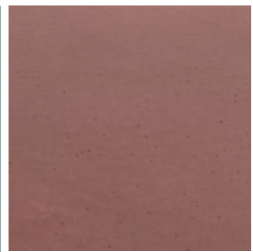
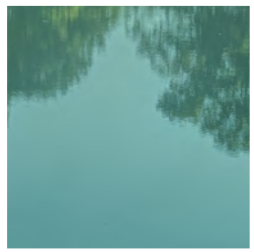
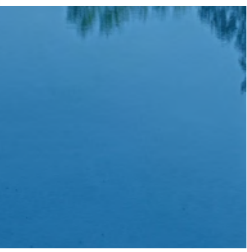


City of Columbia, Missouri

Columbia Climate Action & Adaptation Plan (CAAP) Annual Report


For Calendar Year 2022




City of Columbia, Missouri

Columbia Climate Action & Adaptation Plan (CAAP) Annual Report - 2022



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Columbia's CDP Score

In 2022, the City of Columbia's Climate Action and Adaptation Plan received an A- score from the Carbon Disclosure Project (CDP), which is the world's leading climate reporting platform. Columbia's A- score places us a top performer as it pertains to Climate mitigation and adaptation initiatives on both a regional and global scale.



Improving Sustainability Data Accessibility

The Office of Sustainability's webpage (CoMo.gov/sustainability) hosts a dashboard with Climate Action and Adaptation Plan (CAAP) related data. There are now downloadable and screen reader-friendly CSV tables of the data in the dashboard. There is also a CSV download option for the Municipal Benchmarking Dashboard. This download option expands who can explore our data and how the data can be explored.



Energy

- **A Cleaner Grid**
- **Energy Emissions**
- **Energy Minute Monday**
- **Improving Energy Efficiency in the Columbia Community**



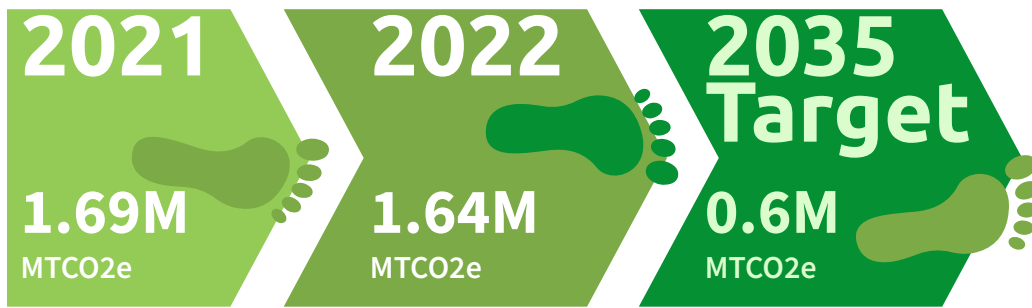
A Cleaner Grid

In 2022, 18.15% of the City of Columbia Utility's energy was supplied by renewable energy, which is the highest percentage yet. This means that the electricity supplied from the electric utility was less carbon-intense than in previous years. Learn more about the City of Columbia's renewable energy in the [City of Columbia Utilities 2023 Renewable Energy Plan](#).

Energy emissions have decreased by 2.5% from the 2015 baseline levels.

Visit CoMo.gov/sustainability for more information.

Energy Emissions:



Energy Minute Monday

In 2022, the Clean Energy CAAP team launched Energy Minute Monday, a social media campaign that features a weekly term related to renewable energy. These terms come from an internal renewable energy glossary for City staff. You can follow Energy Minute Monday in 2023 on the Office of Sustainability [Facebook](#) and [Twitter](#).

Improving Energy Efficiency in the Columbia Community

[City of Columbia utility energy efficiency programs](#) resulted in an estimated reduction of 4,296 MWhs of electricity, avoiding an estimated 3,153 metric tons of CO2 equivalent in the Columbia community in 2022. Community participation in energy savings programs is an important component of the success of this program.

Energy Savings from Efficiency Programs

Energy Savings from Efficiency Programs	Energy Savings (kWh)	GHGs Avoided (MTCO2e)
Home Performance with Energy Star	309K	342
Residential Air Conditioner/Heat Pump Rebates	391K	276
Commercial Lighting Incentive Program	2.1M	1,522
Air Conditioner/Heat Pump Rebates	58K	41
Commercial Solar	48K	34
Residential Solar	1.3M	939





Housing, Building and Development

- .. Benchmarking Municipal Buildings
- .. 2022 Energy Emissions and Consumption by Sector
- .. Municipal Building Energy Use Intensity



Housing, Building and Development

Benchmarking Municipal Buildings

City staff have made progress on tracking and reporting energy performance and emissions of municipal buildings.

The first Building Energy Benchmarking report was published.
Spring 2022

A Municipal Benchmarking Dashboard was published for further data exploration.
Fall 2022

Water consumption and cost data was benchmarked.
Spring 2023



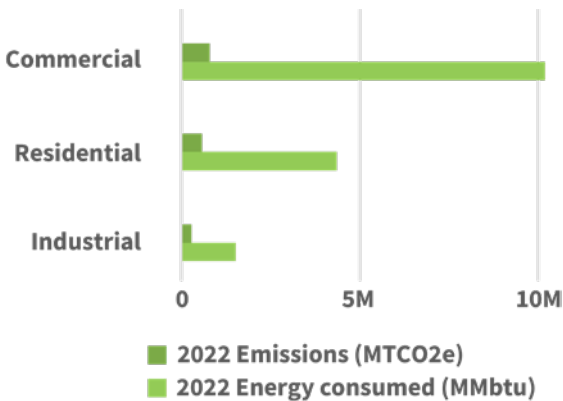
The Building Energy and Transparency Policy was passed requiring all municipal buildings to be benchmarked.
October 2021

Individual building report signs were posted in municipal buildings.
Summer 2022

Data was compiled to benchmark an additional 15 municipal buildings.
Winter 2022/2023

Staff will continue benchmarking the remaining estimated 22 buildings.
Next steps

2022 Energy Emissions by Sector



2022 Energy Emissions:

1.65 MTCO_{2e}
0% change from 2015

2022 Energy Consumption:

16.1 MMBtu
↑ 14% from 2015

2022 Municipal Building Energy Use Intensity(EUI):

77.2
kBtu/square foot

- 22.5% higher than the portfolio's national median EUI
- 1.65% lower than the 2018 portfolio EUI





Transportation

- Drafting a Fleet Electrification Policy
- Improving Transit Sustainability
- Automatic Vehicle Locator (AVL) Data
- 2022 Community Transportation Emissions
- 2022 Municipal Transportation Emissions

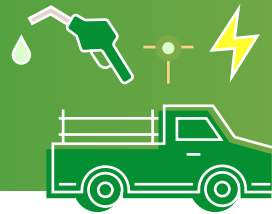


Transportation

Drafting a Fleet Electrification Policy

City staff have drafted a Fleet Electrification Policy that would require the replacement of internal combustion fleet vehicles with zero-emission vehicles to phase out fossil fuel use in the municipal fleet by 2040. The policy was presented to City leadership and the Climate and Environment Commission in 2022. City staff expect to have the drafted policy signed in 2023.

By 2028, this policy would result in 140 electric/hybrid vehicles, equivalent to 20% of the vehicle fleet. This would avoid an estimated 175 MTCO₂e per year (assuming 40% renewable electricity).



Improving Transit Sustainability



Adding Bus Shelters

In 2022, City staff planned the addition of three bus shelters in the Columbia community that will be added in 2023. These shelters provide relief from traffic, heat, and other weather for transit riders.



Grant for Electrifying City Transit

A LoNo (low or no emissions) grant was received in 2022 to add six electric buses to the City's transit fleet. These buses will replace diesel buses and will result in a total of 10 electric buses in the City fleet and a 40% electric transit fleet. The new buses will seat more people and have an extended travel range compared to the City's existing electric buses.

Automatic Vehicle Locator (AVL) Data

AVLs were added to City fleet vehicles in 2021 to track vehicle data such as mileage and idling. 2022 was the first full year of data collection. This data will be analyzed in 2023 and used to improve fleet efficiency.

2022 Community Transportation Emissions:

609.6k MTCO₂e

↓ 8.7% from 2015

2022 Municipal Transportation Emissions:

12.2k MTCO₂e

↓ 21.5% from 2015





Waste

- **Resource Stewardship CAAP Team**
- **Spring Recycling Collection**
- **Household Hazardous Waste Events**
- **2022 Waste Emissions**
- **2022 Waste Diversion**

Resource Stewardship CAAP Team

The Resource Stewardship CAAP team reorganized and added new members in 2022. They begin reviewing existing goals, strategies, and actions to reduce landfill waste and encourage water conservation.

Spring Recycling Collection

On May 7, 2022, the City of Columbia joined Boone County, the University of Missouri and the Mid-Missouri Solid Waste Management District in hosting a collection for tires and electronic waste. The event diverted 27.8 tons of electronic waste and over 19 tons of tires.

Household Hazardous Waste Events:

60.4
Tons Diverted
4,251
Total Vehicles
Attended



The City of Columbia hosts 15 annual household hazardous waste collection events to keep toxic waste out of landfills. Many of the materials collected are able to be reclaimed or recycled.

HOUSEHOLD HAZARDOUS WASTE (HHW)
COLLECTION FACILITY



2022 Waste Emissions:

32.6k MTCO₂e

↓ **38% from 2015**

2022 Waste Diversion:

8% Recycled **11%** Composted

81% Landfill



Health, Safety and Well-being

•• Rental Energy Efficiency



Health, Safety and Well-being

Rental Energy Efficiency



In July 2022, City Council responded to a report provided by the Climate and Environment Commission by supporting an initiative to identify ways to improve energy efficiency in rental housing. The initial phase of this process concluded in March of 2023 and consisted of two activities: a stakeholder questionnaire and focus groups. Throughout the process, responses from tenants, property managers/owners, and community based organizations surfaced points of agreement and points of friction/tension in priorities. The top four priorities from the survey and focus groups were the cost of rental housing, quality of rental housing, cost of energy efficiency improvements, and cost of utilities.

The next phase of the project will involve the work of a third-party consultant to evaluate the energy efficiency improvement potential of the rental housing stock in Columbia, suggest actions/policies that could be implemented in our community, and analyze the potential impacts on all stakeholders in the rental housing market.





Natural Resources

- **Growing CoMo Wild Yards**
- **Biodiversity is Climate Resilience**
- **Prescribed Burns for Ecosystem Health**
- **Per Capita Water Consumption & Wastewater Emissions**



Natural Resources

Growing CoMo Wild Yards

In late 2022, Office of Sustainability staff started to transition the ever-popular CoMo Wild Yards program to add exciting new partners and services. In cooperation with the U.S. Fish and Wildlife Service, the program will now be able to offer direct services to help support the installation of native landscaping on residential and commercial properties.

Biodiversity is Climate Resilience

A high level of biodiversity in the City provides a buffer for urban plant and animal populations when a flood, drought, or heat wave hits our town. Parklands are not large enough to maintain a high level of biodiversity, so the City of Columbia has begun restoring prairies, wetlands, and other Missouri natural communities in other urban areas.

Since 2019, the Public Works department has converted and maintained 29.5 acres of mowed turf grass along roadsides, medians, and roundabouts to native prairie vegetation. In addition to improving the biodiversity of the City, this program also contributes to our carbon emissions reduction goals by removing carbon from the atmosphere and storing it in the soil. Roadside prairies are the first line of defense against stormwater runoff pollution, trapping trash and pulling pollutants from the water as it passes through the plant and soil.

Prescribed Burns for Ecosystem Health

In 2022, the City of Columbia obtained a Prescribed Burning Contract for all City departments to utilize. Prescribed fire mimics the historical presence of fire on the landscape that many Missouri native plants adapted to and now require to thrive. This burn contract allows the City to manage our natural resources better. Prescribed fire returns nutrients to the soil, promotes native plant growth, and keeps fire-adapted natural communities healthy.



Per Capita Water Consumption

42.6k gallons per person

↑ 10.4% from 2015

↑ 9.7% from 2021

Wastewater Emissions

7.8k MTCO₂e

↑ 3.2% from 2015

↓ 31.3% from 2021



SHOW ME THE HEAT

Columbia Heat Map 2022

CAAP Implementation Spotlight: Community Heat Mapping Campaign

CAAP Implementation Spotlight: Show Me the Heat Campaign

Summer is already hot in Missouri, and climate change is making it hotter for longer. People living in cities are at greater risk of extreme heat because they have more heat-absorbing surfaces than suburban and rural areas as well as fewer trees. The lack of vegetation and high density of buildings trap heat in place, creating a heat island around the city.

Prioritizing communities that feel the heat the most is integral to preparing our community for future extreme heat events. To do that, we need to know where the urban heat islands in Columbia are located. The City and our community partners worked with CAPA Strategies, Inc. to identify where urban heat islands exist in Columbia by hosting a Heat Watch community science project called "Show Me The Heat."

On August 6, 2022, thirty-six volunteers collected thousands of data points by attaching sensors to their vehicles and driving six predetermined routes throughout Columbia on one of the year's hottest, driest, and most cloudless days. As a result, we now have heat distribution maps that show us how heat is distributed across the City. View the Show Me The Heat results at CoMoClimateAction.org.



Climate and Environment Commission(CEC) 2022 Report

A report from CEC Chair, Leanne Tippett Mosby

On behalf of the Climate and Environment Commission, I am pleased to provide these highlights of our activities in calendar year 2022 and priorities for 2023.



Rental Energy Efficiency

Members researched and presented information to the Water and Light Advisory Board and Finance Audit and Advisory Committee on rental energy efficiency. The CEC presented the information to City Council, and the council supported city staff to begin a process to develop rental energy efficiency ordinance or policy.

CATSO Long Range Transportation Plan

At the end of 2021, City Council assigned the CEC a task to analyze the CATSO long range transportation plan. CEC formed a transportation working group and the CEC approved a report that was sent to City Council. City Council wrote a letter to CATSO in support of the analysis made by the CEC.

Building Codes

CEC members interacted with the Building Construction Codes Commission on the issue of adopting the 2021 IECC building codes for energy. The BCCC voted against moving forward with the 2021 code due to concerns over the limited benefits relative to greatly increased costs, especially with respect to building envelope requirements. A small ad hoc committee of BCCC and CEC members have been working to craft a consensus opinion for City Council on how to move forward.

Other actions undertaken by the CEC include:

- Triple Bottom Line: CEC recommended a TBL approach in 2021. Council allocated \$25,000 for FY22 to support implementation. Staff conducted pilots using the TBL assessment tool.
- Developed a report to the City Council on the Integrated Electric Resource & Master Plan.
- Developed letters of recommendation to support a federal grant application for electric buses and for the Grissum site redevelopment.
- Monitored legislation and raised awareness among members regarding climate and environment related proposals.
- Worked closely with the Tree Board to develop a joint set of principles for resource management.
- Prepared a recommendation on water rates that was forwarded to City Council, WLAB and the Utility Director.
- Worked to gain a greater understanding of natural gas usage and developed proposals aimed at reducing usage.
- Reviewed the livable streets policy formulated by Local Motion and prepared a letter in support.

Outreach:

- Sponsored a free virtual screening of The Human Element in March, which included a panel discussion of a diverse group of experts to bring the issues in the documentary to the local level.
- Participated in Columbia's Earth Day celebration sharing a booth with the Tree Board.
- Participated in the Juneteenth event at Cosmo Park.
- Sponsored a webinar by renowned entomologist and wildlife ecologist Doug Tallamy on the importance of oak trees in the ecosystem.

Highlights of presentations to CEC:

- John Simon, liaison to BCCC, presented on the 2021 IECC energy code changes.
- Danielle Fox, Office of Sustainability community conservationist, presented on the Show Me the Heat campaign.
- Kevin Carpenter, environmental program coordinator, presented on the draft Fleet Electrification Plan.
- Mike Sokoff, transit and parking manager, presented on the master plan/study of the city transit system.
- David Switzer, chair, WLAB, presented on water rates (multiple appearances).
- Mike Guilford, fleet manager, presented on fleets and fuels.
- Alison Harris, member of the Youth Advisory Committee, addressed the CEC about topics the YAC has been discussing.
- Bella Kamplain, co-student director of Mizzou's student group Sustain Mizzou, presented highlights of the sustainability measures their group is involved with on campus.

The commission wishes to thank Sustainability Manager Eric Hempel and Sustainability Analyst Rebecca Elder for providing outstanding support to the commission throughout the year. In addition, we thank the many members of city staff, the public, and other boards and commissions for their presentations before the commission and willingness to collaborate on important issues. Finally, we thank members of the Columbia City Council and Mayor Buffaloe for their continuing support of the Climate Action and Adaptation Plan.

Climate and Environment Commission (CEC) 2023 Priorities



Energy

Staff Priority List	CAAP Action	CEC Next Steps	Work Initiated?	Status
Y	E-1.3.2 – Codify through ordinance Columbia Water & Light’s responsibility to meet 100% renewable energy generation or purchase by 2035.	Next step is to work with the staff and the WL Advisory Board to propose a new ordinance.	Yes	CEC approved a recommendation to the IERMP task force that Columbia achieve 100% renewable energy from water and light by 2030. This is a change from 2035 to 2030. IERMP has been completed and has been presented to the City Council.
Y	E-1.2.1 – Include CAAP priorities in Columbia Water & Light’s long-range electric and water resource planning goals.	CEC will monitor the implementation of the IERMP and provide input or assistance as needed.	Yes	CAAP goals were included in the IERMP statement of work. CEC list of priorities was voted on at the September 2020 meeting and provided to W&L staff for inclusion in the IERMP.



Housing, Building and Development

Staff Priority List	CAAP Action	CEC Next Steps	Work Initiated?	Status
	H-1.1.2 - Increase energy efficiency funding options for families (low-interest financing, on bill financing, Pay As You Save, PACE, etc.).	CEC will monitor and provide input on the Utility’s process of revising programs as needed.	No	
Y	H-1.1.3 – Establish a date by which all rental housing will be required to meet basic energy efficiency standards at license renewal.	CEC will continue to monitor the process and provide input as needed.	Yes	Staff from the offices of Sustainability, Neighborhood Services and Utility Services developed a plan, deployed in early 2023, to collect information from stakeholders in the community regarding rental energy efficiency.

Y	H-1.3.3 – Introduce a policy that requires all new and existing municipal buildings to meet and maintain energy and resource efficiency standards (ENERGY STAR, LEED, Home Energy Score or other).	CEC will continue to monitor the city CAAP team’s progress and provide input as needed.	Yes	City CAAP teams are working on this.
Y	H-1.3.4 - Introduce a policy that requires all municipal buildings to be benchmarked with the current Energy Score rating, the energy use intensity (kBtu/sqft) and the energy reduction goal. These benchmarks and goals shall also be posted on the City’s website.	CEC will monitor implementation of the benchmarking process and provide input as needed.	Yes	The City adopted the formal policy proposed by CAAP staff team and reviewed by CEC for benchmarking standards. Benchmarking of buildings is in progress.
Y	1.4.1 - Require that the City adopts the International Building Energy Conservation Codes for municipal, commercial and residential buildings as written.	On May 23, 2023, the CEC voted to accept a consensus position developed by members of the CEC and BCCC.	Yes	The CEC and BCCC formed a small ad hoc group to discuss building codes.
	1.5.1 - Incentivize switching space and water heating from fossil fuel-based to electric heat pumps.	CEC provided a recommendation to the Water and Light Advisory Board on incentives. CEC will monitor Utility Services review and update of rebates and incentives and provide input as appropriate.	Yes	Sustainability staff is involved in the Utility Services review and update of the electric and water efficiency rebates and incentives.



Transportation

Staff Priority List	CAAP Action	CEC Next Steps	Work Initiated?	Status
Y	T-1.1.2 – Revise street design standards to prioritize people walking, biking and riding transit while also accommodating vehicles.	CEC will monitor the efforts of the Public Works Department study and provide input as appropriate.	Yes	The Public Works Department received grant funding to evaluate transportation safety issues.
Y	T-1.2.1 – Improve efficiency, convenience and reliability of bus service and infrastructure	CEC will monitor progress and provide input as needed.	Yes	The transportation team met with transit manager to understand current routes and challenges

Implementation

Staff Priority List	CAAP Action	CEC Next Steps	Work Initiated?	Status
Y	I-1.1.1 - Use recommendations in the annual report to identify budgetary priorities that support implementation of the CAAP.	CEC will move its discussion of budget priorities to early fall to provide timely input to align with the city manager's budget development process.	Yes	Upon recommendation of city staff, the CEC considered and provided input on budget priorities during the city manager's budget plan development process.
Y	I-3.3.1 Align existing City educational and engagement programs with CAAP goals and programs. Provide additional support to education and outreach for the CAAP and its individual actions.	CEC will continue to collaborate with city staff on communications related to the CAAP and CAAP topics.	Yes	CEC will propose relevant outreach activities to City Staff for use in social media posts. And will continue to participate in public engagement opportunities.
Y	I-3.4.1 – Develop specific funding options for CAAP priorities	CEC will review communications about funding opportunities that the City could take advantage of; explore community partnerships.	No	
Y	I-3.5.1 - Use online dashboard to report on the status of the CAAP priority actions/KPIs (eg. Progress of actions that have been initiated, implementation schedule of other actions not yet started, community and municipal GHG emissions, equity impacts of actions Implemented).	Propose changes to the online dashboard to make it more up-to-date and relevant. Support continued funding for maintenance of KPIs and dashboard.	No	In process - dashboard deployed with staff updates.
	I-3.5.2 - Host a community event every two years to celebrate the annual progress report on the implementation of the CAAP.	The CEC will explore community outreach events with city staff.	Yes	The CEC participated in the Juneteenth celebration at Cosmo Park, which is approximately the same time as the anniversary of the CAAP, but did not hold a separate event in 2022.



Natural Resources

Staff Priority List	CAAP Action	CEC Next Steps	Work Initiated?	Status
Y	NR-1.1.1 - Manage publicly-owned natural areas to enhance and maintain diverse native communities.	Advocate for ecological planning for habitat improvement in City-led efforts such as the Natural Resources Inventory and upcoming Comprehensive Planning Process.	Yes	
Y	NR - 1.1.2 - Establish and effectively manage native-habitat corridors along trails and utility easement areas to restore and maintain landscape connectivity.	Draft a collaborative letter with the Tree Board encouraging holistic forest management or other suggested points of attention for the Comprehensive Planning Process.	Yes	
Y	NR - 2.1.1 - Complete change to rate structure to encourage reduced water use.	CEC will continue to collaborate with the Water and Light Advisory Board.	Yes	CEC collaborated with and provided input to the Water and Light Advisory Board on water rates.
	NR - 3.1.1 - Implement strategies to mitigate stormwater impacts due to development and redevelopment of properties currently exempted from stormwater management requirements.	Advocate for ecological planning for sensitive area protection in City-led efforts such as the Natural Resources Inventory and upcoming Comprehensive Planning Process.		
	NR - 3.2.2 - Perform detailed studies to identify areas that are at high risk for flooding and are maybe a prospect for property acquisition or mitigation.	Advocate for ecological planning for flood risk reduction in City-led efforts such as the Natural Resources Inventory and upcoming Comprehensive Planning Process.	No	

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