuels are not included in totals.
[30] Wood biomass, ethanol, and biodiesel consumption emissions are not included in the sum of Energy sector totals. Net carbon fluxes from changes in biogenic carbon reservoirs are accounted for in LULUCF estimates.

Gas/Source	2005	2021
Iron and Steel Production & Metallurgical Coke Production	+	NO
Ferroalloy Production	NO	NO
Enteric Fermentation	7.6	7.5
Manure Management	1.2	1.7
Rice Cultivation	0.6	0.9
Field Burning of Agricultural Residues	0.0	0.0
Landfills	2.9	1.9
Wastewater Treatment	0.4	0.4
Composting	0.0	0.0
Anaerobic Digestion at Biogas Facilities	+	+
Incineration of Waste	NO	NO
International Bunker Fuels[31]	+	+
N_2O	14.8	14.0
Stationary Combustion	0.6	1.0
Mobile Combustion	0.8	0.4
Adipic Acid Production	NO	NO
Nitric Acid Production	0.7	0.3
Manure Management	0.3	0.2
Agricultural Soil Management	12.0	11.6
Field Burning of Agricultural Residues	0.0	0.0
Wastewater Treatment	0.3	0.4
N_2O from Product Uses	0.1	0.1
Caprolactam, Glyoxal, and Glyoxylic Acid Production	NO	NO
Incineration of Waste	NO	NO
Composting	0.0	0.0
Electronics Industry	+	+
Natural Gas Systems	+	+

[31] Emissions from international bunker fuels are not included in totals.

Gas/Source	2005	2021
Petroleum Systems	+	NO
International Bunker Fuels[32]	0.0	+
HFCs, PFCs, SF_6 and NF_3	3.7	3.054
HFCs	0.0	2.8
Substitution of Ozone Depleting Substances	0.0	2.8
Fluorochemical Production	NO	NO
Electronics Industry	+	+
Magnesium Production	NO	NO
PFCs	2.2	0.1
Aluminum Production	2.2	0.1
Electronics Industry	+	+
Electrical Equipment	NO	NO
Substitution of Ozone Depleting Substances[33]	NO	+
SF_6	1.5	0.2
Electrical Equipment	0.6	0.1
Electronics Industry	+	+
Magnesium Production	0.9	0.0
NF_3	+	+
Electronics Industry	+	+
Total (Sources) Emissions[34]	141.3	154.5
LULUCF Emissions[35]	1.2	1.4
LULUCF CH_4 Emissions	1.2	1.3
LULUCF N_2O Emissions	+	0.1

[32] Emissions from international bunker fuels are not included in totals.
[33] Small amounts of PFC (spell out) emissions also result from this source.
[34] Total emissions presented without LULUCF.
[35] LULUCF emissions of CH_4 and N_2O are reported separately from gross emissions totals.

Gas/Source	2005	2021
LULUCF Carbon Stock Change[36]	(24.9)	(17.823)
LULUCF Sector Net Total[37]	(23.7)	(16.4)
Net Emissions (Sources and Sinks)[38]	117.6	138.1

[36] LULUCF Carbon Stock Change is the net C stock change from the following categories: Forest Land Remaining Forest Land, Land Converted to Forest Land, Cropland Remaining Cropland, Land Converted to Cropland, Grassland Remaining Grassland, Land Converted to Grassland, Wetlands Remaining Wetlands, Land Converted to Wetlands, Settlements Remaining Settlements, and Land Converted to Settlements.

[37] The LULUCF Sector Net Total is the net sum of all CH_4 and N_2O emissions to the atmosphere plus net carbon stock changes.

[38] Net emissions include LULUCF.

Appendix B: Project Idea Submissions

The Air Pollution Control Program received over 200 project ideas submittal forms. Each project is being carefully reviewed and evaluated for inclusion in Missouri's Implementation Grant application. Several of the following projects will be preliminary chosen for inclusion pending the collection of the additional information needed to form a strong case for receiving CPRG implementation funding. Not all projects listed will be included in the State's Implementation application, however all entities are able to seek an eligible municipality to apply on their behalf if they are not chosen for the State's application.

Entity	Location	Priority Measure	Project	Cost ($)
Job Point Organization	Boone	Electric Conversion	Replace 2 organization gas vehicles with hybrid vehicles and install solar panels on headquarters building	200,600
City of Springfield Utilities	Greene County	Electric Conversion	Replace current City Utilities diesel fleet with electric vehicles with bidirectional charging capabilities.	3,700,000
Dynamic EVC	Taney County	Electric Conversion	Install level 2 and 3 DC fast charging stations	375,000
n/a	Greene County	Electric Conversion	3 DC fast chargers for public EV charging	350,000
KW Commercial- Jennifer Grove	Greene County	Electric Conversion	Install 3 180kW DC fast charging stations and associated parking spaces	475,000
WCSB40	Washington County	Electric Conversion	Purchase 2 hybrid 14 passenger, wheelchair accessible vans for providing transportation to individuals with developmental disabilities.	320,000
City of Jefferson City Gov.	Cole County	Electric Conversion	Establish EV charging stations in public spaces and at public buildings. Purchase electric vehicles for City fleet, parking enforcement vehicles, fire ATVs, and electric bicycles for police.	575,000
City of Springfield Utilities	Greene County	Electric Conversion	replace diesel with two city transit electric buses/ install charging infrastructure to support-off peak charging, backup chargers in case of equipment downtime, support growth of electric fleet City	2,500,000
Richard Osa	Dent County	Electric Conversion	Provide a pre-paid long-term lease or other concession as an incentive for priority EV charging station installation.	30,000
Division of Energy	Multiple Counties	Electric Conversion	State Fleet Electrification Pilot- EVs for regional offices and LCSOB and chargers	1,000,000
Department of Conservation	Pike	Electric Conversion	MDC is proposing to replace the four diesel engine powered pumps at the North end of the Ted Shanks Conservation Area with four electric motor-powered pumps in the existing water distribution structures.	1,000,000

Entity	Location	Priority Measure	Project	Cost ($)
Department of Conservation	Mississippi	Electric Conversion	MDC is proposing to replace 20 of the remaining diesel engine powered wells with 15 electric motor-powered wellsat the Ten Mile Pond Conservation Area.	5,250,000
Department of Conservation	Multiple (Boone, Cole, Greene, Jackson, St. Louis	Electric Conversion	Purchasing ten electric vehicles with 4-wheel drive capability for the MDC fleet and installation of associated charging station infrastructure at five Department locations.	1,200,000
Tom Pingelton	Boone	Electric Conversion	Subsidizing or eliminating the cost of the MO Special Fuel Decals for motor vehicles in MO.	not yet quantified
City of Columbia Gov	Boone	Electric Conversion	The Columbia Parks and Recreation Department has utilized a fleet of 52 gas-powered golf carts at L.A. Nickell Golf Course for over 30 years. Staff wants to convert the existing fleet of carts to electric powered golf carts to eliminate the greenhouse gas impact from the everyday use of the golf carts. The project will include renovations to the existing cart shed at the golf course and the purchase of 52 electric-powered golf carts.	260,000
City of Columbia Gov	Boone	Electric Conversion	Development of 4 EV charging depots for public and municipal fleet use.	4,100,000
City of Columbia Gov	Boone	Electric Conversion	Expansion and installation of EV charging stations in the lower level of the parking structure at 5th and Walnut.	not yet quantified
City of Columbia Gov	Boone	Electric Conversion	Electrification of gas HVAC systems to either dual fuel systems and/or all electric heat pump systems	not yet quantified
City of Poplar Bluff	Butler	Electric Conversion	install two charge point express 250 electric vehicle chargers	175,000
Van Burn School District	Carter County	Electric Conversion	purchase EV for school district and charging station	180,000
Christian County Government	Christian County	Electric Conversion	three EVs trucks	142,650
Lifetime Destinations	Christian County	Electric Conversion	Utilize property owned to install 3 dual 180 kW DC fast charging stations along hwy 65. No fast-charging stations at this area as of now.	535,000
Lifetime Destinations	Taney County	Electric Conversion	Install two charge 180kW fast EV charging stations	355,000
Lifetime Destinations	Taney Couny	Electric Conversion	install two 180kW DC fast charging stations Ticket Center in Branson	365,000
Nicholas Barrack	Phelps County	Electric Conversion	Install EV charging stations at City of Rolla parking lost (30 locations)	450,000

Entity	Location	Priority Measure	Project	Cost ($)
Jefferson College	Jefferson County	Electric Conversion	Install 2 dual pedestal chargers (single fixture capable of charging two vehicles at one time) at Arnold and Hillsboro campus in Jefferson College.	not yet quantified
City of Kirkwood	St. Louis County	Electric Conversion	Kirkwood Electric will be installing six (6) Electric Vehicle charging stations at the Kirkwood Community Center.	25,500
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Electric Conversion	Rebates or tax credits for purchasing EVs	not yet quantified
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Electric Conversion	Installing one EV charging station per county	not yet quantified
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Electric Conversion	rebates or tax credits for the purchase of electric farm equipment	not yet quantified
Great Mines Health Center/T.R. Dudley	Washington County	Electric Conversion	EV charging stations	2,500,000
T.R. Dudley	St. Francois County	Electric Conversion	EV charging stations	300,000
University of Missouri Science & Technology-Mehdi Ferdowsi	Phelps County	Electric Conversion	EVs and hydrogen vehicle charging stations in Hy Point, MO.	20,000,000
St. Louis County Health Department	St. Louis County	Electric Conversion	Subsidize purchase of electric lawn equipment by coupons through retailers.	155,000
Susan Wrasmann	Phelps County	Electric Conversion	Electric charging station	not yet quantified
Missouri State University/City of Springfield Gov	Greene County	Electric Conversion	Replace gas powered vehicles with EVs for MO State University Transportation Services and 10 electric patrol vehicles	1,080,000
Infinity Miles	Crawford County	Electric Conversion/Research Project	Infinity Miles Inc. is developing a new generation of EV chargers which will directly interface the 12.4 kV medium voltage distribution system to deliver multi-megawatt charging capability through the MCS protocol without the need for the massive 12.4kV to 480V transformers used in conventional solutions. This will lead to lower real-estate	500,000

Entity	Location	Priority Measure	Project	Cost ($)
			requirements, faster charging, lower costs of charging infrastructures, and large-scale deployment of station-type charging locations.	
Doe Run	Iron County	Electric Conversion/Research Project	Implementing electric train technology called Railveyor for underground mining to replace ore hauling using diesel trucks with this electric train system.	5,000,000
		Electrification of buildings/incentives	HVAC system in county courthouse	not yet quantified
Americorps	Kansas City	Energy Efficiency/ Land Us/Energy storage/Renewable energy	community scale solar, wind turbine farms, and utility scale batteries in terms of land use projects, afforestation, urban greening, and urban farming	not yet quantified
WM Waste Management	St. Joseph, St. Louis	Alternative Fuel	Replace 34 heavy-duty diesel solid waste collection vehicles with near-zero emission CNG vehicles.	1,700,000
Division of Energy	Statewide	Energy Efficiency	Pre-Weatherization Expansion to supplement existing Weatherization Program	not yet quantified
Division of Energy	Cole County and Various	Energy Efficiency	State building energy efficiency upgrades. Weatherization/appliances Shoe Factory and Various other state facility buildings	10,000,000
Division of Energy	Statewide	Energy Efficiency	"Agriculture Energy Efficiency Grant Program: Two grant programs focused on reducing energy costs in the agriculture sector. Projects could include solar generation at farms, irrigation energy efficiency upgrades, equipment replacements with electric equipment (tractors, harvesters, etc.), or other upgrades to reduce energy use and costs. The smaller program would focus on near-term projects with a lower dollar among cap for projects. A larger program would also exist for longer-term projects with a higher dollar amount cap."	10,000,000
City of Columbia Gov.	Boone	Energy Efficiency	New fire station to have geothermal heating/cooling along with programmable thermostats, replace various appliances with energy-efficient appliances.	4,500,000
City of Columbia Gov.	Boone	Energy Efficiency	Weatherize Wastewater Treatment Facility and new HVAC	500,000
Christian County Sheriff Department	Christian County	Energy Efficiency	Energy Star appliances for jail. Replace four non-insulated garage doors in the jail with insulated doors. Update to smart thermostats.	150,000

Entity	Location	Priority Measure	Project	Cost ($)
Dallas County Government	Dallas County	Energy Efficiency	remodel courthouse with HVAC, lighting, and etc.	1,500,000
Missouri State University	Greene County	Energy Efficiency	Upgrade MSU campus building to automation system JCI Metasys-interface between campus building automation system and room scheduling system.	1,810,000
Missouri State University	Greene County	Energy Efficiency	Replace chiller units at 2 locations with 2 mag bearing chillers with VPG control	8,400,000
Missouri State University	Greene County	Energy Efficiency	Replace outside parking lot lights with LED	1,250,000
Borntobore.com	Greene County	Energy Efficiency	17,000 sqft of closed cell foam insulation at a business	25,500
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Energy Efficiency	Rebates for PHA housing units and low-income housing units for home energy improvements through better insulation, new windows, energy star appliances, and any other upgrades that would reduce the energy use of the unit.	not yet quantified
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Energy Efficiency	align with MO Green Schools to assist school districts with energy audits	not yet quantified
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Energy Efficiency	Rebates for PHA housing units and low-income housing units for home energy improvement	not yet quantified
City of Jefferson City Gov	Cole County	Energy Efficiency	Weatherization and renewable energy for public buildings	2,400,000
Maryville University	St. Louis County	Energy Efficiency	HVAC replacement for student apartments and construction of lab building with newer chillers	3,750,000
Maryville University	St. Louis County	Energy Efficiency	Campus Parking Lot Lighting Conversion – Convert 115 light poles with older high pressure sodium light fixtures over to LED fixtures.	450,000
City of Hermann	Gasconade County	Energy Efficiency	Weatherize historic homes	23,700
RMU Rolla Organization	Phelps County	Energy Efficiency	Peak demand response program to provide thermostats and water heater controllers with yearly rebates and incentives for off peak hours	600,000
Roberts Ags Service	Platte	Energy Efficiency	replace fertilizer building with energy efficiency fixtures and make it green fertilizer	3,000,000
East Missouri Action Agency	Bollinger, Cape, Ion, Madison, Perry, Ste.	Energy Efficiency	Pre-Weatherization Expansion to supplement existing Weatherization Program / appliance replacement	5,800,000

Entity	Location	Priority Measure	Project	Cost ($)
	Francois, St. Genevieve, Washington			
University of Missouri Science & Technology- Jianmin Wang	Phelps County	Energy Efficiency	energy reduction in wastewater treatment by using iMLE Modified Ludzack-Ettinger	5,000,000
North American Sustainable Refrigeration Council	Statewide	Energy Efficiency	incorporate a state incentive program to replace HFC-based refrigeration equipment	10,000,000
Department of Conservation	Greene	Energy Efficiency	HVAC replacement project at the Springfield Conservation Nature Center	1,000,000
Department of Conservation	Cole	Energy Efficiency	Updating Commission Headquarters with fiber cement siding, insulated doors, double pane glazing system, insulation, air sealing and high reflectively metal roof.	5,000,000
rmurolla.org	Phelps County	Energy Efficiency	Advanced Metering Infrastructure (AMI)	4,000,000
MPUA.org Brenaud@mpua.org	Boone (Multiple Counties)	Energy Efficiency	14 small and rural municipal utilities in updating and modernizing their electric systems. These technologies include infrastructure to enhance utility communications, net-metering and utilization of distributed energy resources, advanced metering infrastructure to allow for time-based electric programs, distribution monitoring systems. Funding will also allow MPUA to identify and coordinate with additional cities to perform necessary engineering studies to replicate the success of the grid modernization project. The initial list of cities includes Albany, Bethany, Butler, Cabool, Chillicothe, Gallatin, Mansfield, Monett, Richland, Salsbury, Seymour, Slater, Waynesville, and Willow Springs.	23,850,000
John Meinzenbach	Boone	Energy Efficiency	Close all coal fired power plants	not quantified
City of Columbia Gov	Boone	Energy Efficiency	Develop Portfolio level solutions for building owners to measure and manage energy use, also to develop and meet energy reduction/emissions reduction goals. This project would consist of outreach and education activities as well as direct support for building owners and managers wishing to participate in the USEPAs Portfolio Manager platform.	500,000

Entity	Location	Priority Measure	Project	Cost ($)
			Connecting building managers to training opportunities similar to the functions of the Building Energy Exchange in St Louis.	
City of Springfield Utilities	Greene County	Energy Efficiency	Develop and operate a turnkey for direct load control demand response program to reduce energy consumption during peak periods of demand.	750,000
City of Springfield Utilities	Greene County	Energy Efficiency	Coordinate with Ozark's Area Community Action Corporation (OACAC) to provide additional weatherization to low-income families and Energy Star heat pumps.	2,100,000
Missouri State University	Greene County	Energy Efficiency	HVAC replacement for the student apartments, along with the new cooling system in the academic complex.	2,400,000
University of Central Missouri-Warrensburg	Johnson County	Energy Efficiency	Install lamps, ballasts, and fixtures to upgrade lights in buildings in several buildings.	1,160,000
University of Central Missouri-Warrensburg	Johnson County	Energy Efficiency	The replacement cooling tower will have VFDs on both fans. A new chemical treatment system will be required as part of the cooling tower replacement. The existing tower has no issues meeting capacity but leaks due to age.	600,000
RMU Rolla Organization	Phelps County	Energy Efficiency	install ground source heat pump	350,000
Northwest Missouri State University	Nodaway	Energy Efficiency	replace HVAC system at four on campus buildings using geothermal	13,000,000
Richard Osa	Statewide	Energy Efficiency	Precision agricultural technology such as drones	650,000
Richard Osa	Statewide	Energy Efficiency	weatherization on residential homes	875,000
Richard Osa	Statewide	Energy Efficiency	satellite recycling collection sites in rural communities	262,000
East-West Gateway Gathered Projects	St. Louis Region	Energy Efficiency		
		Energy Efficiency	Ecoblock in academy neighborhood	not yet quantified
		Energy Efficiency	green schools program	not yet quantified
Richard Osa	Statewide	Energy Efficiency	weatherize community buildings	575,000
Missouri Energy Initiative	Statewide	Energy Efficiency	Create a Small Business Loan Fund expanding access to PACE	Unknown
Missouri Energy Initiative	Springfield, MO	Renewable Energy	Support growth of a Missouri-Based renewable energy manufacturing base (PV/Solar) – Sun Solar Mfg. LLC	Unknown
Missouri Energy Initiative	Washington, MO	Renewable Energy	Support growth of a Missouri-Based renewable energy manufacturing base (RNG) – Timber Ridge	Unknown

Entity	Location	Priority Measure	Project	Cost ($)
City of Nixa	Christian County	Energy Efficiency/Electric Conversion	1,000 programmable thermostats for Nixa Utility Customers, 10 EV's fleet for Utility Billing Department and Development Department along with 5 dual chargers for the EVs.	600,000
Division of Energy	Multiple Counties	Energy Efficiency/Land Use/Renewable Energy	"Behalf of MO State Parks Projects could include, but are not limited to: -New or expanded renewable energy generation at State Parks, Energy storage at State Parks, -Energy upgrades (weatherization, appliances, HVAC, etc) at State Parks facilities, Land use projects at State Parks as natural carbon sequestration	10,400,000
Culver Stockton College	Lewis County	Energy Efficiency/Renewable Energy	Weatherization, upgrade HVAC, solar arrays	4,590,000
Circe Energy	Multiple	Energy Storage	implement battery energy storage system (BESS) 10 Megawatt batteries	9,250,000
MUPA	Macon and Saline Counties	Energy Storage	Replace diesel back-up generators with 1 MW 4-hour battery storage	2,500,000
Dynamic EVC	Greene County	Fleet Electrification	DC Fast Charging Stations at 2647 N Kansas Expy, Springfield, MO 65803 located 0.27mi from I-44.	590,000
		Land Use	Heartland Watershed urban forest	not yet quantified
Waterborne Environmental	Statewide	Land Use	program for incentivized carbon sequestration for farmers and nurturing campaign for farming	1,500,000
Great Mines Health Center/T.R. Dudley	Washington County	Land Use	sidewalk and trails	12,000,000
	Jackson County	Land Use	urban greening project	143,000
City of St. Peters	St. Charles County	Land Use	Material Recovering Facility upgrades to support a single stream recycling program.	6,000,000
University of Missouri Regenerative Agriculture	Statewide	Land Use	expand statewide cover crop grazing program expecting 500-1,000 farmers to enroll	14,000,000
H2Ozarks Organization	Stone County	Land Use	Building a household and hazardous waste collection facility in Stone County.	300,000
		Land Use	demonstrate and educate climate smart food production	not yet quantified

Entity	Location	Priority Measure	Project	Cost ($)
Department of Conservation	Texas	Land Use	Updated HVAC system for the 2 mil native tree seedlings coolers	2,500,000
Zero Food Waste Coalition	Statewide	Land Use	Donation and upcycling of food	not yet quantified
John Meinzenbach	Boone	Land Use	Support a Climate Smart Farm Bill and Agrivoltaics	not quantified
John Meinzenbach	Boone	Land Use	b) Map existing levees for understanding of flood impacts and awareness of potential disasters. Move levees back to create room for the river. c) Increase erosion control in streams and rivers to protect fisheries habitat. d) Increase stream buffer requirements. Take steps to mitigate soil and creek erosion due to flooding and heavy precipitation events. e) Protect groundwater and surface water from pollution from agricultural run-off including from concentrated animal feeding operations.	not yet quantified
John Meinzenbach	Boone	Land Use	PROMOTE REGENERATIVE AGRICULTURE a) Empowering farmers and ranchers to deploy climate-smart agricultural practices that help farmers feed the world and save the planet b) No-till cultivation, blade-in seeding. c) Use natural soil enhancements and biochar, no chemical applications. d) Use cover-crops to improve soil quality, to produce nutrient dense food. e) Support agrivoltaic farming and livestock grazing.	not yet quantified
John Meinzenbach	Boone	Land Use	Safeguard Water Quality a) Remove lead pipes under EPA's Proposed Water Rule. b) Increase CAFO runoff restrictions and protect waste sheds. c) Blade-in soil manure applications; prohibit spraying to reduce runoff. d) Cleanup power plants and industrial sites near water resources. e) Increase water protection enforcement, no acceptable discharges. f) Promote the concept of rainscaping statewide to manage watersheds.	not yet quantified
John Meinzenbach	Boone	Land Use	Increase forest management practices to reduce wildfire risk, native plants between buildings, wildlife corridors	not yet quantified
Steve Callis	Boone (Statewide)	Land Use	Statewide Compost Educational Program for communities	10,000
William Folk Mizzou	Boone	Land Use	City of Columbia Urban Tree Cover	1,000,000
City of Columbia Gov	Boone	Land Use	An inventory of city trees to monitor changes over time using mobile LiDAR to make better management decisions.	200,000

Entity	Location	Priority Measure	Project	Cost ($)
City of Columbia Gov	Boone	Land Use	An updated tree inventory, including biometrics, tree condition, location, structure, impacts to infrastructure, eco-benefits, value, and more. An inventory of city trees to monitor changes over time using mobile LiDAR to make better management decisions.	280,000
City of Columbia Gov	Boone	Land Use	Update the City of Columbia, Missouri's natural resources inventory (NRI). Funds will be used for the acquisition of new aerial imagery and LiDAR.	242,000
City of Columbia Gov	Boone	Land Use	F create five new community gardens in the City of Columbia, MO. Prioritization of garden locations will be analyzed using the Climate and Economic Justice Screening Tool to help meet the needs of people who lack access or means to fresh food. Each garden will be retrofitted to capture and store storm water for garden use, install native Missouri plant beds to support pollinators, and a shed to store garden equipment.	120,000
Ozarks Transportation	Greene County	Land Use	Division Street Railroad Grade Separation West of US 65	3,000,000
Evangel University	Greene County	Land Use	One to two-year academic program for students for environmental and conservation efforts and partner with other organizations.	not yet quantified
Forest Releaf of Missouri	Statewide	Land Use	Community tree expansion and access expanding Forest Releaf's nursery operation to grow more plant material, education program, increase access to tree, program already distributes 8,000 3-gallon native trees and shrubs	750,000
T.R. Dudley	St. Francois County	Land Use	sidewalk/trail network throughout the city	2,000,000
n/a	Lafayette County	Land Use	prairie restoration	not yet quantified
n/a	Lafayette County	Land Use	encourage walking, biking, sidewalks	not yet quantified
Ozark Land Trust Organization	Statewide with emphasis on Ozarks	Land Use	Facilitate the conservation of lands through the emplacement of perpetual conservation easements on private property	150,000
Northeast Power Co-op	Marion County	Land Use	green space in business district	197,000
Northeast Power Co-op	Marion County	Land Use	install 5-acre pollinator plot	3,250
Missouri Western University	Buchanan County	Land Use	increase carbon sequestration on 723-acre campus by prairie restoration plant native trees	172,000

Entity	Location	Priority Measure	Project	Cost ($)
Bernadette Holzer	Maries County	Land Use	Implement bicycle community by creating biking trails	5,000,000
City of St. Peters	St. Charles County	Land Use	recycle carts for municipal solid waste	1,200,000
City of St. Peters	St. Charles County	Land Use	Route optimization software for solid waste collections, curbside recycling	160,000
All State Consultants	Sullivan, Linn, Charlton	Land Use	watershed restoration	86,000,000
Jeffrey Owens	Unknown	Land Use	Adding crushed rock to farmland to pull carbon out of the air	Unknown
Jessica Norris	Unknown	Land Use	Use carbon sequestration accounting to prioritize and supplement ongoing restoration and land management projects. Propose rewetting landscapes and restoring floodplain forests.	Unknown
Julia Marsh	Statewide	Land Use	Community-scale reuse systems, specifically for food ware.	Unknown
Missouri Prairie Foundation	Statewide	Land Use, Renewable Energy	An example of conservation siting would include avoiding intact, old-growth prairies and other intact natural communities, as they are increasingly rare.	not yet quantified
Waterborne Environmental	Boone	Land Use/Possibly Research Based Project	Proposed tiered on-farm evaluation project is to design, implement, and demonstrate how the adoption of enhanced efficiency fertilizers (EEFs) by farmers in Missouri impact N2O emissions. Tier 1 trials incentivize farmers (n = 20) to apply one of three chosen EEFs on a "treatment" field alongside a similar field that hosts their typical nitrogen application (i.e., anhydrous ammonia) that will serve as a "control." S Tier 2 trials will allow farmers (n = 5) to engage in the high-intensity evaluation of cutting edge EEF implementation and subsequent N2O emissions monitoring. Tier 2 will utilize a rainfall simulator to mimic a high-intensity storm event at the field scale on a control and 3 treatment (1 plot/EEF) plots.	2,500,000
City of Jefferson City Gov	Cole County	Land Use/Renewable Energy	green infrastructure improvements and solar street lighting	75,000,000
City of Columbia Gov	Boone	Renewable Energy	Seeking qualified engineers to analyze infrastructure and make recommendations for how or if City-owned utility-scale batteries may impact the reliability of the electric grid and potentially move the city toward its goals of increasing renewable energy adaptation.	100,000

Entity	Location	Priority Measure	Project	Cost ($)
City of Columbia Gov	Boone	Renewable Energy	solar-powered public toilets	100,000
City of Columbia Gov	Boone	Renewable Energy	Examine the efficiency and expansion of the gas capture system at bioreactor landfill in Columbia, MO.	7,100,000
City of Columbia Gov	Boone	Renewable Energy	Construction of city owned community solar for low to moderate income customers	not yet quantified
LogBoat Brewing Company	Boone	Renewable Energy	Integrate CO2 capture technology into our brewery, advancing sustainability in the brewing industry.	125,000
Poplar Bluff Utilities	Butler	Renewable Energy	Purchase and install a ground mounted 5,000 kW solar photovoltaic system/proposed site is owned by the City of Poplar Bluff	9,600,000
Greene County Gov	Greene	Renewable Energy	New roof for Greene County government buildings	130,000
City of Springfield Utilities	Greene County	Renewable Energy	Floating solar arrays on city utilities land that surrounds three lakes	50,000,000
City of Springfield Utilities	Greene County	Renewable Energy	1,000 acres for local renewable generation in service area owned and operated by utility.	not yet quantified
City of Springfield Gov	Greene County	Renewable Energy	City-owned Noble Hill Sanitary Landfill expanding as of now the gas well collection field, renewable natural gas project at the landfill cleaning of methane to compress the cleaned biogas injected into a commercial pipeline distribution system RFP process	40,000,000
Doug Neidigh	Greene County	Renewable Energy	Implement a grant program for solar installations targeted at Missouri industrial facilities	1,250,000
Borntobore.com	Greene County	Renewable Energy	install 60kw solar panels at a business	119,300
City of St. Louis/Missouri Botanical Garden	St. Louis County	Renewable Energy	Add a 100-140 kw solar array to the greenhouse at MoBOT	300,000
Doe Run	St. Francois County	Renewable Energy	develop a compressed natural gas fueling facility that provides CNG to replace diesel hauling trucks fleet and convert Resource Recycling Facility from propane to CNG	5,000,000
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Renewable Energy	solar panels on multi-family dwellings	not yet quantified
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Renewable Energy	solar panels on closed landfills	not yet quantified

Entity	Location	Priority Measure	Project	Cost ($)
Great Mines Health Center/T.R. Dudley	Washington County	Renewable Energy	solar farm on 200-acre landfill site	20,000,000
Missouri S&T	Phelps County	Renewable Energy	install solar array with lithium-ion battery backup on campus or near site	5,000,000
DeanAye Willow Springs	Howell County	Renewable Energy	solar for residential homes	2,100,000
RMU Rolla Organization	Phelps County	Renewable Energy	install five 100KW photovoltaic solar energy to Rolla municipal utilities properties	4,250,000
CWEP	Jasper County	Renewable Energy	solar farm at Carthage Water and Electric Plant	10,000,000
City of Knob Noster	Johnson County	Renewable Energy	Install solar power array on water tower to power the tower's pumps and equipment.	620,000
City of Warrnsburg	Johnson County	Renewable Energy	City to install solar power on two wastewater treatment plants	8,500,000
Ameren	Montgomery County	Renewable Energy	Develop a third solar site to support Ameren Community Solar Program	not yet quantified
East Missouri Action Agency	Cape, Madison, Ste. Genevieve, St. Francois, Washington	Renewable Energy	Install solar panels on nine buildings owned by Southeast MO Facilities Co-op	5,600,000
Robert Jones	Cole County	Renewable Energy	flow-back program for electrical companies, wind generators, and etc.	not yet quantified
St. Louis MSD	St. Louis County	Renewable Energy	Bissell Wastewater Treatment Facility to install solar arrays.	12,700,000
Cole County Organization	Cole County	Renewable energy	solar panels on County Public Works Maintenance facility	240,000
Southwest City	McDonald County	Renewable Energy	Solar panels on wastewater facility	250,000
City of Springfield Gov	Greene County	Renewable Energy	Southwest Wastewater Treatment Plant wants to install renewable natural gas from cleaned methane, upgrade the biogas from treatment to remove contaminants, compress, inject into a commercial pipeline distribution system for transportation fuel and etc. , RFP process in the future	7,000,000
MPUA.Org Brenaud@MPUA.org	Boone (Multiple Counties)	Renewable Energy	MPUA-MEC will lead, administer, construct, and own solar farms for the direct benefit of small communities with municipal electric utilities. This statewide initiative is focused on small, rural municipal utilities seeking to diversify their power supply while also reducing reliance on fossil fuels.	66,400,000

Entity	Location	Priority Measure	Project	Cost ($)
Jane Church	Boone	Renewable Energy	Close all coal fired power plants and enforce the 2015 Clean Air Act to limit emissions from industrial facilities.	not yet quantified
Shaw Nature Reserve-Missouri Botanical Garden	Franklin County	Renewable Energy	Install closed loop ground source geothermal heating and cooling system	300,000
Richard Osa	Statewide	Renewable Energy	New livestock watering pumps ("waterers") will be subsidized to incentivize	460,000
		Renewable energy	solar panels green roof for government buildings	not yet quantified
RioGen	Statewide	Renewable Energy/Demonstration Project	Renewable energy projects on Missouri River by RioGen	3,000,000
City of Higginsville	Lafayette County	Renewable Energy/Energy Efficiency	install solar panels on 20 acres, high energy battery, LED lights streets and buildings, 10 EV charging stations,	8,800,000
William Jewel College	Clay County	Renewable Energy/Energy Efficiency	William Jewel College residential facilities to replace HVAC with geothermal or VRF system, replace windows and doors	10,000,000
Union Fire Department	Franklin County	Renewable Energy/Energy Efficiency	solar panels on 3 fire stations energy efficient appliances, lighting, weatherization	1,200,000
Webster County Gov	Webster County	Renewable energy/Energy Efficiency	involves the collection and treatment of Webster County Landfill Leachate and install solar panels	1,060,000
Blue Sphere Energy	Ste. Genevieve	Renewable Energy/Land Use	Biesser Farms seeks funding for prairie grass planting in between rows of solar arrays.	5,000,000
Mizzou	Boone	Research Renewable Energy/Land Use	Integrating climate-smart agricultural practices (e.g., through a combination of conservation tillage, cover crops, nutrient management, and soil amendments) with AD.	5,000,000
Mizzou	Boone	Research/Energy Efficiency	transform agricultural waste into roof and window materials	600,000
Mizzou	Boone	Research/Energy Efficiency	development of self-healing concrete	400,000
Mizzou	Boone	Research/Energy Efficiency	develop a high energy-efficiency air conditioning system enabled by radiative cooling technology	1,500,000

Entity	Location	Priority Measure	Project	Cost ($)
Mizzou	Boone	Research/Energy Efficiency	Optimizing the asphalt mixture designs to employ state-of-the-art, energy efficient materials and construction techniques.	600,000
Harris Stowe State University	St. Louis City	Research/Energy Efficiency	aviation maintenance program that is green	5,000,000
Mizzou	Boone	Research/Energy Efficiency	propose a new ejector integrated heat pump system for residential use, utilizing low-GWP HFO (hydrofluoroolefin) refrigerants	750,000
Mizzou	Boone	Research/Energy Efficiency	create a residential and commercial Heating Ventilation & Air Conditioning (HVAC) systems operate more efficiently	350,000
Harry Stowe State University	St. Louis City	Research/Energy Efficiency	study the relationship between urban greening and living space	150,000
Missouri S&T	Phelps County	Research/Energy Storage	develop advanced battery electrodes, hyper-thick electrodes, using a micro-electric-field-casting (MEFC) process for lithium-ion batteries (LIBs)	360,000
Mizzou	Boone	Research/Energy Storage	wastewater electrolyzer for green hydrogen	3,000,000
Mizzou	Boone	Research/Energy Storage	creation of a new electric power grid planning framework built on three pillars of innovative technology	395,000
Missouri S&T	Phelps	Research/Energy Storage	develop a new fast charging algorithm for lithium-ion batteries (LIBs)	360,000
Mizzou	Boone County	Research/Energy Storage	Develop super capacitors from biomass-derived activated carbons, involves carbon sequestration.	145,000
Missouri S&T	Phelps	Research/Energy storage	design and development of a real-time locational emission rate estimation and forecast algorithm, enhanced unit commitment and economic dispatch algorithm incorporating emission cost and emission target and coordinated scheduling of hybrid power system consisting of hydro, storage, thermal and renewable resources.	1,000,000
Mizzou	Boone	Research/Energy Storage	Utilizing glycerol produced in biomass processes (e.g., biodiesel) to replace water as solvent to produce metal oxide powders for lithium-ion batteries in a spray pyrolysis technique.	5,000,000
Mizzou	Boone	Research/Energy Storage	Innovate a single converter topology to develop a low-cost and high efficiency integrated Bi-Directional AC Super Charger and EV Traction Inverter.	3,000,000

Entity	Location	Priority Measure	Project	Cost ($)
Missouri S&T	West Alton	Research/Energy Storage	"Feasibility Study of a Subsurface CO2 Gas Storage Facility near Sioux Energy Center in West Alton County, Missouri." comprehensive feasibility study to establish a Subsurface CO2 Gas Storage Facility	12,000,000
Missouri S&T	Phelps	Research/Energy Storage	study aims to assess the viability of both the Lamotte formation and existing natural gas storage sites for hydrogen storage	15,000,000
Mizzou	Boone	Research/Fuel Conversions	involves synthesizing activated carbons from waste biomass using physical and chemical activation methods	1,000,000
Mizzou	Boone	Research/Land Use	propose unmanned aircraft systems to enhance WRE programs/identify wetlands	1,135,000
Mizzou	Boone	Research/Land Use	make multiscale porous substrates for effective growth of diatom bed,	1,000,000
Mizzou	Boone	Research/Land Use	Land-based rapid algae cultivation for biofuel production with negative carbon emissions.	1,000,000
Mizzou	Statewide	Research/Land Use	informing large-scale, intensive afforestation projects using a two-phase planning strategy	650,000
Mizzou	Boone	Research/Land Use	to track soil changes from crop management, give incentives to farmers	1,000,000
Missouri S&T	Phelps	Research/Land Use	Preparation of well pads for plugging, removal of equipment, placing cement plugs, and necessary excavation and capping works. Post-plugging	11,600,000
Mizzou	Boone	Research/Land Use	develop effective management strategies for agricultural and urban ponds	668,000
Mizzou	Boone	Research/Land Use	use smart farm technology on agriculture	2,000,000
Mizzou	Boone	Research/Land Use	develop an innovative solar-splitting metamaterial (SSM) that enables a transformative agrivoltaic technology that significantly increases crop yield	1,200,000
Missouri S&T	Phelps	Research/Land Use	Propose the implementation of CO2 sequestration technology to recycle the pond ash. CO2 captured will be utilized for the pretreatment of reclaimed pond ash	2,000,000
Mizzou	Statewide	Research/Land Use	Develop high-quality maps of tree planting suitability that will allow our partner(s) to target tree plantings in areas that will provide the greatest benefit.	1,750,000
MSU	Greene	Research/Land Use	Initiate the establishment of large populations of cane plants in a greenhouse and nursery that are available to 25	45,000

Entity	Location	Priority Measure	Project	Cost ($)
			underserved farmers per year. The greenhouse gas capture can easily be tracked from plant to commodity.	
Mizzou	Boone County	Research/Land Use	Project is focused on developing innovative, modified biochars derived from agricultural and various other biomass wastes. These biochars are intended to serve as soil amendments, nitrogen capturers, and agents for slow nutrient release	99,000
Mizzou	Boone	Research/Renewable Energy	provide an inventory of GHG emissions in WWTPs, propose quantified measures to reduce GHG emissions, including energy-saving initiatives, promote resiliency in WWTPs through process optimization and other measures	5,000,000
Missouri S&T	Phelps	Research/Renewable Energy	Project aims to divert food waste from landfills using anaerobic digesters to convert waste products into biogas for energy and compost.	not yet quantified
Missouri S&T	Phelps	Research/Renewable Energy	proposed project are: (i) Rescoping of the Hydrogen Fueling Station to generate electricity via fuel cells for EVs and hydrogen delivery for fuel cell vehicles, (ii) Diversity, Equity, Inclusions and Accessibility (DEIA) and Justice 40, (iii) Hydrogen production utilizing alternative energy (green hydrogen) and natural gas (blue hydrogen) with CO2 capture and sequestration, (iv) Workforce Development, Community Outreach/Teaching and Entrepreneurship.	20,000,000
Harry Stowe State University	St. Louis	Research/renewable energy	Supports providing a pipeline for future hydrogen energy workforce training. HSSU proposes to leverage its developing expertise to serve as a catalyst for the State of Missouri and other academic institutions to launch efforts to explore the opportunities and benefits of implementing hydrogen-based energy solutions in storage, distribution and usage	4,500,000
Mizzou	Grundy, Linn, Boone, Lawrence	Research/renewable energy	Our proposed project is designed to integrate elevated solar arrays over land actively managed for livestock	3,000,000
Missouri S&T	Phelps	Research/renewable energy	Propose to implement phase change materials (PCMs)-based advanced thermal energy storage technology for facilitating renewable energy deployment and enhancing building's energy efficiency.	1,000,000

Entity	Location	Priority Measure	Project	Cost ($)
Missouri S&T	Phelps	Research/renewable energy	project deliverable includes developing electrode assemblies based on copper, nickel, and iron-based materials that will be integrated into water electrolyzer and fuel cell stacks for on-demand generation of green hydrogen in large scale	800,000
Mizzou	Boone	Research/renewable energy	provide inventory of GHG emissions in Missouri landfills, quantified measures to reduce N2O and maximize CH4 collection, and etc.	4,000,000
Missouri S&T	Phelps	Research/renewable energy	Demonstrate the SMAD technology at Vichy Road Wastewater Treatment Plant, Rolla, to digester most, if not all, of its waste activated sludge. We will gain experience and determine the design parameters under practical field setting	400,000
Mizzou	Rural areas with agriculture	Research/Land Use	We focus on CO2 removal through agricultural processes as well as carbon capture and storage or CCS.	750,000
Mizzou	Boone & Callaway	Research/Land Use	project will provide funding for a 20-mile, green corridor technology demonstration between Columbia and Kingdom City, MO. Funding will be required for purchase of recylates to incentivize contractor use of those	1,000,000
		transportation projects	bike/trails	not yet quantified
Sullivan Precision Metal Finishing	Franklin County	Unclassified	Sullivan Precision Metal Finishing proposes to install air scrubbers above their chemical tanks and use water treatment to not use hazardous chemicals.	2,600,000
Metro Energy Orgnization	Jackson County	Unclassified	pilot business district and interactive artwork project aiming to restore commercial function to a vacant lot in Kansas City's District 5 through ground-level converted shipping containers serving various community amenities	1,500,000
	Ste. Genevieve	Unclassified	Transition from traditional cement to low carbon products	not yet quantified
City of Columbia Gov	Boone	Waste Management	Upgrade the McBaine Water Treatment Plant to include charcoal filtration post-treatment t	34,000,000
Summit Utilities	Greene County	Waste Management	Capture methane from the landfill convert it into Renewable Natural Gas (RNG)at the Noble Hill Sanitary Landfill in Willard	40,000,000

Entity	Location	Priority Measure	Project	Cost ($)
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Waste Management	Methane capture at active landfills	not yet quantified
Meramec Region Organization	Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski, Washington	Waste Management	tax incentives for farms and businesses to install and operate anaerobic digesters	not yet quantified
Missouri S&T	Phelps County	Waste management	MO municipal wastewater treatment facilities to upgrade technology for anaerobic digesters to energy-producing microbial fuel cells.	not yet quantified
SCS Engineers	Jackson County	Waste Management	Lee's summit Landfill methane conversion to CO2	750,000
SCCMO Organization	St. Charles County	Waste Management	Recycling center drop-off	7,000,000
City of Lamar	Barton	Waste Management	Expanding and adding additional methane to energy generation equipment to the Prairie View Landfill	6,000,000
Perry County Economic Development Authority	Perry County	Waste Management/ Renewable Energy	Waste to energy project to divert waste from the landfill to combust for renewable energy source	95,000,000
East-West Gateway Gathered Projects				
	St. Louis Region	Energy Efficiency	weatherization energy efficiency improvements for multifamily affordable housing	
			weatherization for low-income residents	
			indoor air quality HVAC filters	
			Weatherization/solar for all renovation of Parson Place Apts.	
		Incentives for energy efficiency for homes	ecoblock in academy neighborhood	
			energy disclosure ordinance incentives	
			grow food in cold seasons, renovation to kitchen for energy efficiency	
			solar on superfund site	
			energy efficient rehab for African Cultural Center building	
		Electrification of buildings/incentives	hvac system in county courthouse	
			rehabilitant of Murphy Park Apts.	
			North Sarah Apt. hvac system and solar readiness	
			future preservation square phases solar installation	

Entity	Location	Priority Measure	Project	Cost ($)
			electrification of HVAC and water heater, solar repairs for Arlington Grove	
			Murphy Park energy star appliances and weatherization	
			workforce development energy repairs	
			free energy audits	
			passive solar design	
			adobe and insulated concrete blocks	
			upgrades to City Greenhouse	
			cool roof incentive program	
		renewable energy	solar panels green roof for government buildings	
			solar for low income	
			streamline solar permits	
			cutting edge energy projects	
			ground source heat for the city	
			district wide ground source heat pump	
			close coal plants	
			neighborhood solar array Brentwood Red Complex	
			real community solar micro girds	
			vehicle to home solar	
		transportation projects	bike/trails	
			trail connectivity/expanding	
			road diets and intersections for bikers and walkers	
			planned greenways	
			sidewalks and bike lanes	
			plan for walking and biking design field	
			multi-model bridges	
			bike lanes/trails	
			complete Bricklane Greenway	
			city/county electric fleet	
			mobility hubs	
			micro mobility	
			school zone no idling	
			school bus electric fleet	
			district resiliency plan	

Entity	Location	Priority Measure	Project	Cost ($)
			free bus passes	
			hydrogen public buses	
			EV chargers on public property	
			HD charging depot for businesses	
			port to handle container on vessel ships to replace semi-trucks	
			electrified parking shuttle buses	
			aircraft maintenance facility projects	
			county- wide signal prioritization	
			Space reallocation bike facility	
			bike share program	
			e-bike rebates	
			employer transit pass program	
			education on public transit	
			metro link access lines	
		forestry/carbon sequestration	Heartland Watershed urban forest	
			wetland floodplain restoration	
			woodland restoration MDC's cost share program	
			expand Forest Releaf canopy project	
			green infrastructure on streets	
			shade and native plants at bus/metro stops	
			community gardens with Seed STL	
			Great Rivers National Park	
		Native Prairie Restoration	demonstrate and educate climate smart food production	
			promote local food	
			conservation easements	
			map priority tree planting locations	
			tree planting	
			Green living walls along highways	
		waste projects	food waste diversion	
			food waste collection and composting	
			divert waste from landfills	
			roll cart expansion	

Entity	Location	Priority Measure	Project	Cost ($)
			large scale reuse system	
			trash free water efforts	
			illegal dumping of materials	
			source separation at drop-off sites	
			anaerobic methane digester regeneration of RNG and biochar	
			electronics recycling program	
		Other	green schools program	
			gas lawn mower replacement	
			community closet	
			EH education and resources event	
			HydePark Environmental Heros	
			connecting leadership with you on agriculture	
			unhoused union	
			grants for buyouts along creeks	
			resilience hubs	
			public awareness program	
			energy burden report	
			housing code enforcements	
			neighborhood planning	
			PM 2.5 monitors	
			put workers on hybrid remote schedule	
			flooding issues	
			update Brentwood Climate Plan	
			hydroponic food production with passive solar	
			% of bills covered for extreme temp. times	
			indoor air quality monitor distribution program	
			workforce development for energy efficiency	

Appendix C: Municipal Outreach Subgrant Final Reports

CPRG Municipal Outreach Subgrant
Final Report – Harry S. Truman Coordinating Council

Applicant Organization:		**Harry S. Truman Coordinating Council**					
Report Date:		**December 10, 2023**					
Meeting Date	**Meeting Location**	**Meeting Time**	**Attendance Options**	**Virtual Attendance Estimate**	**In-Person Attendance Estimate**	**Description of Meeting Content**	**Other Notes**
November 2, 2023	105 E 11th St., Lamar, MO 64759	12:00 p.m.	Both Virtual and In-Person	5	30	Gave a brief overview of content in the Presentation 1 then presented the CPRG Presentation 2 – Sector Detail Workshop	Handed out and discussed the Project Idea Submission Form
November 13, 2023	502 Main St., Pineville, MO 64856	9:15 a.m.	Both Virtual and In-Person	1	5	Gave a brief overview of content in the Presentation 1 then presented the CPRG Presentation 2 – Sector Detail Workshop	Handed out and discussed the Project Idea Submission Form
November 14, 2023	302 S Main St. Room 101, Carthage, MO 64836.	9:00 a.m.	Both Virtual and In-Person	1	20	Gave a brief overview of content in the Presentation 1 then presented the CPRG Presentation 2 – Sector Detail Workshop	Handed out and discussed the Project Idea Submission Form

November 16, 2023	101 S Wood St., Neosho, MO 64850.	10:30 a.m.	Both Virtual and In-Person	3	10	Gave a brief overview of content in the Presentation 1 then presented the CPRG Presentation 2 – Sector Detail Workshop	Handed out and discussed the Project Idea Submission Form

Describe all non-meeting outreach activities (e.g. advertising, flyers, etc).

HSTCC solicited further input through the use of social media. The Project Idea Submission Form was posted on HSTCC's Facebook page 4 times throughout the month. It was also provided to all county commissions for redistribution to their respective jurisdictions. Anyone was invited to participate. The form was mailed to communities. HSTCC met 1 on 1 with the city of Neosho (in addition to the commission meeting) and discussed potential ideas.

1) Barton County – This meeting had the largest outreach. Representatives from most communities within the county attended. At least 3 people took submission forms.

2) McDonald County – This meeting was attended by primarily McDonald County officials. All took submission forms.

3) Jasper County – This meeting had the second largest outreach. Representatives from most communities within the county attended. Many people took submission forms.

4) Newton County - This meeting was attended primarily by Newton County Officials. Many took submission forms.

Please describe any outreach activities you conducted to specifically target low-income or disadvantaged communities, and any successes or difficulties you experienced in reaching these target audiences.

The majority of HSTCC's 67 communities are low-income and/or disadvantaged. We worked with many cities to ensure they have up-to-date knowledge on the upcoming grant opportunities and informed them that we would assist in any grant writing. Due to staffing limitations of many of our smaller cities, we invited community members to complete forms and assisted them with any questions they had.

Please describe any feedback you received at the meetings and any projects ideas that meeting attendees or outreach audiences provided as a result of the meetings and outreach activities. (Include Attachments as Necessary)

The main project idea was addressing Newton County's deficient landfill. It was proposed to renovate the landfill, subsequently reducing landfill emissions. Other project ideas are attached separately or were submitted directly to CPRG.

Any other comments or notes:

HSTCC informed all interested parties that HSTCC would assist with any next steps and grant applications. Many communities already utilize HSTCC's services for similar grant funding opportunities. HSTCC will keep all communities updated on the CPRG project progress and will notify all communities when implementation funding opens. Jurisdictions that submitted project proposals will be contacted personally by HSTCC.

CPRG Municipal Outreach Subgrant
Final Report – Meramec Regional Planning Commission

Applicant Organization:		Meramec Regional Planning Commission				
Report Date:		December 7, 2023				
Meeting Date	**Meeting Location**	**Meeting Time**	**Attendance Options**	**Virtual Attendance Estimate**	**In-Person Attendance Estimate**	**Description of Meeting Content**
November 14, 2023	MRPC Offices, 4 Industrial Dr., St. James, MO	2:00 p.m.	Both Virtual and In-Person	0	2	Welcome and introductions. Stated purpose of the meeting and program. Provided the PowerPoint Presentation for cities developed by MDNR - added a few slides on sectors from the sector PowerPoint. Provided hard copies of the presentation and the project idea submittal form. Shared links for the idea submittal form, the on-line survey and how to sign up for updates from MDNR. Also shared MDNR contact information. Discussed the importance of including underserved communities and that projects needed to be "shovel ready". Allowed time for questions, brainstorming and sharing of project ideas. Gathered email addresses so that the presentation, along with notes, could be shared with all attendees.
November 15, 2023	Waynesville City Hall, 100 Tremont	10:00 a.m.	Both Virtual and In-Person	1	0	Welcome and introductions. Stated purpose of the meeting and program. Provided the PowerPoint Presentation for

	Center, Waynesville, MO					cities developed by MDNR - added a few slides on sectors from the sector PowerPoint. Provided hard copies of the presentation and the project idea submittal form. Shared links for the idea submittal form, the on-line survey and how to sign up for updates from MDNR. Also shared MDNR contact information. Discussed the importance of including underserved communities and that projects needed to be "shovel ready". Allowed time for questions, brainstorming and sharing of project ideas. Gathered email addresses so that the presentation, along with notes, could be shared with all attendees.
November 21, 2023	Cuba City Hall, 202 N. Smith, Cuba, MO	10:00 a.m.	Both Virtual and In-Person	3	7	Welcome and introductions. Stated purpose of the meeting and program. Provided the PowerPoint Presentation for cities developed by MDNR - added a few slides on sectors from the sector PowerPoint. Provided hard copies of the presentation and the project idea submittal form. Shared links for the idea submittal form, the on-line survey and how to sign up for updates from MDNR. Also shared MDNR contact information. Discussed the importance of including underserved communities and that projects needed to be "shovel ready". Allowed time for

						questions, brainstorming and sharing of project ideas. Gathered email addresses so that the presentation, along with notes, could be shared with all attendees.

Describe all non-meeting outreach activities (e.g. advertising, flyers, etc).

The meetings were promoted in the following ways: notices for each meeting were placed on the MRPC Facebook page and boosted; press releases were sent out to all print media in the eight-county region. There were two rounds of press releases - the first one promoted the first three meetings. The second press release promoted the fourth meeting that was added on November 30th; emails were sent to MRPC board members, which includes all eight county commissions and representatives of 36 communities. Letters and/or emails were sent to organizations that serve underserved populations in the region (a list is attached); invitations were also sent to all employers in the region who employ 50 or more and to any companies that work in the area of renewable energy (list attached); and personal invites were sent via email to professors at the Missouri University of Science & Technology (list attached). Results of social media outreach are as follows: there were a total of four social media posts with one post being boosted to increase coverage; total reach for the social posts was 2,896 individuals.

Please describe any outreach activities you conducted to specifically target low-income or disadvantaged communities, and any successes or difficulties you experienced in reaching these target audiences.

All cities in the Meramec Region are statistically considered low-income. We also sent emails and/or letters to a list of organizations that serve disadvantaged populations in the region. That list is attached. We had at least one person attend who had ideas for a program to provide weatherization and solar panels to low-income neighborhoods. Another idea that was generated was developing a program for HUD landlords to provide assistance in improving their housing stock through weatherization, high efficiency HVAC and Energy Star appliances. There are currently over 700 HUD rental units in the Meramec Region. These upgrades would improve the overall housing stock in the region and reduce energy usage and costs for over 700 low-income families. The most significant difficulty faced with outreach to disadvantaged communities was identifying and finding contact information for many of the organizations that provide services to these underserved populations.

Please describe any feedback you received at the meetings and any projects ideas that meeting attendees or outreach audiences provided as a result of the meetings and outreach activities. (Include Attachments as Necessary)

We allowed time at each meeting for sharing of ideas, discussion and questions. There were a number of innovative ideas brought up by representatives from staff from the Missouri University of Science & Technology pertaining to anaerobic digester composting, improving processes at wastewater treatment plants that will reduce energy requirements including baffled bioreactor (BBR) technology; tax incentives or funding to install large- or small-scale anaerobic digestion composting; and an extensive program to help with the transition to a hydrogen economy. A local manufacturer is very excited about installing improved scrubbers for processes at his facility. An MRPC board member had ideas for installing small solar installations in low-income neighborhoods to reduce reliance on carbon fuels and provide energy cost relief to residents. There were also a number of project ideas that were repeated at most of the meetings: developing electric car charging infrastructure throughout the region as there are very few public charging stations at this time; weatherization and energy efficiency improvements at schools and other public facilities; programs that include rebates/tax incentives for energy improvements in HVAC, windows, doors, insulation, appliances, etc. in homes; programs to assist landlords in doing weatherization and improving energy efficiency in HUD approved housing to reduce energy bills and improve housing stock for low-income renters; installing solar farms on closed landfills; capturing methane at landfills to use for energy; rebates and tax incentives for the purchase of electric farm equipment; and the installation of solar powered EV charging stations in rural areas of the state (not just along interstate highways). All of the idea submissions that staff were copied on are attached.

Any other comments or notes:

After participants realized the size of grants that EPA was planning to fund, they had understandable concerns about how rural areas and small communities could access these funds and implement smaller scale projects. We fully support the option of having MDNR submit one, statewide grant application that would include the eligible project ideas from all over the state. This is the only way that small, rural areas will be able to access these funds. There are many small projects that are shovel ready and will have an impact on reducing climate pollution. Furthermore, by funding those projects, local residents will be able to see first-hand the benefits of these actions in reducing greenhouse gases and the benefits to their communities.

CPRG Municipal Outreach Subgrant
Final Report – City of Higginsville

Applicant Organization:		City of Higginsville, MO					
Report Date:		December 7, 2023					
Meeting Date	**Meeting Location**	**Meeting Time**	**Attendance Options**	**Virtual Attendance Estimate**	**In-Person Attendance Estimate**	**Description of Meeting Content**	**Other Notes**
November 6, 2023	City Hall Auditorium	6:00 p.m.	In-Person	N/A	23	Explained the importance and ways of reducing climate pollution, handed out project idea submission forms.	There was good discussion and interaction with citizens
November 20, 2023	City Hall Auditorium	6:00 p.m.	In-Person	N/A	37	Went deeper in-depth ways of reducing climate pollution and how the city could implement them, received idea submission forms	Again, there was good discussion and interaction with citizens, in the following weeks we received and handed out more idea submission forms.
November 14, 2023	City Hall Auditorium	6:00 p.m.	In-Person	N/A	21	Received a few more idea submission forms there was discussion on	Again, there was good discussion and interaction

						what we could implement to provide the best reduction.	with citizens, they seem to see the importance.

Describe all non-meeting outreach activities (e.g. advertising, flyers, etc).
Posted at City Hall community board, Facebook and word of mouth.
Please describe any outreach activities you conducted to specifically target low-income or disadvantaged communities, and any successes or difficulties you experienced in reaching these target audiences.
Posted at City Hall community board, Facebook and word of mouth.
Please describe any feedback you received at the meetings and any projects ideas that meeting attendees or outreach audiences provided as a result of the meetings and outreach activities. (Include Attachments as Necessary)
Through discussion at the meetings and idea submissions it was suggested to install solar field since we own 20 acres, EV charging stations throughout town, LED lighting upgrades (City buildings and streetlights), weatherization of City buildings, green spaces, planting of trees, large scale battery storage, and educating the citizens about weatherization, LED upgrades, energy efficient appliances, and greenspaces and trees.
Any other comments or notes:
Through this grant the City of Higginsville Could implement solar, EV charging station, and lighting upgrades all while lowering pollution and keeping the citizens' rates lower. All of the idea submissions were sent with the Grant application,

CPRG Municipal Outreach Subgrant
Final Report – Southwest Missouri Council of Governments

Applicant Organization:		Southwest Missouri Council of Governments					
Report Date:		December 10, 2023					
Meeting Date	**Meeting Location**	**Meeting Time**	**Attendance Options**	**Virtual Attendance Estimate**	**In-Person Attendance Estimate**	**Description of Meeting Content**	**Other Notes**
November 15, 2023	Branson City Hall	10:00 a.m.	Both Virtual and In-Person	5	5	The meeting was presented by two SMCOG staff and included a PowerPoint presentation that utilized slides and notes prepared by DNR. The presentation was a combination of the Community Kickoff and Sector Detail Workshop. Following the presentation, we opened the floor to Q&A and asked the audience to share potential project ideas for the CPRG Implementation phase. Meeting and open discussion lasted approximately 75 minutes. Attendees were encouraged to fill out the	The first meeting had a variety of attendees, primarily non-profit organizations, such as H2Ozarks and business owners, including an electric vehicle infrastructure company (Dynamic EVC).

						CPRG community survey on the grant-funded tablets as they left the meeting. Several meeting materials were made available to attendees, including the project idea submission form and QR code to the community survey.	
November 15, 2023	Springfield Public Library	5:30 p.m.	Both Virtual and In-Person	3	3	The meeting was presented by two SMCOG staff and included a PowerPoint presentation that utilized slides and notes prepared by DNR. The presentation was a combination of the Community Kickoff and Sector Detail Workshop. Following the presentation, we opened the floor to Q&A and asked the audience to share potential project ideas for the CPRG Implementation phase. Meeting and open discussion lasted approximately 75 minutes.	We originally anticipated this meeting would have the highest attendance count since it was held after 9-5 working hours, however, to our surprise this meeting had the lowest number of attendees. However, we were successful in having a handful of visitors fill out the CPRG community survey

						Attendees were encouraged to fill out the CPRG community survey on the grant-funded tablets as they left the meeting. Several meeting materials were made available to attendees, including the project idea submission form and QR code to the community survey.	on the grant-funded tablets.
November 29, 2023	Springfield Public Library	10:00 a.m.	Both Virtual and In-Person	10	5	The meeting was presented by two SMCOG staff and included a PowerPoint presentation that utilized slides and notes prepared by DNR. The presentation was a combination of the Community Kickoff and Sector Detail Workshop. Following the presentation, we opened the floor to Q&A and asked the audience to share potential project ideas for the CPRG Implementation phase. Meeting and open	Before the last meeting was held, we sent reminder notices to our full distribution list as well as targeted disadvantaged and low-income communities. We saw the largest virtual turnout from this event that included both local governments and utility companies as attendees.

						discussion lasted approximately 75 minutes. Attendees were encouraged to fill out the CPRG community survey on the grant-funded tablets as they left the meeting. Several meeting materials were made available to attendees, including the project idea submission form and QR code to the community survey.	
N/A	Video Recording	N/A	Virtual	25	N/A	A video recording of a previously held meeting was published to our website and shared to SMCOG's distribution list along with meeting materials (idea submission form, survey link, etc.).	The recorded video received the highest attendance/view count of all meetings. The recording was wide-reaching, and we believe it was easier for our region to watch the video at their own availability and convenience.
Describe all non-meeting outreach activities (e.g. advertising, flyers, etc).							

Upon receiving a notice to proceed from DNR, SMCOG prepared and published a newspaper notice that ran in the widest circulated newspaper in the region, the Springfield News-Leader. The notice was successful in reaching residents, business owners, and local governments. Resultantly, several people contacted SMCOG to gain more information about the CPRG program after the ad was published. The notice was also published on SMCOG's website. Additionally, a press release was distributed to several regional media groups and financial corporations, including tv stations and local banks. Notice of the regional meetings was shared with Ozarks Headwaters Recycling District and Missouri State University who passed the message along through their own distribution lists. SMCOG distributed additional meeting materials to our email distribution list as well as offered printed versions at the in-person meetings. Materials included the following items: project idea submission form, QR code for community survey, SMCOG-CPRG project flyer, EPA global greenhouse gas emissions data sheet, IPCC health fact sheet, Climate Action "Fast Facts" sheet, and EPA Tips for Preventing Pollution pamphlet. Lastly, SMCOG held a Board meeting on December 6, 2023, where we further discussed the CPRG implementation phase and encouraged our members and communities to submit project ideas by the December 10th deadline.

Please describe any outreach activities you conducted to specifically target low-income or disadvantaged communities, and any successes or difficulties you experienced in reaching these target audiences.

All three meetings were held in communities that were identified to be most vulnerable to climate-related impacts (i.e. Branson and Springfield). Vulnerability was defined by using EPA Environmental Justice Screening Tool in a variety of environmental indicators, including low-income, air toxicity, cancer exposure risk, and toxic releases to air. Additionally, EPA's Climate and Economic Justice Screening Tool was utilized to identify low-income and disadvantaged populations. Direct email invitations were sent to the communities identified at greater risk to discuss their potential vulnerability to air pollution and encourage their participation in the regional meetings. Unfortunately, we did not see as large of a turnout from these communities as we had planned. A large majority of our region is dominated by isolated rural communities, many of which have limited municipal staffing capacity. Due to the short time available in the project, we believe this impacted our ability to effectively reach these disadvantaged communities.

Please describe any feedback you received at the meetings and any projects ideas that meeting attendees or outreach audiences provided as a result of the meetings and outreach activities. (Include Attachments as Necessary)

We received a wide range of project ideas during the project period, with greatest interest in electric conversion, renewable energy, energy efficiency, and land use and waste management projects. Specific project ideas are listed below:

1) Increased availability of public Electric Vehicle DC fast-charging stations. Current EV charging infrastructure is predominated by slow charge stations which requires significant charge times and limits travel. By increasing public fast chargers, vehicle consumers may be more inclined to transition to EV technology. Idea proposed by Dynamic EV Charging (a local EV infrastructure company) at November 15, 10 AM meeting. Comment from Dynamic EV Charging - "we need DC Fast charging stations in SWMO to nourish EV adoption."
2) Utility company EV offsets/financial support. Residential DC fast chargers demand higher electricity usage commonly exceeding local utility electric use thresholds resulting in excessively high electric bills for EV consumers. Idea proposed by (a local EV infrastructure company) at November 15, 10 AM meeting. Comment from Dynamic EV Charging - " it would be really a major win if [utility companies could] receive support if they form some type of DC Fast EV Charging Station "demand fee" billing/credit system that would address the elephant in the room which is the UNMANAGEABLE operating cost of owning a DCFC. Currently, the demand fee (accounting for 90percent of operating costs) is the single largest factor preventing investors from deploying DC Fast Charging stations. The public WILL be more likely to choose an EV for their next vehicle if they know they have access to public fast charging stations. If not CPRG, I can only hope this very real issue can reach the right discussion board in our state as it will be a very important issue to address very soon. All EV production goals for Auto manufacturers are as early as 2025 with most being 2030. We can look at other states who are just ahead of us on all this and they have 100percent had to address this, some at the legislative level. . . It's new but very real, and this bottleneck has and is slowing adoption down like a traffic jam at 5:00pm. We need to address this any chance we get."
3) Energy efficiency building improvements for nonprofit organizations, residents, industries, and other businesses. Mirrored after recent Renew America's Nonprofits award to the Mid-American Regional Council in Kansas City, energy efficiency upgrades are severely needed for southwest Missouri. According to the Department of Energy, operational costs are the second-highest expense for non-profits specifically. Building efficiency can drastically reduce energy consumption and lead to reduced greenhouse gas emissions. Idea proposed by Entegrity Energy Partners, LLC at November 15, 10 AM meeting.
4) Construction of hazardous waste facility in Stone County. Recycling hazardous waste assists in limiting greenhouse gas emissions by reducing the need to manufacture new products that require more energy and raw materials than

recycled materials. Idea proposed by H2Ozarks at November 15, 10 AM meeting. Comment from H2Ozarks -"Stone County currently has no site for citizens to dispose of household or hazardous waste within the county. Additionally, Table Rock Lake sits in the center of Stone County and is the engine that drives the economic life of the region. The EPA has designated Table Rock Lake as an “impaired water” for aquatic life due to high levels of algae, nitrogen, and phosphorus. Protecting the waters of Table Rock Lake and the tributaries from household and hazardous waste that may feed into it are crucial to preventing human health issues, the deterioration of natural resources, and loss of economic vitality in the county." Project Idea Form attached.

5) Residential and building weatherization financial support. Idea briefly mentioned by City Utilities of Springfield at November 29, 10 AM meeting.
6) Greene County attended the November 29, 10 AM meeting and mentioned they would be submitting a few project idea submission forms to DNR. Exact projects were not described.
7) Bolivar attended the November 29, 10 AM meeting and mentioned they would be submitting a project idea submission form to DNR. Exact project was not described.
8) On-site wastewater treatment system for closed landfill in Webster County. The closed landfill currently requires daily hauling of 5,000 of landfill leachate. By constructing an on-site treatment system, the landfill can eliminate greenhouse gas emissions generating from heavy-duty hauling trucks. Additionally, the landfill area could be utilized to implement solar energy to power the proposed facility. Idea proposed by Webster County following SMCOG Board Meeting on December 6, 2023. Comment from Great River Engineering and Webster County - "As heavy-duty vehicles generate more than 25 percent of the total global warming emissions, elimination of the need to haul the leachate generated would directly reduce greenhouse gas emissions in this community. Estimates suggest that these trips are emitting up to a pound of particulate matter into the local atmosphere on a daily basis. The construction of an onsite leachate treatment system would eliminate these trips, significantly reducing emissions over time. This proposed project is within a disadvantaged census tract, reduces greenhouse gas emissions, proposes renewable energy, and improves the efficiency of a waste management system." Project Idea Form attached.
9) Publicly expressed ideas and opinions (specific to southwest Missouri region): a) funding or rebates for residential and business solar panels; b) funding or rebates for electric vehicle acquisitions; c) funding or rebates for atmospheric water generators or hydro panels; d) increased use biofuel conversion for renewable energy sources, such as cow dung or agricultural waste; e) increased access to EV charging stations; e) electric conversion for

recreational boating to reduce fossil-fuel powered engines; f) increased urban greenspaces; g) incentives for the construction, implementation and education of "green rooftops;" h) electric conversions for freight and public transit vehicles; i) renewable energy sources from building rooftop wind-turbines (search Ridgeblade products); j) increased use of public transportation; k) increased capacity of active transportation (i.e. sidewalks, bike paths) to encourage people to drive less; l) creation of carpooling programs; m) support community health through sustainable farming support with start-up costs and training for residential uses, including innovative farming techniques such as hydroponics, aquaponics, aeroponics, recycling agriculture waste to encourage composting and to limit agricultural tilling which releases stored carbon into the atmosphere.
Any other comments or notes:
Overall, the region was highly interested in this program. However, due to limited time available we believe some communities and targets were not reached. Additionally, several found it unclear how funds would be distributed to communities, regions, or on the residential-to-industrial scale in the implementation phase. We are excited to see the development of Missouri's Priority Climate Action Plan and extend our support in future environmental planning and implementation opportunities.

CPRG Municipal Outreach Subgrant
Final Report – City of Columbia

Applicant Organization:		City of Columbia, MO					
Report Date:		December 11, 2023					
Meeting Date	**Meeting Location**	**Meeting Time**	**Attendance Options**	**Virtual Attendance Estimate**	**In-Person Attendance Estimate**	**Description of Meeting Content**	**Other Notes**
November 2, 2023	N/A	1:30-3:00 p.m.	Virtual	23	N/A	DNR's Community Kick Off slides were presented along with general project category ideas for which those attending could submit feedback. This meeting was targeted toward Community based organizations, local businesses, and industry representatives. With that, the information was presented and explained for how it would be most useful to these entities.	
November 3, 2023	Columbia's Activity and Recreation Center	5:30-7:00 p.m.	In-Person	N/A	25	DNR's Community Kick Off slides were presented along with general project category ideas for which those attending could submit feedback. This	Childcare and food was provided at a central location to make the meetings as

						meeting was targeted toward community members and any other interested parties. With that, the information was presented and explained for how it would be most useful to these entities.	accessible as possible.
November 9, 2023	Columbia's Activity and Recreation Center	5:30-7:00 p.m.	In-person	N/A	27	DNR's Community Kick Off slides were presented along with general project category ideas for which those attending could submit feedback. This meeting was targeted toward community members and any other interested parties. With that, the information was presented and explained for how it would be most useful to these entities.	Childcare and food was provided at a central location to make the meetings as accessible as possible.
Describe all non-meeting outreach activities (e.g. advertising, flyers, etc).							

In addition to the three meetings, the Office of Sustainability staff flyers at various locations throughout all parts of town. Information on CPRG was also provided to the City's Boards and Commissions, as well as all City department directors through email. Each in person meeting was also followed-up with multiple emails. The flyers included a QR code that would take the reader to the City's BeHeard page where they would find the links to the DNR Project Idea Submission Form, DNR's survey monkey, and a survey that the City created to gain feedback from the community on how they would like to see CPRG funds used with regard to City owned projects. The City's survey was designed to address inequity and barriers to resources that people may face.
Please describe any outreach activities you conducted to specifically target low-income or disadvantaged communities, and any successes or difficulties you experienced in reaching these target audiences.
In addition to flyers at community-based organizations that provide services to low-income and vulnerable communities, Office of Sustainability staff also presented a community resource fair and planning meeting held by local non-profit, Powerhouse. Powerhouse Community Development's mission is to prepare and equip individuals for economic and life challenging situations as it relates to their personal growth and development. One of their areas of focus for "Building Bridges Over Barriers" is the natural environment. The intersection of such issues as poverty, crime, and food shortages (among others) with climate change was discussed with other stakeholders and community members at these meetings.
Please describe any feedback you received at the meetings and any projects ideas that meeting attendees or outreach audiences provided as a result of the meetings and outreach activities. (Include Attachments as Necessary)
In addition to the projects and ideas listed on the attached Project Idea Submission form summary page, there was a theme across all feedback inputs of the value in providing programs and supporting projects that directly benefit low-income households and communities. From the community feedback side of things, this was especially the case with regard to energy efficiency and renewable energy programs/projects.
Any other comments or notes:

Appendix D: List of Missouri Low-Income and Disadvantaged Communities (LIDAC) by County

The following table lists all Missouri census tracts by county that are identified as low-income disadvantaged communities according to the Climate and Economic Justice Screening Tool (CEJST).[39]

Table 1: Missouri LIDAC Communities by County

Census tract 2010 ID	County	Census tract 2010 ID	County	Census tract 2010 ID	County
29001950100	Adair	29095005700	Jackson	29179380100	Reynolds
29001950200	Adair	29095005801	Jackson	29179380200	Reynolds
29001950300	Adair	29095006000	Jackson	29181870100	Ripley
29001950900	Adair	29095006100	Jackson	29181870200	Ripley
29005950100	Atchison	29095006300	Jackson	29181870300	Ripley
29007950100	Audrain	29095006500	Jackson	29181870400	Ripley
29007950200	Audrain	29095007600	Jackson	29183311500	St. Charles
29007950500	Audrain	29095007700	Jackson	29185480100	St. Clair
29009960100	Barry	29095007802	Jackson	29185480200	St. Clair
29009960200	Barry	29095007900	Jackson	29185480300	St. Clair
29009960300	Barry	29095008000	Jackson	29187950300	St. Francois
29009960401	Barry	29095008700	Jackson	29187950400	St. Francois
29009960402	Barry	29095008800	Jackson	29187950600	St. Francois
29009960500	Barry	29095008900	Jackson	29187950800	St. Francois
29009960600	Barry	29095009500	Jackson	29187950902	St. Francois
29011960100	Barton	29095009600	Jackson	29187951000	St. Francois
29011960300	Barton	29095009700	Jackson	29187951100	St. Francois
29013070300	Bates	29095010201	Jackson	29189210200	St. Louis
29013070400	Bates	29095010500	Jackson	29189210300	St. Louis
29015460100	Benton	29095010702	Jackson	29189210400	St. Louis
29015460200	Benton	29095011000	Jackson	29189210501	St. Louis
29015460300	Benton	29095011100	Jackson	29189210502	St. Louis
29015460400	Benton	29095011200	Jackson	29189210600	St. Louis
29015460800	Benton	29095011405	Jackson	29189210702	St. Louis
29017950100	Bollinger	29095011500	Jackson	29189210703	St. Louis
29017950200	Bollinger	29095011600	Jackson	29189210704	St. Louis
29017950300	Bollinger	29095011700	Jackson	29189211102	St. Louis
29019000700	Boone	29095011800	Jackson	29189211201	St. Louis
29019000900	Boone	29095011900	Jackson	29189211500	St. Louis
29019001502	Boone	29095012000	Jackson	29189211801	St. Louis
29019001503	Boone	29095012100	Jackson	29189211802	St. Louis

[39] Explore the map - Climate & Economic Justice Screening Tool (geoplatform.gov)

Census tract 2010 ID	County
29019002100	Boone
29021000300	Buchanan
29021000400	Buchanan
29021000500	Buchanan
29021000702	Buchanan
29021000900	Buchanan
29021001000	Buchanan
29021001100	Buchanan
29021001200	Buchanan
29021001500	Buchanan
29021002100	Buchanan
29021002400	Buchanan
29021003000	Buchanan
29023950100	Butler
29023950201	Butler
29023950202	Butler
29023950300	Butler
29023950400	Butler
29023950500	Butler
29023950600	Butler
29023950700	Butler
29023950800	Butler
29023950900	Butler
29025950100	Caldwell
29025950200	Caldwell
29029950200	Camden
29029950400	Camden
29029950500	Camden
29029950800	Camden
29029950900	Camden
29031880900	Cape Girardeau
29031881400	Cape Girardeau
29031881600	Cape Girardeau
29033960300	Carroll
29035960100	Carter County

Census tract 2010 ID	County
29095012600	Jackson
29095012903	Jackson
29095012906	Jackson
29095013003	Jackson
29095013100	Jackson
29095013203	Jackson
29095013208	Jackson
29095013210	Jackson
29095013301	Jackson
29095013307	Jackson
29095013309	Jackson
29095013405	Jackson
29095013410	Jackson
29095014004	Jackson
29095014902	Jackson
29095015300	Jackson
29095015400	Jackson
29095015500	Jackson
29095015600	Jackson
29095016000	Jackson
29095016100	Jackson
29095016200	Jackson
29095016300	Jackson
29095016400	Jackson
29095016500	Jackson
29095016600	Jackson
29095016900	Jackson
29095017000	Jackson
29095017100	Jackson
29095017200	Jackson
29095017400	Jackson
29095017500	Jackson
29095017800	Jackson
29095988300	Jackson
29097010600	Jasper

Census tract 2010 ID	County
29189211900	St. Louis
29189212001	St. Louis
29189212002	St. Louis
29189212101	St. Louis
29189212102	St. Louis
29189212200	St. Louis
29189212500	St. Louis
29189212600	St. Louis
29189212700	St. Louis
29189213101	St. Louis
29189213102	St. Louis
29189213300	St. Louis
29189213400	St. Louis
29189213600	St. Louis
29189213800	St. Louis
29189213900	St. Louis
29189214100	St. Louis
29189214200	St. Louis
29189214300	St. Louis
29189214601	St. Louis
29189214602	St. Louis
29189214700	St. Louis
29189216000	St. Louis
29189216900	St. Louis
29189220300	St. Louis
29189221800	St. Louis
29195090100	Saline
29195090300	Saline
29195090400	Saline
29195090600	Saline
29197470100	Schuyler
29197470200	Schuyler
29199480100	Scotland
29199480200	Scotland
29201780100	Scott

Census tract 2010 ID	County
29035960200	Carter County
29037060904	Cass
29039870100	Cedar
29039870200	Cedar
29039870300	Cedar
29041470200	Chariton
29043020102	Christian
29045950200	Clark County
29045950300	Clark County
29047020201	Clay
29047020500	Clay
29047020602	Clay
29047022100	Clay
29051010600	Cole
29051020700	Cole
29053950300	Cooper
29053950400	Cooper
29055450102	Crawford
29055450200	Crawford
29055450302	Crawford
29055450400	Crawford
29057480100	Dade
29057480200	Dade
29059480100	Dallas
29059480200	Dallas
29061470200	Daviess
29063080100	DeKalb
29065960100	Dent
29065960200	Dent
29065960300	Dent
29065960400	Dent
29067950100	Douglas
29067950200	Douglas
29067950500	Douglas
29069360100	Dunklin
29069360200	Dunklin
29069360300	Dunklin
29069360400	Dunklin

Census tract 2010 ID	County
29097010800	Jasper
29097011000	Jasper
29097011100	Jasper
29097011200	Jasper
29097011600	Jasper
29097011700	Jasper
29097011800	Jasper
29097012200	Jasper
29099700605	Jefferson
29099701102	Jefferson
29099701200	Jefferson
29101960600	Johnson
29103960100	Knox
29103960200	Knox
29105960100	Laclede
29105960400	Laclede
29105960500	Laclede
29105960600	Laclede
29107090200	Lafayette
29109470300	Lawrence
29109470400	Lawrence
29109470500	Lawrence
29109470601	Lawrence
29109470602	Lawrence
29111970200	Lewis
29113810100	Lincoln
29113810400	Lincoln
29115490300	Linn
29115490400	Linn
29117480300	Livingston
29117480500	Livingston
29119070100	McDonald
29119070200	McDonald
29119070300	McDonald
29119070400	McDonald
29121960100	Macon
29121960200	Macon
29121960400	Macon

Census tract 2010 ID	County
29201780300	Scott
29201780600	Scott
29201780700	Scott
29201781200	Scott
29203470100	Shannon
29203470200	Shannon
29205450200	Shelby
29205450300	Shelby
29207470100	Stoddard
29207470200	Stoddard
29207470300	Stoddard
29207470400	Stoddard
29207470500	Stoddard
29207470600	Stoddard
29207470700	Stoddard
29207470800	Stoddard
29209090200	Stone
29209090400	Stone
29209090602	Stone
29211480100	Sullivan
29211480300	Sullivan
29213480105	Taney
29213480106	Taney
29213480201	Taney
29213480202	Taney
29213480302	Taney
29213480401	Taney
29213480402	Taney
29215480100	Texas
29215480200	Texas
29215480300	Texas
29215480400	Texas
29217950100	Vernon
29217950200	Vernon
29217950300	Vernon
29217950400	Vernon
29217950600	Vernon
29219820101	Warren

Census tract 2010 ID	County
29069360500	Dunklin
29069360600	Dunklin
29069360700	Dunklin
29069360800	Dunklin
29069361000	Dunklin
29071800701	Franklin
29071800902	Franklin
29071801101	Franklin
29073960200	Gasconade
29073960400	Gasconade
29075960100	Gentry
29075960200	Gentry
29077000400	Greene
29077000501	Greene
29077000502	Greene
29077000600	Greene
29077001100	Greene
29077001302	Greene
29077001400	Greene
29077001700	Greene
29077001800	Greene
29077001900	Greene
29077002200	Greene
29077002300	Greene
29077002402	Greene
29077002700	Greene
29077003100	Greene
29077003200	Greene
29077003300	Greene
29077003600	Greene
29077004302	Greene
29077004400	Greene
29077004802	Greene
29077005500	Greene
29077005600	Greene
29077005800	Greene
29079960400	Grundy
29081950100	Harrison
29081950200	Harrison

Census tract 2010 ID	County
29121960500	Macon
29123960100	Madison
29123960200	Madison
29123960300	Madison
29125880100	Maries
29127960500	Marion
29127960800	Marion
29127960900	Marion
29129470200	Mercer
29131962800	Miller
29131962900	Miller
29133950100	Mississippi
29133950200	Mississippi
29133950300	Mississippi
29133950400	Mississippi
29135385200	Moniteau
29135385400	Moniteau
29137960300	Monroe
29139970100	Montgomery
29139970200	Montgomery
29139970300	Montgomery
29139970400	Montgomery
29141470100	Morgan
29141470200	Morgan
29141470300	Morgan
29141470400	Morgan
29141470500	Morgan
29143960100	New Madrid
29143960200	New Madrid
29143960300	New Madrid
29143960400	New Madrid
29143960500	New Madrid
29143960600	New Madrid
29145020100	Newton
29145020200	Newton
29145020300	Newton
29145020700	Newton
29145020800	Newton
29145020900	Newton

Census tract 2010 ID	County
29219820102	Warren
29219820103	Warren
29221460100	Washington
29221460200	Washington
29221460300	Washington
29221460400	Washington
29221460500	Washington
29223690100	Wayne
29223690200	Wayne
29223690300	Wayne
29223690400	Wayne
29225470101	Webster
29225470102	Webster
29225470201	Webster
29225470202	Webster
29225470302	Webster
29225470401	Webster
29225470402	Webster
29229490100	Wright
29229490200	Wright
29229490300	Wright
29229490400	Wright
29510101500	St. Louis City
29510101800	St. Louis City
29510105300	St. Louis City
29510105400	St. Louis City
29510105500	St. Louis City
29510106100	St. Louis City
29510106200	St. Louis City
29510106300	St. Louis City
29510106400	St. Louis City
29510106500	St. Louis City
29510106600	St. Louis City
29510106700	St. Louis City
29510107200	St. Louis City
29510107300	St. Louis City
29510107400	St. Louis City
29510107500	St. Louis City
29510107600	St. Louis City

Census tract 2010 ID	County
29081950300	Harrison
29083950100	Henry
29083950400	Henry
29083950500	Henry
29083950600	Henry
29085470100	Hickory
29085470300	Hickory
29085470500	Hickory
29087960100	Holt
29089960200	Howard
29091090100	Howell
29091090200	Howell
29091090300	Howell
29091090400	Howell
29091090500	Howell
29091090600	Howell
29091090700	Howell
29091090800	Howell
29093950100	Iron
29093950200	Iron
29093950300	Iron
29093950400	Iron
29095000300	Jackson
29095000600	Jackson
29095000700	Jackson
29095000800	Jackson
29095000900	Jackson
29095001000	Jackson
29095001800	Jackson
29095001900	Jackson
29095002000	Jackson
29095002100	Jackson
29095002200	Jackson
29095002300	Jackson
29095003400	Jackson
29095003700	Jackson
29095003800	Jackson
29095005200	Jackson
29095005300	Jackson

Census tract 2010 ID	County
29145021000	Newton
29147470100	Nodaway
29147470200	Nodaway
29149480100	Oregon
29149480200	Oregon
29149480300	Oregon
29153470100	Ozark
29153470200	Ozark
29155470100	Pemiscot
29155470200	Pemiscot
29155470300	Pemiscot
29155470400	Pemiscot
29155470500	Pemiscot
29155470600	Pemiscot
29157470400	Perry
29159480300	Pettis
29159480400	Pettis
29159480500	Pettis
29159480600	Pettis
29159480700	Pettis
29159480800	Pettis
29159480900	Pettis
29159481000	Pettis
29159481100	Pettis
29161890100	Phelps
29161890200	Phelps
29161890400	Phelps
29163460100	Pike
29163460200	Pike
29163460300	Pike
29163460400	Pike
29163460500	Pike
29165030002	Platte
29167960100	Polk
29167960200	Polk
29167960300	Polk
29169470101	Pulaski
29169470390	Pulaski
29171960100	Putnam

Census tract 2010 ID	County
29510108100	St. Louis City
29510108200	St. Louis City
29510108300	St. Louis City
29510109600	St. Louis City
29510109700	St. Louis City
29510110100	St. Louis City
29510110200	St. Louis City
29510110300	St. Louis City
29510110400	St. Louis City
29510110500	St. Louis City
29510111100	St. Louis City
29510111200	St. Louis City
29510111300	St. Louis City
29510111400	St. Louis City
29510111500	St. Louis City
29510112200	St. Louis City
29510112300	St. Louis City
29510115100	St. Louis City
29510115200	St. Louis City
29510115300	St. Louis City
29510115400	St. Louis City
29510115500	St. Louis City
29510115600	St. Louis City
29510115700	St. Louis City
29510116100	St. Louis City
29510116302	St. Louis City
29510116400	St. Louis City
29510118400	St. Louis City
29510120200	St. Louis City
29510121100	St. Louis City
29510121200	St. Louis City
29510124100	St. Louis City
29510124200	St. Louis City
29510124600	St. Louis City
29510125700	St. Louis City
29510126600	St. Louis City
29510126700	St. Louis City
29510126900	St. Louis City
29510127000	St. Louis City

Census tract 2010 ID	County
29095005400	Jackson
29095005500	Jackson
29095005601	Jackson
29095005602	Jackson

Census tract 2010 ID	County
29171960200	Putnam
29175490200	Randolph
29175490300	Randolph
29175490400	Randolph

Census tract 2010 ID	County
29510127100	St. Louis City
29510127400	St. Louis City
29510127500	St. Louis City

Appendix E: Public Comments and Updates to Draft Plan

The draft Missouri Plan for Environmental Improvement Grants was placed on public notice on the Department of Natural Resources' website at: https://dnr.mo.gov/calendar/event/246091 on January 9, 2024. The plan was available for viewing and comments were accepted through February 7, 2024. The department also hosted a public meeting on the proposed plan on January 25, 2024. The public was able to attend this open forum virtually or in-person. Comments received in response to the public notice and public meeting are listed below. All project ideas submitted during the public notice period were added to Appendix B: Project Idea Submissions.

Changes made to the draft plan prior to finalizing it include:

- Adding a Priority Measure for the Resiliency in Local Energy – Coalition;
- Added a Priority Measure specific to Sustainable Agricultural Practices;
- Added a Priority Measure specific to Decarbonization in Cement Production;
- Updated and added accessible tools for estimating GHG emission reductions for priority measures;
- Updated list of proposed project submissions in Appendix B;
- Added Appendix D – List of LIDAC Communities by census tract ID;
- Added Appendix E - Public Comments and Updates to Draft Plan

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Comments received during the public notice period:

1. **Scott Lewis, Director, Municipal Partnerships for AMP (Comment received via email 2/5,2024):**

   I came across your contact information on the EPA's CPRG Planning website and was hoping I could share some information regarding AMP's technology, which uses AI to accurately and quickly sort both MSW and/or Recycling.

   I recently joined AMP as their Municipal Partnerships Director and know that we could be a great partner as you move forward through your CPRG planning. This grant would lower the cost of implementing MSW-diverting technology. This would in turn reduce all waste disposal in landfills while recovering beneficial commodities. AMP also has an associated solution for the organics material that sequesters the carbon, a key piece in the CPRG program.

   We've designed these Dirty MRF systems to fit into existing transfer stations to minimize the need for new infrastructure and allow them to be deployed more quickly than other solutions. This makes them an even more compelling fit for the CPRG program as you work through the planning and implementation phase.

I'd love to share more if we could set up an intro call in the next week or so? I'd be happy to work around your schedule.

2. **Jeffrey Owens, PC Installation Professional (Comment Received via email 2/6/2024):**
Sorry didn't have time to write up and submit prior to your deadline for the Climate Pollution Reduction grant and your implementation plan and no one was around this afternoon to discuss further. I have reason to believe that MFA would be interested in implementing and cost sharing a program here in Missouri.

   Lithos is in Georgia and claims to have technology to measure the outcome. So far I have not found a trace of this yet here in Missouri but I did find a local news article typifying how Missouri farmers are looking for such a thing. I didn't find a trace of this at MU Extension or at the Ag College at Mizzou but I did find information posted by UC Davis.

   https://www.lithoscarbon.com/contact

   https://www.ucdavis.edu/climate/news/adding-crushed-rock-farmland-pulls-carbon-out-air

3. **Green & Healthy Homes Initiative (GHHI) (Comment received via email during the public notice period):**
Advancing a Whole House Approach: An Equity-Centered Strategy for Pollution Reduction and Environmental Justice Climate Pollution Reduction Grant Program
(GHHI) is a 501(c)(3) nonprofit organization dedicated to advancing racial and health equity and opportunity through the creation of healthy, safe, and energy efficient homes. A national expert and advocate on green and healthy homes, GHHI's groundbreaking work across the United States includes 65 cities, counties, and states that are using housing as a platform for improved health, social, and environmental outcomes. GHHI proposes including a whole house approach—a comprehensive strategy that bundles electrification and energy efficiency improvements along with health, safety, and other necessary home repairs—as a GHG reduction measure in your EPA Climate Pollution Reduction Grant program and offers its assistance in supporting implementation.

   The Case for a Whole House Approach to GHG Reduction Measures
   - A whole house approach could improve the equitable reach and impact of building related GHG measures by integrating electrification and energy efficiency improvements with addressing barriers to those measures such as health and safety deficiencies in those homes. The whole house approach would include environmental hazard removal (e.g., lead, mold, and asbestos), building structure and wiring repairs, electrical upgrades, and improving indoor ventilation. These common interventions are often considered pre-weatherization readiness measures – those completed before building envelope upgrades and appliance electrification can take place.

- GHG Reduction measures listed by the EPA in the CPRG NOFO include, “Incentive programs for the purchase of certified energy-efficient appliances, heating and cooling equipment, lighting, and building products to replace inefficient products” and “Programs and policies to promote electrification of government-owned, commercial, and residential buildings”. Output and outcomes examples include electrified appliances installed, buildings retrofitted, improved public health from reductions in co-pollutants, and reductions in asthma hospital admissions and emergency department visits.

- Whole house approaches are particularly impactful for low-income and disadvantaged communities, where historical disinvestment often results in housing with a range of health, safety, and energy needs. Whole house approaches offer holistic services to residents that reduce pollutants, improve health outcomes, and reduce residents’ energy burden. This approach can also help reduce deferral rates for home electrification and weatherization programs, especially in low-income and disadvantaged communities. Many houses have years of deferred maintenance that present as barriers to electrification, including lead paint hazards, mold issues, structural defects, and poor weatherization. Residents have high energy burdens and higher rates of house-related health disparities such as lead poisoning, asthma, and COPD.
- Health and safety hazards in the home can disqualify residents from receiving weatherization or electrification, and in addition, residents may be skeptical of any electrification or weatherization initiative that does not also address more pressing needs in the home. Whole house programs and initiatives have been launched across the country, including the Built to Last program in Philadelphia, PA; the Trenton Whole House Program in Trenton, NJ; the Detroit 0% Interest Home Repair Loan Program in Detroit, MI, the Low-Income Weatherization Program offered statewide in California, among others. A whole house approach streamlines program administration, saving state resources while simplifying the resident experience with a one-stop shop model. This approach is the most efficient and cost-effective use of federal, state, and local funding sources that have been deployed to collectively address our unified climate goals. As the next section details, whole house approaches meet several climate and community objectives and can strengthen a jurisdiction’s Priority Climate Action Plan.

How a Whole House Approach Strengthens Priority Climate Action Plans

A whole house approach will contribute to greater reduction in pollutants and increased community benefits in low-income and disadvantaged communities, all while advancing environmental justice.

- Whole house approaches can help achieve significant reductions in emissions of greenhouse gases (GHGs), criteria air pollutants, and hazardous air pollutants. This approach broadens the reach and access to appliance electrification services. An estimated 10% of US CO2 emissions stem from fossil fuel appliances, and residential appliance electrification programs can therefore reduce a significant source of GHGs. Fossil fuel appliances such as furnaces and gas water heaters are also sources of criteria

air pollutants such as particulate matter and nitrogen dioxide, among others, and studies have shown that gas stoves emit hazardous air pollutants like benzene. Home health and safety services can further reduce pollutants such as lead hazard reduction. Residential energy efficiency and weatherization can decrease household energy use and therefore reduce any associated electricity generation-related pollutants. Integrating electrification and health and safety services maximizes the potential reduction of residential pollutants.

- Whole house approaches achieve a range of community benefits. Whole house approaches result in lower energy demand and energy bills for residents in low-income and disadvantaged communities. This approach makes communities healthier by reducing their exposure to air pollutants and other health and safety hazards, helping improve health outcomes such as asthma, lead poisoning, and more. Because whole house programs are designed to comprehensively meet the needs of communities and individual households, they both enhance community engagement and reduce barriers that families accessing assistance often face.
- Funding a whole house approach for low-income homes is attainable. The additional cost per unit slated for electrification could range between $5K-$20K for a single-family unit, or $2K-$20K for a multifamily unit. Additionally, other leverageable funding sources could be aligned, braided, and coordinated to maximize benefits.

GHHI's Support for Implementation of Whole House Approaches
GHHI is prepared to support with the implementation of a whole house approach in the following ways:

- Build partnership networks, processes, and protocols to effectively align and braid climate funding with other new and existing funds to maximize the impact of disparate home repair and home upgrade programs.
- Engage community-based organizations in implementing programs by providing capacity building, training, and program management support as needed.
- Model and evaluate health and other non-energy benefits that accrue from the implementation of residential home energy upgrade programs.
- Leverage healthcare and other innovative funding streams to ensure the sustainable delivery of program services beyond the longevity of CPRG funding.

To explore further how GHHI could support implementation of whole house approaches, please contact Michael McKnight, Senior Vice President of National Programs, at mmcknight@ghhi.org

4. **Jessica Norris, Senior Ecologist, Biohabitats (Comment received via email 2/7/2024):**
Both reducing carbon emissions and managing carbon in ecosystems are essential strategies for stabilizing climate change. Properly managed, ecosystems can serve as invaluable carbon sinks, actively capturing and retaining carbon dioxide while also fostering overall

ecosystem health and resilience. However, carbon reservoirs in vegetation and soils are often at risk of depletion due to disturbances such as catastrophic wildfires, windstorms, and severe droughts: these factors are lessened in MO, which means land use conversion is a powerful tool here.

Based on an inventory of carbon stocks, annual carbon flux, and vulnerability to carbon loss, target landscape locations and practices can be identified. Above and belowground carbon sequestration in restored landscapes is an active topic in restoration literature, and this project would seek to use carbon sequestration accounting to prioritize and supplement ongoing restoration and land management projects.

Although the full range of partners necessary to complete this task is not ready to compile a more complete proposal on rewetting landscapes and restoring floodplain forests, please look for a summary within two weeks.

5. **Julia Marsh, Consultant (Comment received via email 2/7/2024):**

Thank you for the opportunity to submit comments on the proposed Missouri Plan for Environmental Improvement Grants.

We are writing to propose the inclusion of community-scale reuse systems, specifically for food ware, in the Plan. Reuse is a transformative climate solution fit for Priority Climate Action Plans and Implementation Grants, and Perpetual can help write the implementation grant for interested entities.

A reusable food ware system would replace current single-use food and beverage containers with reusable ones, providing 'food ware as a service' to restaurants and customers. A service provider would supply restaurants with reusable food ware for a low per-use fee, similar to the disposable supply model. Restaurant customers receive food and drinks in reusable containers and return them in one of many conveniently placed reuse bins.

Containers are collected, cleaned, and inspected before being redistributed. This model can easily be expanded and adapted to provide reusable wares to other institutions, such as public schools, workplace cafeterias, venues, etc.

Reusable food ware systems provide environmental and community benefits. They result in reductions in GHG emissions, offer a better and healthier eating and drinking experience, and reduce air pollution and waste. They deliver economic benefits, including for low-income and disadvantaged communities, by creating good local jobs and keeping more money in the local economy.

The CPRG program is an opportunity to receive government funds to overcome the financial barriers to implementing community-scale reuse systems.

Reuse of food ware, included as a sustainable materials management action under the Landfill and Solid Waste section of the Plan, would drastically contribute to reducing the amount of waste material sent to landfills, especially single use plastic items, and would result in significant cumulative GHG emissions reductions by 2030 and beyond.

To include reuse in the Missouri Plan, the following suggested text (bolded below) could be added on page #17:

"Grant funds can be used to enact the following elements of sustainable materials management to decrease landfill methane emissions: reduce food loss and waste; increase recycling; facilitate reuse of products, such as food and beverage containers; separate collection of organic waste and incentivize alternative uses; install methane capture systems; and apply biologically active cover to landfill. These projects can help low-income communities by creating partnerships among citizens, nonprofit organization and local governments and industry in sustainable community planning, increasing local economic resilience, and creating jobs."

Reusables can result in 2 to 10 times less lifecycle GHG emissions than disposable alternatives. Reusable food ware systems reduce GHGs not only by reducing the amount of disposable food ware entering the waste stream, but also by reducing the quantity of disposable products manufactured.

Replacing single-use disposable products used in Missouri with reusables could reduce GHG emissions in the state by more than 245,000 metric tons of CO2e per year.
Reuse systems drastically decrease waste and pollution, especially from plastic, which has compounding climate impacts that are not reflected in current LCAs. Disposable packaging and food ware are among the most littered items and release GHGs as they degrade.

Replacing single-use disposable products used in Missouri with reusables could eliminate more than 60,000 metric tons of waste per year, of which almost half is plastic.

The avoided manufacture, transportation, use, and disposal of single-use products is associated with reduced health impacts from exposure to toxic chemicals and other co-pollutants. This has particular significance for vulnerable communities, which tend to be most affected by the health consequences of manufacturing, disposal, pollution, and climate change.

Reuse systems have economic benefits, from the avoided costs and productivity losses associated with health impacts to economic savings for local governments and taxpayers

from reduced waste and litter management. Reuse also expands local economic opportunity, creating an estimated 200 to 330 jobs per 10,000 metric tons of single-use waste avoided (Upstream 2021, Perpetual analysis).

Reuse is aligned with the objectives of the CPRG program and implementation grants. It is an ambitious measure that will achieve significant cumulative GHG reductions by 2030 and beyond, it is innovative and replicable, community engagement is a core element of program design and implementation, and, once scaled, reuse systems are economically self-sustaining.

Perpetual is a nonprofit working to implement community-scale reuse systems that replace single-use disposables, starting with food ware, and is currently working with four US cities to design and deploy reuse systems that will be launching starting this fall. Perpetual is making its full process, tools, and materials used to establish these systems publicly available and has resources to assist interested entities with writing CPRG implementation grants to take advantage of this significant opportunity to fund reuse. We can also help identify jurisdictions interested in pursuing implementation grants for reuse.

We would be happy to discuss further or provide additional details or suggestions. Thank you for the opportunity to comment on this draft plan.

6. **Angela Gordon, PACE Manager, Missouri Energy Initiative (Comment received via email 2/7/2024):**

The Missouri Energy Initiative ("MEI") commends the Missouri Department of Natural Resources ("MO DNR") for its diligent efforts in shaping the draft Missouri Plan for Environmental Improvement Grants ("Missouri Plan"). MEI offers these comments to contribute to the further development of an already commendable foundation, fostering continued investment in efficient technologies and resources statewide, involving all segments of energy consumers.

While public attention has centered on the impact of public funds from the Inflation Reduction Act and other recent federal legislation, MEI emphasizes that private investment will also play a crucial role in achieving Missouri's CPRG goals. As highlighted by the White House Maps of Progress tracking initiative, private investment is actively monitored and will be instrumental in identifying the most optimal allocation of public funds.

In our role as administrators for three Missouri-based Property Assessed Clean Energy (PACE) programs, MEI is able to witness the daily economic benefits realized by Missouri businesses, their employees, and communities. PACE programs facilitate public-private partnerships, enabling local businesses to secure private funding for energy efficiency upgrades and renewable energy systems. These initiatives are repaid through a special assessment applied annually to the property by the local public agency.

MEI applauds MO DNR's recognition of the importance of both public and private financing in the successful implementation of the Missouri Plan, particularly in the section titled "Intersection of Other Funding Availability." Show Me PACE, one of the three PACE programs administered by MEI, is featured on page 32 of the draft Missouri Plan. We appreciate this acknowledgment of PACE programs' unique role in supporting investments in Missouri businesses and we offer two suggestions for the final plan.

Suggestion #1: The Show Me PACE description is accurate, but a sentence suggests that only energy cost savings are considered in determining financing eligibility. The Missouri PACE Act requires that the project provides net economic benefits to the borrower, including operation and maintenance savings. Therefore, we propose changing the sentence on page 32: "A key requirement is that energy savings must exceed the cost of the measures." to "A key requirement is that the benefits of the project – such as energy savings and reduction in O&M expenses – must exceed the cost of the measures."

Suggestion #2: As this is a statewide plan, we recommend including the Set The PACE program and the St. Louis County Missouri Energy Savings Program in the listing of available resources for Missouri businesses seeking to implement projects. MEI provides administrative services for both programs, each overseen by its Clean Energy Development Board and having unique service territories.

The following program descriptions may be used in the final Missouri Plan:

(4) Set the PACE St. Louis provides commercial PACE for businesses located in the City of St. Louis. The Set the PACE program connects participants with capital providers offering private funding for energy efficiency and renewable energy projects. The Set the PACE St. Louis program was developed in 2012. After passing an Ordinance and creating the Clean Energy Development Board, the City's Office of Sustainability and St. Louis Development Corporation launched the program in 2013 as an innovative financing tool designed to support sustainability projects on building in the City of St. Louis.

(5) The Missouri Energy Savings Program (MOESP), the official St. Louis County PACE Clean Energy Development Board, provides commercial PACE. MOESP is an Open-Market Commercial PACE program, which connects businesses with multiple capital providers willing to fund energy efficiency projects and renewable energy systems at St. Louis County-based facilities. The program provides funding for both retrofits and new construction. St. Louis County established the MOESP in December 2011, under Ordinance No. 69056. The ordinance established a Clean Energy Development District and associated Board to administer a PACE program within St. Louis County.

As MO DNR prepares the final draft of the Missouri Plan, we urge continued support for public-private partnerships to maximize economic and environmental benefits to Missouri businesses, communities, and residents. Toward this end, we propose the following ideas for how MEI may collaborate with MO DNR and other stakeholders to optimize outcomes:

Proposal #1 – Create a Small Business Loan Fund Expanding Access To PACE
MEI is currently the founder and administrator of the Show Me PACE Clean Energy District (and administrator of St. Louis City and St. Louis County PACE CEDBs) which allows us to support the increased use of energy efficiency and renewable energy. Show Me PACE has been the most successful commercial PACE district in Missouri and MEI has been responsible for facilitating more than $130 Million in PACE financing, which has leveraged more than $550 million in economic development. Our program's open-market program has received more than 90 projects since 2016. Our current project pipeline for PACE is more than $80 million over the next 12 months.

In addition to PACE, MEI has supported the analysis and dialogue needed to increase utilization of energy efficiency measures for commercial and residential partners, through our educational outreach and Midwest Energy Policy Series. MEI is made up of more than twenty of Missouri's most vital energy stakeholders and provides a forum for important and vital discussions for Missouri's energy future.

MEI has seen over the last eight years of our work in PACE that commercial energy efficiency projects under $500,000 and those in rural areas are not being funded or supported. Our program proposal is to develop a two-pronged program that allows the funding of projects under $500,000 through the reduction of upfront costs (such as fixed underwriting, streamlined energy auditing), while also funding rural projects through improved underwriting and the deployment of a loan loss reserve fund. As the administrator of three clean energy districts, which currently service the majority of Missouri's LIDCs, and through the PACE ordinance adoption process is available to 100% of Missouri's LIDCs. Finally, the LIDCs in Missouri's rural communities are rarely targeted and this proposal specifically seeks to serve specifically seeks to service.

Proposal #2 – Support Growth of A Missouri-Based Renewable Energy Manufacturing Base (PV/Solar)
MEI proposes creation of a fund to help grow the Missouri-based solar manufacturing market. Specifically, Springfield, Missouri-based Sun Solar is one of the largest solar companies in the state. Sun Solar Mfg, LLC, is seeking to expand. The company would domestically manufacture and assemble solar components and panels for wholesale distribution (residential and commercial panels). This expansion will create significant economic benefits, new jobs and state resourced renewable energy systems for residents and businesses.

Currently, Sun Solar Mfg, LLC is seeking equity and lending partners to fund a solar panel manufacturing company in the United States and participate in the Inflation Reduction Act (IRA) manufacturers rebate program and allow its customers to participate in the 10% additional tax credit that the IRA program offers. The company may qualify for PACE financing as part of the final capital stack, but state investment would significantly support the growth of Missouri's renewable energy economy.
According to Sun Solar, once production is up and running, they will be able to produce 1.5 Gigawatts of panel production that would result in that same in substantial GHG reductions. The current sited location of the facility is in Mexico, Missouri.

Proposal #3 -- Support Growth of A Missouri-Based Renewable Energy Manufacturing Base (RNG)
MEI proposes developing a fund to support the funding of a Renewable Natural Gas (RNG) project in Washington, Missouri, called Timber Ridge. RNG has significant environmental benefits both at the landfill and at the point of utilization. The project will capture gas from the landfill that is presently being incinerated in a flare, processing it and injecting it into the natural gas pipeline.

When landfill gas is incinerated in a flare at the landfill, the off gas emitted from combustion is carbon dioxide. Recycling the landfill gas at Timber Ridge rather than incinerating it will reduce carbon dioxide emissions by approximately 12,500 tons per year. This represents a substantial improvement in air quality in the community and can provide enough energy for over 200 homes. Timber Ridge is a project costing more than $11 Million.

Timber Ridge is seeking $1M- $3Million CPRG funds that will fund key project components and will be combined with Property Assessed Clean Energy and Private Funds. RNG is a sustainable, reliable, domestic clean energy supply. The RNG will be sold to fleets such as UPS, FEDEX and Amazon, which use compressed RNG in place of diesel fuel.

RNG has the lowest carbon content of any fuel on a lifecycle basis.[40] RNG offers the lowest greenhouse gas emissions of any commercially available fuel.[41] According to the California Air Resources Board, RNG reduces lifecycle greenhouse gas emissions by 90+% compared to conventional diesel or gasoline.

7. <u>Brian Renaud, MUPA (Project idea submitted via email during the public notice period):</u>

[40] Ending the Diesel Era Cleaner Fleets for a Healthier New York City, a Report by Energy Vision May 2018)
[41] (California Air Resources Board)

Energy Storage project idea submitted for Macon and Saline Counties

Project Description: The Utility-Scale Battery Deployment project aims to address climate pollution by installing advanced energy storage systems on a large scale within the electric utility infrastructure that supports both Marshall and Macon Municipal Utilities. The project, led by MPUA, will focus on enhancing grid reliability and reducing greenhouse gas emissions through the optimized use of stored energy. The locations for battery placement have been selected based on capacity needs and availability of ideal sites. These utilities are replacing diesel generators that were previously utilized as grid backups. Each location will contain a 1-megawatt (MW), 4-hour battery. This infrastructure will make a significant impact in meeting utility capacity requirements, ensuring long-range reliability, and reducing emissions. As these communities are each part of a pool of MPUA member electric utilities, the benefits of this installation will be spread across 35 total rural municipal utility communities across the State.

Estimated Cost: The estimated total cost of these projects is $5 Million. MPUA has a target date for these batteries to come online in the fall of 2026.
Existing funds: A match of 50% would allow these projects to be economical and ensure affordability in these areas.

Barriers to implantation: Supply chain delays and increasing costs are known potential barriers. Individually, these municipal utilities face larger economic challenges in updating and modernizing their distribution systems. Both cities are overburdened and underserved as identified in the Climate and Economic Justice Screening Tool, however, with the collaborative approach including MPUA pooled resources and CPRGT funds, the risk to project success is significantly reduced. Grant funding at the 50% level would make these projects viable and would mitigate economic barriers associated with redundant overhead and support services as well as implementation and construction costs.

8. **Crystal Jones, Executive Director, Perry County Economic Development Authority (Comment received via email 2/2/2024):**

Perry County has an opportunity to secure a green energy company to operate in the county. The company, Refuse 2 Energy (R2E), Inc. will process 500 tons per day of solid waste and convert it into base load electricity. The demand for electric generation has grown substantially over the last few years, and demand is quickly outpacing supply. The electrification of vehicles, automation of jobs in manufacturing processes, and use of electronic devices in almost every aspect of our lives has exploded in recent years. Clean energy sources need to come online quickly to help traditional base load generation keep up with demand. R2E can provide that support while solving another issue, filling landfills with solid waste.

The Perry County transfer station currently receives municipal solid waste from the city of Perryville and surrounding communities. The proposed R2E facility will divert 174,000 tons of solid waste from entering landfills where it would generate methane and pose a threat to our supply of groundwater. The R2E facility could also use old tires in its process, eliminating another pain point for the county. The R2E plant would generate 15.8MW of electricity, would operate 24 hours a day, 7 days a week, and create 30 new full-time jobs. Perry County requests that this project, as submitted as a project idea for the MO DNR's Climate Pollution Reduction Grants (CPRG) program.

Additional Information:
Perry County and Perryville MO have teamed up with Refuse 2 Energy, Inc (R2E) to eliminate the need for any landfill and to create a source of renewable base load power. Perry County currently operates a transfer station which receives municipal solid waste from the city of Perryville and surrounding communities. The transfer station currently processes about 1300 tons per month of municipal solid waste and that waste is then hauled to a landfill in southern Illinois.

By adopting the Refuse 2 Energy technology, Perry County can utilize 100% of the municipal solid waste in the County and can process additional waste from surrounding communities to create base load renewable energy and eliminate the need to haul the waste to remotely located landfills.

The R2E facility will be constructed at the closed landfill at the site of the existing transfer station. The project is anticipated to cost $95 million and will be capable of processing 500 tons per day of municipal solid waste. 500 Tons per day is the waste generated by population of approximately 200,000 Missouri residents. A single R2E facility will prevent 174,000 tons of MSW from being disposed of in a landfill where it would generate methane, a greenhouse gas that has 80 times greater global warming potential than carbon dioxide and poses threats to our groundwater supply. In addition to utilizing MSW, the gasification facility is also capable of utilizing old tires which are a problem in almost every Missouri community. The R2E technology also recovers and recycles 100% of the metals from the waste stream. With the R2E Technology nothing is landfilled, everything is returned into the economy.
The Refuse 2 Energy technology is a proprietary process developed over a period of many years at an R&D facility in Kentucky. Upon completion, that facility was capable of process 340 tons per day of MSW. Refuse 2 Energy Inc. has obtained the exclusive right to utilize the technology worldwide. The process uses a rotary kiln to gasify the MSW with no presorting and utilizes the high heat, low BTU syngas produced in the kiln to power a boiler by way of a patented proprietary burner system to create steam. The steam is then used to power a turbine and generator to create electricity. Once the plant is started up the process is fully self-sufficient and requires no outside power source. The process generates 15.8MW of power 24 hours a day 7 days a week and consumes only 10% of the power generated to

sustain its operations resulting in 14.2MW of renewable base load power to be sold to the grid. The facility is zero discharge with all the leachate from the incoming MSW being collected and evaporated in the process. What minor emissions there are from the facility are scrubbed utilizing a state-of-the-art emission control system.

The project in Perryville is ready to begin as soon as funding is secured. R2E has in place an EPC team which has already completed the preliminary engineering and that team is prepared to complete the engineering and begin construction as soon as funding is available. Total time for design and construction is estimated at 30 months. The project will create about 100 jobs during construction and will create 30 new full-time jobs once the plant is in operation.

9. **Project Idea submitted by WM Waste Management (Submitted via email during the public notice period):**

Project Title: WM CNG Refuse Vehicle Replacement Project

Target Regions: St. Joseph, St. Louis

Project Contact: Jayme Parker, Strategic Sourcing Manger, Jparker4@wm.com

Project Description: WM is seeking support to replace thirty-four (34) heavy-duty diesel solid waste collection vehicles with near-zero emission compressed natural gas (CNG) solid waste collection vehicles at its facilities in St Joseph and St. Louis, Missouri. Natural gas engines have certified NOx levels that are 90% below the current diesel standard and provide an opportunity for extremely cost-effective emissions reductions. These vehicles will be deployed by the end of 2025 and will operate in local refuse collection and recycling routes serving these communities.

Community Benefits, including to Disadvantaged Communities: Pollution from diesel refuse collection trucks disproportionately affects communities of color and low-income communities. By replacing diesel trucks with cleaner CNG, this project will enable annual emissions reductions of NOx by 58.8%, diesel particulate matter by 47% and hydrocarbons by 83.7% in the communities served by these refuse vehicles. The reduction of these harmful emissions translates to benefits to community human health, regional air quality and environmental conditions. Additionally, this project will advance the overall deployment of commercially available and technically viable near-zero emission engines.

Project Co-Benefits: The use of low-NOx CNG engines notably improves air quality compared to gas- and diesel-powered engines. Co-benefits include reduced impacts to human health risks associated with exposure to gas and diesel engine exhaust, and associated savings from avoided pollution-induced health incidence.

Emissions Results, AFLEET Heavy-Duty Vehicle Emissions Calculator (HDVEC)[42]

Lifetime Emissions Reductions (15 years)	
Pollutant	34 CNG Trucks
NOx (lb.)	22,619.97
PM2.5 (lb.)	2,145.09
GHG (short tons)	25,290.37

Estimated project cost: $13,615,951

Total funding request: $1,700,000

[42] https://afleet.es.anl.gov/hdv-emissins-calculator/