mesa·az

CLIMATE ACTION PLAN

For a Sustainable Community

CITY OF MESA 2.0 | MESAAZ.GOV/CLIMATEACTION

Contents

Letter from Mayor John Giles

JUNE 2022

Mesa is one of the fastest growing cities in the country. As we grow, it's important to also build a city that is sustainable, so our grandchildren and generations beyond can enjoy what we have today.

Mesa has been on the forefront of sustainability for many years. Our City was one of the first in the state to have a curbside recycling program. We're a Tree City USA, and our robust solar portfolio, our Flare to Fuel program paired with our fleet of natural gas vehicles and water-use reduction programs are all exemplary. These strategies have a significant impact in more ways than one—we're protecting the environment, but also creating jobs, supporting economic growth and building a sustainable future for Mesa.

Resiliency and sustainability go hand in hand. We have a responsibility to future generations to pass along a community that's healthy at every level. We will work with our residents to turn this ambitious plan into steps we can all take to make a difference.

With this Mesa Climate Action Plan, I'm excited that we are taking a critical next step to protect and preserve our environment for generations to come. It is time for us to be bold and determined, and to set achievable goals that guide us in our work to reduce our greenhouse gas emissions.

Acknowledgements

Mesa's Climate Action Plan was only made possible through the input and assistance of many individuals within the City of Mesa. The following list highlights the contributions of many but may not capture all who participated.

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Transit
Transportation
Water Resources

Executive Summary

The City of Mesa (City) created a Climate Action Plan (Plan) as our commitment to proactively and responsibly protect and conserve Mesa's environment and natural resources. The Plan will lower our climate impact, serve as guidance for sustainable growth, and build resiliency by reducing carbon pollution in our community. Through this Plan, we will further study mitigation and adaption strategies, implement intentional policy direction, and support the advancement of innovative technologies.

The City recognizes the significance of climate change. Human activities have increased greenhouse gas (GHG) concentrations in the atmosphere, disrupting the Earth's natural systems and weather patterns. Climate change means unpredictable precipitation patterns, hotter summer temperatures, increased risk of wildfires, and Arizona's worst drought in over a century.

The Plan begins by measuring our impact. Mesa's GHG emissions are estimated through a GHG Inventory, which documents all sources of emissions throughout the community at a point in time. This inventory helps to set the baseline of known gases to develop strategies that reduce emissions and to track progress of those efforts.

The Plan has listed four 'Aspirational Goals' that will be used as a guide for our vision for the future:

ASPIRATIONAL GOAL #1: **Carbon Neutrality**

- Achieve carbon neutrality by 2050 by reducing greenhouse gas emissions and enhancing carbon sinks
- Strive to reduce the greenhouse gas emissions from City Operations by 50% by 2030

ASPIRATIONAL GOAL #2: **Renewable Energy**

- Prioritize the use of renewable, resilient energy to achieve 100% renewable energy by 2050

ASPIRATIONAL GOAL #3: **Materials Management**

- Manage material responsibly and divert 90% waste from the landfill by 2050

ASPIRATIONAL GOAL #4: **Climate Ready Community**

- Enhance community resilience through collaboration and inclusive engagement

We set forth ambitious, community-focused goals that will contribute to the overall climate impact for Mesa. This is the second version of the Plan, updated June 2022, that reflects a community vision to enhance quality of life, embrace smart City innovation, and improve social equity for a vibrant healthy future for Mesa. The City will be leading by example through projects and programs that will achieve progress toward these goals based on data and targeted strategies.

Reduction targets are incorporated into six 'Focus Areas':

FOCUS AREAS

The Plan will be a living document that will evolve over time as new strategies, resources, technologies, and collaborations come to light. This Plan sets the framework for cross-sector collaboration between subject-matter experts, local businesses, community stakeholders, and residents alike to help put Mesa on the path to carbon neutrality. We will look to the community to help us develop a pathway of equitable and inclusive initiatives based on data, best practices, and local expertise that will contribute to the reduction of GHG emissions each year.

We know what we need to do. The Plan provides a pathway to accelerate our historical success so that we can more positively contribute to the global climate action impacts. We want Mesa to continue to be a vibrant, prosperous, and thriving city for generations to come.

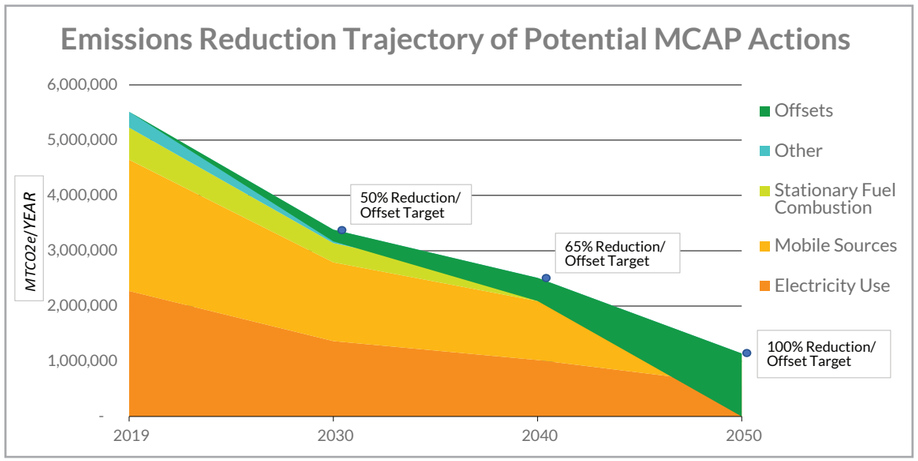
Ch 1. Looking to the Future

The Plan has four 'Aspirational Goals' that will be used as a guide for our future vision. To achieve these Aspirational Goals, we have identified efforts and initiatives needed to champion these impactful goals that support the Earth, our Mesa community, and future prosperity.

ASPIRATIONAL GOAL: **Carbon Neutrality**

Achieve carbon neutrality by 2050 by reducing greenhouse gas emissions and enhancing carbon sinks

Strive to reduce greenhouse gas emissions from City Operations by 50% by 2030

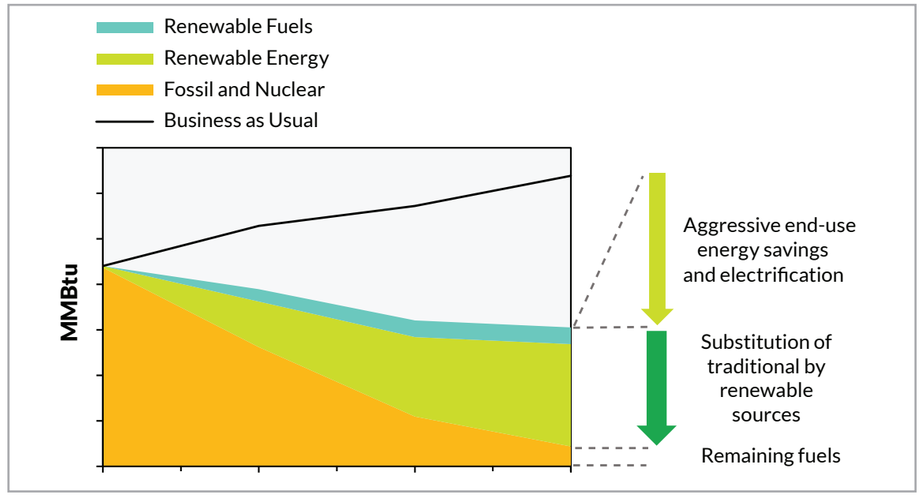


The following efforts will help Mesa achieve this goal:

1. Build smart, energy efficient buildings and operations with the goal of net-zero GHG emissions energy use.
2. Build a carbon-free transportation system, with walking, biking, carpooling, transit, and next generation mobility.
3. Transition to clean energy, such as hydropower, biogas, solar, and innovative technologies, to decarbonize the grid.
4. Transform the circular economy and reduce waste sent to the landfill.
5. Invest in neighborhood parks and preserve natural open space.
6. Study climate vulnerability in Mesa to guide decision making on land use, carbon-free energy, and energy efficiency policies.
7. Inspire community action to ensure environmental justice, equity, and affordability as Mesa transforms to carbon neutrality.

ASPIRATIONAL GOAL: **Renewable Energy**

Prioritize the use of renewable, resilient energy to achieve 100% renewable energy by 2050



The following efforts will help Mesa achieve this goal:

1. Support energy efficiency in buildings and vehicles, and pair with renewable energy strategies.
2. Develop utility-scale renewable electric and natural gas energy generating facilities.
3. Collaborate with the community to increase access to renewable energy.
4. Seek out wholesale and retail renewable energy purchases.
5. Use verified and proven carbon offsets where renewable energy options are not feasible.

ASPIRATIONAL GOAL: **Materials Management**

Manage material responsibly and divert 90% waste from the landfill by 2050

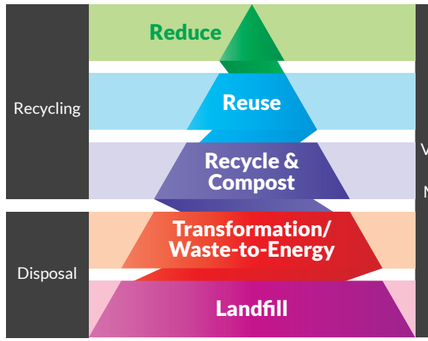


Figure 1: Traditional Waste Hierarchy

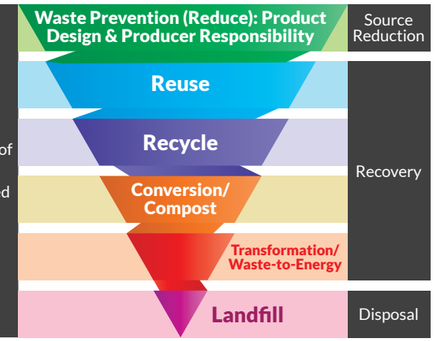


Figure 2: New Waste Management Paradigm

Change the Paradigm!

The following efforts will help Mesa achieve this goal:

1. Focus on waste reduction.
2. Inspire a zero-waste culture so people purchase mindfully; reduce, reuse, and recycle intentionally through the circular economy.
3. Advance the “Food Waste to Energy” and “Waste to Energy” programs.
4. Contribute to regional circular economy programs.

ASPIRATIONAL GOAL: **Climate Ready Community**

Enhance community resilience through collaboration and inclusive engagement

It is important to understand that climate change is a global challenge that the City cannot tackle alone. To achieve these aspirational goals, collaboration from a variety of stakeholders is necessary to accelerate emission reductions from sectors where the City has limited control. The City will lead by example but to make a difference, we also need community action.

The Plan incorporates priorities from a cross-sector collaboration of subject-matter experts, local businesses, community stakeholders, and residents to help put Mesa on the path to carbon neutrality. We looked to the community to identify the equitable and inclusive initiatives based on data, best practices, and expertise for community-based actions intended to act as a catalyst that will help to reduce GHG emissions each year.

The following efforts will help Mesa achieve this goal:

1. Education
2. Ongoing Communication
3. Strategic Partnerships
4. Funding and Incentives

Doing Our Part

OUR CLIMATE IS CHANGING faster than at any point in history

Ch 2. Sustainability & Climate Action Plan for Mesa

Our climate is changing faster than at any point in history, primarily due to generations of growth and human impact on the earth. Climate change has the ability to jeopardize everything we value: the resilience of our natural resources, our physical infrastructure, our financial security, economic competitiveness, and most importantly our health and well-being. Our collective global responsibility is to mitigate, prepare and adapt for a future that is projected to have hotter temperatures, harmful air pollution, longer droughts, more significant natural disasters, and more intense rain events. We will all need to work together, community and City alike, to build a sustainable future.

The City's Climate Vision

The City is in a unique position to be on the front lines of direct impact and to provide leadership to local efforts that will contribute towards meaningful and sustainable action. It is our role to set the framework for citywide measures and advance these goals across programmatic and departmental lines. The City has created this Plan as our commitment to proactively and responsibly protect and conserve Mesa's environment and natural resources.

The City is committed to fostering solutions with long-term community benefits, building resilience in City operations, and maximizing climate action for a healthy community with sustainable growth. The City has been making investments that support Mesa with clean air, clean water, and reduced emissions for many decades. These investments protect the resiliency of our natural resources, physical infrastructure, financial security, and economic competitiveness. The Plan will guide collaborative decision-making, future investments and daily operations that promote a shared vision for an innovative, resilient, and thriving community.

Many cities, including the City of Mesa, have embraced sustainability as a philosophy to enhance the viability of their organization and community. The benefits from this include reduced energy use, reduced operating costs, enhanced social services, preservation of valuable environmental resources, and motivating innovation. Our actions will be targeted towards local impact, improving our quality of life, and ensuring greater stability to climate impacts for generations to come. But climate change is a global challenge that does not account for local or national borders. Emissions anywhere affect people everywhere. We are proud to be joining a movement of global influencers coming together to combat and adapt to climate change.

What is Climate Change?

Climate change is the variation in average weather patterns and conditions spanning over years and decades. It encompasses the steady rise in temperatures, shifts in rainfall, elevated severity of weather events, and other fluctuations of the climate system driven in large part by human activity.

Statewide & Regional Climate Change

Data collected by the National Weather Service and National Oceanic and Atmospheric Administration, shows that year 2020 ended up being the 2nd warmest year recorded in the history of Metro Phoenix and the 2nd driest.

The number of years of above-average normal days are shown in Fig 1 and Fig 2. Figure 3 shows the downward trend in the 30-year average rainfall.

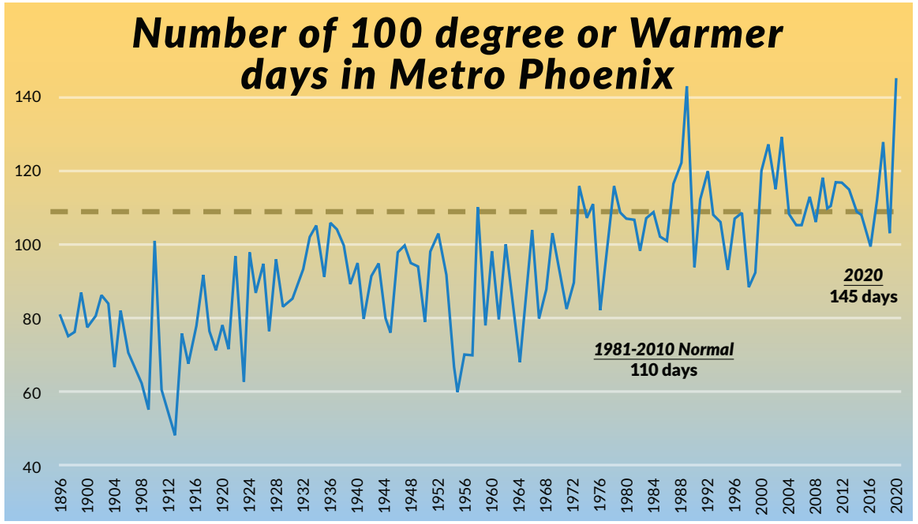


Figure 1

Data source: (National Weather Service, 2021)

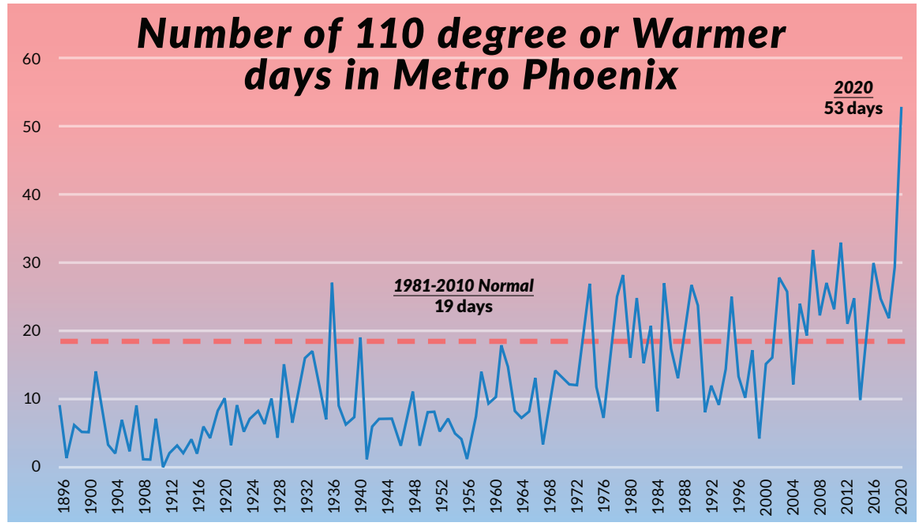


Figure 2

Data source: (National Weather Service, 2021)

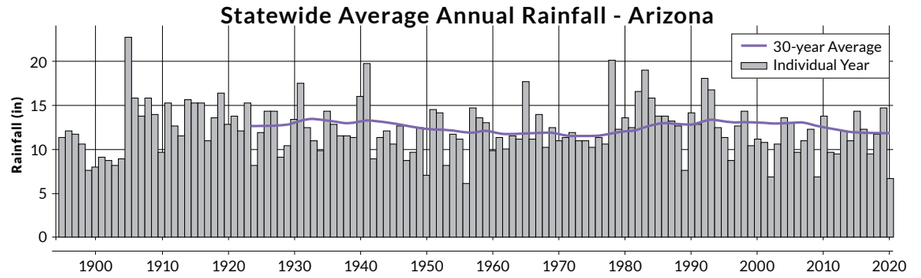


Figure 3

Data source: (National Weather Service, 2021)

There is a link between climate and carbon emissions that drive some of the effects we see above. To better understand the facets of climate change, the following elements have been identified:

GREENHOUSE GAS EMISSIONS: *The total amount of carbon dioxide and other carbon compounds, specifically greenhouse gases (GHG), emitted into the environment by direct actions. City operations depend on fossil fuel-based energy for activities, such as traveling, heating and cooling buildings, pumping water, and processing waste.*

CARBON NEUTRALITY: *Carbon neutrality means having a balance between the emission of carbon dioxide and other GHGs, with removal or mitigation measures intended to achieve net-zero carbon. For the City, this means reducing carbon emissions from buildings, transportation, waste, and our energy supply as much as possible, and supporting activities that remove carbon from the atmosphere (carbon offsets) to compensate for any remaining emissions.*

SUSTAINABILITY: *Sustainability means meeting the needs of today without compromising the ability to meet the needs of tomorrow for future generations (Sustainability, 2021). To support our natural environment, this means we must cultivate conditions where humans and nature can flourish together. The City embraces the three common pillars of sustainability: planet, people, and prosperity, to guide and frame decisions with environmental impacts.*

CO-BENEFITS: *The ability to have positive impacts in multiple areas at once. Many of the actions in the Plan have numerous co-benefits in addition to reducing emissions. For example, actions that reduce vehicle miles traveled (VMT) may also result in cost-savings by lowering transportation expenses and improving environmental quality by decreasing vehicle emissions. Consideration of these added benefits is an opportunity to prioritize actions that also positively impact other needs.*

Health Impacts and Equitable Solutions

Mesa is a vibrant and diverse community. We must proactively address and provide solutions for climate impacts and social vulnerability to remain resilient and ensure future equitability. National studies (Prevention, 2021) have found that climate change constitutes a threat to public health and welfare through direct and indirect effects on communities. More extreme weather events, heat waves, the spread of infectious diseases, and detrimental impacts on air and water quality can all negatively impact quality of life.

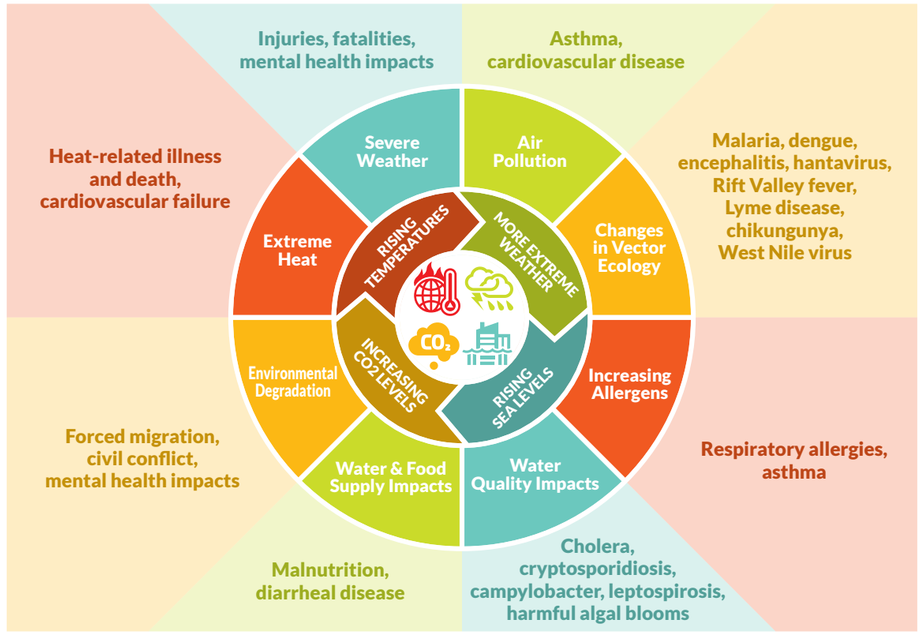
There are two main ways climate change directly affects health:

1. Severity or frequency of health problems directly caused by climate or weather factors.
2. Unprecedented or unanticipated health problems or threats in places where they have not previously occurred.

Additionally, some segments of the community can have greater vulnerability to health risks depending on varying factors such as language, economic, cultural, or geographic barriers. They may be disproportionately disadvantaged with limited resources and/or access to healthcare services. For example, a family with limited income living in a deteriorating home is more likely to experience disproportionate impacts and will be less likely to recover following extreme weather events, therefore increasing their vulnerability to climate-related health effects. Such a family will face tough decisions about how to spend limited funds: food, medical care, or repair/replace an aging air conditioning unit. Recognizing and identifying these health and equitable climate change impacts will lead toward interventions or actions that will reduce or prevent exposures to those at risk (Program, 2021).

Below is a chart provided by the Centers for Disease Control and Prevention depicting climate effects on health (Prevention, 2021):

Impact of Climate Change on Human Health



The City is committed to incorporating equitable solutions throughout the Plan that meet community needs and do not place additional burdens on vulnerable populations.

How the Plan Will be Used

The Plan will be a guiding document to support the direction of Mesa's City Council, City departments and community alike with shared sustainability and climate action vision and goals. Under the 'Healthy Environment' strategic initiative, the City Council stated that they want to proactively and responsibly protect and conserve Mesa's environment and natural resources to reduce urban heat, carbon, and waste for a healthy community for all. The Plan will be a living document used as a short-term and long-term planning tool to guide a strategic framework for these shared outcomes.

Within the City, individual departments will continue to be the owners of the projects and programs that will achieve progress toward these goals, but priority will be placed on actions that can be implemented quickly and achieve long-lasting positive impacts. While there has been measurable progress on the City's sustainable practices, the Plan will accelerate progress in a more coordinated manner and help achieve even more significant outcomes.

Ch 3. Measuring City's Impact: Understanding Mesa's Greenhouse Gas Emissions

Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). Some GHGs such as carbon dioxide occur naturally and are emitted into the atmosphere through natural processes and human activities. Other GHGs are created and emitted solely through human activities (Agency, 2021). The principle GHGs that enter the atmosphere because of human activities are:

The principle GHGs are:

CARBON DIOXIDE (CO2): Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees, and wood products; and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

METHANE (CH4): Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

NITROUS OXIDE (N2O): Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste. N2O is commonly found in vehicle tailpipe emissions.

FLUORINATED GASES: Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as High Global Warming Potential gases ("High GWP gases").

The effect of each gas on climate change depends on three main factors:

How much is in the atmosphere? Concentration, or abundance, is the amount of a particular gas in the air. Larger emissions of GHGs lead to higher concentrations in the atmosphere. GHG concentrations are measured in parts per million, parts per billion, and even parts per trillion. One part per million is equivalent to one drop of water diluted into about 13 gallons of liquid (roughly the fuel tank of a compact car).

How long do they remain in the atmosphere? Each of these gases can remain in the atmosphere for different amounts of time, ranging from a few years to thousands of years. All of these gases remain in the atmosphere long enough to become well mixed, meaning that the amount that is measured in the atmosphere is roughly the same all over the world, regardless of the original emission source.

How strongly do they impact the atmosphere? For each GHG, a Global Warming Potential (GWP) has been calculated to reflect how long it remains in the atmosphere, on average, and how strongly it absorbs energy. Gases with a higher GWP absorb more energy, per pound, than gases with a lower GWP, and thus contribute more to warming Earth. (Agency, 2021)

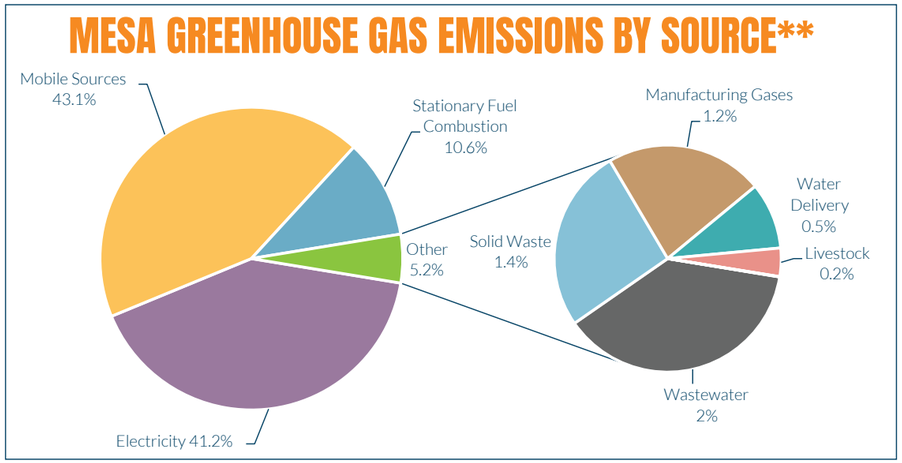
What is a GHG Inventory?

The United States Environmental Protection Agency (US EPA) defines a GHG inventory as a list of emission sources and the associated emissions quantified using standardized methods. Maricopa County Air Quality Department prepared this GHG emissions inventory to give our community an understanding of Mesa's emissions. By understanding the sources of GHG emissions, leaders can make operational decisions and implement voluntary programs to reduce GHG emissions within our community. Businesses and individuals can also make personal choices to reduce their GHG emissions.

Here is Mesa's GHG inventory and what it tells us:

The inventory identifies sectors with the highest overall GHG impacts. In Mesa, emissions from mobile sources (vehicles and transportation) and electricity account for a majority of emissions. Interestingly, emissions from the residential sector account for 53.2% of emissions, the commercial sector accounts for 33.7% and industrial activities account for the remaining 13.1%. This Plan identifies emission reduction strategies.

GHG Emission By Soruce	GHG Emmsions *MTCO$_2$e	Percent
Electricity Use	2,271,359	41.2
Mobile Sources	2,374,594	43.1
Stationary Fuel Combustion	583,297	10.6
Wastewater	107,874	2.0
Solid Waste	74,770	1.4
Manufacturing (Flouorinated Gas Use)	64,332	1.2
Imported Water (Electricity Used)	27,108	0.5
Livestock	11,554	0.2
Fertilizer Use	121	0.0
Total *MTCO$_2$e	5,515,009	



Ch 4. Community Climate Action

The Mesa community collectively possesses the skills, knowledge, and resources that can be harnessed to create solutions to mitigate Mesa's climate impact. Taking action needs to include all local community partners, as well as, support at the state and national levels. Everyone has a role, and everyone must do their part, both on a personal level and at the community level. If we think globally and act locally, we can collaboratively address the impacts of climate change together.

Study Approach

The Community Action Study (Study) commenced in August of 2021 branded as "Footprint for the Future" and concluded with findings and final recommendations at the start of 2022.

Community engagement efforts included:

- Community Workshops
- On-line Engagement through an interactive platform
- Virtual Public Meetings
- Climate Action Prioritization Survey

Equitable Engagement

Equitable and inclusive engagement is not only about ensuring that diverse perspectives are at the table but also that deliberate actions and targeted strategies are taken to ensure that underrepresented communities participate and contribute. To validate inclusive participation, providing equitable opportunities was at the forefront throughout the entire Study. Marketing materials for outreach activities were developed in English and Spanish, bi-lingual staff were present at community workshops, and the project website was multilingual.

Additionally, where appropriate, participants were asked to provide demographic information. Understanding the demographics of Mesa residents is important because it is reflective of the diversity, and values of the community. This type of information can assist the City in outreach opportunities that are relevant and meaningful to all City residents.

Community Implementation Strategies

Effective climate action depends on successfully communicating information about the Plan to the wider Mesa community and encouraging broader participation in climate-related activities. GHG emissions reduction goals will not be met without the community playing a key role. The following outlines strategies to assist with an inclusive approach to implementing community action within the Plan:

- Partnerships
- Continued Education and Outreach
- Tracking and Ongoing Communications

Community Priorities

Individuals and community groups have a key role to play in reaching Mesa's climate action goals.

Through our diverse and comprehensive outreach efforts, the following priorities to mitigate climate change and viewpoints on City led initiatives emerged:

Priorities

Responsible Water Management
Improve Air Quality
Transition to Renewable Energy

City initiatives viewed as providing the most benefit to mitigating the effects of climate change

Resilient Water Supply
Tree and Shade Plan
Increase Renewable Energy Infrastructure

To see the Community Action Study in its entirety, please see Appendix A.

Ch 5. Leading by Example: Closer Look at Focus Areas

Based on the City's GHG inventory, the Plan is organized into six 'Focus Areas.' These Focus Areas provide a framework for further areas of study that will evolve with innovation and new approaches over time. In many cases, the Focus Areas are interrelated and provide co-benefits to the identified targets.

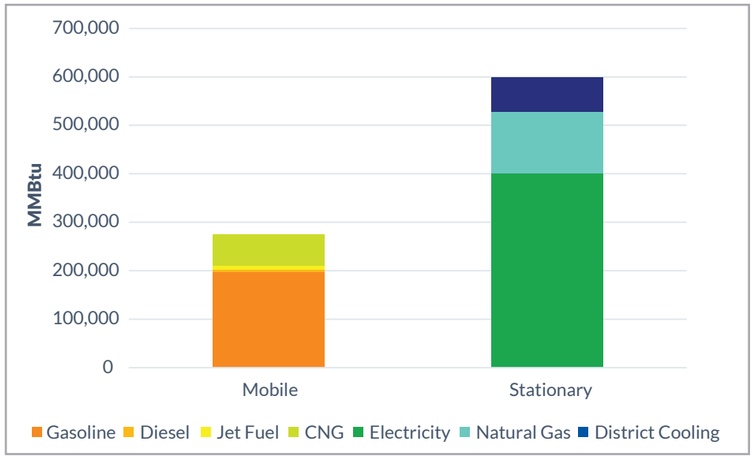
FOCUS AREA 1: **Energy**

Climate change means higher temperatures and higher demand for energy. Activities, such as traveling, heating and cooling buildings, and utility operations, are energy intensive and currently depend heavily on fossil fuel-based energy.

The most important step we can take to reduce Mesa's GHG emissions is to minimize energy use. The next step is to fulfill remaining energy needs with reliable, renewable, carbon-free energy. To account for and offset emissions from existing fossil-fuel power generation, the community must also continue to invest in new, cost-effective emission reduction strategies. Carbon sequestration, carbon capture, utilization and storage, and other negative emission strategies are key to reaching carbon neutrality.

ENERGY For a Sustainable Community

What kind of energy do we use in City operations today?



LEADING BY EXAMPLE: *Even as the City grows, Mesa has reduced energy use in City buildings over the last 3 years. The City is on track to have solar power for 25% of our electric energy use by 2025. The City will install technology that will capture renewable biogas for use in the City's Solid Waste fleet.*

TARGET 1.1: **Reduce energy use and decarbonize buildings**

STRATEGIES:

a. Develop programs that improve building energy efficiency, with a goal of net-zero GHG emission energy use.
b. Improve energy performance in less efficient buildings with periodic, cost effective and incremental energy efficiency improvements.
c. Weatherize City buildings in need of energy efficiency improvement. Pair with strategies like electric vehicle charging, energy storage, and fuel switching.
d. Promote use of established home energy rating system for all single-family home so potential buyers and renters can make informed decisions.
e. Partner with local utilities and non-profit organizations to weatherize homes and multifamily dwellings for those with the largest risk of the negative effects of climate change. Extend partnerships to commercial facilities to help small business stay ahead of potentially rising energy costs and climate challenges.

TARGET 1.2: **Reduce energy use and decarbonize transportation**

STRATEGIES:

a. Increase access to healthy transportation options, like active transportation (walking, biking), carpooling, public transit, and next generation mobility, with goal to reduce vehicle miles traveled in single occupant vehicles.

b. Develop an electric vehicle charging master plan for deployment of charging infrastructure at City sites, such as parks, libraries and rights-of-way, with special attention to neighborhoods where charging infrastructure is not available.

c. Work collaboratively with the community on strategies that will increase electric vehicle charging infrastructure-ready homes and businesses.

d. Advocate for access to electric vehicles for low-income people.

TARGETS 1.3: **Increase the use of clean, renewable energy and decarbonize the grid**

STRATEGIES:

a. Accelerate the use of carbon-free, renewable energy supplies that come from hydroelectric, solar, biogas, wind, and other innovative technologies in local utility energy portfolios.

b. Expand on-site renewable energy generation and storage capacity to support resilience in the community.

c. Subscribe to and advocate for utility scale renewable energy projects that provide energy for the community.

d. Accelerate the installation of infrastructure for electric vehicles and renewable natural gas vehicles.

e. Support community-based renewable energy initiatives.

f. Use verified and proven carbon offsets where renewable energy options are not feasible.

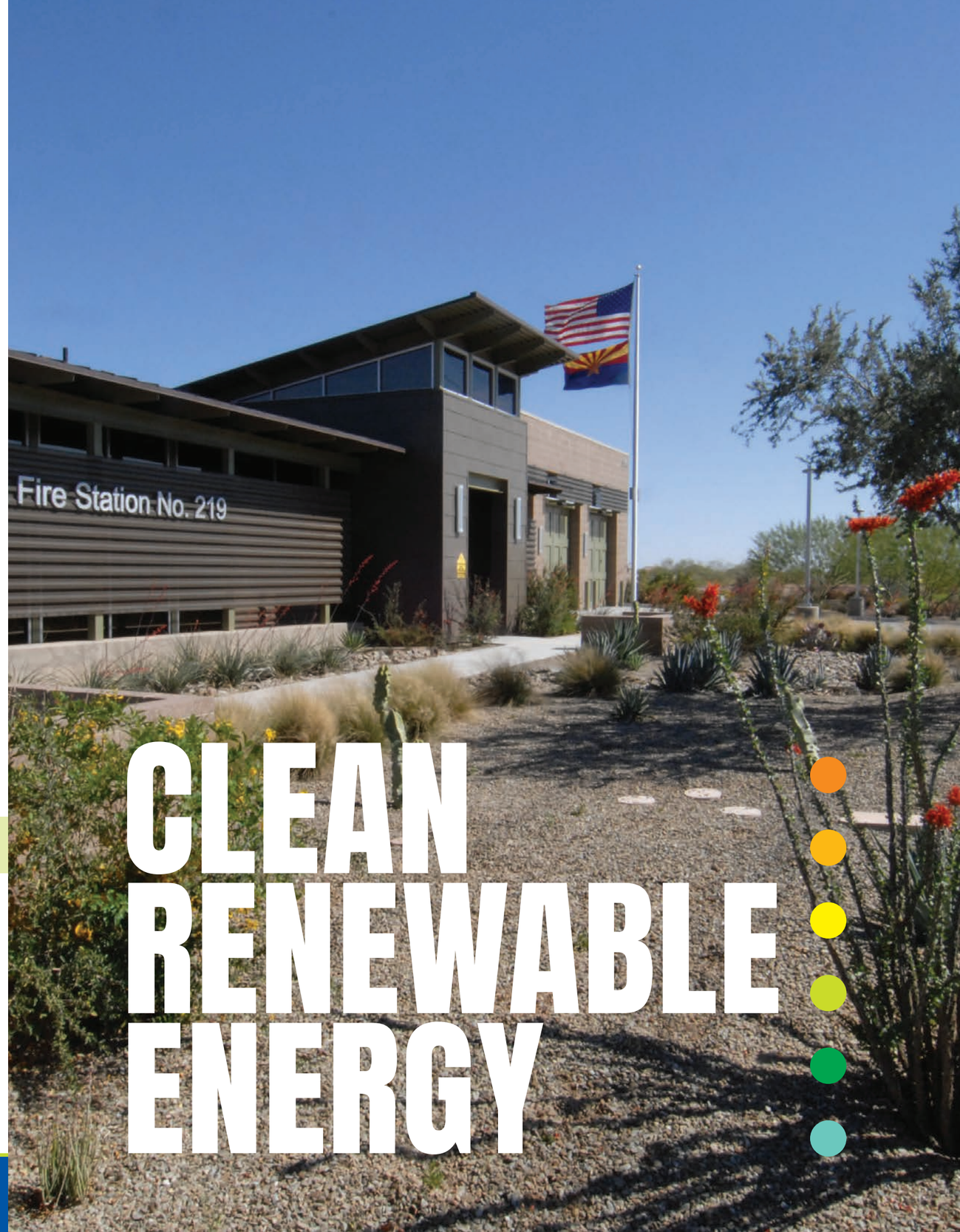
TARGET 1.4: **Maintain a resilient, clean energy supply**

STRATEGIES:

a. Invest in resilient energy sources and infrastructure.

b. Advocate for resilient energy supplies for the community.

Co-Benefits: **Air Quality, Heat Mitigation**



IMPROVING AIR QUALITY for Generations to Come

"We have a responsibility to future generations to pass along a community that is healthy at every level."

– Mayor John Giles

FOCUS AREA 2: **Air Quality**

Air quality is adversely affected by ozone, dust, and smoke. The community has identified improving air quality as a high priority.

Ozone at ground level is a harmful air pollutant. Ozone is not emitted directly into the air but is created by chemical reactions between oxides of nitrogen (NOx), a principal GHG, and volatile organic compounds (VOC). This happens when pollutants emitted by cars, gas powered landscape equipment, power plants, industrial boilers, refineries, chemical plants, and other sources react chemically in the presence of sunlight.

Two additional air pollutants of concern are dust and smoke. Prolonged drought and development has decreased natural vegetative ground cover on disturbed sites. City staff work with contractors, businesses, and residents to implement strategies that control dust generation. The City also partners with Maricopa County Air Quality Department on regional programs designed to reduce smoke generating activities, like wood burning, which can create poor air quality when the air is stagnant. Below are strategies that reduce GHG emissions, improve air quality and reduce carbon emissions that trigger climate change. The goal is to achieve a level of air quality that is healthy for humans and the environment.

LEADING BY EXAMPLE: *The City purchased the nation's first electric fire truck. The City plans to replace gas and diesel fleet vehicles with electric vehicles.*

TARGET 2.1: **Reduce GHGs and ozone**

STRATEGIES:

a. Implement programs that help Mesa meet US EPA National Ambient Air Quality Standards.

b. Educate community on the value of energy efficiency and the transition to carbon-free energy.

c. Enhance comfortable, walkable connections to public facilities, parks, and neighborhood-level services. Promote compact, healthy, livable land use patterns.

d. Develop a tree and shade master plan that will be part of the evaluation of walkable connections and promote carbon sequestration.

e. Provide transit options and transportation networks, such as electric vehicles charging stations, for longer trips.

f. Convert gasoline and diesel-powered powered equipment, such as landscaping and construction equipment, to electric or low-emission fuels.

g. Reduce vehicle trips on High Pollution Advisory Days.

TARGET 2.2: **Reduce dust**

STRATEGIES:

a. Implement strategies that result in stricter adherence with Maricopa County dust control regulations.

a. Invest in the urban forest, including appropriate plant selection, irrigation and care.

TARGET 2.3: **Reduce smoke**

STRATEGIES:

a. Enhance local compliance with smoke emission requirements on "no-burn" days through outreach and incentives.

TARGET 2.4: **Increase community commitment to air quality recommendations**

STRATEGIES:

a. Enhance inclusive community education on Maricopa County's Clean Air Make More program and other collaborative air quality programs.

Co-Benefits: **Energy, Heat Mitigation**

FOCUS AREA 3: **Urban Heat Mitigation**

Urban development has significantly raised daily high temperatures and overnight lows. Sustainability-minded urban design, landscape, building materials and cooling strategies can improve the quality of life during Mesa's extreme heat events.

Climate change threatens the livability and iconic landscapes of our region. The City is heavily committed to managing the urban built environment, open spaces, travel corridors, and urban landscapes to promote and protect equity, thermal comfort, and ecosystem health. Purposeful shade and landscape installations can prevent erosion, support air and water quality, and provide natural cooling.

Unequivocally, healthy landscapes mitigate climate change and reduce the urban heat island effect. Plants and, by association, their vibrant microbial soil capture and store carbon dioxide. Considering the large-scale impacts of urban heat and developing strategies to mitigate those effects will provide a path to maintaining the livability of the community.

LEADING BY EXAMPLE: *Community Leaders, Arizona State University (ASU), business benefactors and City staff are working on Heat Action initiatives in Mesa neighborhoods. The City has installed green infrastructure in parks and along streets, providing shade and reducing urban heat.*

TARGET 3.1: **Mitigate heat island effects in urban areas**

STRATEGIES:

a. Coordinate with ASU, Arizona Department of Health Services, National Oceanic and Atmospheric Administration and similar organizations on the collection and distribution of heat and weather data for the community.

b. Identify shading strategies for key pedestrian networks, including transit stops.

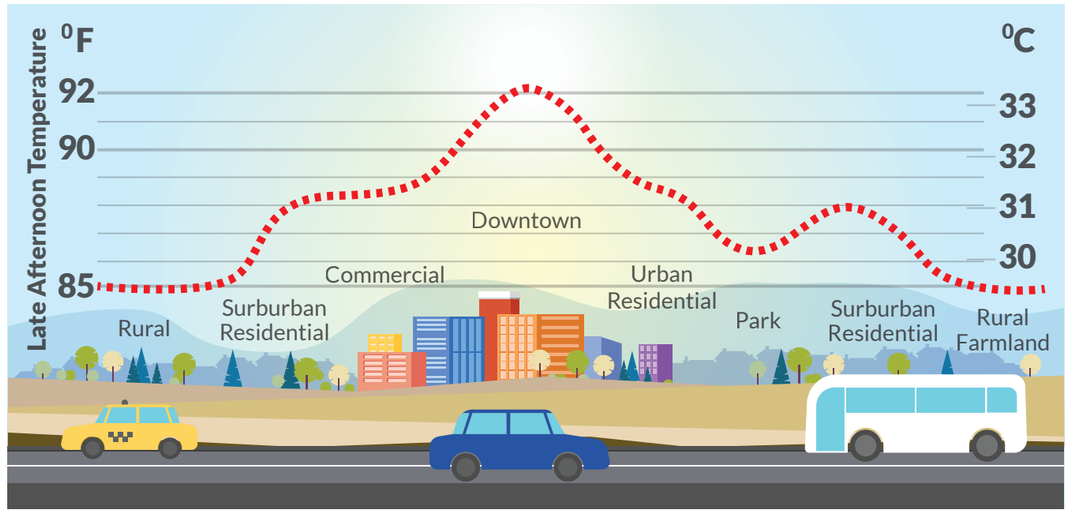
c. Develop a plan with recommendations for strategic placement of trees and structured shade.

d. Reduce the number of unshaded transit stops through the use of trees or structural shade elements.

e. Collaborate with designers, engineers and contractors to use alternative materials and coatings hold less heat and that more effectively dissipate heat.

f. Promote the use of green infrastructure and stormwater management.

g. Install solar canopy parking structures in parking lots.



TARGET 3.2: **Support resilient ecosystems and Mesa's natural ability to capture and store carbon**

STRATEGIES:

a. Collaborate with community partners to ensure a healthy urban forest.

b. Protect natural open space and conserve native wildlife, plants, and natural areas.

c. Manage areas to support resilient ecosystems and biodiversity.

d. Support resilient ecosystems through selection of desert adapted trees and plants that will thrive in the anticipated climate of 2030.

TARGET 3.3: **Prepare the community and workforce**

STRATEGIES:

a. Develop an energy performance and heat resilience program that provides a path to weatherize less efficient homes and businesses.

b. Foster a safe work environment by preparing workforce for climate change risks they may encounter at their work sites.

c. Provide the resources necessary to adequately prepare the community for climate change risks that may affect their home or work environment.

d. Work with the City's Community Engagement Division and local nonprofits to educate neighborhoods about heat concerns and issues.

Co-Benefits: **Energy, Air Quality, Water Stewardship**

HEALTHY LANDSCAPES

mitigate climate change and reduce the urban heat island effect

FOCUS AREA 4: **Water Stewardship**

Water is one of our most vital resources. It is essential to nearly every facet of life, from food cultivation to the generation of electricity. Yet, in the Sonoran Desert, it is also one of our most precious assets. The City and community at-large have made great strides in reducing the use of water. However, continuing drought, changing precipitation patterns, reduced snowpack and higher temperatures mean additional strategies will be needed.

It takes a tremendous amount of energy to transport and treat raw water to drinking level standards, pump it from reservoirs to businesses and homes, and then treat the wastewater. In addition to protecting renewable surface water supplies, saving water saves emissions required to treat and move water.

LEADING BY EXAMPLE: *The City continues to make strategic investments in wastewater infrastructure and beneficial reuse projects. The City is investing in new smart meters for all water customers that will show water use in near real-time and promote conservation, installing smart irrigation controllers with weather sensors, monitoring water use and setting leak alerts at all City sites. The City has installed green infrastructure on City owned property, including parks, landscape areas around City facilities, and along public streets. New City parks feature natural open space, eliminating the need for extensive irrigation.*

TARGET 4.1: **Efficient use of potable water**

STRATEGIES:

a. Install efficient fixtures and equipment.

b. Implement effective water conservation strategies and incentives.

c. Enhance incentives for customers to use water efficiently outdoors.

d. Provide water customers with detailed information about planting, caring for and the value of desert-adapted trees and landscaping. Encourage limiting grass to areas that have recreational value.

e. Conduct audits, install leak detection and replace water cooled equipment with efficient air-cooled equipment.

f. Collaborate with utilities and the community to develop a water use efficiency performance program, including incentives, so that less efficient users understand how to make periodic, cost-effective, incremental water efficiency improvements, indoors and out.

g. Expand the City's conservation education and outreach programs for students. Challenge students at all levels to learn about conservation strategies, engage in conservation research and develop water efficiency solutions.

h. Encourage the use of rainwater in the landscape areas by implementing green infrastructure and low impact development strategies that use rainwater on-site to reduce potable water use, reduce urban heat affect and improve air quality.

TARGETS 4.2: **Protect surface water resources**

STRATEGIES:

a. Look for opportunities in new City projects, parks, roads and buildings, as illustrated in the Low Impact Development Toolkit and the Greater Phoenix Green Infrastructure and Low Impact Development Details for Alternative Stormwater Management.

b. Reduce stormwater pollution by installing stormwater quality retrofit pilot projects on three City sites. Coordinate flood control with water quality projects.

c. Protect natural resources and conserve natural areas.

TARGET 4.3: **Maintain a resilient water supply for City operations**

STRATEGIES:

a. Invest in resilient water infrastructure projects to maintain resilient water supplies.

b. Implement strategies and infrastructure that optimize reuse and underground water storage.

Co-Benefits: **Energy, Air Quality, Heat Mitigation**

FOCUS AREA 5: **Materials Management**

The items we purchase, and the management of this material can emit many times more greenhouse gases than that of the energy used in our homes, businesses and schools. We should all think about sustainable alternatives to the things we purchase and use every day – use a reusable water bottle, reusable grocery bags, and buy only what we really need. These actions save energy, save water, and protect our natural resources. Recycling is great but reducing and reusing should always be our first choice in managing our waste. If we don't create waste, we don't have to worry about what to do with it.

Purchasing sustainably produced and locally manufactured materials can improve energy, water and waste efficiency and significantly reduce our GHG emissions. Making purchases with sustainability in mind can support local businesses, promote community prosperity, and mitigate climate change.

LEADING BY EXAMPLE: *The City is replacing hazardous materials with ones that are safer for workers and non-hazardous. City departments recycle office materials, batteries, old metal streetlights, meters, and wood pallets, to name a few.*

TARGET 5.1: **Eliminate GHG emissions, volatile organic compounds (VOCs) and hazardous material to the greatest extent possible**

STRATEGIES:

a. Replace chemicals and materials identified as GHG and VOC emitters with alternatives in construction, maintenance, and operations.
b. Select products with low supply chain emissions.
c. Purchase products sourced locally.

TARGET 5.2: **Reduce waste and transform the circular economy**

STRATEGIES:

a. Implement mindful purchasing for capital projects, maintenance projects and standard operations.
b. Expand options for reuse and recovery of hard to recycle materials.
c. Develop initiatives that support a circular economy framework and engage the community on upstream solutions to reduce waste.
d. Reuse, repair, refurbish, repurpose equipment and materials whenever possible and look into alternative markets for reuse.
e. Use the Recycle Right Wizard search tool available at MesaRecycles.org and on the MesaNow app.
f. Strategically set up waste stream systems that beneficially use waste that is not reusable or recyclable to create power from waste.
g. Reduce waste by converting heavy duty fleet and CNG powered vehicles to low-emission, renewable natural gas vehicles.
h. Work with local organizations to support local businesses that have similar goals.
i. Expand education and outreach for sustainable purchasing guidelines.

TARGET 5.3: **Ensure safe and cost-effective long-term disposal**

STRATEGIES:

a. Increase long-term landfill sustainability.
b. Advance multi-family and commercial recycling.
c. Turn waste into a resource and promote upstream solutions to reduce waste.

Co-Benefits: **Air Quality, Heat Mitigation, Water Stewardship**

CITY OF MESA CLIMATE ACTION PLAN: FOR A SUSTAINABLE COMMUNITY

FOCUS AREA 6: **Local, Sustainable Food Systems**

Local, sustainable food systems ensure that food is fresh, nutritious, and grown without harm to producers, our community members, or our environment. Food grown and produced locally reduces the environmental impacts of transportation, refrigeration, and preservation. Of great significance is that local food systems increase equitable access to affordable, healthy food, and reduce food waste.

LEADING BY EXAMPLE: *Mesa's libraries host programming on backyard gardening and urban farming. A local non-profit manages the Downtown Mesa Farmers Market and community volunteers manage the vibrant Mesa Urban Garden.*

TARGET 6.1: **Cultivate natural systems**

STRATEGIES:

a. Support low-carbon food production, distribution, and ecosystems. In addition to mitigating climate impacts, this strategy will support biodiversity.
b. Support sustainable urban growth that includes equitable access to local food systems.
c. Support a strong community network of successful and culturally diverse businesses that produce, process, cook, transport, and sell foods with the goal of preventing food loss and waste.
d. Optimize waste operations that create energy and compost from waste.
e. Incorporate sustainable growth, agriculture, food processing and distribution into existing and future economic development initiatives.

TARGET 6.2: **Cultivate local food systems and natural systems**

STRATEGIES:

a. Recognize that local food systems and natural systems are an integral part of the economy.
b. Encourage backyard gardens and urban gardens (for personal use or business).
c. Support sustainable urban growth that includes equitable access to local food systems.
d. Build agriculture (farms, processing, distribution and sales) into land use planning.
e. Support a strong community network of successful and culturally diverse businesses that produce, process, cook, transport, and sell foods with the goal of preventing food loss and waste.
f. Support local agriculture education programs.

TARGET 6.3: **Build a model where all people in Mesa have access to affordable, healthy, local food.**

STRATEGIES:

a. Encourage farmers markets, promote local gardening and sales.
b. Build local food purchases into procurement policies.
c. Partner with local organizations such as Local First Arizona, to provide technical assistance to business owners.
d. Provide economic development support for local food businesses.
e. Identify "food deserts" in Mesa, map available parcels, work with non-profits, and remove barriers to filling the gaps.

TARGET 6.4: **Waste and composting**

STRATEGIES:

a. Limit food waste by removing obstacles for efficient systems, partner with food banks and grocery stores.
b. Optimize waste operations that create energy and compost from waste. Lead by example - Food Waste to Energy project.
c. Work with Phoenix Metro partners to determine which reduction actions will reduce GHG emissions from the production, processing and delivery of food.

Co-Benefits: **Energy, Air Quality, Heat Mitigation, Water Stewardship, Materials Management**

A VIBRANT HEALTHY FUTURE FOR MESA

Ch. 6 Where We Go From Here: Plan Implementation

Mesa's Climate Action Plan is a dynamic document that will evolve over time as added resources, modern technologies, and collaborations come to light. There will be periodic updates when significant changes have been accomplished or identified to ensure that the intended vision is continuously reflected over the next several decades, or until the Aspirational Goals are achieved.

We set forth ambitious, community-focused goals that will make Mesa climate-ready. This is the second version of the Plan, updated in June 2022, that reflects a community vision to enhance quality of life, embrace smart City innovation and improve social equity for a vibrant healthy future for Mesa.

Monitoring Reports and Updates

The City will maintain updated reporting to easily track and monitor impacts to GHGs and other climate action progress. City staff will provide regular progress updates to the City Council and conduct future GHG inventories to evaluate the Plan's effectiveness. Public information, including metrics and reporting data, related to City operations and other known variables will be made available on the Open Data Portal listed under 'Healthy Environment'.

Financial Investments

The City is committed to ongoing financial investments to help meet our climate action goals. Current City operations that include sustainable initiatives are fully funded under an existing, adopted budget. Each year the City Council reviews and approves budgets with proposed new projects and full fiscal impact analysis. Although the actions outlined in the Plan are designed to demonstrate a pathway to achieve carbon neutrality by 2050, there is much uncertainty in predicting future technologies, costs, and regulations. Therefore, the City will continue to use its annual budget process as a mechanism to evaluate programs, projects, and services with the environmental lens, and adjust associated costs accordingly as new resources emerge and mature.

Project Ranking Tool

To support City Council with making fiscal and programming decisions, a project ranking tool was developed to identify environmental impacts and prioritize projects. The creation of this tool was created based on Council direction, community input and other decision-making factors. See Appendix B for the *Implementation Matrix*.

Ch. 7 Climate Care for All

Climate change is an unavoidable and unprecedented global issue that has great potential to cause disruption to our way of life if mitigative actions are not taken. Recent climate events have given us a preview of what may become the 'new abnormal.' However, this gives us a great reason to come together and collectively envision what we hope for Mesa's future.

We know what we need to do. We have identified solutions to reduce emissions, increase efficiency, promote economic vitality, and improve our quality of life. The Plan provides a pathway to accelerate our historic success so that we can more greatly contribute to the global climate action impacts. It is also a call to action for residents, community institutions, nonprofits, and businesses to also take an active part. Through a collective process, we will foster equity within our health and economy, increase our resiliency, and set up Mesa as a vibrant and sustainable community for generations to come.

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Appendices

Appendix A Community Action Study

Appendix B Implementation Matrix

This Plan was created with consideration of other community plans for best practices and discussion on regional efforts including: City of Phoenix, City of Tempe, Pima County, City of Houston, City of Santa Monica, and City of Cleveland.

This Plan also relies on research and data from the following agencies: Maricopa Association of Governments, Maricopa County Air Quality Department, Arizona State University, and National Oceanic and Atmospheric Administration among others.

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