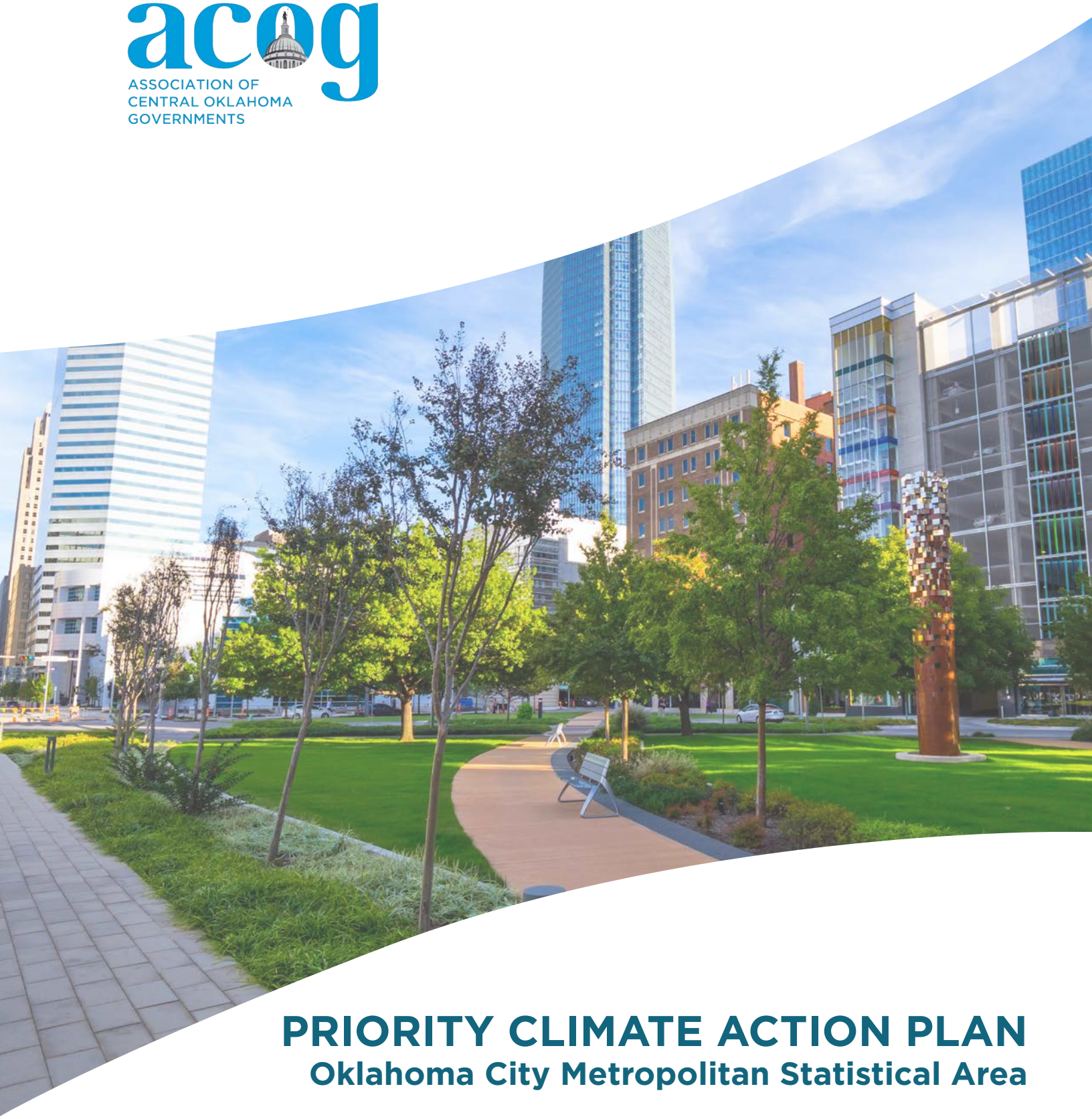
ASSOCIATION OF CENTRAL OKLAHOMA GOVERNMENTS



PRIORITY CLIMATE ACTION PLAN

Oklahoma City Metropolitan Statistical Area

MARCH 2024

Association of Central Oklahoma Governments
4205 N. Lincoln Blvd. | Oklahoma City, OK 73105 | 405.234.2264 | acogok.org

OKLAHOMA CITY METROPOLITAN STATISTICAL AREA
ASSOCIATION OF CENTRAL OKLAHOMA GOVERNMENTS
March 2024
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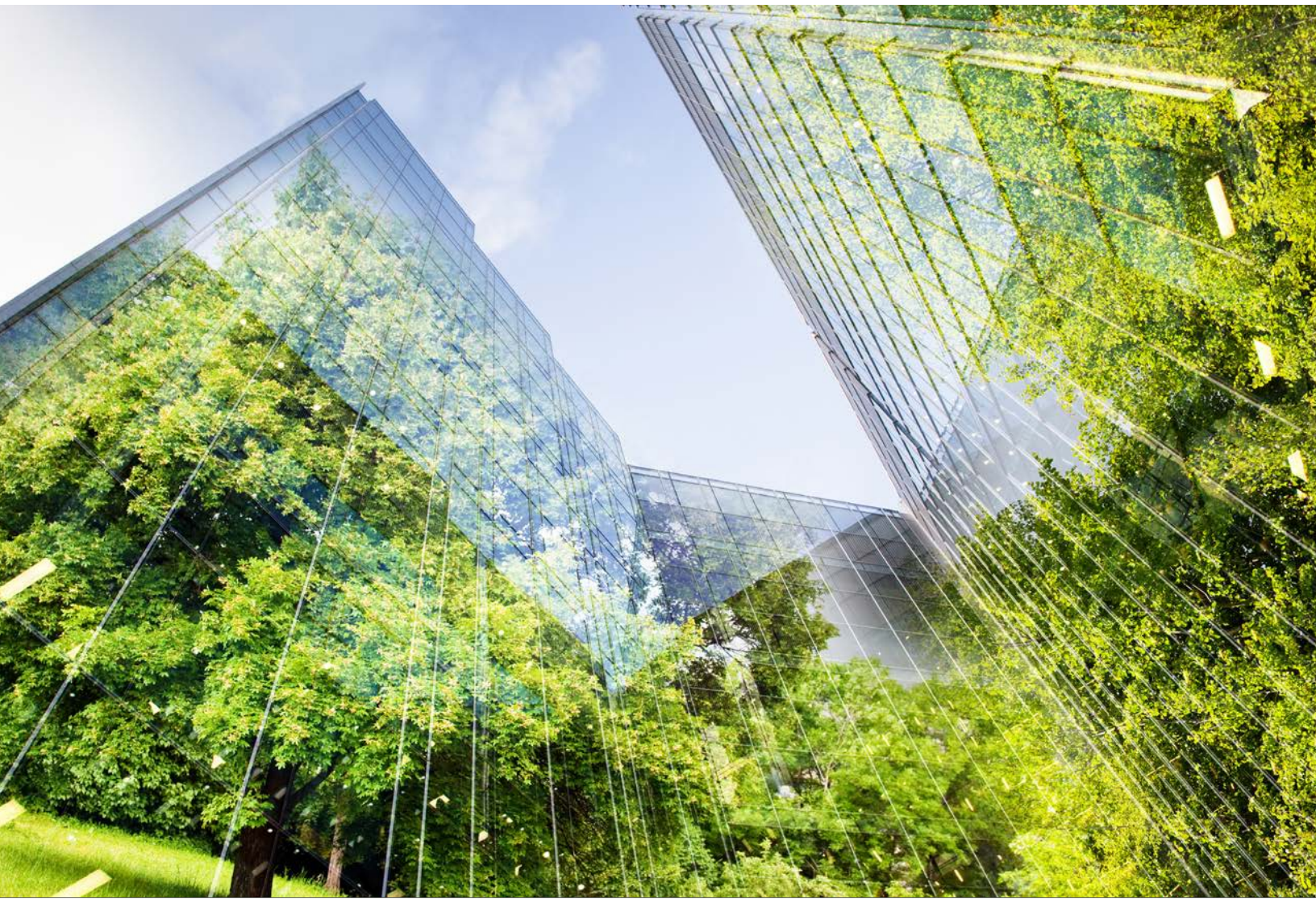
Thank you to all of our state, local, community, and tribal partners for the continued participation and support of this process. You are appreciated. Through cooperation we can improve the health, safety, air quality, and overall quality of life of our community.



DEFINITIONS AND ACRONYMS

ACOG	Association of Central Oklahoma Governments
CCAP	Comprehensive Climate Action Plan
CRPG	Climate Pollution Reduction Grants
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
LIDAC	Low Income Disadvantaged Communities
MSA	Metropolitan Statistical Area
PCAP	Priority Climate Action Plan

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EXECUTIVE SUMMARY

THE CLIMATE IS CHANGING

The not so distant past provides an example of environmental disaster that led to extreme societal and economic hardship. The combination of extreme weather and man-made technological advances and practices produced The Dust Bowl, a devastating scourge for countless communities across the Southern Plains. But as adaptokc states, "a proportionate response came as across the country people were enlisted in a peacetime war against environmental degradation, mounting hundreds of public works projects including drainage, erosion control, fire, disaster response, development and construction of infrastructure from rural fire roads to urban parks, and a "shelter belt" of nearly 220 million trees planted to reduce the landscape-scouring winds."

Today, the climate is changing at an increasing rate and is putting communities at risk from climate hazards that impact the land, water, and quality of life for the region. Central Oklahoma communities are seeing extreme weather and heat, ice storms, flooding and drought, water quality and quantity concerns, and wildfires. Warming temperatures are worsening air pollution by elevating near-surface ozone levels.[1] The Oklahoma City Metropolitan Statistical Area (MSA) is rapidly growing, and that growth is contributing to increases in greenhouse gas (GHG) emissions, resulting in accelerated climate change. Climate action for the region will rely on comprehensive planning and implementation strategies for mitigation (emissions reductions) and adaptation actions (strategies to reduce the impacts). The impact of these actions extends beyond an individual project and direct impacts to GHGs. Climate hazards are exacerbated by climate change and disproportionately impact low-income and minority communities in how the hazard effects communities and how the hazard is mitigated. Often, housing in these communities lacks adequate weatherization and shade from tree canopies, and residents are subject to increases in flood vulnerability.[2] Investments in planning and implementation create new workforce development opportunities and position the region to continue to support a green economy.

Authorized under the 2022 Inflation Reduction Act, the Climate Pollution Reduction Grants (CPRG) Program provides $5 billion in federal funding to states, metropolitan statistical areas, and tribal nations to develop climate action plans that reduce GHG emissions. GHG emissions reductions are an important step to reducing the rate of climate change and the harmful effects.

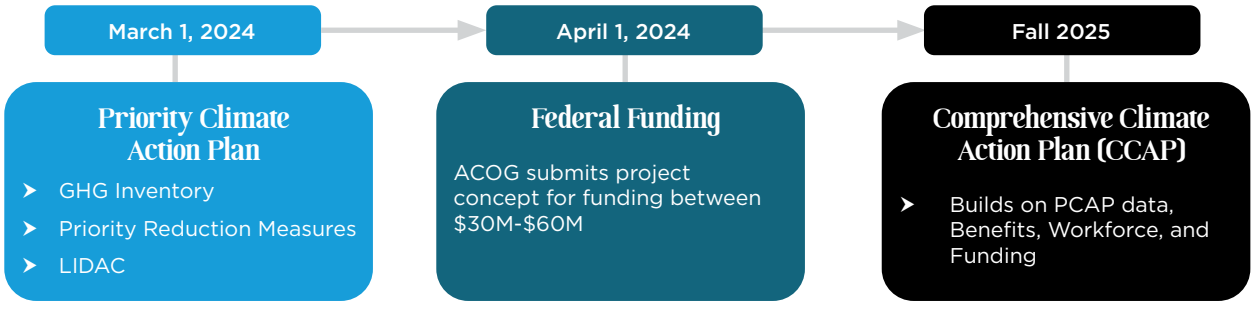


Figure 1: CPRG program milestones

Investments in climate action planning goes beyond developing a plan. The process brings partners together to address complex and correlated environmental, economic, and social challenges. It opens the door for meaningful engagement and dialog with those who have traditionally not had a voice in the decision-making process. It creates a structure so that investments achieve reductions in GHG emissions but also result in co-benefits and workforce development opportunities.

This Priority Climate Action Plan (PCAP) has been developed for the Oklahoma City Metropolitan Statistical Area (MSA) that covers eight counties in Central Oklahoma. Led by the Association of Central Oklahoma Governments (ACOG), this multi-jurisdictional coordinated strategy will result in a future Comprehensive Climate Action Plan (CCAP) that can guide partners through policy, program, and plan design while reducing GHG emissions and considering the community. As a region, this process is a commitment to understanding how climate change and GHG emissions are impacting air quality, low-income and disadvantaged communities, and the region at large.

At the state and regional level, the State of Oklahoma (Secretary of Energy & Environment Office & state lead organization Oklahoma Department of Environmental Quality), the Tulsa Metropolitan Statistical Area, Muscogee (Creek) Nation, Kickapoo Tribe, and Kiowa Tribe are also participating in the EPA CPRG Program to support the development of strategic and implementable climate action plans. ACOG and the State of Oklahoma are working together through this process to align GHG reduction objectives and coordination efforts.

This plan recognizes the need to balance economic, environmental, and social needs for the Oklahoma City MSA. Action to mitigate and adapt to climate change will require partnerships on all levels between public, private, and tribal sectors. Investments in climate change mitigation and adaptation have tremendous co-benefits that positively impact public health such as improved air quality, expansion of multi-modal transportation networks, and financial savings. **This Priority Climate Action Plan (PCAP) provides an inventory of the contributing sectors for GHG emissions and outlines three priority reduction measures for the Oklahoma City MSA to continue to improve air quality and reduce GHG emissions for the region. This PCAP lays the foundation for creating a more comprehensive climate action plan in 2024 and 2025.**

Note: Central Oklahoma is required to meet EPA standards for regulated pollutants including those required by the National Ambient Air Quality Standards. As such, this PCAP recognizes transportation as a significant contributor to GHGs and identifies measures to support reduction of ozone-forming emissions and maintain alignment with air quality standards.

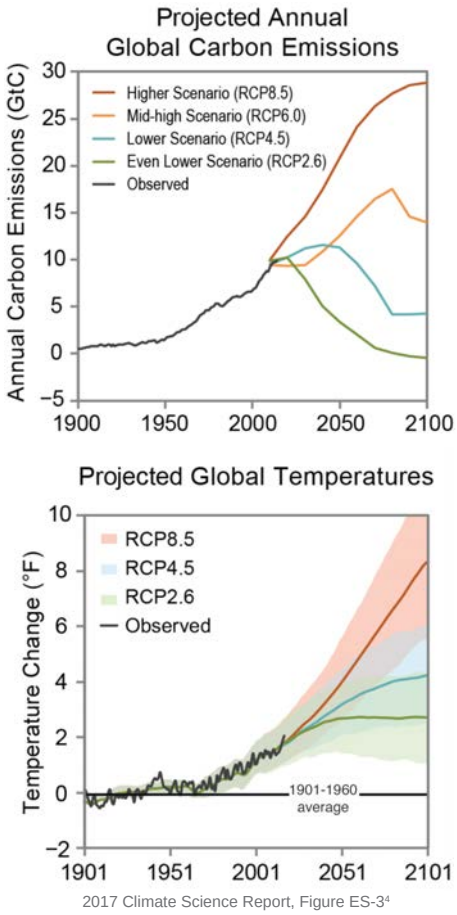


Figure 2: Data from the National Oceanic and Atmospheric Administration demonstrating the correlation between GHG emissions and global temperatures

> ***"The climate is changing because the earth is warming. People have increased the amount of carbon dioxide in the air by 40% since the late 1800s. Other heat-trapping greenhouse gases are also increasing. These gases have warmed the surface and lower atmosphere of the planet about one degree during the last 50 years. Evaporation increases as the atmosphere warms, which increases humidity, average rainfall, and the frequency of heavy rainstorms in many places—but contributes to drought in others.[3]"***

1 INTRODUCTION

CLIMATE CHANGE AS A PRIORITY

Central Oklahoma is experiencing the effects of a changing climate, and the negative effects are only likely to intensify in the coming years.

As adaptokc states, "One of the most serious threats confronting us is climate change. Characterized by changes in temperature and precipitation, climate change is a threat multiplier, intensifying existing challenges already facing us through infrastructure, safety and security, and public health." Human activity including land-use changes, energy use, consumption, and production activities have resulted in increased greenhouse gas emissions, leading to accelerated climate change.

Critical infrastructure including water, wastewater, energy, and communication systems are compromised by extreme climate events that result in economic losses and disruption in service in our communities.[5] How do we balance tackling the threat of climate change while fostering thriving communities and a high quality of life for our region that depends on energy, technology, and infrastructure in addition to clean air, clean water, and housing?

At the national level, the United States identifies climate change as a priority and is working to understand what climate change means for the country and how to balance economic prosperity and growth with public health and jobs.[6] The EPA has created the CPRG Program for states, metropolitan statistical areas, and tribal nations that provides funding to develop priority climate action plans, provide funding to implement priority projects, and ultimately result in the creation of a comprehensive climate action plan that will increase the understanding of challenges and, importantly, identify a suite of solutions that will support GHG reductions, economic growth, workforce development, and improved water, land, and air quality.

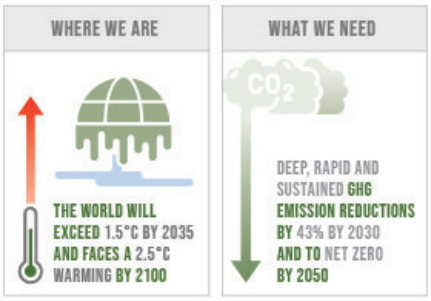


Figure 3: Climate change must become a priority with associated actions to reduce GHG emissions SDG_report_2023_infographics_Goal 13.jpg (649×865) (un.org)

The CPRG Program has three broad objectives that support how to reduce impacts from GHGs:

- Tackle damaging climate pollution while supporting the creation of good jobs and lowering energy costs for families
- Accelerate work to address environmental injustices and empower community-driven solutions in overburdened neighborhoods
- Deliver cleaner air by reducing harmful pollution in places where people live, work, play, and go to school

Cities, towns, tribal nations, and regions are interconnected at every level. The Oklahoma City MSA depends on a vibrant economy with a foundation in energy generation that supports transportation, jobs, education, and quality of life. Municipalities and decision-makers are being pushed to make tougher choices while providing critical services like waste, water, energy, and transportation on shrinking budgets. Communities are faced with ever changing stressors like increased food costs, higher heating and cooling bills, and impacts from extreme weather all while the most vulnerable populations are disproportionately impacted by these stressors. The PCAP is a structured approach that makes climate change a priority and develops a cohesive process for climate action.

REGIONAL APPROACH TO REDUCING IMPACTS OF CLIMATE CHANGE

This plan addresses the uncertainties of climate change, the need to reduce GHG emissions, and the recognition that climate change disproportionately impacts vulnerable populations. Notably, there are nine tribal jurisdictions that account for 29% of the Oklahoma City MSA population. These tribes include the Wichita-Caddo-Delaware, Chickasaw Nation, Cheyenne-Arapaho, Kiowa-Comanche-Apache, Sac and Fox Nation, Iowa Tribe, Kickapoo Tribe, Potawatomi Tribe, and the Absentee Shawnee Tribe.

The Oklahoma City MSA collectively is working towards a vision for climate action that is being facilitated by ACOG. ACOG was established in 1966 and is a regional vehicle for change that facilitates regional planning and grant administration to local jurisdictions. ACOG approaches regional opportunities and barriers from a comprehensive perspective and coordinates problem solving through cooperative action. As the EPA planning grant recipient, they are dedicated to bringing together stakeholders to develop the PCAP and CCAP that will provide a GHG emissions inventory, quantified reduction measures, emissions projections, reduction targets, benefits analysis, low-income and disadvantaged communities benefits, connection with other funding, and a workforce planning analysis.

Although ACOG does not have the authority to implement priority projects, this process directly supports ACOG's charge to remain in compliance with ozone standards and air quality. With transportation being a significant source of the gasses that react to form ozone, there is direct alignment with evaluating the emissions from transportation and creating projects to reduce those emissions to remain in compliance with National Ambient Air Quality Standards.

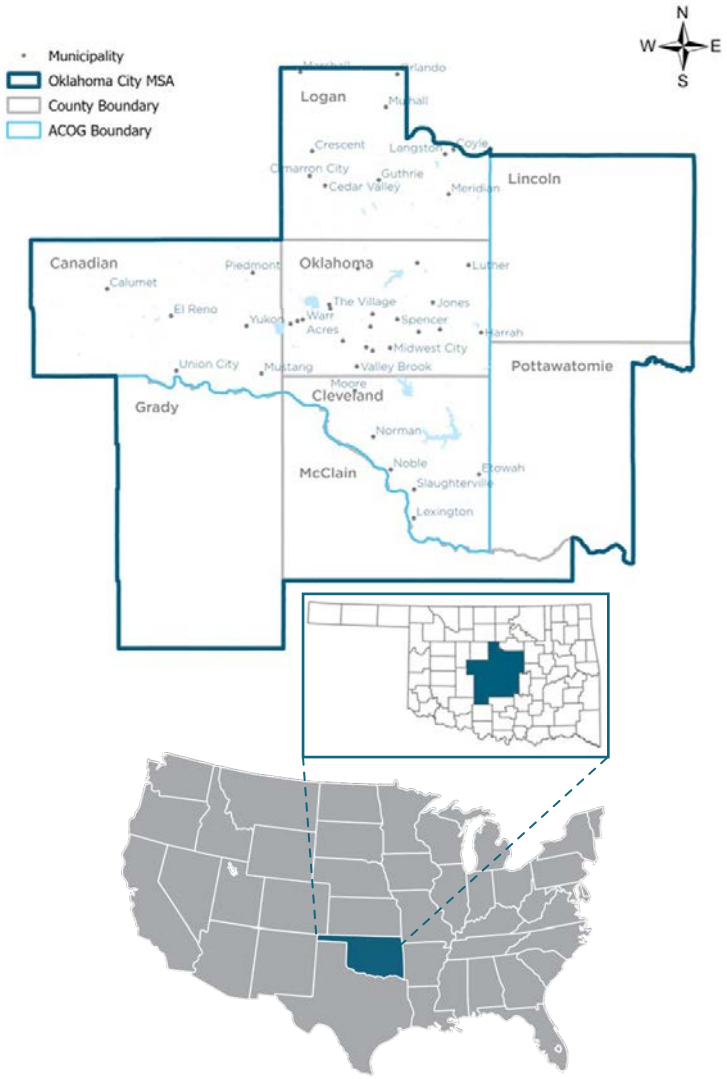


Figure 4: Oklahoma City MSA PCAP boundary

Together the Priority and Comprehensive Climate Action Plans will provide a long-term strategy for reduction of GHG emissions, while improving quality of life and reducing the disproportionate burden of pollution on the region's low-income and disadvantaged communities.

Stakeholder responses during Workshop #1 to what the ideal vision for climate action looks like in the community.

- ...a greater understanding of the air quality problem
- More green transportation that's accessible and affordable
- Local involvement, reduced waste, new jobs & economic opportunity
- Public engagement to aid in education and understanding of what climate action can be

2 CLIMATE IMPACTS TO LOW-INCOME AND DISADVANTAGED COMMUNITIES

The Oklahoma City MSA covers eight counties, 6,298 square miles, and is home to over 1,455,000 people. Climate change impacts the people, businesses, and operations of this extensive metropolitan area. Importantly, low-income and disadvantaged communities (LIDAC) have historically been impacted to a greater extent by environmental decisions and investments (or lack thereof).

This plan and process strives to strategically identify ways to engage and invest in these disadvantaged communities, explore how to align future benefits with GHG projects, and involve the community as equal-ownership stakeholders. The negative impacts of pollution are compounding and climate action planning needs to advance the connection between land use, transportation, and other sectors to promote economic vitality, enhanced mobility, alignment with air quality standards, improvements to public health, and reduction of negative environmental impacts.

Understanding where LIDACs are located, how they are disproportionately impacted by climate risks, and the need to engage can begin to address issues of environmental justice and will support how projects are designed and implemented in these communities. The EPA defines environmental justices as:

> ***...the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other Federal activities that affect human health and the environment...***[7]

LIDACs have been identified based on the following criteria from the EPA IRA footprint[8]:

- Located within a census tract identified as disadvantaged by the Council of Environmental Quality (CEQ)'s Climate and Economic Justice Screening Tool (CEJST)
- Located within a census block group at or above the 90th percentile on any of the Environmental Protection Agency (EPA)'s EJScreen's Supplemental Indexes and located within tribal jurisdictions

Within the Oklahoma City MSA, 58% of census blocks are considered disadvantaged. Within those disadvantaged census blocks, 57% are urban and 43% are rural US Census Bureau-designated, federally recognized Oklahoma Tribal Statistical Areas.[9]

Recognizing that engagement strategies and projects will vary based on land use (urban versus rural) and population, three distinct LIDAC geographic areas have been identified for the PCAP. Understanding where these communities are can help refine approaches for engagement, project development, implementation, and impact.

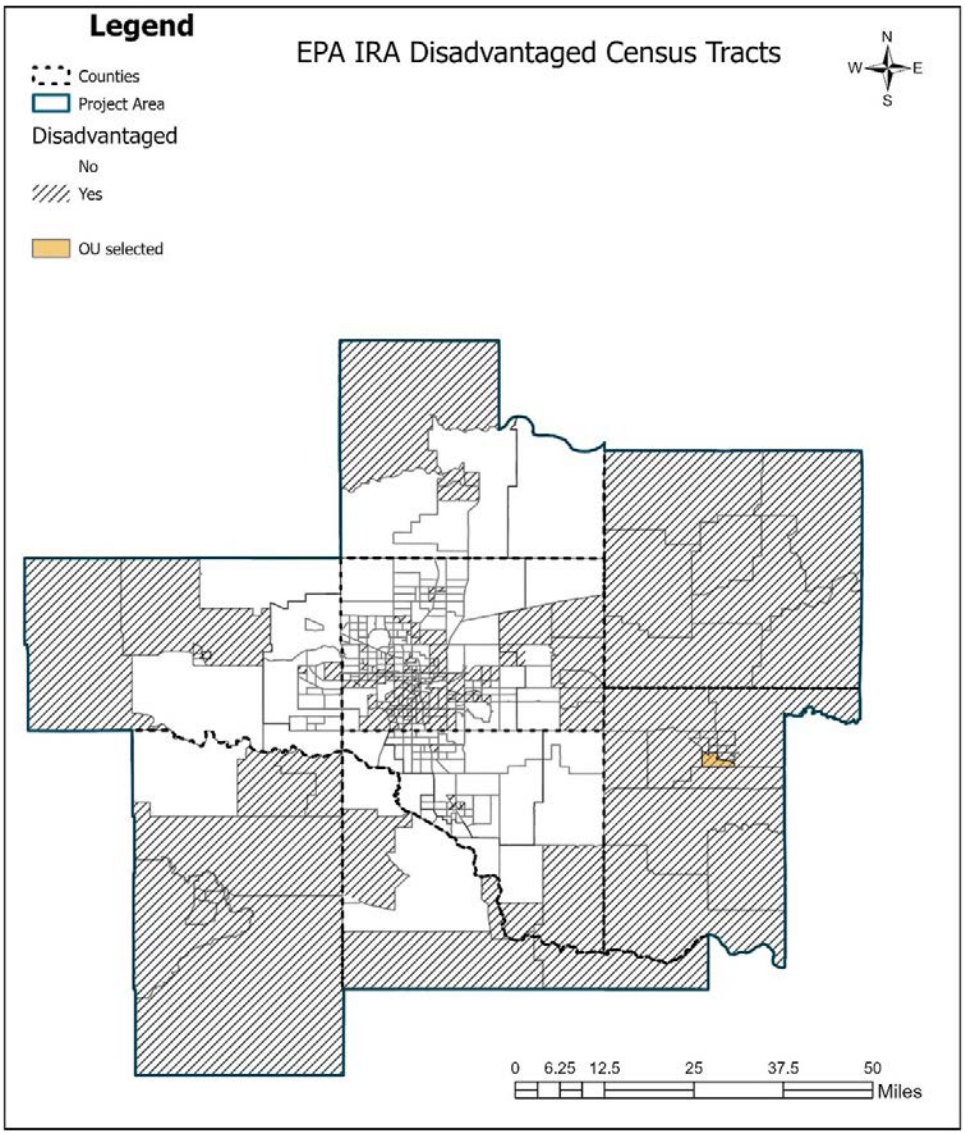


Figure 5: State of Oklahoma LIDAC census tract

1. **Alignment With The State:** The State of Oklahoma completed a comprehensive analysis (conducted by the University of Oklahoma) requiring that race/ethnicity align with disparities in four categories of variables (health, pollution, climate, and energy). This methodology resulted in a single census tract being identified in the Oklahoma City MSA as a LIDAC. This LIDAC area is being included in this PCAP for potential future alignment with State GHG reduction projects.

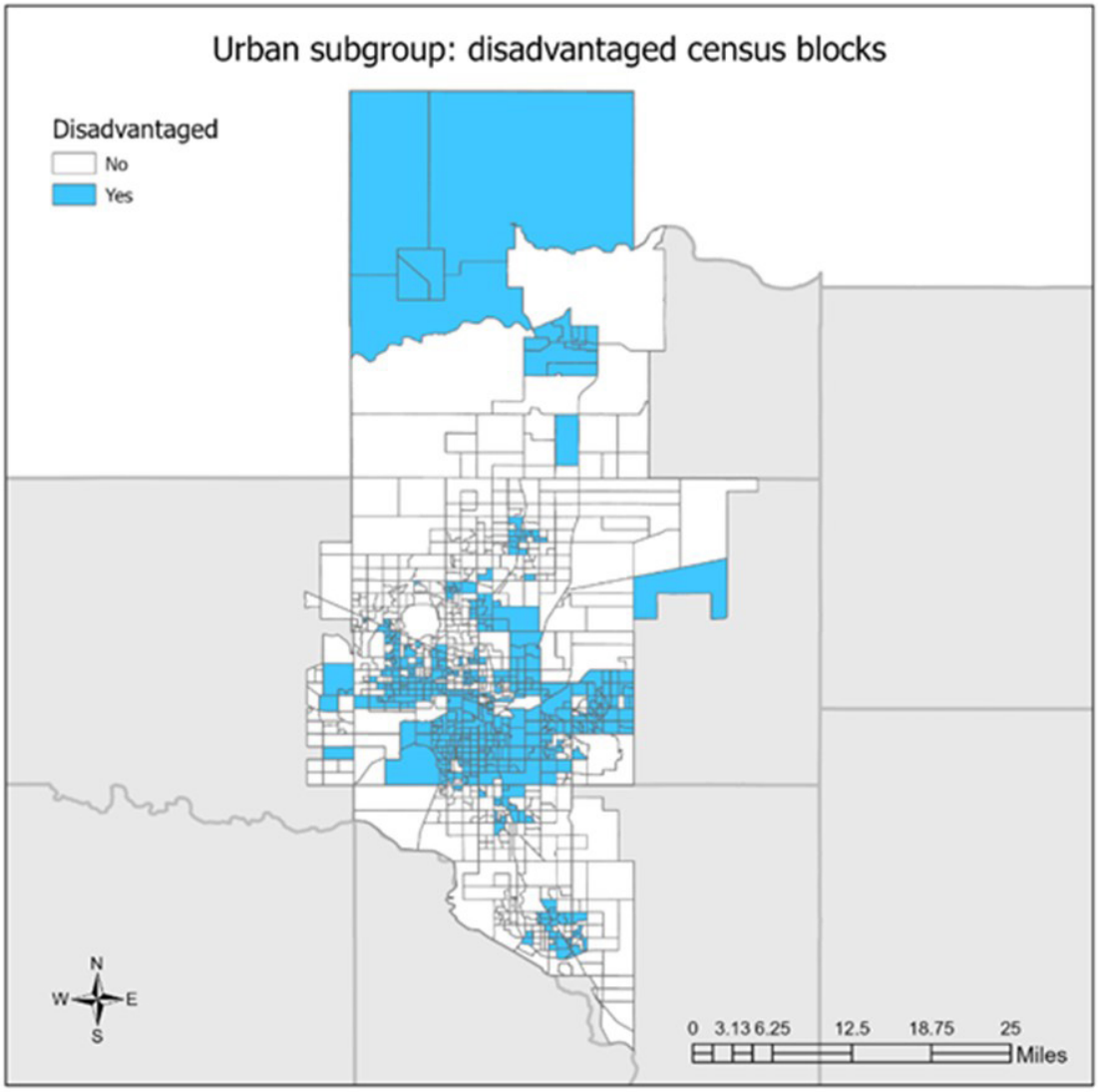


Figure 6: Urban LIDAC census tracts

2. **Urban LIDACs:** This approach recognizes the need to identify GHG mitigation strategies to meet the needs of communities of color and inner-city areas with high percentages of built-out and impervious land use. These areas have significant percentages of Hispanic and African American populations. Projects, engagement, and emissions sources should be addressed to understand how climate challenges disproportionately impact people in the Urban LIDACs.

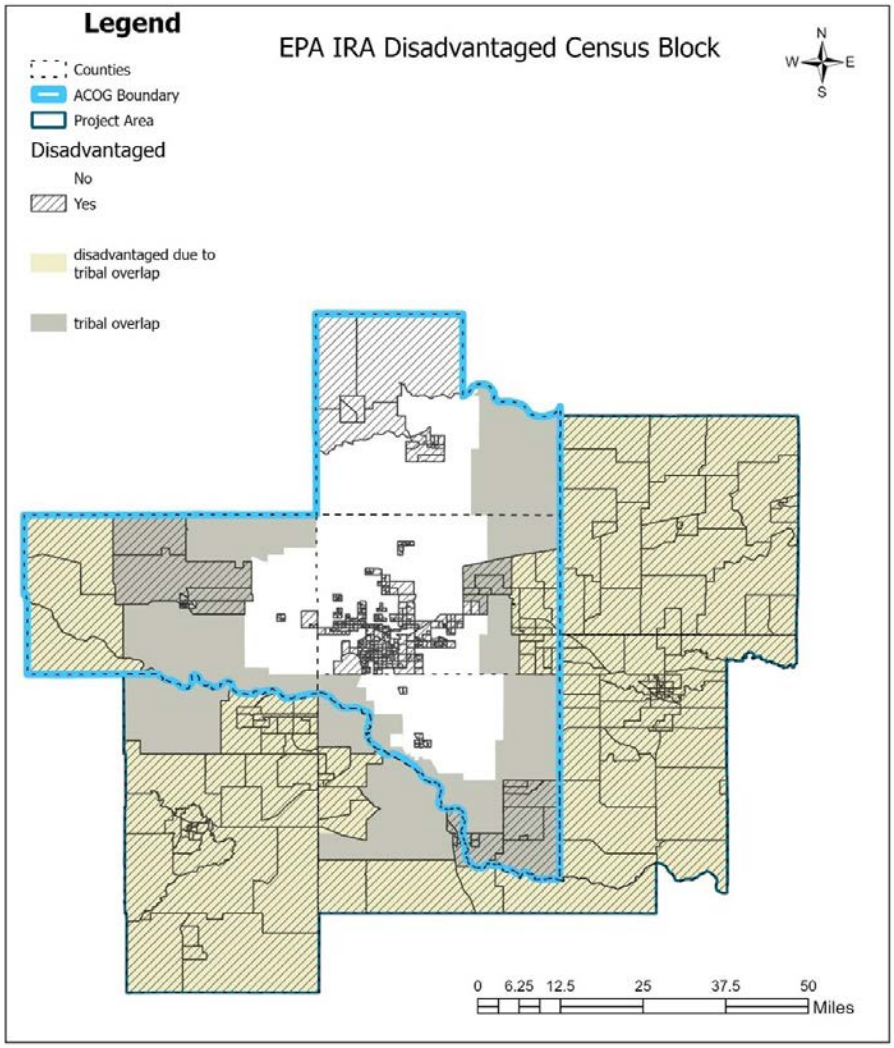


Figure 7: Oklahoma Tribal Statistical Area census tracts

3. **Oklahoma Tribal Statistical Areas**: The Oklahoma Tribal Statistical Areas are all designated as disadvantaged by the EPA. The land cover in these census tracts is more undeveloped with significantly higher percentages of open space, barren land, forests, and wetlands. It is understood that in the United States, Native Americans will likely be disproportionately impacted by consequences of climate change compared to their non-native counterparts.[10] Incorporating traditional knowledge into the adaptation planning should be considered. Traditional knowledge 'is a body of observations, oral and written knowledge, innovations, practices, and beliefs that promote sustainability and the responsible stewardship of cultural and natural resources through relationships between humans and their landscapes'.[11] Traditional knowledge should not be included in public documents without tribal nation consent.[12]

CLIMATE RISKS

LIDACs have historically been subjected to structural discrimination that has resulted in unequal access to resources, political representation, and treatment.[13] This discrimination impacts everything from public health to the siting of polluting industries. These vulnerable groups may live in locations that are prone to climate-related hazards such as flooding and air pollution, be impacted more by medical conditions that are worsened by the impacts of climate change, live in areas with aging infrastructure that is not designed to manage climate-related events, and have limited financial resources or cultural barriers that restrict access to health care and social services.[14] The following is a list of climate risks and conditions that will be exacerbated by a changing climate. They impact all people in the Oklahoma City MSA but have a disproportionate impact on LIDAC communities.

Extreme Weather

Extreme weather events are those that occur with high intensity, frequency, or duration, and often cause significant damage or disruption to natural and human systems. Examples of extreme weather events include severe storms, flooding, heat, and drought. Climate change has increased the frequency of occurence and severity of extreme weather events with the likelihood and intensity of some extreme weather events significantly increasing over the past half century.[15]

LIDACs are often disproportionately affected by extreme weather events. These communities are particularly at risk because they most likely live in areas with subpar housing and aging infrastructure which may be more vulnerable to power outages, water issues, and damage.[16] These communities may also struggle to access resources and care during and after extreme weather events.[17]

Extreme Heat and Urban Heat Islands

Extreme heat and urban heat islands are made worse by a warming climate. Urban heat islands are areas in cities that are significantly warmer than surrounding rural areas due to the built environment and lack of urban tree canopy.[18] These areas can be up to 14°F hotter than surrounding rural areas.[19] Extreme heat events, or heat waves, are periods of abnormally high temperatures that can cause heat exhaustion, heat stroke, and other heat-related illnesses.[20] For LIDACs, the ability to withstand and recover from these public health challenges is hampered by limited resources and an already stressed urban environment. Climate change is expected to increase the frequency, duration, and intensity of extreme heat events, which will exacerbate the urban heat island effect and increase public health risks.

Urban LIDACs and tribal nations are expected to experience a three-to-five-fold increase in the number of extremely hot days annually. Low-income communities in urban areas are more vulnerable to the effects of extreme heat which can lead to more heat illnesses and deaths among socially vulnerable groups, increasing overall health disparities.[21] Increasing the urban tree canopy in impervious areas can mitigate the impacts of heat risk and provide shade.

During the summer of 2023, Oklahoma City was selected to participate in the National Oceanic and Atmospheric Administration Urban Heat Mapping Campaign. ACOG served on the steering committee to provide data and direction for how the campaign findings could support regional programs and policies.

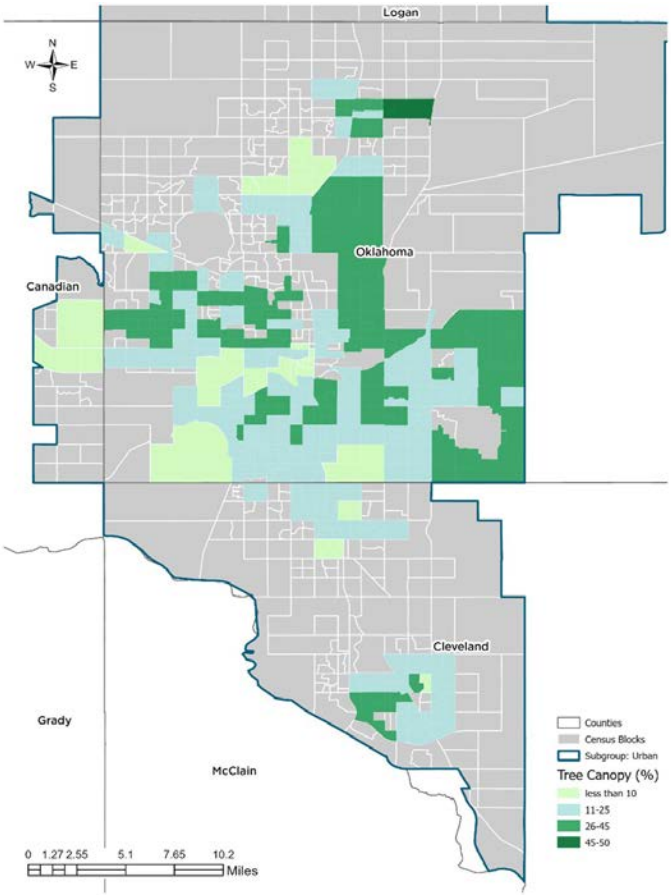


Figure 8: Tree canopy percent coverage for the urban LIDAC census blocks. Data indicate that a large portion of the disadvantaged census blocks have 0%-25% tree canopy coverage.

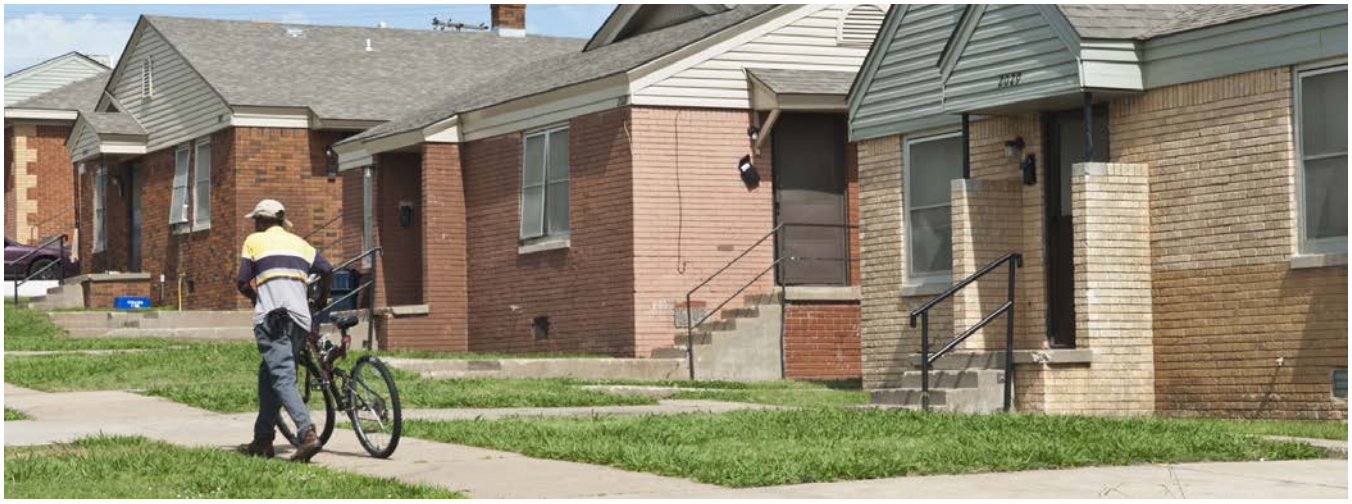
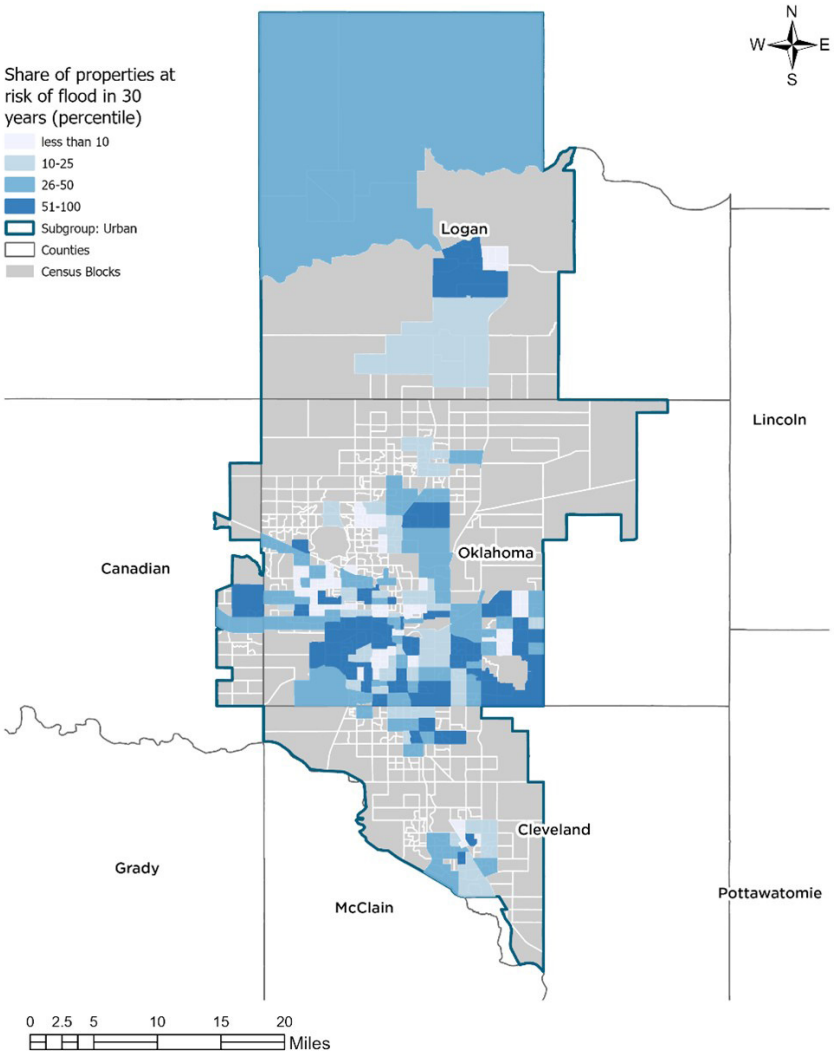


Figure 9: Source: https://christeenbatts.blogspot.com/2022/09/norman-housing-authority-norman-oklahoma.html

Flooding

Flooding in the Oklahoma City MSA occurs in two ways. River flooding occurs when excessive rainfall happens over an extended period and causes waterways to overflow the river's edge. Surface flooding occurs when heavy rainfall inundates the urban drainage and conveyance system and stormwater flows into the streets and nearby structures. Climate change is expected to increase the frequency and severity of rainfall events and thus the likelihood and frequency of river and surface flooding.[22]

Oklahoma is projected to see significant flood risks by 2050, ranking #12 compared to the rest of the U.S.[23] Among the urban disadvantaged census tracts, associated counties are expected to see an increase of 116% in number of days with extreme precipitation by midcentury. Tribal nations are expected to see the same increase during the same timeframe, with Sac and Fox Nation seeing upwards of 133% in number of days with extreme precipitation.[24]



Increased flooding events can have negative impacts on LIDACs through property damage which is more difficult to recover from due to inadequate insurance and limited recovery resources.[25] Flooding can also increase exposure to waterborne diseases, mold, and mental stress. LIDACs are disproportionately impacted due to reduced access to health care and higher rates of chronic conditions.

Figure 10: Urban LIDAC census blocks properties at risk of flood in 30 years

Drought

Drought results when there is a discrepancy between moisture supply and demand.[26] In the Oklahoma City MSA, drought can impact food production, water quality, and public health.[27] Climate change is likely to decrease the consistent availability of water but increase demand. Droughts are also lasting longer. They are transitioning from a temporary extreme event to a new 'normal' that results in long-term aridification.[28]

Low-income and disadvantaged communities are particularly vulnerable to the impacts of droughts. Such households with marginal disposable income are especially sensitive to higher water costs and drought surcharges.[29] Drought can lead to air quality changes associated with dust storms and wildfires, which in turn increases risk of cardiovascular/pulmonary disease and premature death. Drought affects water levels in rivers and lakes, affecting access to public waterbodies for recreational purposes and the ability to find relief from extreme heat.

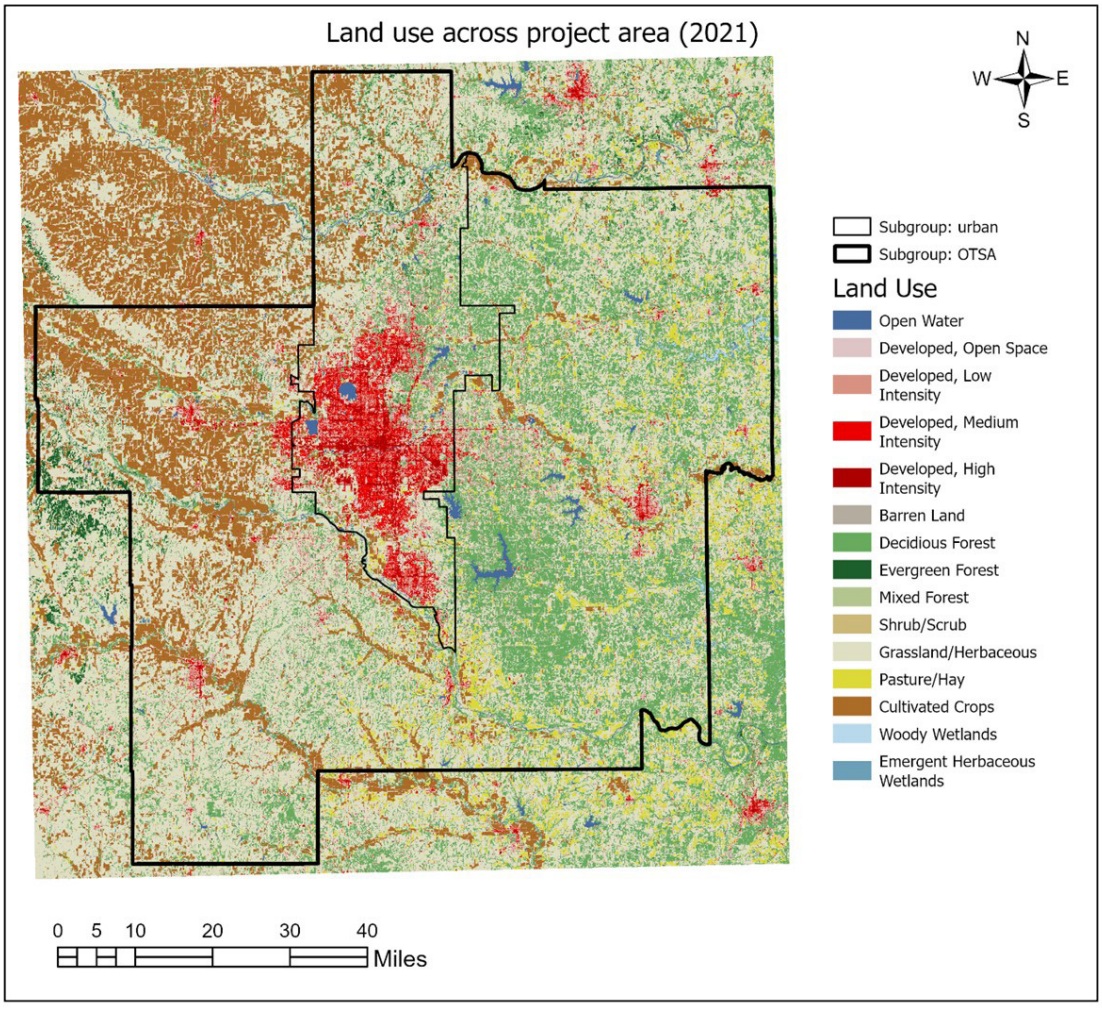


Figure 11: Cultivated cropland subject to drought in Oklahoma City MSA

Wildfires

Wildfires are becoming more frequent and intense due to the combination of extreme heat and drought. A wildfire is an uncontrolled fire that burns vegetation, often in rural areas. They can start from a natural occurrence such as a lightning strike or a human-made spark.[30] Wildfires are dangerous because they can spread quickly and unpredictably, burning everything in their path including homes, infrastructure, and natural resources.[31] Wildfires also cause air pollution which can be harmful to human health.

Oklahoma has a very high fire risk. Among the urban LIDAC census tracts, the associated areas are expected to see 244-249 annual dry days, compared with the modeled history of 241 annual dry days. Tribal nations are expected to see a wide range of annual dry days from 211-221 based on the specific nation, with the Wichita-Caddo-Delaware nations expecting the highest amount of dry days with between 240 and 242 annually.[32]

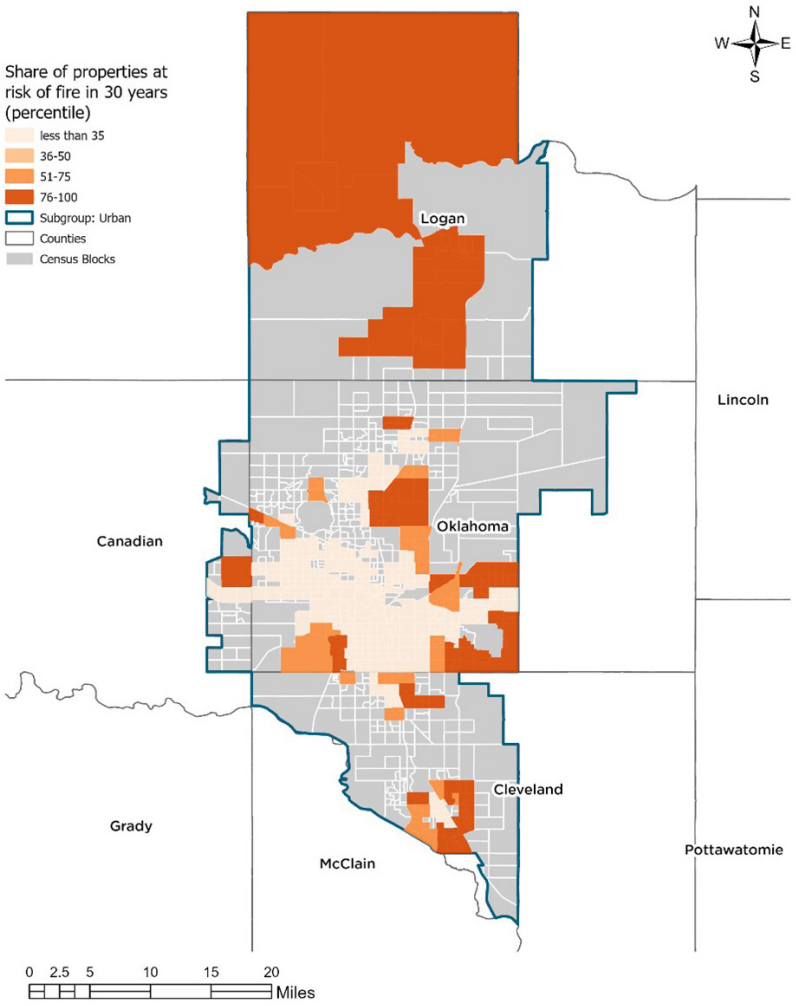


Figure 12: LIDAC census tracts that are at risk of fire in 30 years

Wildfires can have a disproportionate impact on low-income and disadvantaged communities. These communities have increased vulnerability to wildfires as many reside in at-risk areas that are faced with high insurance premiums and canceled homeowner insurance policies. They may also lack the necessary resources to invest in fire safety which can lead insurance companies to decline coverage in wildfire-prone regions to avoid major profit losses, resulting in fewer insurance options for these communities.[33] Smoke from wildfire increases air pollution and can affect regional air quality. Wealthier communities are more likely to have access to personal vehicles and the ability to afford temporary lodging elsewhere during evacuations as well as manageable insurance premiums and disposable income to invest in wildfire defense strategies for their homes.[34]

Winter Storms

Winter Storm Uri took place in February 2021 and had a significant impact on Central Oklahoma. Six inches of snow, loss of power, dangerous wind chills dipped to –18 degrees, negative single digit temperatures (-6), and dangerous road conditions all contributed to a weather event that Central Oklahoma was not prepared for. The legacy impact of that single storm is still being felt today. Utilities are still trying to recoup financial losses resulting from paying premium prices for fossil fuel due to market volatility to keep the power on. This financial impact is being passed on to customers and those being hit the hardest with high energy bills are LIDAC communities.

Storm events like Winter Storm Uri are likely to increase due to climate change. Central Oklahoma must plan and adapt for future winter storms to minimize the impact and move away from a reactionary response

3 COLLABORATION & ENGAGEMENT

The undertaking of a comprehensive GHG inventory and implementation strategy can be strengthened with input from local government, tribal nations, private, and public-sector representatives (stakeholders). PCAP stakeholders were engaged in from December 2023 to February 2024 in various ways to solicit input. Stakeholders have contributed to PCAP and the next phase of planning by helping set goals, identify priority GHG reduction measures, and suggest additional stakeholders.

Below is a summary of the engagement strategies and resulting feedback.

Digital Survey #1

In December 2023, a digital survey was sent out as a call for projects to stakeholders that requested a list of priority GHG reduction projects. The survey resulted in 22 individual responses and 69 unique projects were submitted for consideration.

Digital Survey #2

In January 2024, a digital survey was sent out to stakeholders that asked participants to identify the types of projects they would be most interested in implementing within each emission sector. As part of designing feasible projects, it is critical to understand barriers to implementation. Overwhelmingly, participants identified lack of financing as the biggest barrier followed by climate change being a low priority and challenges related to gathering support and participation.

Stakeholder Workshop #1

This 90-minute workshop was attended by 27 stakeholders. The purpose of this workshop was to understand participants views on climate and their community and to solicit feedback on the priority GHG reduction projects. A synopsis of the results is included here.

ANSWER CHOICES	RESPONSES
Climate change is not a priority to our industry	41.67%
Making climate-conscious improvements is too difficult	33.3%
Getting support and coooperation from stakeholders in our industry/ organization is too difficult	41.67%
The financial burden is too great to make improvements	83.33%
We don't know how to make improvements.	16.67%
Other (please specify)	25.00%

Figure 13: Survey #2 response to the question regarding biggest barrier To implement climate change projects

- Overall, participants think the region has made some progress regarding emissions reductions but is still insufficient in what needs to be done.
- There are a lot of positive things happening related to climate change in the community including support for electric vehicles and solar networks, support for more bike and pedestrian infrastructure, communication between the public and leaders, and ongoing planning efforts.
- Ideally, climate action would include more substantial community engagement and awareness, additional partnerships, funding support, and further understanding of how to address specific industry opportunities (i.e., concrete).
- Expansion of partnerships was addressed with the development of an additional stakeholders list and the offering of one-on-one meetings with partners who could not attend the workshop.

Social Media
Identified as a strategy to make the PCAP and CCAP process more accessible to the public, a limited social media campaign was launched with four posts and a plan for a press release. The post themes included:

- Introduction to PCAP process
- Request to public to share environmental projects
- Information to public to view recommended reduction strategies
- Invite input via ACOG attending event or meeting

Figure 14: PCAP social media post

Community Focus Groups
Three community focus groups were held and led by the State of Oklahoma and Oklahoma University in the Oklahoma City MSA. Approximately 60 people attended the focus groups to discuss their experiences and areas of focus for the LIDAC communities they represented as they relate to climate change and priorities. A critical question focused on areas of investment needed and wanted by the community to address climate change and resulted in the following three themes.

As priority GHG reduction measures continue to be identified in the CCAP, these community themes should be considered as opportunities to add value to projects.

Building community resilience –There was a strong emphasis on utilizing solar-powered solutions to build community capacity and resilience. Utilizing solar energy would help address the power outages in communities without underground utilities and diversify energy sources. There was also a desire to have resilience hubs to support the community during and after extreme weather events, which would provide food, water, and shelter for those in need.

Climate adaptative infrastructure – Respondents noted the lack of adequate infrastructure as an issue, especially as climate change continues to increase frequency and intensity of extreme weather and flooding events. Having climate adapted housing infrastructure can help reduce damage from storms, which will help reduce long term costs of repair and replacement.

Improvements in air quality – Because many community members are located near industrial facilities, there is a strong desire to put limits on air pollution from industrial areas while simultaneously increasing the tree canopy to help reduce air pollution; however, it was found that large-scale tree planting initiatives would require substantial maintenance and management programs.

STAKEHOLDERS IN FUTURE PLANNING PHASES

ACOG recognizes that additional stakeholders should be engaged in the CCAP process. An expanded stakeholder list could include OKC Beautiful, Oklahoma Department of Transportation, business community leaders, park representatives, Oklahoma University, and the Federal Transit Administration.

Tribal nations and the Tinker Air Force Base also need to be directly engaged likely with specific processes outside of typical engagement strategies. These two groups represent significant amounts of the population, land use, and economy. Tribal nations will need to be meaningfully engaged during the CCAP which likely will include the development of specified engagement activities that are culturally appropriate.

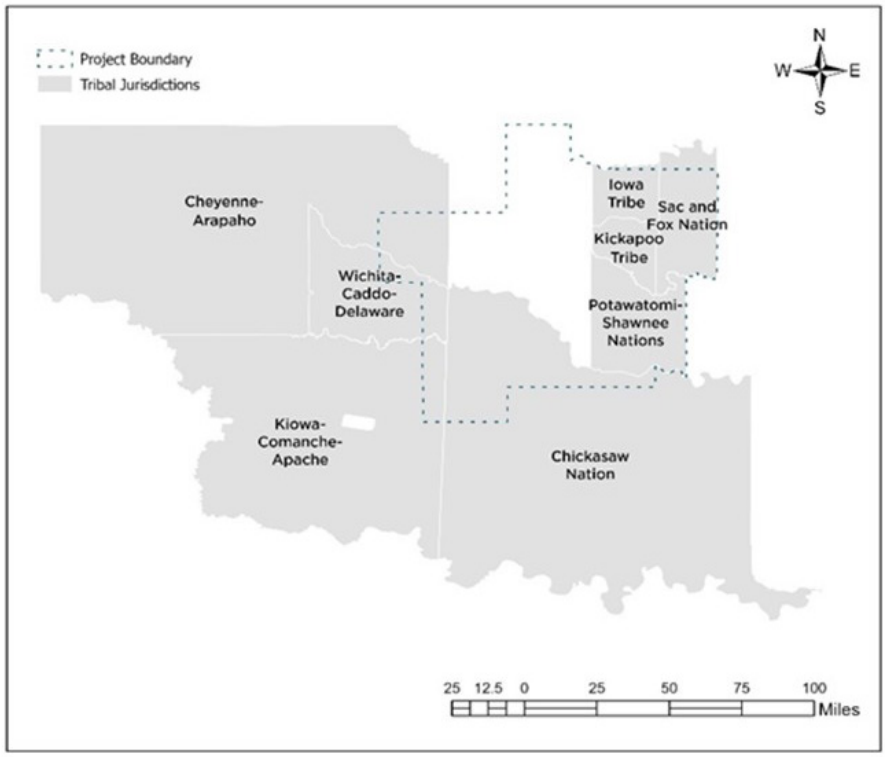


Figure 15: Tribal nations represent 29% of the Oklahoma City MSA population

As a military post, Tinker Air Force Base aligns climate change planning with federal requirements. It is the largest single-site employer in Oklahoma with over 26,000 military and civilian employees. Tinker has an annual statewide economic impact of $3.51 billion and owns 4,048 acres of land. The Department of the Air Force has developed a Climate Campaign Plan that includes developing a climate-informed workforce to reduce climate risk, optimize energy use, and pursue alternative energy sources. The base received a 2023 Citation Award from the Air Force Civil Engineer Center for new facilities construction that was designed with climate resilience and energy efficiency considerations.[35, 36, 37] During the CCAP, Tinker Air Force Base will be engaged to align potential projects and actions with the Department of the Air Force.

4 UNDERSTANDING OKLAHOMA CITY MSA EMISSIONS

INVENTORY METHODOLOGY

The GHG emissions inventory was developed using the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC) accounting standard and utilized data from the EPA's Greenhouse Gas Reporting Program (GHGRP),[38] the EPA's National Emissions Inventory (NEI)[39] the DOE's State and Local Planning for Energy (SLOPE) Platform,[40] and state-based land use data.[41] This data accounted for the seven primary GHGs and has been vetted and released for public consumption and use. The year 2020 was used as the base year due to the most complete data being available.

The GHG inventory encompassed the Oklahoma City MSA and included the following GHG emissions sectors:

- Stationary Energy
- Transportation
- Waste
- Industrial Processes and Product Use (IPPU)
- Agriculture, Forestry, and Other Land Use (AFOLU)

Based on the data available, the total annual GHG emissions amounted to 49,647,118 MtCO2e in the 2020 reporting year, or approximately 34 MtCO2e per capita. Approximately 39.5% of the State of Oklahoma GHG emissions are from the Oklahoma City MSA. The emissions sectors are represented in the following chart with the most substantial areas for potential being in the building and on-road transportation sectors. Understanding where the emissions are originating has helped to align which priority GHG reduction strategies could be most effective.

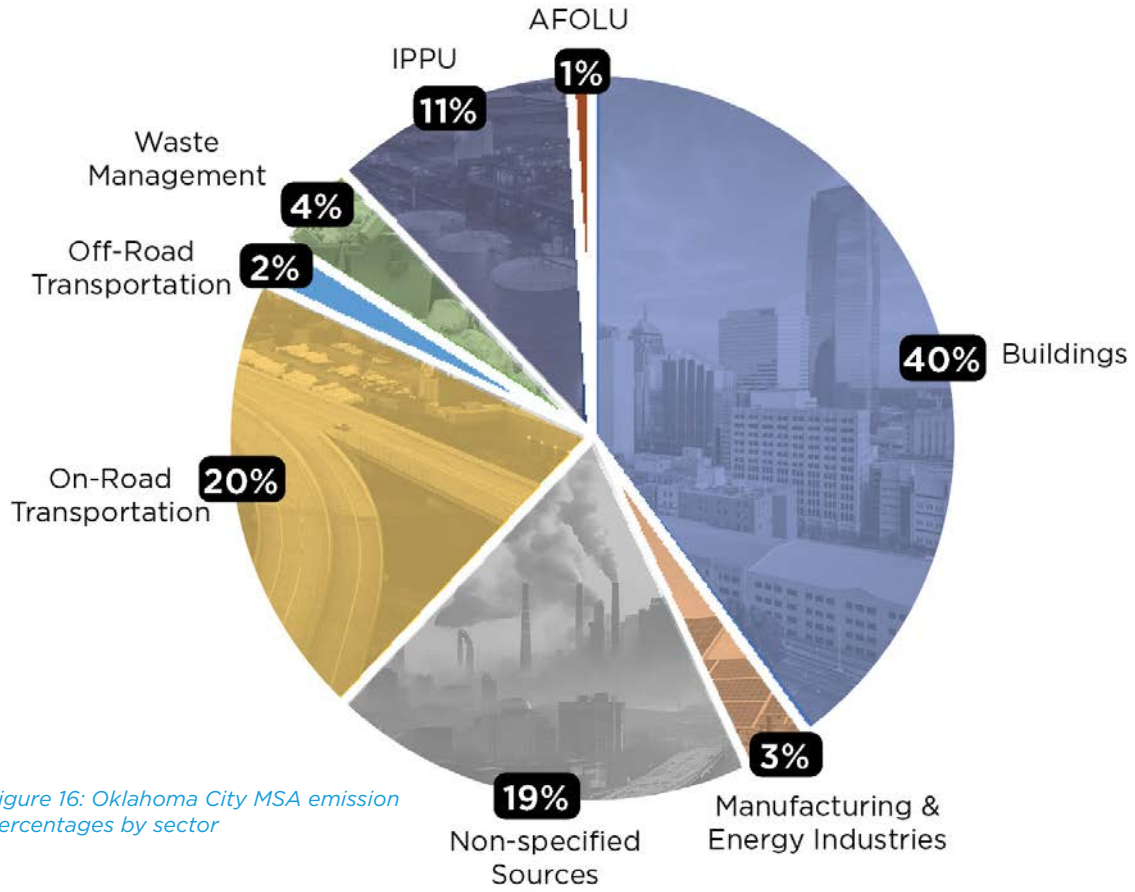


Figure 16: Oklahoma City MSA emission percentages by sector

STATIONARY ENERGY EMISSIONS

Stationary energy sources are typically one of the largest contributors to a community's GHG emissions. In general, these emissions come from fuel combustion and fugitive emissions. They include the emissions from energy used to heat and cool residential, commercial, and industrial buildings, as well as the activities that occur within these residences and facilities. Emissions associated with distribution losses from grid-supplied electricity/steam/heating/cooling are also included, as are some fugitive emissions from sources such as coal piles and natural gas. In accordance with the GPC Protocol, the stationary energy sector breaks down into the following sub-sectors:

- Residential buildings
- Commercial and institutional buildings and facilities
- Manufacturing industries and construction
- Energy industries
- Energy generation supplied to the grid*
- Non-specific sources

**Emissions related to electricity generation activities occurring within a community's boundaries are to be reported; however, the GHG emissions from these sources are not reported separately as they are accounted for elsewhere and to prevent double counting.*[42]

What We Found

The data indicates that 31,249,755 metric tons of CO2e are generated annually by stationary energy.

This accounts for 62% of the total GHG emissions within the Oklahoma City MSA. Within the stationary energy emissions 19% of total emissions were from residential buildings and 22% were from commercial buildings.

The majority of those emissions are associated with residential buildings, commercial and industrial buildings/facilities, and non-specified sources (e.g., emissions from mobile sources such as agriculture or construction machinery).[43]

What Stakeholders Prioritize For Energy Emissions Reduction Strategies

- Development of distributed or community-scale renewable energy generation microgrids, or vehicle-to-grid infrastructure in disadvantaged communities, including remote, tribal nations, and rural regions
- Adoption and implementation of the most up-to date energy codes and performance standards for new buildings

What Could a Reduction Strategy Look Like?

- Increasing commercial, residential municipal building energy efficiency and updated energy codes

TRANSPORTATION EMISSIONS

Transportation emissions from on-road vehicles, railroads, commercial aircraft, and other sources, occur in all communities. The transportation GHGs released in the atmosphere result from combustion of fuels in journeys by on-road vehicles, railway, waterborne navigation, aviation, and off-road transportation. As such, the transportation sector includes the following sub-sectors:

- On-road
- Railways
- Aviation
- Off-road

**No data was available for waterborne transportation.*

What We Found
The data indicates that 11,062,269 metric tons of CO2e are generated by transportation.

This accounts for 22% of the total GHG emissions within the Oklahoma City MSA.

The majority of those emissions are associated with on-road transportation. Within on-road transportation, diesel heavy duty vehicle and non-diesel light duty vehicles were the largest transportation contributors.

What Stakeholders Prioritize For Transportation Emissions Reduction Strategies

- Encourage and incentivize a shift in transportation modes to increase multi-modal transit (walking, biking, public transportation, carpooling) and reduce one-person car trips through policies and information campaigns
- Create new or expanded transportation infrastructure projects to facilitate public transit, micro-mobility, car sharing, bicycle, and pedestrian modes

What Could A Reduction Strategy Look Like?

- Programs to increase the share of electric light-, medium-, and heavy-duty vehicles, and to expand electric vehicle charging infrastructure
- New or expanded transportation infrastructure projects to facilitate public transit, micro-mobility, car sharing, bicycle, and pedestrian modes

WASTE EMISSIONS

Cities and communities produce GHG emissions that arise from activities related to the treatment of wastewater and organic materials, as well as the disposal and management of solid waste. Waste does not directly consume energy, but releases GHG emissions due to decomposition, burning, incineration, and other management methods. The waste sector of the GHG emissions inventory includes the following sub-sectors:

- Solid waste disposal
- Incineration and open burning
- Biological treatment of waste
- Wastewater treatment and discharge

What We Found

The data indicates that 1,956,604 metric tons of CO2e are generated by waste.

This accounts for 4% of the total GHG emissions within the Oklahoma City MSA. That 4% is split between solid waste (2%), wastewater (1%), and incineration and open burning (1%).

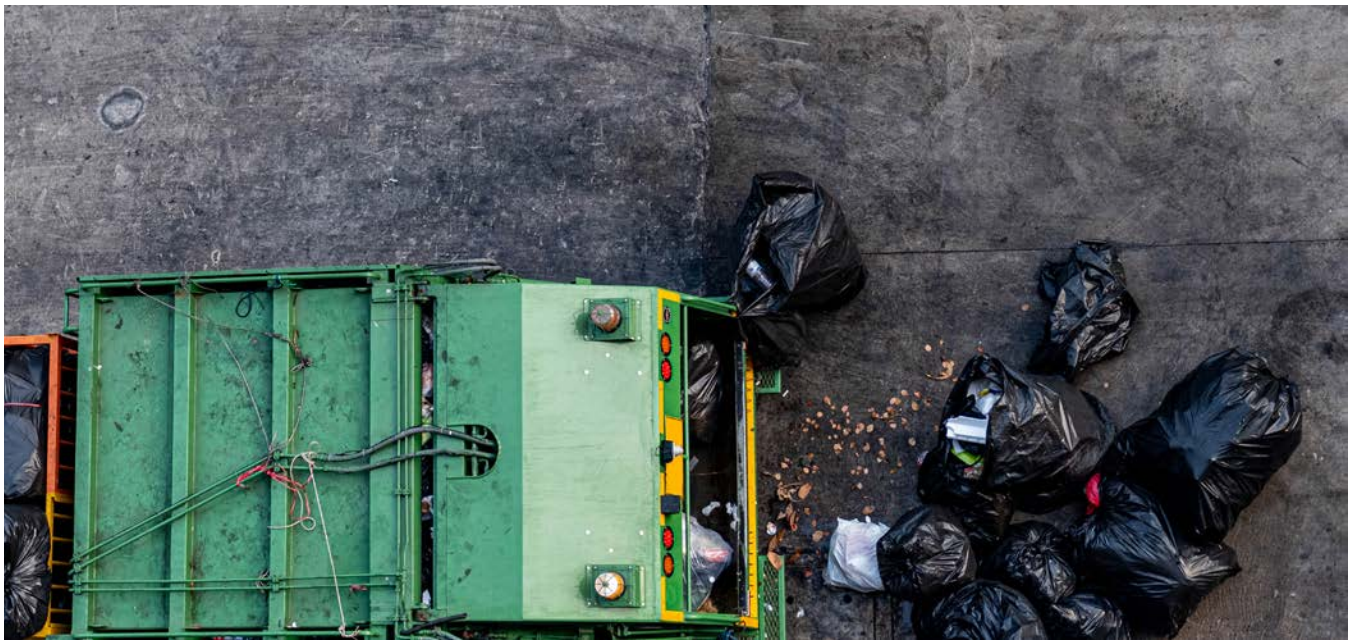
The majority of those emissions are associated with municipal and industrial waste.

What Stakeholders Prioritize For Waste Emissions Reduction Strategies

- Programs and incentives to reduce or divert waste (including food and/or yard waste) through improved production practices, updated collection services, and increased reuse or recycling rates
- Programs and incentives to reduce GHG emissions associated with plastics production, use, and its waste management

What Could A GHG Reduction Strategy Look Like?

- Increase organic waste diversion and collection
- Increase recycling



INDUSTRIAL PROCESSES AND PRODUCT USE EMISSIONS

This sector encompasses GHG emissions produced from industrial processes that chemically or physically transform materials. It also includes product use by industry and end-consumers (e.g., refrigerants, foams, aerosol cans).[44] This also includes petrochemical production and cement production.[45] The GHG emissions inventory includes the following sub-sectors:

- Industrial processes
- Product use

What We Found

The data indicates that 5,579,012 metric tons of CO2e are generated by industrial processes and produce uses.

This accounts for 11% of the total GHG emissions.

The majority of those emissions are associated with industrial processes.

What Stakeholders Prioritize For Industrial Processes And Produce Use Emissions Reduction Strategies

- Programs to support or incentivize GHG reductions in industrial energy use and industrial processes, including use of low/no carbon fuels, electrification, renewable energy, and process improvements

Addressing these emissions requires partnerships and communication with private industry. This requires a multitude of agencies being led by the authority to implement. Priority GHG reduction measures for this sector were not selected to be included in the PCAP but should be considered in the CCAP.

AGRICULTURE, FORESTRY, AND OTHER LAND USE EMISSIONS

Agriculture, Forestry, and Other Land Use (AFOLU) GHG emissions are those that are captured or released because of land-management activities. These activities can range from the preservation of forested lands to the development of crop land. Specifically, this sector includes GHG emissions from land-use change, manure management, livestock, and the direct and indirect release of nitrous oxides (N2O) from soil management, rice cultivation, biomass burning, urea application, fertilizer, and manure application.[46]

The GHG emissions inventory includes only the land-use subsector data as no agricultural data was available using the EPA data sources. The AFOLU subsectors – livestock and aggregate sources and non-CO2 emission sources on land were not estimated based on the lack of available data.

What We Found

The data indicates that -200,523 metric tons of CO2e are absorbed within the Oklahoma City MSA. This sector functions as a carbon sink, which is the uptake (or absorption) of carbon dioxide through storage in forests, vegetation, and soils.[47]

What Stakeholders Prioritize For Agriculture, Forestry, And Other Land Use Emissions Reduction Strategies

- Adding new tree cover in urban areas and developing green infrastructure programs and projects

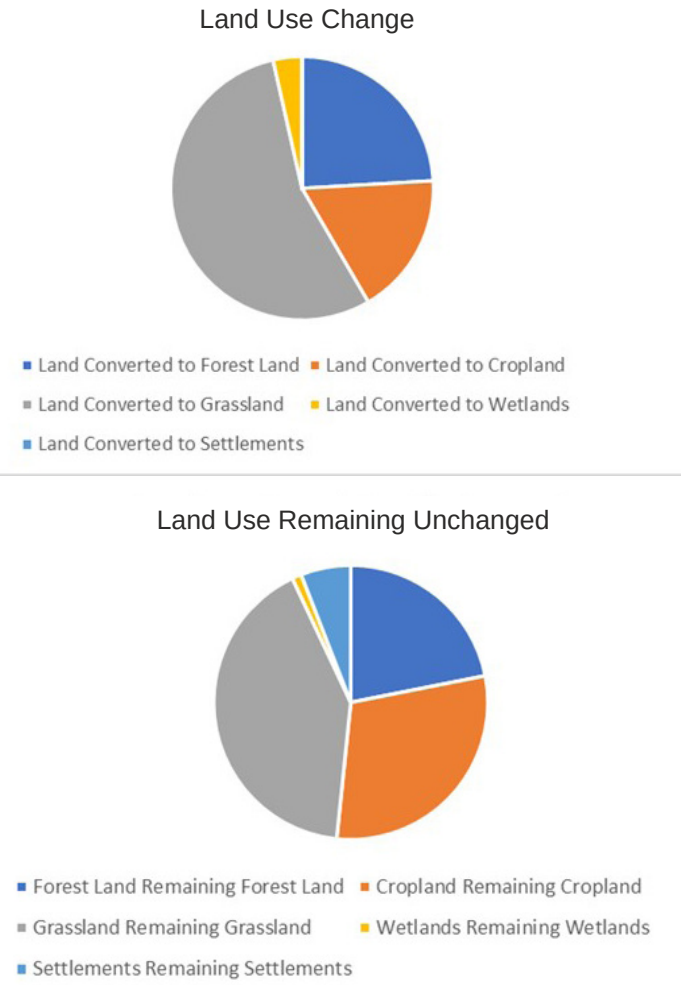


Figure 17: Land Use Changes and Remaining Unchanged

What Could A Reduction Strategy Look Like?

- Increase tree canopy
- Implement nature-based solutions to increase carbon storage
- Maintain and enhance urban forests

WE ARE DOING GOOD WORK BUT MORE NEEDS TO BE DONE

From homes to landfills, partners are making important progress in each of the GHG contributing sectors. The following examples are just a small demonstration of the capacity and willingness of the Oklahoma City MSA to take on challenges and create environmentally and economically thriving communities.

Stationary Energy: Oklahoma is the nation's second largest wind producer. According to Oklahoma's State Energy and Environmental Plan (2021), nearly 50% of the state's electricity generation is renewable, reducing Oklahoma's carbon dioxide emissions from the power sector by nearly three times the national average since 2005. These advances support energy independence and helps commercial and industrial clients meet their own sustainability requirements. In conjunction with energy credits, this results in some of the lowest costs in the United States which makes achieving profitability and doing what's best for the environment feasible.[48]

Transportation: From 2015-2023, ACOG has distributed over $15.8 million dollars for 29 projects as part of the Transportation Alternatives Program. This program focuses on improving alternative modes of transportation through improvements in bike lanes, recreational trails, bike/pedestrian bridges, sidewalks, road diets, and shared micromobility.[49] Since 2015, Central Oklahoma increased the amount of bike lanes and shared use paths by 33% and the number of sidewalks by 22%. Nearly 500 miles of bicycle network have been designated in the area since 2000 and 1,000+ miles are planned for the future.[50]

Waste: ONEOK, in conjunction with landfills and processing companies, gathers gas that is generated in landfills from natural decomposition of organic material to capture the methane emissions and use them as an energy source.[51]

Forestry and Land Use: The 2019 Oklahoma City Metropolitan Area Tree Canopy Assessment completed by ACOG evaluated a 536 square mile area within the Oklahoma City MSA to understand land cover, energy savings, air and water quality improvements, and community benefits (including quality of life improvements and socioeconomic benefits) from tree coverage. The findings indicate that the study area has an estimated 65 million trees that annually provide up to $150 million dollars in environmental benefits.[52]

Environmental Sector	Annual Value
Pollution Removal	$77,763,563
Carbon Sequestered	$34,990,155
Avoided Runoff	$22,710,112
Energy	$14,179,531
Total	**$149,643,361**

Figure 18: Environmental annual value

Plans & Policies That Support Climate Action

This table includes some of the current plans that support climate action.

- *Association of Central Oklahoma Governments Cost Of Nonattainment Study For The Oklahoma City Area*
- *Climate Projections for Oklahoma City*
- *adpatokc*
- *Climate In The Heartland*
- *City of Edmond: Green Infrastructure Report and Recommendations*
- *City of Edmond: 2018 Sustainability Report*
- *City of Nichols Hills 2023 Sustainability Plan*
- *City of Norman Sustainability Initiatives*
- *Tribal Climate Resilience Program -Eastern Oklahoma Region*
- *Department of the Air Force Climate Campaign Plan*

BARRIERS TO CLIMATE CHANGE ACTION

Taking action to reduce the impact of climate change is challenging and requires a long-term strategy to coordinate private and public sector partners as well as understanding how to balance reducing GHG emissions and increasing the use of nature-based solutions, like wetlands and trees, to absorb GHG emissions. Bridging the gap between the GHG data, what work is currently happening, and what still needs to be done is complicated. The following are some barriers to addressing climate change that should be considered during the development of priority projects and the CCAP.

Financial Resources

Barrier: Oklahoma City MSA stakeholders agree that lack of financing is the biggest barrier to implementing solutions.

Opportunity: Short-term, the PCAP will be used to request funding from the EPA as part of the CPRG in April 2024 to fund priority GHG reduction measures. Long-term, this plan is the baseline and precursor for the development of a comprehensive plan that creates a path forward so that as investments are decided, they can be made with an understanding of strategies that reduce GHG emissions, engage and invest in LIDAC communities, and advance workforce opportunities. A plan to leverage other federal funding will be developed as part of the CCAP.

Lack Of Support

Barrier: Government actions play a crucial role in enabling and accelerating pathways that support GHG reductions. Political support includes prioritizing risk reduction, equity and justice, and integrating climate objectives, decision-making, and financing through capital budgets.[53]

Opportunity: Through continued engagement, invite all people and roles to the decision-making table. Build coordination across all sectors and develop vertical communication strategies between the implementors, planners, and policy makers.[54]

Climate Change Is Not A Priority
Barrier: Shifting an organizations culture is incredibly difficult. There must be strong leadership that results in organizational change which requires difficult conversations, generating participation, and in some cases, demonstrating a return on investment.

Opportunity: Increase communication between all parties to develop clear values, priorities, and strategies.

Making Climate Improvements Is Too Difficult/Don't Know How
Barrier: Everything does not need to change at once and it may be unclear what the benefit of the climate improvement is.

Opportunity: Invite people to participate in developing climate solutions and strategies, learn from other partners participating in the PCAP to understand best practices, and address strategies and solutions for how to make climate improvements (including the process) in the CCAP.

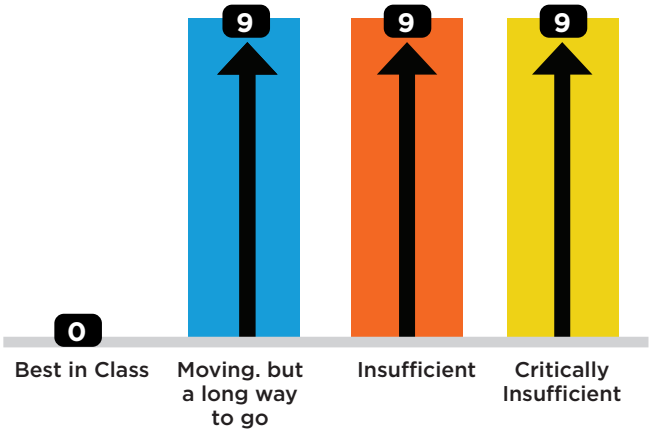


Figure 19: Stakeholders agree that more needs to be done regarding climate action

5 PRIORITY GHG REDUCTION MEASURES

Priority GHG reduction measures were identified from a call for projects via a stakeholder survey conducted in December 2023. From an original list of 70 projects, 18 were identified to have the highest potential for immediate GHG reduction, and these were further consolidated into 11 project categories with similar themes. These themes include increasing urban tree cover, solar power generation on municipal property, natural gas or electric fleet vehicle standards, electric vehicle (EV) charging station installations, enhanced efficiency of water treatment systems, efficiency upgrades in public buildings, and improved access to residential energy audits and rebates.

The EPA's 2022-2026 strategic goals were referenced for alignment of priority GHG reduction measures with EPA strategic objectives, which influenced the prioritization of reduction strategies. The strategic goals that align with the prioritized strategies include components to tackle the climate crisis, take decisive action to advance environmental justice and civil rights, ensure clean and healthy air for all communities, ensure clean and safe water for all communities, and safeguard and revitalize communities.[55]

The priority GHG reduction measures were drafted based on their potential to substantially reduce emissions in a short period of time and impact LIDAC communities. Specifically, projects were selected that could benefit both rural and urban communities underserved by existing environmental programs and disproportionately impacted by climate change pressures. In addition to these considerations, projects were screened based on their ability to complement existing regional climate initiatives, remain future-proof and cost-effective, promote high-quality 'green' workforce development, and balance reduction with carbon sequestration. Stakeholder input was received during the drafting process to further reduce and refine priority action items.

ACOG does not have the authority to implement projects. However, as the regional planning agency, their ability to facilitate projects and manage federal funding across multiple jurisdictions is critical. ACOG will be acting as the 'project manager' to take the lead on developing scopes, schedules, budgets, collecting progress metrics, and maintaining partnerships as priority GHG reduction measures move into planning and implementation.

PRIORITY MEASURE #1: FLEET & SCHOOL BUS ELECTRIFICATION

Overview

On-road **transportation emissions account for 20%** of Oklahoma City MSA emissions. This priority measure accelerates the transition of municipal light-duty fossil-fuel powered vehicles to electric. Replacing gasoline and diesel operated vehicles with electric vehicles will improve regional air quality and reduce GHG emissions in the **transportation sector.** To support electrification, Level 2 charging stations will be installed for municipal use with the potential for public use.

This priority project also includes the transition of 20 diesel school buses manufactured before 2010 to electric equivalents. The school buses are owned and operated by individual school districts. Electrification of buses supports improvements to air quality, reduced health risks (especially to children), and reduced GHGs.

For both fleet and school bus transitions, a focus will be placed on transitions where vehicle routes are primarily located in LIDAC and tribal communities. Solar charging stations will be considered if building code and zoning requirements allow. Electrification of vehicles also supports two primary facets of workforce development: manufacturing and maintenance.

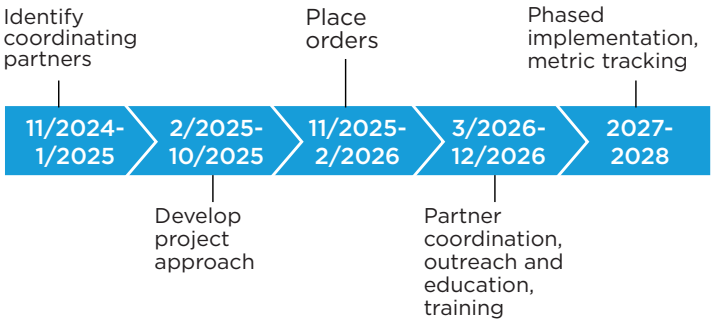
Goal

- Convert light-duty gas-powered fleet vehicles to electric vehicles
- Convert school buses manufactured before 2010 to electric buses

Milestones

- Develop project approach to refine scope and schedule
- Perform a fleet assessment to understand vehicle routes, mileage, service hours, vehicle parking locations, and anticipated replacement date for the vehicle
- Plan for charging infrastructure locations and options that are compatible with electric vehicles
- Create a fleet charging schedule
- Train staff to maintain and operate vehicles and charging infrastructure
- Electrify vehicles/buses and install charging infrastructure

Schedule



Implementing Agency And Authority To Implement

Municipal, county, tribal nations, and school district representatives enacting reduction measure have the authority to implement the measure.

GHG Emissions Reductions

Emissions reductions are based on transitioning 100 light-duty diesel vehicles and 20 school buses to electric vehicles.

Progress Metrics

- Number of light duty fleet replacements
- Number of electric bus replacements
- Number of charging stations installed
- GHG reductions as a result of implementation measures

Period	Light-duty Fleet Vehicles	School Buses	Combined Vehicles & Buses
Annual GHG Reduction	227,721 $MtCO_2e$	16,982 $MtCO_2e$	244,703 $MtCO_2e$
Total GHG Reduction 2027-2030	10,884 $MtCO_2e$	67,927 $MtCO_2e$	978,811 $MtCO_2e$
Total GHG Reduction 2031-2050	4,326,700 $MtCO_2e$	322,653 $MtCO_2e$	4,649,352 $MtCO_2e$

**Emissions reductions are calculated starting in 2027 based on the anticipated project schedule.*

Figure 20: Priority measure #1 GHG reductions

PRIORITY MEASURE #2: BUILDING DECARBONIZATION

Overview

Commercial and municipal **buildings account for 22%** of Oklahoma City MSA emissions. This priority measure creates a replicable approach to commercial and municipal energy efficiency building upgrades, starting with buildings where the authority to perform projects is already committed. Energy audits will be deployed to identify retrofit opportunities (electrification, solar, etc.) to reduce costs, improve building operations, increase climate resilience, and reduce GHG emissions. This project addresses emissions in the **stationary energy sector**. This priority measure also results in improved/expanded partnerships, improved air quality, and integration of workforce development. Case studies and project overviews will be developed to communicate lessons learned to other stakeholders in the Oklahoma City MSA. Additional skills will be required to perform energy audits, install, and maintain energy improvements. These skills will be developed through training partnerships as part of this priority project.

Goal

- Increase building efficiency
- Integrate workforce development

Milestones

- Develop project approach to refine scope and schedule
- Understand and establish a baseline for how building currently performs
- Perform energy audit to analyze energy savings opportunities
- Implement energy improvements
  - Upgrades/replacement for energy efficiency including equipment and building management practices
  - Electrification
  - Renewable energy and energy storage for distributed generation
  - Managed electricity loads to address peak shaving and demand management
- Partner with sector leaders to develop training workshops, templates, and facilitate building operator training programs

GHG Emissions Reductions

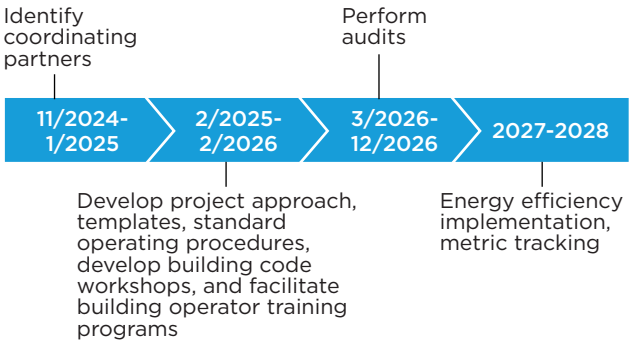
Emissions reductions were calculated based on performing energy audits and upgrades to 20 buildings using an average of 7,000 square feet per building. It is assumed that buildings operate on natural gas and electricity. Building improvements will include a range of options from lighting replacement to HVAC system upgrades and the installation of solar.

Annual GHG Reduction	1,060 $MtCO_2e$
Total GHG Reduction 2027-2030	4,124 $MtCO_2e$
Total GHG Reduction 2031-2050	20,146 $MtCO_2e$

**Emissions reductions are calculated starting in 2027 based on the anticipated project schedule.*

Figure 21: Priority measure #2 GHG reductions

Schedule



Implementing Agency And Authority To Implement

- Municipal, county, tribal nations and commercial building owners enacting reduction measure have the authority to implement the measure.

Progress Metrics

- Number of audits completed
- Financial savings as a result of implementation measures
- GHG reductions as a result of implementation measures
- Number of participants in workforce training

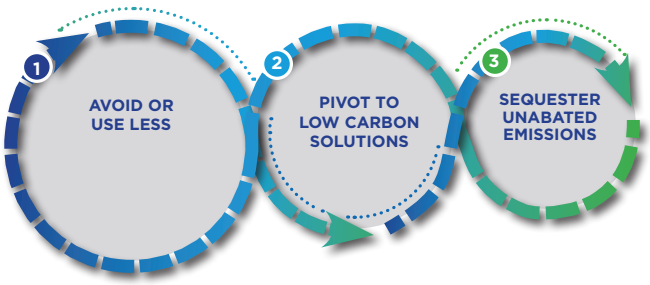


Figure 22: Prioritization of GHG measures for emissions reduction planning in buildings
ERP_Framework_Building_Portfolios.pdf (energy.gov)

PRIORITY MEASURE #3: NATURE-BASED SOLUTIONS FOR CARBON SEQUESTRATION

Overview

This priority measure will plant an additional 10,000 trees to support carbon sequestration, air quality improvements, and reduce building energy use through increased tree canopy. This priority measure supports and builds on the ACOG OKC Metro Area Tree Canopy Assessment that outlines the positive impacts of trees on public health, reduced urban heat island effect, reduced GHG emissions, improved air quality, and positive economic impacts. Tree planting will be prioritized in LIDAC and tribal communities.

It is anticipated that this priority measure will require additional municipal staff to plant and maintain the trees (similar to the need to maintain any other public works asset or investment). The anticipated increase in staff provides workforce development opportunities through arborist apprenticeship programs.

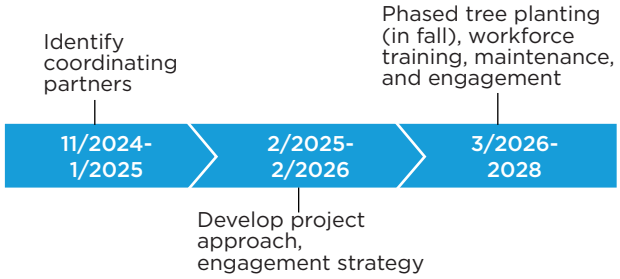
Goal

- Create carbon sinks

Milestones

- Develop regional tree planting program in partnership with existing forestry divisions
- Identify priority tree planting zones based on existing tree canopy, urban heat island, and LIDACs
- Create/expand apprenticeship programs for urban forestry
- Assess need to increase municipal forestry staff to maintain trees
- Provide maintenance beyond the time of planting to establish trees
- Monitor via LIDAR updates to existing urban tree canopy data

Schedule



Implementing Agency And Authority To Implement

Municipal, county, and tribal nations enacting reduction measure have the authority to implement the measure.

GHG Emissions Reductions

Emissions reductions were calculated anticipating an average MtCO2e per tree annually is 0.0091667 and that 10,000 trees are planted. Tree mortality, replacement, lifespan, species and operations and maintenance were not included in the GHG reduction estimates. .

Annual GHG Reduction	92 $MtCO_2e$
Total GHG Reduction 2027-2030	367 $MtCO_2e$
Total GHG Reduction 2031-2050	1742 $MtCO_2e$

**Emissions reductions are calculated starting in 2027 based on the anticipated project schedule.*

Figure 23: Priority measure #2 GHG reductions

Progress Metrics

- Number of trees planted
- Number of staff hired
- Carbon dioxide sequestered
- Energy conserved
- Air pollutants captured and avoided
- Stormwater filtered
- Canopy cover

BENEFITS OF GHG EMISSION REDUCTION MEASURES TO LIDACS

Environmental Benefits

- Improved air quality/reduced air pollution
- Ecosystem protection and creation of wildlife habitat
- Reduction of urban heat island effect

Community Benefits

- Connectivity
- Resilience
- Noise pollution reduction

Economic Benefits

- Financial savings (e.g., fuel and energy costs)
- Improved home values
- Job creation

Health Benefits

- Improved physical and mental health

ADDITIONAL PROJECTS FOR FUTURE CONSIDERATION

The original call for projects via the stakeholder survey conducted in December 2023 resulted in 70 total projects. These projects were consolidated into 18 themes that included the expansion of municipal LED lighting, the creation of more walking trails, the introduction of compressed natural gas (CNG) infrastructure, the improved coordination of city traffic lights, and the implementation of municipal composting programs. Although these project submissions were unable to be integrated into the priority GHG reduction measures list, they should be referred to and considered as additional projects are identified and developed for the CCAP and beyond.

1. LED lights on all city street lights and municipal properties
2. Improve efficiency of water system
3. Create new trails
4. Widen Garth Brooks Blvd to include a turn lane from Vandament Ave to NW 10th St
5. Hire a horticulturist/arborist to help plant and maintain trees & plants throughout the city
6. Construction of CNG Facilities
7. Landscaping Equipment Electrification Project, including: lawn mowers, leaf blowers, trimmers, chainsaws, pressure washers, and snow blowers
8. Improve Sidewalk Access to EMBARK Transit System
9. Hire a full-time staff member to serve as an "Energy Inspector" in order to fully measure the GHG emissions
10. A feasibility study for a transition to EV vehicles for our Citylink public transit system
11. A feasibility study for solar on city facilities
12. Hardscaping areas in Warr acres for water conservation
13. City of Warr Acres - Storm shelter removal: return the sites to an original green field on both City Facility property and public parks. The estimated cost for this would be $12,000.00
14. City of Warr Acres - Hammond and NW 34th Street Drainage improvements to eliminate localized flooding, using green infrastructure low impact design, and reducing concrete drainage structures and underground piping with impervious materials and a natural channel bottom. The probable first phase of this project could be accomplished for $900,000.00
15. Provide incentives for affordable new construction homes to be built to high efficiency standards (e.g., Energy Star, or the latest energy code)
16. Build a compost facility at Remington Park to process Zoo waste, Remington waste, and residential food and yard waste from local residents
17. Upgrade coordination of traffic lights
18. Thin concrete paving for streets

Figure 24: Additional projects recommended by stakeholders

6 PLANNING TO IMPLEMENTATION

Realizing GHG reductions will require this plan (and the CCAP) to be put into practice as part of policy, financing, design, and engagement. ACOG is not a regulatory agency and does not have authority to implement new pollution restrictions or require communities to implement projects. However, ACOG is a regional leader and can develop cross-jurisdictional strategies and direct funding opportunities to partners to promote regional emissions reductions measures and support project implementation. ACOG will work with stakeholders and regulatory bodies who do have the authority to implement new policies, such as Oklahoma Department of Environmental Quality and other state agencies, to facilitate implementation of PCAP goals. ACOG will continue to operate as the regional voice for municipalities and communities and as projects are identified, ACOG will work to identify what entity has authority to implement.

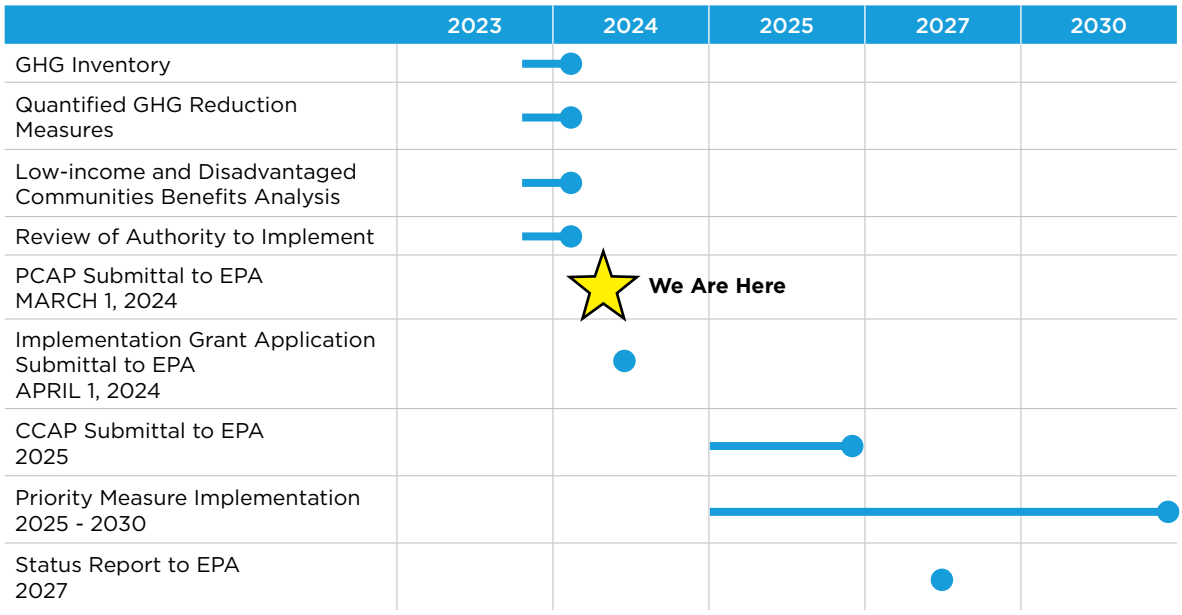


Figure 25: Project timeline

7 NEXT STEPS

Through the understanding of regional GHG emissions, impacts to LIDACs, and the identification of priority reduction measures, ACOG and partners can develop comprehensive plans that address GHG emissions and add immense quality of life benefits to those communities most in need. This process has laid the foundation for how the Oklahoma City MSA can move into the development of the Comprehensive Climate Action Plan. As that process moves forward, ACOG and partners will build out additional details in the following areas:

- Complete a workforce planning analysis to understand and grow workforce development opportunities related to achieving a Climate Ready Workforce
- Identify other federal funding opportunities to support the implementation of GHG reduction measures and identify funding gaps
- Create a cohesive stakeholder and public engagement approach that leverages EPA environmental justice resources with a focus on environmental justice in the community and for tribes and indigenous peoples
- Strengthen and grow partnerships with current and future stakeholders
- Increase coordination with the State of Oklahoma and the University of Oklahoma to align strategies, data, and engagement activities

The Oklahoma City MSA understands the need to balance economic prosperity, public health, and environmental quality. This Priority Climate Action Plan has created an understanding of how investments, programs, projects, and policies can be developed to reduce GHG emissions and support a vibrant future for a thriving and healthy community.

APPENDICES

APPENDIX A:
Emissions Source and Quantity

GPC ref No.	GHG Emissions Source (By Sector and Sub-sector)	Total GHGs (metric tonnes CO_2e)			
		Scope 1	Scope 2	Scope 3	Total
I	STATIONARY ENERGY				
I.1	Residential buildings	3,670,288	5,324,197	272,562	9,267,047
I.2	Commercial and institutional buildings and facilities	3,498,731	7,022,017	359,479	10,880,227
I.3	Manufacturing industries and construction	756,899	IE	IE	756,899
I.4.1/2/3	Energy industries	770,082	IE	IE	770,082
I.4.4	Energy generation supplied to the grid	8,622,525			
I.5	Agriculture, forestry and fishing activities	IE	IE	IE	IE
I.6	Non-specified sources	4,516,513	4,762,597	243,812	9,522,923
I.7	Fugitive emissions from mining, processing, storage, and transportation of coal	52,578			52,578
I.8	Fugitive emissions from oil and natural gas systems	NE			NE
SUB-TOTAL	(city induced framework only)	**13,265,091**	**17,108,811**	**875,853**	**31,249,755**
II	TRANSPORTATION				
II.1	On-road transportation	6,522,358	IE	3,462,496	9,984,854
II.2	Railways	88,704	IE	IE	88,704
II.3	Waterborne navigation	NE	NE	NE	NO
II.4	Aviation	144,217	IE	IE	144,217
II.5	Off-road transportation	844,494	IE	IE	844,494
SUB-TOTAL	(city induced framework only)	**7,599,773**	**0,000**	**3,462,496**	**11,062,269**
III	WASTE				
III.1.1/2	Solid waste generated in the city	900,571		IE	900,571
III.2.1/2	Biological waste generated in the city	NE		NE	0,000
III.3.1/2	Incinerated and burned waste generated in the city	598,237		NE	598,237
III.4.1/2	Wastewater generated in the city	457,797		IE	457,797
III.1.3	Solid waste generated outside the city	IE			
III.2.3	Biological waste generated outside the city	IE			
III.3.3	Incinerated and burned waste generated outside city	IE			
III.4.3	Wastewater generated outside the city	IE			
SUB-TOTAL	(city induced framework only)	**1,956,604**	**0,000**	**0,000**	**1,956,604**
IV	INDUSTRIAL PROCESSES and PRODUCT USES				
IV.1	Emissions from industrial processes occurring in the city boundary	5,579,012			5,579,012
IV.2	Emissions from product use occurring within the city boundary	IE			IE
SUB-TOTAL	(city induced framework only)	**5,579,012**			**5,579,012**
V	AGRICULTURE, FORESTRY and OTHER LAND USE				
V.1	Emissions from livestock	NO			NO
V.2	Emissions from land	-200,523			-200,523
V.3	Emissions from aggregate sources and non-CO2 emission sources on land	NO			NO
SUB-TOTAL	(city induced framework only)	**-200,523**			**-200,523**
VI	OTHER SCOPE 3				
VI.1	Other Scope 3			NE	NE
TOTAL	(city induced framework only)	**28,199,957**	**17,108,811**	**4,338,349**	**49,647,118**

APPENDIX B:
Full List of Municipalities, Tribes, and Counties in the Oklahoma City MSA

Counties
Logan
Lincoln
Oklahoma
Canadian
Grady
McClain
Cleveland
Pottawatomie

Tribal Jurisdictions
Wichita-Caddo-Delaware
Chickasaw Nation
Cheyenne-Arapaho
Kiowa-Comanche-Apache
Sac and Fox Nation
Iowa Tribe
Kickapoo Tribe
Citizen Potawatomi Nation

Municipalities		
Agra	Geary	Orlando
Alex	Goldsby	Piedmont
Amber	Guthrie	Pink
Arcadia	Harrah	Pocasset
Asher	Johnson	Prague
Bethany	Jones	Purcell
Bethel Acres	Kendrick	Rosedale
Blanchard	Lake Aluma	Rush Springs
Bradley	Langston	Shawnee
Bridge Creek	Lexington	Slaughterville
Brooksville	Luther	Smith Village
Byars	Macomb	Sparks
Calumet	Marshall	Spencer
Carney	Maud	St. Louis
Cedar Valley	McLoud	Stroud
Chandler	Meeker	Tecumseh
Chickasha	Meridian	The Village
Choctaw	Midwest City	Tribbey
Cimarron City	Minco	Tryon
Cole	Moore	Tuttle
Coyle	Mulhall	Union City
Crescent	Mustang	Valley Brook
Davenport	Newcastle	Verden
Del City	Nichols Hills	Wanette
Dibble	Nicoma Park	Warr Acres
Earlsboro	Ninnekah	Warwick
Edmond	Noble	Washington
El Reno	Norge	Wayne
Etowah	Norman	Wellston
Fallis	Okarche	Woodlawn Park
Forest Park	Oklahoma City	Yukon

APPENDIX C:
Urban LIDAC Census Tracts

LIDAC Subgroup Group				
400173009041	400272020053	401091011001	401091044003	401091059074
400173009042	400272020055	401091013001	401091045001	401091061001
400173009043	400272020062	401091013002	401091045002	401091061002
400173010012	400272021021	401091013003	401091046001	401091061003
400173013011	400272021022	401091014001	401091047001	401091061004
400272001001	400272021064	401091015001	401091047002	401091061005
400272002001	400836001011	401091019001	401091048001	401091061006
400272002002	400836001012	401091021001	401091048002	401091063011
400272003001	400836001013	401091021002	401091048003	401091063012
400272003002	400836002001	401091021003	401091049001	401091063013
400272003003	400836002002	401091022001	401091049002	401091063014
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400272004002	400836003001	401091022003	401091049004	401091063022
400272005002	400836003002	401091023001	401091050001	401091063023
400272006032	400836004013	401091023002	401091050002	401091063024
400272006042	400836007001	401091023003	401091052011	401091063025
400272006043	400836007002	401091023004	401091052021	401091063031
400272007001	400836007003	401091024001	401091053001	401091065025
400272008002	400836007004	401091024002	401091053002	401091066011
400272009002	400836007005	401091024003	401091053003	401091066012
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400272012022	401091001002	401091032001	401091055003	401091066101
400272012023	401091001003	401091033001	401091055004	401091066111
400272012041	401091001004	401091033002	401091056001	401091066112
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400272012044	401091002033	401091039001	401091056003	401091067022
400272013022	401091004001	401091039002	401091056004	401091067023
400272013023	401091004002	401091039003	401091056005	401091067063
400272013031	401091004003	401091039004	401091059041	401091067091
400272013033	401091005001	401091041001	401091059042	401091067092
400272016022	401091005002	401091041002	401091059043	401091067101
400272016023	401091005003	401091042001	401091059044	401091067102
400272016034	401091008001	401091042002	401091059051	401091067103
400272016042	401091008002	401091042003	401091059052	401091067104
400272019043	401091008003	401091043001	401091059061	401091068012
400272020023	401091010001	401091043002	401091059062	401091068021
400272020024	401091010002	401091043003	401091059071	401091068022
400272020042	401091010003	401091044001	401091059072	401091068031
400272020051	401091010004	401091044002	401091059073	401091068032

LIDAC Subgroup Group (Cont'd)				
401091068033	401091072071	401091073032	401091078053	401091082084
401091068042	401091072121	401091073033	401091078061	401091082301
401091068043	401091072122	401091073051	401091078062	401091083011
401091068044	401091072123	401091073052	401091078063	401091083012
401091069023	401091072124	401091073053	401091078073	401091083023
401091069031	401091072125	401091073061	401091078082	401091083071
401091069032	401091072126	401091073062	401091078091	401091083091
401091069061	401091072131	401091073063	401091078092	401091083092
401091069062	401091072132	401091074011	401091078101	401091083102
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401091069071	401091072134	401091074013	401091079001	401091083142
401091069101	401091072141	401091074014	401091079002	401091083185
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401091069133	401091072161	401091074061	401091080071	401091083222
401091069134	401091072162	401091076011	401091080072	401091083223
401091069135	401091072163	401091076012	401091080073	401091085141
401091069136	401091072164	401091076013	401091080074	401091085144
401091069137	401091072171	401091076014	401091080081	401091085211
401091069141	401091072172	401091076041	401091080082	401091085263
401091069142	401091072181	401091076042	401091080083	401091086042
401091069143	401091072182	401091076051	401091080084	401091089001
401091069144	401091072191	401091076052	401091080091	401091095001
401091069145	401091072192	401091076081	401091080092	401091095002
401091069161	401091072201	401091076082	401091080101	401091095003
401091069162	401091072202	401091076083	401091080102	401091095005
401091069171	401091072203	401091077031	401091080103	401091097001
401091069172	401091072211	401091077032	401091080111	401091098001
401091069173	401091072212	401091077033	401091080112	401091099001
401091070011	401091072221	401091077041	401091080113	401091099002
401091070012	401091072222	401091077052	401091080114	401091099006
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401091072061	401091072262	401091078041	401091082072	401099800062
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401091072063	401091073022	401091078051	401091082082	401099800091
401091072064	401091073031	401091078052	401091082083	

APPENDIX D:
Oklahoma Tribal Statistical Area LIDAC Census Tracts

LIDAC Subgroup OTSA				
400173001001	400173010031	400272023022	400510006002	400819612001
400173001002	400173010032	400272023023	400510006003	400819612002
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400173002021	400173010142	400272024034	400510007021	400819614012
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400173003003	400173012011	400272024044	400510008023	400819615003
400173004001	400173012012	400272024045	400510009011	400819616001
400173004002	400173012013	400272024051	400510009012	400819616002
400173005001	400173012014	400272024052	400510009013	400819617001
400173005002	400173012015	400272024053	400510009021	400819617002
400173005003	400173012021	400272024054	400510009022	400819617003
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400173006001	400173013012	400272024056	400510009024	400836006001
400173006002	400173013013	400272024061	400510009025	400836006002
400173007011	400173013021	400272024062	400510009026	400836006003
400173007012	400173013022	400272024063	400510009027	400874001031
400173007021	400173013023	400272024071	400510009028	400874001032
400173007022	400173013024	400272024072	400510009041	400874001033
400173007023	400173014071	400272025023	400510009042	400874001041
400173007024	400173014072	400272026001	400510009043	400874001042
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400173008054	400173014092	400510004003	400510010003	400874001061
400173008062	400173014101	400510004004	400510010004	400874001062
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400173009021	400272023015	400510005022	400819611004	400874002011
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LIDAC Subgroup OTSA (Cont'd)			
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400874002043	401091088042	401255006001	
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400874003005	401091088054	401255007002	
400874004001	401091088061	401255007003	
401091087011	401091088062	401255008001	
401091087012	401091088071	401255008002	
401091087013	401091089002	401255009011	
401091087061	401091089003	401255009012	
401091087062	401091089004	401255009013	
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401091087073	401091090032	401255010032	
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401091087083	401091090041	401255010042	
401091087091	401091090042	401255010043	
401091087092	401091090043	401255010051	
401091087093	401091090044	401255010052	
401091087094	401091092021	401255010053	
401091087101	401091092023	401255010061	
401091087102	401255002001	401255010062	
401091087103	401255002002	401255011011	
401091087111	401255002003	401255011012	
401091087112	401255002004	401255011013	
401091087121	401255003011	401255011031	
401091087122	401255003012	401255011041	
401091087131	401255003013	401255011042	
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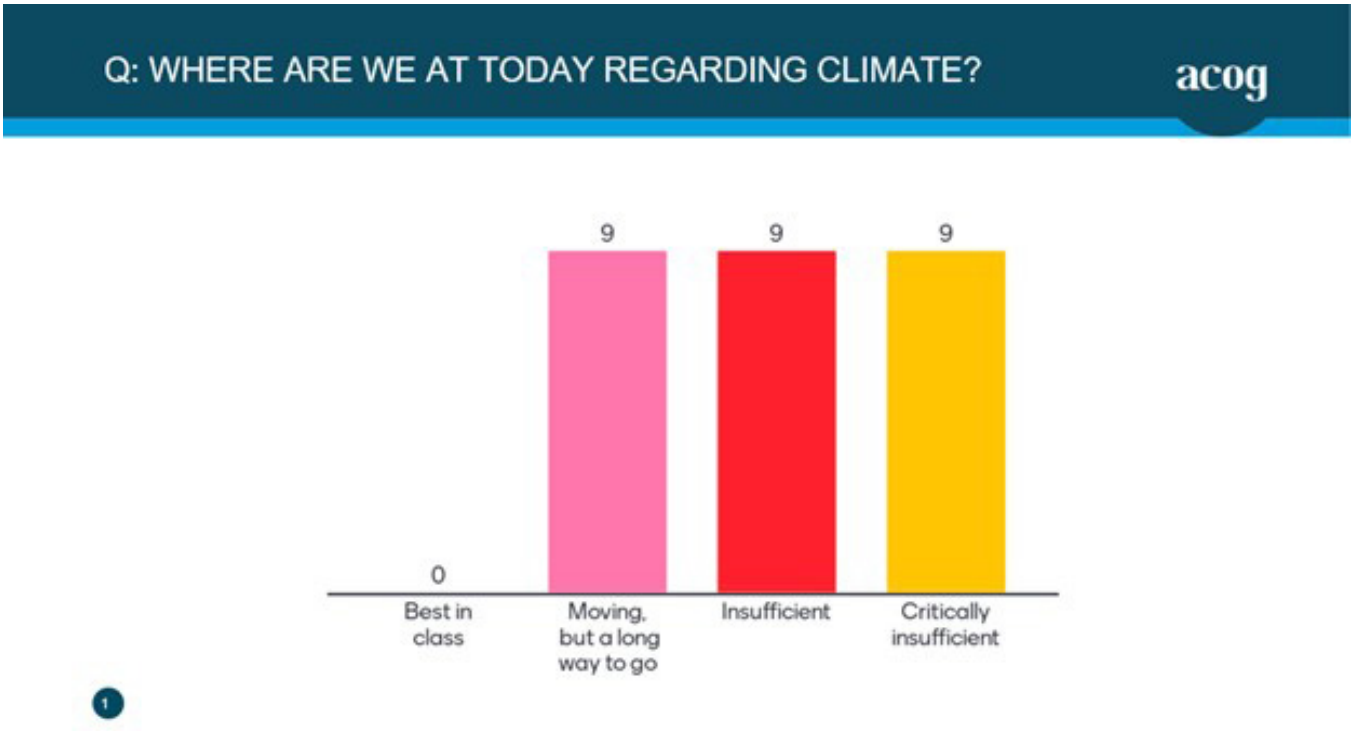
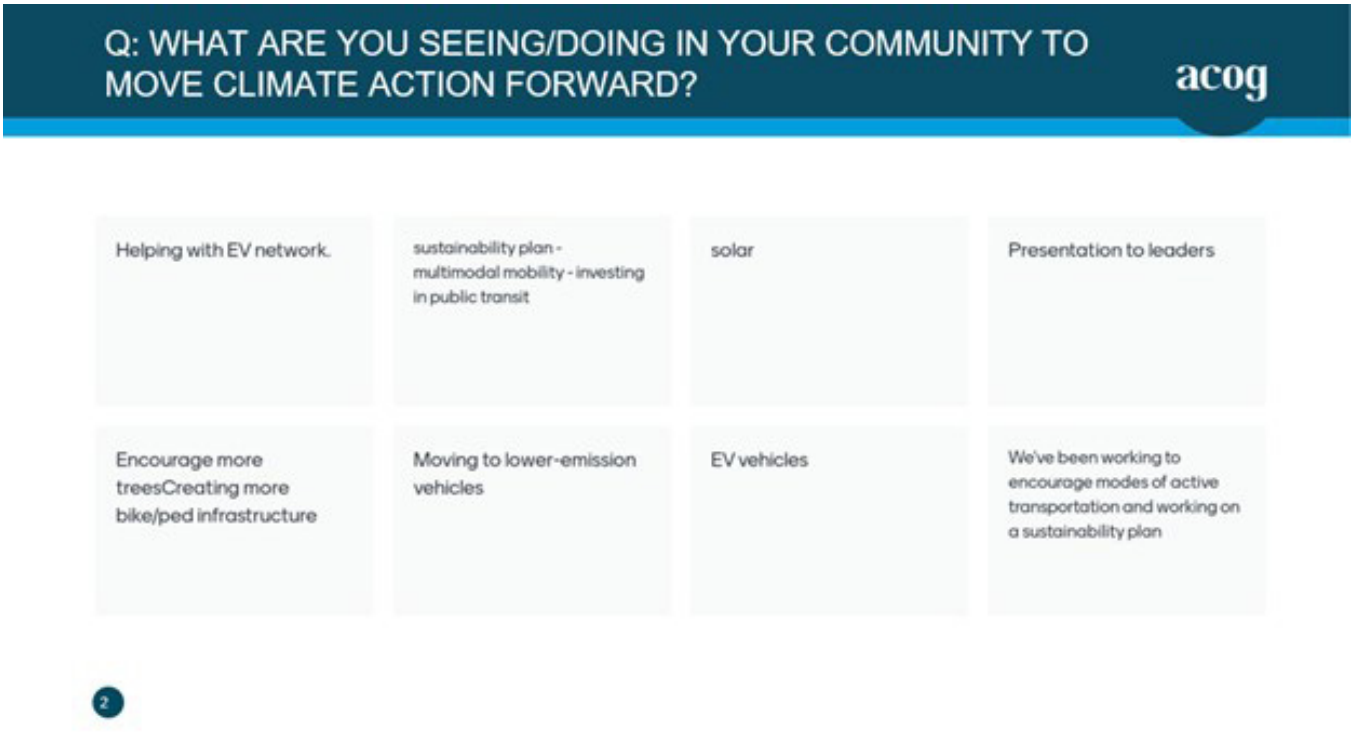
401091087133	401255003022	401255011044	
401091087134	401255003023	401255011051	
401091088021	401255004001	401255011052	

APPENDIX E:
Stakeholder Survey Results





Q: WHAT ARE YOU SEEING/DOING IN YOUR COMMUNITY TO MOVE CLIMATE ACTION FORWARD?

acog

Invest in public transit, walking and biking infrastructure	More trees!	Supporting EE and RE at the Corporation Commission.	Building sidewalks, bike lanes and bus routes
EV; Solar; Afforestation;	Expanded transit, even though not expressly for environmental benefit	We're installing and partnering to install public EV stations, we're implementing a bicyle master plan and implementing Intelligent Transportation System, planting trees, multimodal transportation.	Removing methane. Carbon sequestration

3

Q: WHAT ARE YOU SEEING/DOING IN YOUR COMMUNITY TO MOVE CLIMATE ACTION FORWARD?

acog

Public information - bridging communication gaps	Improve processes throughout our different programs to eliminate unnecessary pollution producing vehicles and activities.	Metro environmental studies

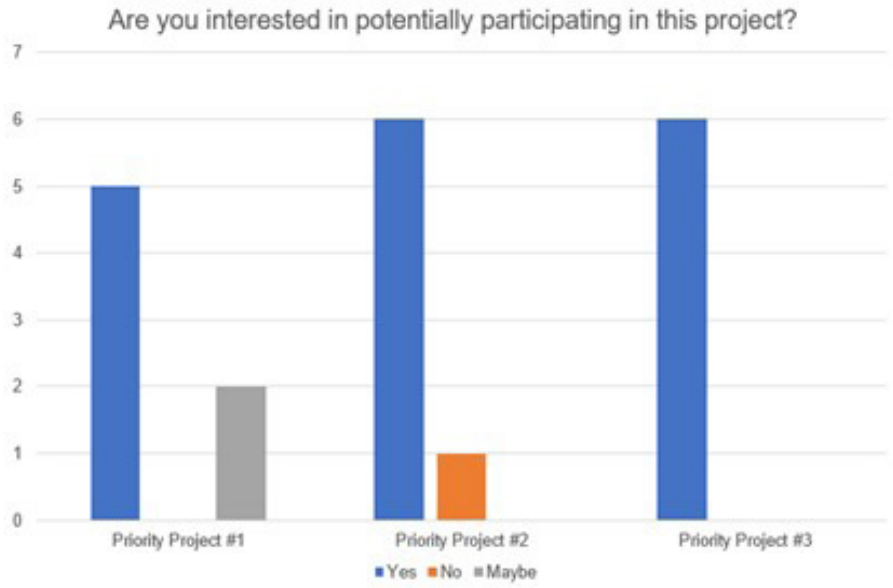
4


Q: WHAT DOES YOUR IDEAL VISION FOR CLIMATE ACTION LOOK LIKE IN YOUR COMMUNITY?
acog
climate good :) air clean
Personal: More people caringAgency: modal shift from a vehicle-centric culture to more public transit/ public transit SUPPORT
Degrowth
Local involvement, reduced waste, new jobs &economic opportunity
Large public engagement; to aid in education and understanding what climate action can be.
A community that prioritizes health and community over car traffic
More social infrastructure
Concrete carbon capture
5


Q: WHAT DOES YOUR IDEAL VISION FOR CLIMATE ACTION LOOK LIKE IN YOUR COMMUNITY?
acog
Opportunities for a broad number of communities and families and individuals to participate. Reduction of co-pollutants in places where people live, play, and attend school.
community engagement
resources/funding ($) to underserved communities, co-pollutant benefit, jobs/economic development/workforce
More options for trips and a greater understanding of the air quality problem.
More green transportation that's accessible and afforadable
Partnering with local businesses on EV stations, moving more residents to using renewable energy, providing services that are available to increase effiency in homes, and making more people aware.
Inclusionary zoning
Public awareness and involvement.
6

SECTOR AREA FOCUS AREA SURVEY RESULTS

acog



7

Priority Focus #1 Feedback – Which population/sectors do you think this project would benefit

acog

- Municipal Fleet
- Significant regional benefit is that Federally-funded EVSE now requires installing electricians to have certification from an EV maintenance program, so doing large-scale workforce development for EVs/EVSE would be beneficial given Federal funds are now more widely available for EVSE (e.g. STBG-UZA).
- Fleet is hard to switch over because they need new maintenance and certifications. There are also not a lot of vehicles that the city can benefit from right now that are EV. Transit, waste, and large vehicles are too $$$ and don't have the capacity to run.
- Transit/local government
- our fleet and community
- could benefit utility and building sectors and interested in public transit
- I would be interested in using funds for private/public EV station partnerships

8

Priority Focus #2 Feedback – Which population/sectors do you think this project would benefit

acog

- Do not anticipate interest in my agency
- We would love to reduce operating costs by reducing electricity consumption via renewables but also we know residents and businesses are also dealing with higher and higher electricity costs. A residential component would be helpful, though SHPO/Section 106 review has historically been difficult.
- City buildings
- Municipal buildings, community with solarize, we could do one or two buildings per year and have some with the infrastructure ready to go.
- City Buildings could be upgraded
- I think the whole community would benefit from more clean energy production and less need to purchase energy

10

Priority Focus #3 Feedback – Which population/sectors do you think this project would benefit

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- Especially using it to better define green infrastructure/low impact development standards even if just for City buildings/properties.
- Community wide benefit and would have community support and participation
- Transit/Local government along transit routes to reduce GHG emissions/improve air quality + provide shade for transit riders from extreme heat
- Our drinking watershed is impaired and NBS goes hand in hand with climate pollution reduction AND water resource improvement. Win-win! We have reforestation projects, NBS infrastructure projects, etc.
- Street trees are needed for us in lower income areas; our forestry dept is already heavily involved and are always looking for more funding.
- Street tree plantings on all major thoroughfares, hiring arborist staff, wetlands

12

STAKEHOLDER LIST DEVELOPMENT

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Shannon @ OKC (SNI Initiative) & The brownfield persons from there as well	Business community leaders - Scott Martin	OKC Beautiful	ODOT
OKC Sustainability Office	OTA	tribes, CBOs, public health nonprofits	FTA, FHWA

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STAKEHOLDER LIST DEVELOPMENT

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Kelly Dillow, OKC Zoo & Botanical Garden

- Michele Lounden
- Yukon, City Manager
- Parks, public works
- OU Climatological Survey
- OML

16

Q: WHAT CAN WE DO MOVING FORWARD TO MAKE THIS PROCESS EASIER/CLEARER/MORE ACCESSIBLE

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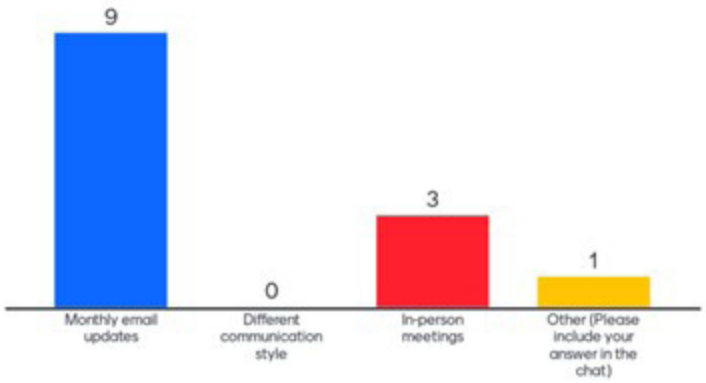
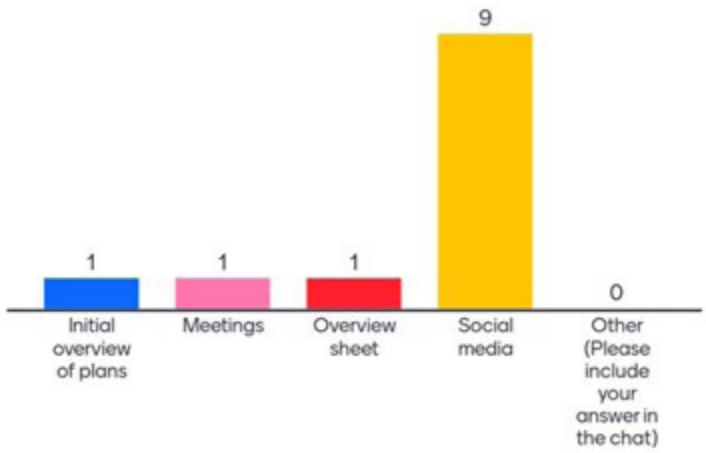


- Discord was recommended as an option

17

Q: WHAT CAN WE DO MOVING FORWARD TO MAKE THIS PROCESS ACCESSIBLE TO THE GENERAL PUBLIC

acog



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