



HARRIS COUNTY'S

CLIMATE ACTION PLAN

FOR INTERNAL OPERATIONS:

AN INTERDEPARTMENTAL EMISSIONS REDUCTION STRATEGY

JANUARY 2023

CONTENTS

EXECUTIVE SUMMARY	1
ACRONYMS	2
INTRODUCTION	3
PLANNING PROCESS	13
GOALS & TARGETS	17
GOAL 1- Reduce total energy consumption and maximize savings.	21
GOAL 2- Increase use of renewable and resilient energy sources for County buildings and operations.	28
GOAL 3- Shift County fleet to zero- or low-emission vehicles.	30
GOAL 4- Reduce emissions from employee commuting.	32
GOAL 5- Sustainable procurement and waste management.	34
GOAL 6- Improving reporting and management of county waste stream.	36
PATH FORWARD	38
APPENDIX	39

Thank You!

We thank the following departments for their participation and contributions to this plan.

- Harris County Judge’s Office
- Harris County Precinct 1
- Harris County Precinct 2
- Harris County Precinct 3
- Harris County Precinct 4
- Harris County Attorney’s Office*
- Harris County Commissioners Court’s Analyst’s Office
- Harris County Community Services Department
- Harris County Department of Economic Equity and Opportunity
- Harris County Flood Control District
- Harris County Office of County Administration
- Harris County Office of County Engineer/Building Operation Services
- Harris County Office of Management and Budget
- Harris County Pollution Control Services
- Harris County Public Health
- Harris County Public Library
- Harris County Purchasing Department
- Harris County Sports & Convention Corporation/NRG Park
- Harris County Toll Road Authority
- Harris County Universal Services

EXECUTIVE SUMMARY

This is Harris County’s first Climate Action Plan (CAP) for internal operations. It provides an overview of recent climate hazards that have impacted the County, climate risks through the lens of public service delivery, and the benefits and opportunities for taking local climate action. It includes a high-level summary of the County’s first greenhouse gas (GHG) emissions inventory from CY2021, the co-creation process with County departments to develop the CAP, existing sustainability initiatives and precedents upon which the plan is founded, and GHG emissions modeling to illustrate one potential emissions pathway for this plan. Finally, a table of the CAP goals, 2030 targets, strategies, and actions along with narrative summaries for each action provide more depth to the body of work that will be implemented through 2030.

OBJECTIVES		
THEMES	ENVIRONMENTAL	<ul style="list-style-type: none">• Track and reduce greenhouse gas (GHG) emissions associated with County operations
	FINANCIAL	<ul style="list-style-type: none">• Lower operating expenses• Leverage local and federal clean energy funding
	RESILIENCE	<ul style="list-style-type: none">• Address climate risk and increase adaptive capacity• Bolster operational resilience of critical County assets
	GOVERNANCE	<ul style="list-style-type: none">• Institutionalize sustainability initiatives

*The Harris County Attorney’s Office will do legal reviews of proposed policies before implementation as needed

ACRONYMS

BAS	Building Automation System
BOS	Building Operation Services
CAP	Climate Action Plan
CEER	Coalition for Environment, Equity, and Resilience
CURB	Climate Action for Urban Sustainability
CY	Calendar Year
ESPM	ENERGY STAR Portfolio Manager
EV	Electric Vehicle
GDP	Gross Domestic Product
GHG	greenhouse gas(es)
HARC	Houston Advanced Research Center
HCFC	Harris County Flood Control District
HCPH	Harris County Public Health
HCTRA	Harris County Toll Road Authority
HRRM	Human Resources & Risk Management
ICE	Internal Combustion Engine
IJA	Infrastructure Investment and Jobs Act of 2021
IPCC	Intergovernmental Panel on Climate Change
IRA	The Inflation Reduction Act of 2022
MW	Megawatt
OCA	Office of County Administration
OCE	Office of the County Engineer
OMB	Office of Management and Budget
PCS	Pollution Control Services
PPA	Power Purchase Agreement
PUR	Purchasing
RECs	Renewable Energy Certificates
REP	Retail Electric Provider
TERP	Texas Emissions Reduction Plan
US	Universal Services

INTRODUCTION

This Climate Action Plan (CAP) for Harris County internal operations provides a strategic but flexible path forward for the County to prioritize improving the operational efficiency and energy resilience of its buildings and fleet. Setting a goal of reducing the County’s greenhouse gas (GHG) emissions 40% by 2030 from a 2021 baseline aligns with climate action plans of similar local governments and the global effort of getting as close as possible on a pathway to hold global warming to 1.5°C by setting up foundations for a net-zero future.¹

Harris County has seen devastating impacts from extreme weather events, which are increasing in frequency and intensity due to climate change. In recent years, these local climate hazards have ranged from hurricanes, winter storms, and record-breaking heat and drought. These climate hazards not only cause physical impacts to the built environment but also affect the County’s operations. Harris County government is responsible for offering a range of services to its residents, including but not limited to public health and mental health, housing and social services, judicial and law enforcement, juvenile and adult justice, economic development, libraries, flood control, pollution control, regulatory enforcement, emergency management, and construction and maintenance of the area’s 7,112 miles of road, 955 bridges, and 198 parks.^{2/3/4}

The CAP catalyzes change within County departments and welcomes Precincts and other elected offices to adopt these strategies for their internal operations. It also creates a signal and demand to the community for local climate action. With technology advances, an influx of climate-related federal funding, and the region’s collective shift to an energy transition, Harris County will be ready to lead and play an active role in this new energy economy.



Harris County At-A-Glance

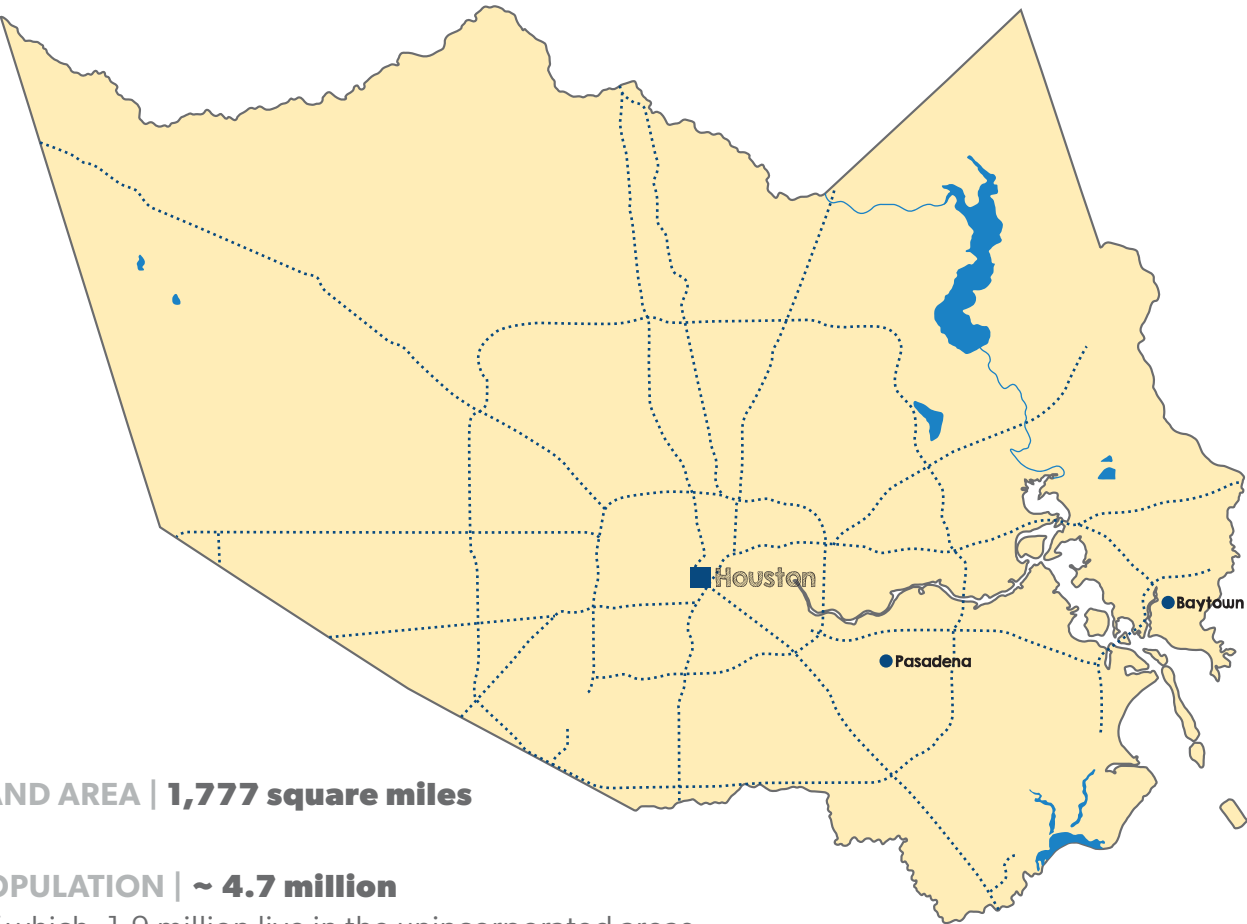
GOVERNING BODY

The Commissioners Court is a five-member body led by the County Judge with four commissioners joining. Each of the four commissioners represents approximately 1.2 million residents in one of the County’s four precincts and is responsible for services in the precinct, including maintenance of parks, roads, bridges, construction projects, and traffic signs; operation of community centers; and administration and budget for their respective precincts. The Court coordinates County services through its County Administrator and departments led by locally elected and appointed officials (see Appendix A for a County-wide Organizational Chart).

COUNTY EMPLOYEES
17,775 public servants

COUNTY BUILDINGS
1,279 facilities

COUNTY FLEET
7,698 vehicles



LAND AREA | 1,777 square miles

POPULATION | ~ 4.7 million

Of which, 1.9 million live in the unincorporated areas where the County is the key provider of public services.

MUNICIPALITIES WITHIN HARRIS COUNTY | 34

Including Houston (2.3 million residents), Pasadena (148,626 residents), and Baytown (82,480 residents).

Climate Hazards Impacting Harris County

Rising global average temperature is associated with an increase in intensity and frequency of extreme weather events. Harris County has experienced a wide range of climate impacts in recent years – from temperature extremes to record-breaking precipitation and drought conditions – which have led to social and economic disruptions for residents and financial and operational consequences for County services.

HURRICANE HARVEY

In August 2017, Hurricane Harvey brought one trillion gallons of water to Harris County in a four-day period, an amount that could cover all of Harris County in 33 inches of water.⁵ The damage from Hurricane Harvey produced 1.2 million cubic yards of debris in Harris County alone, which cost the County \$35 million to remove.⁶ This extreme weather event impacted several County operations, including interruptions in County services and caused over \$7 billion dollars in damages and emergency program funding.^{7,8}

WINTER STORM URI

In February 2021, Winter Storm Uri brought unprecedented freezing temperatures to Harris County causing 91% of residents reported that they lost power during the storm. On average, a Harris County resident lost power for 49 hours.⁹ While most County facilities were able to remain operational aside from some equipment failures caused by the freezing temperatures, the most notable impact was related to the County’s fleet as fuel supply disruptions prevented fleet operators from finding available gas for vehicles.

EXTREME HEAT AND DROUGHT

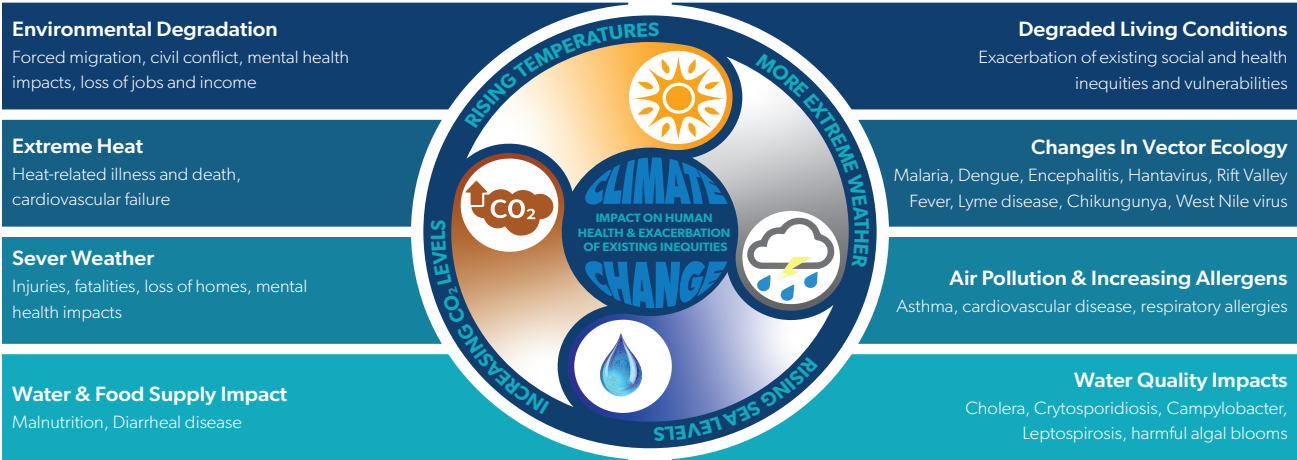
Most recently, in the summer of 2022, the entire state of Texas experienced extremely high temperatures and one of the worst droughts in over a decade.¹⁰ Counties across Texas implemented restrictions on activities, including limiting water usage and outdoor burning. Reservoirs, lakes, and rivers were drying up, and counties were expecting damages to properties, increased heat-related illnesses.¹¹ Electricity demand in Texas continuously broke record highs as the heat wave persisted across the state, and demand for cooling in buildings peaked. The state’s grid operator issued several voluntary energy conservation measures to the public to aid in maintaining grid stability. This afforded the County an opportunity to re-examine ways to leverage its building technology systems in preparation for future instances when the grid is stressed.



What is at Risk?

The Health of Communities and County Employees

Though local extreme weather events are felt county-wide, they do not impact all communities equally. There are individuals, communities, environments, infrastructure, and resources that suffer greater impacts due to differences in exposure to climate hazards or other factors that affect the ability to respond and recover from climate impacts and disasters. With public health being a core service that the County provides to its residents, addressing how the County plays an active role in mitigating climate hazards as a public health measure is vital.



Climate change affects human health in two main ways: first, by augmenting the severity and/or frequency of health problems that are already affected by climate or weather factors. Second, it creates unprecedented or unanticipated health problems or threats in places where they may not have previously occurred. For example, extreme heat can cause heat stroke, extreme cold can cause hypothermia, and both temperature extremes can lead to death. Air pollution can exacerbate respiratory conditions, lead to premature birth and low birth weight. Changing temperatures, flooding, and drought can impact vector-borne diseases and water-borne disease. While Phase I of the CAP is focused on internal County operation, Phase II will begin in early 2023 and address environmental health disparities associated with local climate impacts. Phase II will be developed jointly with community partners,

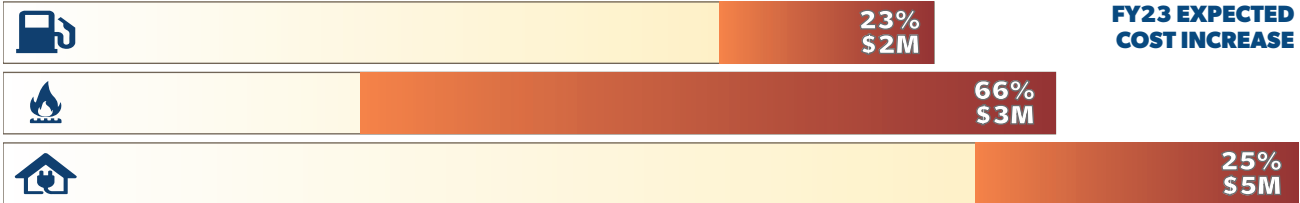
including the Coalition for Environment, Equity, and Resilience (CEER) and the Jacob and Terese Hershey Foundation, and will create actionable steps towards a more climate just future in Harris County. Funding for Phase II has already been partially secured through grants from the Jacob and Terese Hershey Foundation and Partners for Places.

In addition to seeing these health impacts among Harris County constituents, this can also affect Harris County employees, especially those who work outside during extreme temperature events. As hotter summers persist into the future, adjustments to work schedules or providing cooling mechanisms for outdoor workers may be needed to counteract extreme heat. These adaptive measures will be important to consider as the County also works to reduce emissions.

The Costs of Insufficient Climate Action

Recent federal estimates suggest that the future cost of climate inaction in the United State could translate into an annual revenue loss to the federal budget of over 7%, or about \$2 trillion in today's dollars.¹² Others estimate that the economic cost of climate change could reach \$14.5 trillion (in present-value terms) by 2070¹³. For the Southwest region, insufficient action could impose economic losses of more than 5.5% of the region's GDP—or nearly \$350 billion, in 2070 alone¹⁴—affecting every industry with regional government services being one of the top three industries that will likely face the greatest economic impact.

If left unchecked, the main impacts for Harris County government will be felt through the delivery of services and through the ability to maintain business continuity. Risks include:



Health impacts

Higher temperatures impact hospital systems and emergency department utilization. Research by HCPH and HARC found that Harris County could see an additional 92 deaths and 41,285 emergency room visits per year by 2050 if global GHG emissions maintain a business-as-usual scenario.

Service delivery

Increased pressure on public health and services in extreme weather events.

Infrastructure disruption

Due to flood events and loss of utilities, such as water supply, telecommunications, and electricity which can mean extra expenditures for repairs.

Transport disruption

Due to increased adverse weather conditions which will affect county-wide services and logistics and employees' ability to commute to their place of work.

Staff attrition

Due to school closures, transport disruption, uncomfortable working conditions.

Financial costs

Expected utility cost increases of maintaining the same levels of service due to higher and more volatile energy prices (i.e., electricity, natural gas, and fuel). Through unexpected direct costs of repairing structures to the indirect costs of delayed services in extreme weather events.

Loss of economic competitiveness

Limits the region's ability to achieve and sustain competitive advantage and attract economic development and social opportunity under climate change constraints.

Other indirect impacts

Security, implications to political stability, and shifting domestic migration patterns, etc.

Benefits of Climate Action

The Economic Gains

Acting now will not only save the U.S. from the economic cost of unchecked climate change but also could lead to a \$3 trillion increase in the nation’s GDP by 2070, according to recent estimates¹⁵. This economic gain amounts to \$885 billion being added annually to the economy in 2070 alone, and the regions hardest hit would have the most to gain. It is estimated that the Southwest region could realize a \$245 billion economic gain.

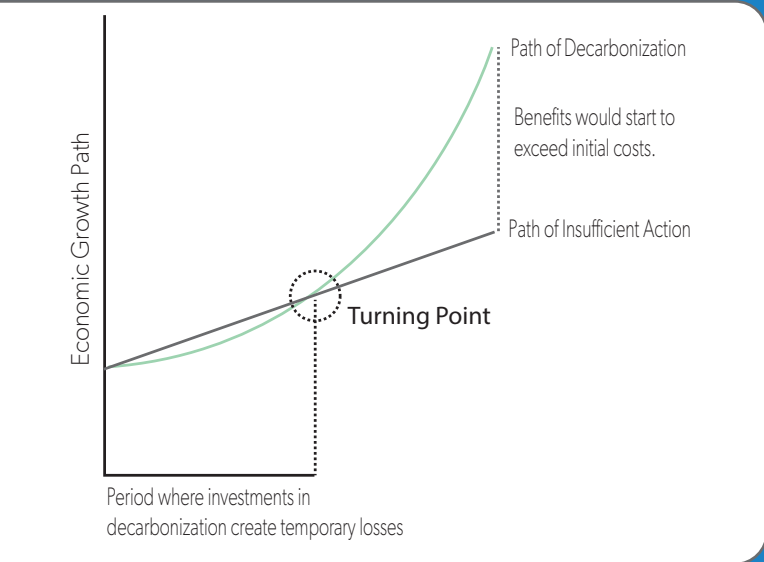
Transforming the U.S. economy could be accomplished at a more manageable cost than many may think. According to a Deloitte’s modeled scenario¹⁶, this could cost just 0.1% of GDP, or an average of about \$35 billion, every year to 2050. This net cost captures the enormous investments that will lead to value creation in the economy, as well as the disruption to activity in other parts of the economy.

To realize the above, it is necessary to make a substantial upfront investment. As the benefits of decarbonization start to occur, however, the economy could reach a point when the benefits of decarbonization would start to exceed the initial costs. This is the net economic gain of the transformation, or the turning point.

There has never been a more important time for local government leadership in the country’s turning point on climate change, and the transition to a prosperous, decarbonized economy. How the Harris County government responds and adapts to extreme weather challenges now will determine its viability to serve the public and the collective future of County residents. Decisions made today will either usher a trajectory of creative problem solving, collaboration and efficiency, or lock the County government into deficient and ultimately more expensive trajectories.

Reaching the Turning Point

Conceptual illustration that shows the turning point - the economic moment when the benefits of decarbonization exceed the combined costs of climate change and the cost of transitioning.



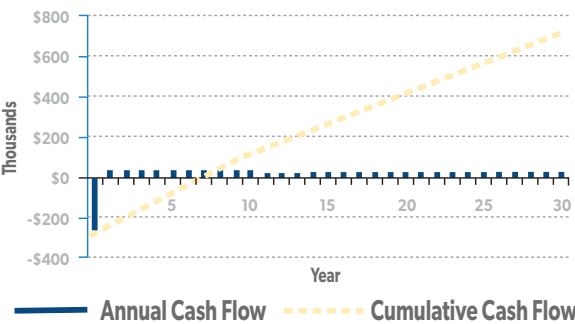
BENEFIT-COST ANALYSIS

Annual energy production **150,000 kWh/year**

KEY FINANCIAL ANALYSIS METRICS

Internal Rate of Return	12.3%
Simple Payback Years	7
Net Present Value	\$289,143
Annual Avg. Direct Financial Benefits	\$32,815

CASH FLOWS OVER TIME



ADDITIONAL COMMUNITY IMPACTS

Annual CO2 avoidance is equivalent to:

Greenhouse gas emissions from:
247,813 miles driven by an average passenger vehicle.

The CO₂ emissions from:
19.4% average homes’ annual electricity use, or **110,459** lbs. of coal burned.

The Carbon Sequestered by”
1,651 tree seedlings grown for 10 years, or **118** acres of U.S. forest in one year.

The recommended measures in this CAP are made with a view towards quickly lowering our GHG, promoting long-term cost savings and efficiencies for Harris County, and providing economic benefits such as workforce training and small business opportunities for County residents. Prior to implementation, each measure will receive additional analysis of its financial implications to ensure that its implementation would be both fiscally sound and consistent with County policy. If so, existing channels for analyzing and approving new projects and expenditures will be followed.

The economic frameworks to be used will be supported by common tools or methods such as cost-benefit analysis, risk analysis, and integrated assessment models.

Economic Decision Framework

Illustration that shows initial assessment of an energy infrastructure pilot program where the County anticipates its implementation will be fiscally sound.

Cost of CAP Implementation Framework

Potential cost of CAP implementation ranges from low-cost operational changes to new investments in County emission reduction activities. The list of actions varies among each strategy that will be implemented through 2030, and most of the actions fall under the low cost/redirecting existing funds financial framework.

LOW	REDIRECT FUNDING	NEW INVESTMENTS
Low cost operational or administrative actions that enable cost savings or a reduction in GHGs	Redirecting existing capital to prioritize actions that yield multiple co-benefits	New County investments that support clean energy transition initiatives

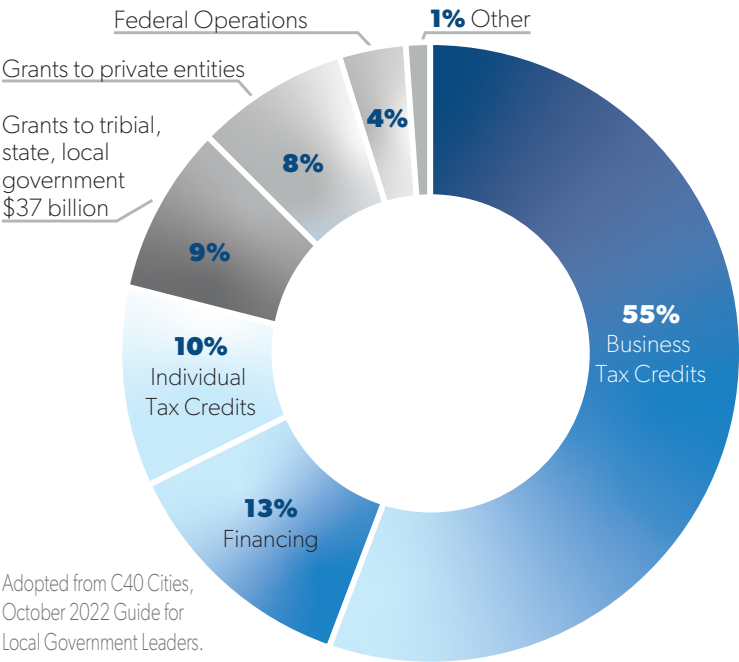
In addition, the financial cost and resulting benefits will be evaluated as each action is reviewed to support the delivery of the County’s climate targets.

There is a compelling business case for the County to make investments now

The Inflation Reduction Act of 2022 (IRA) marks a historic federal investment with \$369 billion for climate solutions and environmental justice through tax incentives and direct investment and complements the Infrastructure Investment and Jobs Act of 2021 (IIJA).

In broad terms, the greatest share of IRA funding goes to shifting from nonrenewable to low-carbon energy sources by expanding tax credits or providing financial incentives for renewable electricity production, battery storage deployment, and the electrification of vehicles, buildings, and industrial processes.

Historical funding opportunity for energy efficiency, clean energy, and clean vehicle investments for local governments



Over \$30 billion will be available as grants to tribal, state, and local governments. Incentives available to counties primarily take the form of a direct payment from the U.S. Department of the Treasury. For example, the Investment Tax Credit (ITC) and Alternative Fuel Vehicle Refueling Property Tax Credit can include a cash payment of up to 30% of project costs for solar, battery storage projects, and electric vehicle charging. The Production Tax Credit (PTC) can provide revenue over the life of the

project based on power generated. Other key provisions and bonus credits can significantly enhance the benefit up to 50% of construction and operational project costs.

Many case studies support the business case for taking climate action. For Harris County, not only are these investments sound but also demonstrates fiscal responsibility in ensuring that the County is prepared and climate resilient going forward.

COMPLEMENTARY IRA PROGRAM	
Electric Vehicles	\$2 billion Domestic manufacturing grants
Schools & Ports	\$3 billion Zero-emissions equipment at ports
Transit	\$3 billion Neighborhood Access & Equity Grants to improve transportation access
Electric Grid	\$9.7 billion Reliability and resilience improvements in rural areas
Homes	\$8.6 billion Energy efficiency upgrades
Environmental Remediation	\$27 billion National climate bank to finance green projects in underserved communities
Agricultural & Forestry	\$19.5 billion for climate-smart agricultural practices

Tackling the causes of climate change by reducing GHG emissions

IMPACT: The County government has a significant role to play in demonstrating leadership and aligning with other local governments and private corporations pushing for climate action, developing, and sharing best practices, and setting an example for others to follow.

Research¹⁷ has shown that, collectively, pivoting from an economy solely reliant on fossil fuels to an economy primarily powered by renewable energy would spur new sources of growth and job creation¹⁸.

COST: Many of the costs associated with investing in emissions reduction measures will pay for themselves in the short to medium term, especially with federal clean energy funding that will be available over the next 8-10 years¹⁹. Also, given the County’s strong debt capacity, ability to access relatively low interest financing, and potential operational budget savings it makes environmental and economic sense to address these issues now.

In the long term, acting now will prevent unsustainable pathways of operating that will cost much more in the long run.



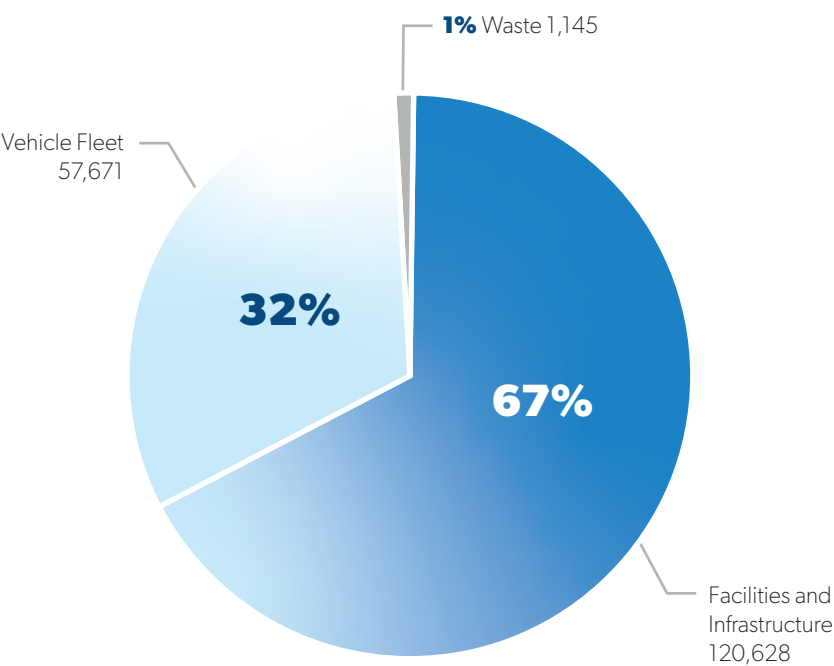
Preparing for the consequences of climate change through adaptation and sustainability

IMPACT: Ensuring county-wide services continue to function in the face of intensifying climate hazards will be central to a more climate resilient Harris County. From a preparedness standpoint, the County is in an ideal position to implement solutions that address flooding, drought, and extreme heat through its authority in delivering key services (e.g., flood control, public health, infrastructure development, etc.)

COST: Adaptation occurs at all scales and focuses on planning for what changes need to be made and when, based on the risk of impacts. Beyond capital spend, adapting to climate change is just as likely to be about changing systems, behaviors, or how the County operates. The cost of inaction would be far higher than the cost of action.

GHG Emissions from County Operations

In the summer of 2022, Harris County conducted its first GHG emissions inventory for internal operations. Using calendar year data from 2021, this served as a starting point for the County to baseline its emissions and identified the key focus areas for the climate action plan. Total emissions from County operations in CY2021 were 179,445 metric tonnes of CO2e (MTCO2e).



As shown above, Harris County’s carbon emissions are predominantly associated with the operations of the County’s facilities and infrastructure, making up 67% of the County’s GHG emissions. This includes emissions associated with electricity and natural gas usage at Harris County’s owned and leased assets, including courthouses, jail complex, office buildings, libraries, community centers, central plants, parks, streetlights, and traffic signals, as well as facilities managed by the Harris County Sports & Convention Corporation, such as NRG Park.

Vehicle fleet emissions from the County’s internal operations are associated with the use of gasoline and diesel fuel to run County-owned, County-leased, or Precinct-owned vehicles and equipment, including passenger fleet vehicles; light, medium, heavy-duty trucks; law enforcement vehicles; transit buses; commercial boat; construction equipment; and grounds keeping equipment.

While the waste sector often represents the smallest contribution to GHG emissions inventories in general, the County’s waste generation data is also lacking robust reporting and only reflects available waste data from 7 County facilities.

Planning Process

Timeline Overview

Along with the development of the County’s GHG emissions inventory, summer 2022 kicked off the background research for this 6-month planning effort. A review of climate action plans produced by local governments in Texas and other peer counties was conducted to synthesize common themes and strategies that could inform Harris County’s approach. Facilitated workshops in October 2022 brought together key departmental stakeholders to discuss and develop climate strategies. Departments reviewed and provided feedback on an outline of final strategies and actions in November, and a final draft was shared with Commissioners Court offices in early December for additional feedback.



Department Engagement

Engaging departments for the CAP was central to this intensely collaborative planning process as it built upon the wealth of knowledge of County employees and engendered a sense of ownership across multiple departments. A series of in-person and virtual workshops in October 2022 enabled staff and decision-makers from County departments, Precincts, and the County Judge’s Office to review, discuss, and provide feedback on what needed to be in the plan.

Planning Process Cont.

An in-person workshop on October 6, 2022 kicked off the planning process with staff from the County Judge’s Office, Precincts 1 and 2, and 15 departments in attendance. After a brief overview of the CAP objectives and timeline, attendees broke out into smaller working groups to engage in discussions around buildings and energy, fleet, and waste. Breakout session facilitators collected feedback on potential strategies, target year of completion, barriers to success, and other important considerations.

Two follow-up virtual workshops held on October 19th (buildings and energy) and 20th (fleet, commuting, waste, and green purchasing) brought new and previously engaged participants together to collaborate digitally. In these sessions, attendees discussed draft goals, 2030 GHG targets, supporting actions for climate strategies, and implementation timeline.

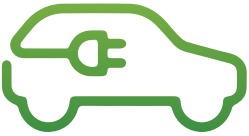
After synthesizing input from participants across each of the three workshops, an outline of goals, targets, strategies, and actions was sent out to all participating departments. Additional feedback was collected during a two-week open comment period in late October/early November. Meetings with department leaders with a significant role in plan implementation also occurred during this time. A final draft of the plan was released for final review on December 1, 2022 to Commissioners Court offices and key implementation partners.

This internal departmental plan serves as the first phase of a broader, inclusive county-wide climate planning effort. Phase II will entail an external-facing, community-driven climate plan, beginning in 2023. While all Harris County residents will be invited to participate, the county-wide plan will prioritize the needs of front-line communities who have been most impacted by climate hazards and disasters and who are disproportionately impacted by environmental inequities. The second phase of the CAP aims to uplift fence line community voices early on to have their input shape the planning process, activate communities to engage in local emissions reduction activities, and share the co-benefits of climate action broadly and equitably.

Alignment with Existing Initiatives

In addition to examining other climate action plans, an internal review of existing County sustainability initiatives provided a foundation for many of the strategies in the plan. This document builds upon existing sustainability initiatives, some dating back to 2009, that Harris County developed. One example was a strategy drafted by HCPH called Addressing Climate Change in Harris County. Though this plan was never formally adopted by Commissioners Court, it provided insight to potential strategies the County was considering at that time. More recently, HCPH conducted climate and health vulnerability assessments²⁰ that show which areas in Harris County are more challenged in addressing extreme heat and air quality issues.

Other precedents for climate mitigation efforts range from green building policies and on-site solar deployment at County facilities to electric and hybrid vehicle adoption. Some departments have incorporated single stream recycling in their office and recycle their end-of-life electronic waste. The figure below highlights some of these existing sustainability initiatives.



- 12 electric vehicles (PCS)
- 50+ hybrid vehicles (HCTRA, OCE, HCFCD, HCPH)
- Harris County METRO RideSponsor Program
- OCA Telework Policy

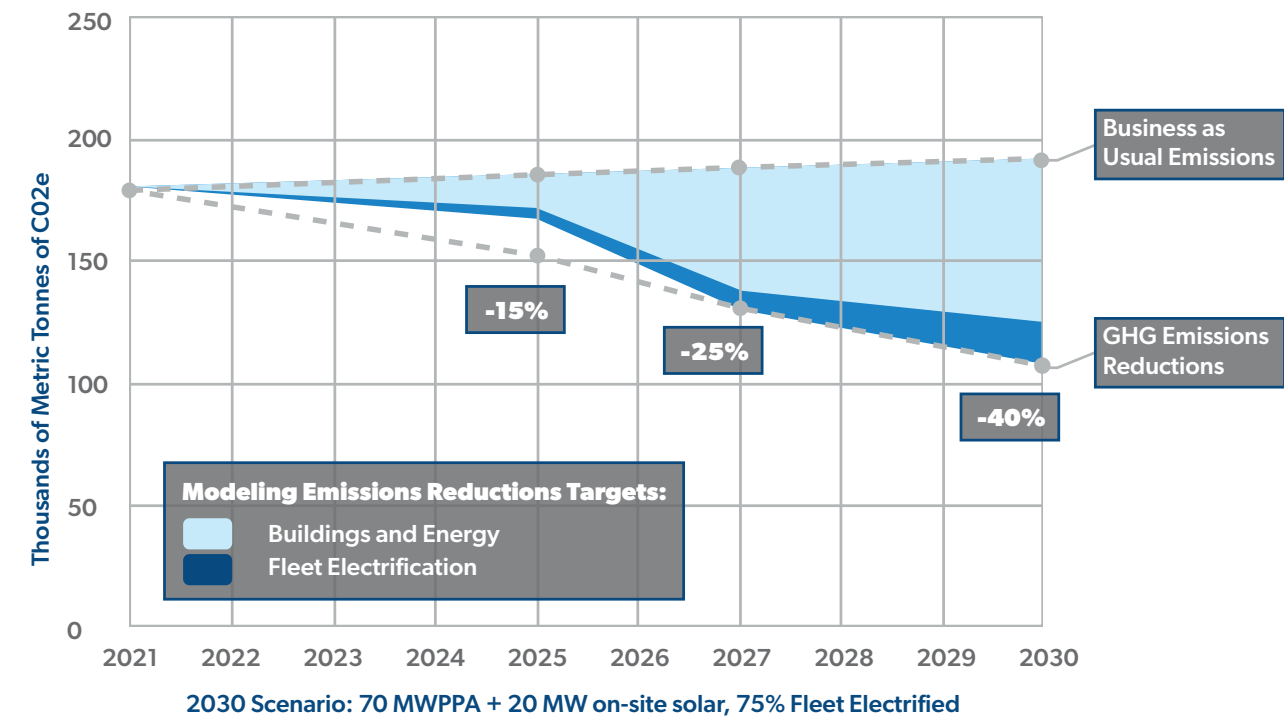


- Clean Energy Strategy
- EPA Green Power Partner 2022
- On-site solar at 3 County properties
- LEED Building Commitment 2009



- E-waste recycling
- Shredded paper recycling
- Single stream recycling (limited facilities)

These efforts provide historical insight into barriers and challenges to wider deployment as well as benefits and cost savings for implementing these environmental programs. Throughout the planning process, staff brainstormed how these existing programs could be leveraged to ensure that emissions reduction is achieved going forward.



Modeling GHG Emissions Reduction Pathways

Harris County worked with the Houston Advanced Research Center (HARC) to model the GHG emissions reduction potential of proposed goals and targets to achieve a 40% reduction of 2021 (base year) emissions by 2030. Interim targets were established to help meet the 2030 goals, reducing Harris County operations emissions by at least 15% by 2025 and at least 25% by 2027. The resulting scenario shows the potential cumulative impact of achieving certain targets outlined in the plan: 1) credits for off-site renewable energy expected to be generated by a 70 MW Power Purchase Agreement (PPA), 2) development of 20 MW on-site solar generation, and 3) electrification of 75% of the County Fleet.^a The analysis also incorporated growth factors for fuel and electricity use and assumed an annual 5% reduction

in electricity use per state mandate.^b This scenario is viewed as a starting point, reflecting a range of possibilities and uncertainties in future technologies and federal policies. Although they were not included in the modeling, additional reductions can be realized through measures addressing employee commuting, waste reduction, and green purchasing.

The modeling was done using Climate Action for Urban Sustainability (CURB), a tool developed by the World Bank, AECOM consulting, Bloomberg Philanthropies, and C40 Cities Climate Leadership Group. CURB is an interactive scenario planning tool that helps local governments assess the implications of policy and technology interventions by allowing them to evaluate their feasibility and impact.

^a Estimated by converting the county's fleet managed by US Department to EVs, including both emergency and non-emergency vehicles.

^b <https://comptroller.texas.gov/programs/seco/reporting/local-gov.php>

GOALS & TARGETS

2030 OVERVIEW AND IMPLEMENTATION



FOCUS AREA	GOALS	2030 TARGETS
BUILDINGS AND ENERGY	Goal 1: Reduce total energy consumption and maximize savings.	<ul style="list-style-type: none"> Reduce GHG emissions by 50% across buildings and facilities without the use of offsets by 2030. Reduce electricity usage by at least 5 percent per year.
	Goal 2: Increase use of renewable and resilient energy sources for County buildings and operations.	<ul style="list-style-type: none"> Structure a long term 50-100 MW Power Purchase Agreement. Develop 20 MW on-site solar + 10 MWh battery storage.
CLEAN FLEET AND COMMUTING	Goal 3: Shift County fleet to zero or low-emission vehicles.	<ul style="list-style-type: none"> Electrify 50-75% of light duty fleet. Increase percentage of hybrid and fuel-efficient vehicles.
	Goal 4: Reduce emissions from employee commuting.	<ul style="list-style-type: none"> Shift 10% of commuter trips from single occupancy vehicles. Increase usage of METRO Q-Card benefits by 25%.
SUSTAINABLE PROCUREMENT AND WASTE MANAGEMENT	Goal 5: Use sustainable and responsible products.	<ul style="list-style-type: none"> Increase proportion spent on green procurement.
	Goal 6: Reduce waste and promote reuse.	<ul style="list-style-type: none"> Reduce 50% of landfilled waste from County operations by 2030.

IMPLEMENTATION LEGEND

TARGET YEAR	Time frame for implementing each action: 2023-24, 2025-27, or 2028-30
LEAD DEPT	Harris County Department with primary responsibility for implementation.
SUPPORTING DEPT(S)	Harris County Department(s) that may participate or partner with the Lead Department on implementation. This list is not exhaustive.

GOALS & TARGETS

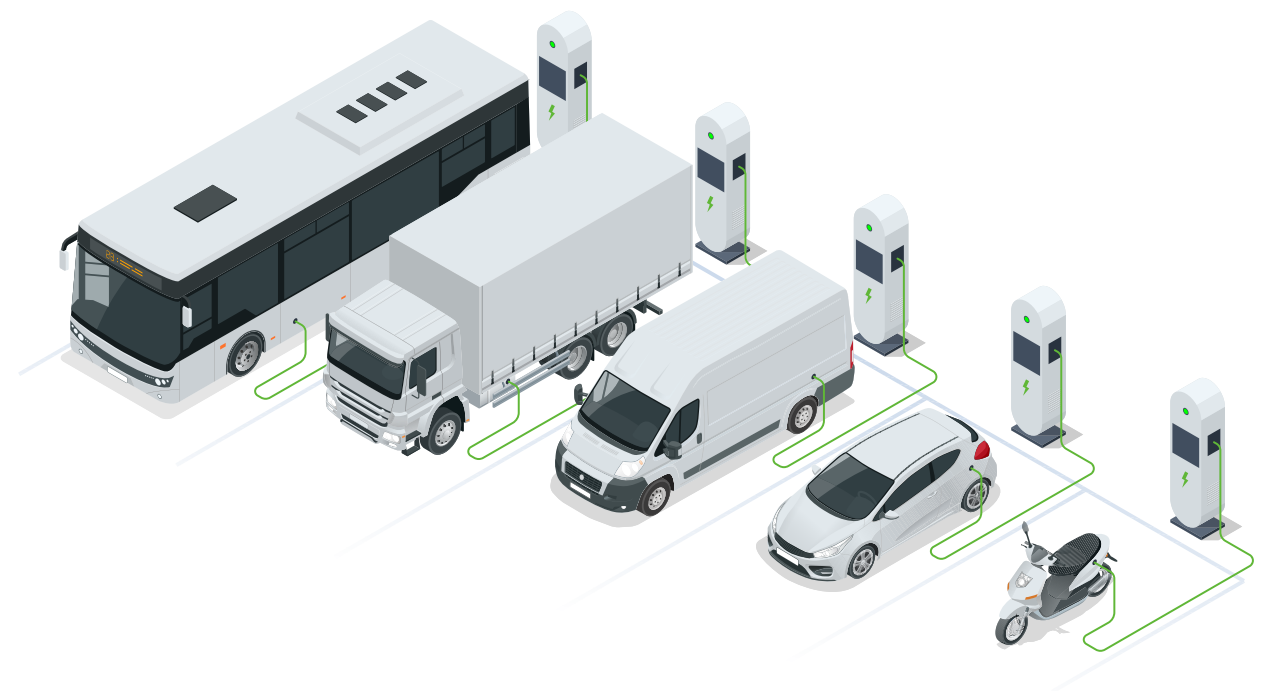
BUILDING AND ENERGY

BUILDINGS AND ENERGY			
GOALS, STRATEGIES, AND ACTIONS	TARGET YEAR	LEAD DEPT	SUPPORTING DEPT(S)
GOAL 1: REDUCE TOTAL ENERGY CONSUMPTION AND MAXIMIZE SAVINGS.			
STRATEGY 1.1: INVESTING IN ENERGY-EFFICIENT OPERATIONS AND PROTOCOLS.			
1.1.1: Benchmark energy consumption and provide regular reports	2023-24	OCA	US, OCE/BOS
1.1.2: Conduct energy audits beginning with high energy intensity buildings.	2023-24	OCE/BOS	OCA
1.1.3: Create a dedicated energy manager position and revolving energy efficiency fund.	2023-24	OCA	OCE/BOS, OMB
1.1.4: Develop an ongoing training program for building operators to incorporate energy management best practices.	2023-24	OCE/BOS	OCA
1.1.5: Develop an employee education and awareness campaign for energy conservation.	2023-24	OCA	OCE/BOS
1.1.6: Optimize building automation system (BAS) for all County buildings and pilot a demand response program.	2025-27	OCE/BOS	OCA
1.1.7: Create an inventory of non-electric powered building systems for each facility.	2023-24	OCE/BOS	OCA
STRATEGY 1.2: ENSURING NEW FACILITIES ARE RESOURCE EFFICIENT.			
1.2.1: Revise facility design guidelines and standards to incorporate solar-ready and EV-ready requirements, adhere to green building certification and Net Zero best practices.	2023-24	OCE/BOS	OCA
1.2.2: Incorporate more green space at new facilities.	2023-24	OCE/BOS	OCA
STRATEGY 1.3: INCREASING ENERGY EFFICIENCY AND LOAD FLEXIBILITY AT COUNTY FACILITIES.			
1.3.1: Implement ongoing commissioning to optimize building systems.	2023-24	OCE/BOS	OCA, OMB, Precincts
1.3.2: Modernize equipment with energy-efficient options.	2023-24	OCE/BOS	OCA, OMB, Precincts
1.3.3: Retrofit occupied County building envelopes.	2028-30	OCE/BOS	OCA, OMB, Precincts
1.3.4: Upgrade all interior and exterior lighting to LED and automate controls.	2025-27	OCE/BOS	OCA, OMB, Precincts
GOAL 2: INCREASE USE OF RENEWABLE AND RESILIENT ENERGY SOURCES FOR COUNTY BUILDINGS AND OPERATIONS.			
STRATEGY 2.1: DEVELOPING NEW RENEWABLE ENERGY GENERATION.			
2.1.1: Pilot solar and battery storage projects for 12 critical County facilities and increase the use of cost-effective clean energy sources (solar and geothermal).	2023-24	OCA	OCE/BOS, Precincts
2.1.2: Structure long-term Power Purchase Agreement (PPA) with a new solar and/or wind farm.	2025-27	OCA	OCE/BOS
2.1.3: Expand exterior solar-powered lighting.	2025-27	OCE/BOS	Precincts

GOALS & TARGETS

CLEAN FLEET AND COMMUTING

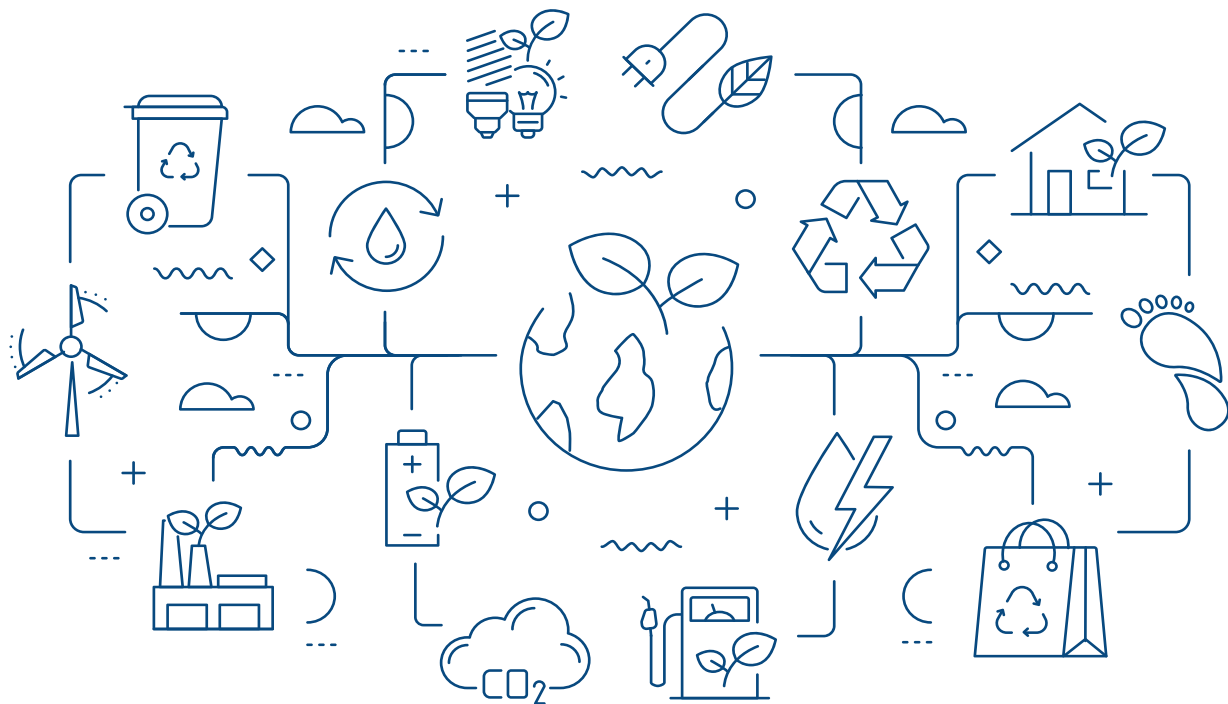
CLEAN FLEET AND COMMUTING			
GOALS, STRATEGIES, AND ACTIONS	TARGET YEAR	LEAD DEPT	SUPPORTING DEPT(S)
GOAL 3: SHIFT COUNTY FLEET TO ZERO- OR LOW-EMISSION VEHICLES.			
STRATEGY 3.1: IMPLEMENTING NEW TECHNOLOGIES TO RETROFIT FLEET AND USE LESS FUEL.			
3.1.1: Expand clean vehicle programs and pilot EV technologies.	2023-24	OCA	US, Precincts
3.1.2: Install EV charging infrastructure and pilot solar powered EV charging.	2023-24	OCA	US, OCE/BOS, Precincts
3.1.3: Consider right-sizing of vehicle fleet and assess life cycle costs and benefits.	2025-27	US	OCA, Precincts
3.1.4: Create anti-idling guidance for internal combustion engine (ICE) fleet vehicles.	2025-27	OCA	US, Precincts
3.1.5: Continue inter-agency collaboration and coordination to support EV adoption.	2023-24	OCA	US, Precincts
GOAL 4: REDUCE EMISSIONS FROM EMPLOYEE COMMUTING			
STRATEGY 4.1: ENCOURAGING EMPLOYEES TO REDUCE EMISSIONS FROM COMMUTING AND LOCAL WORK TRIPS.			
4.1.1: Conduct an employee commuter survey.	2023-24	OCA	HRRM, US
4.1.2: Expand employee commuting programs that incentivize and encourage alternative commuting modes.	2025-27	OCA	US, HRRM
4.1.3: Improve end-of-trip amenities at County facilities.	2025-27	OCE	OCA, Precincts



GOALS & TARGETS

SUSTAINABLE PROCUREMENT AND WASTE MANAGEMENT

SUSTAINABLE PROCUREMENT AND WASTE MANAGEMENT			
GOALS, STRATEGIES, AND ACTIONS	TARGET YEAR	LEAD DEPT	SUPPORTING DEPT(S)
GOAL 5: USE SUSTAINABLE AND RESPONSIBLE PRODUCTS.			
STRATEGY 5.1: DEVELOPING GUIDELINES AND CONSIDERATIONS FOR GREEN PROCUREMENT.			
5.1.1: Establish a formal clean vehicle purchasing and replacement process.	2023-24	OCA	PUR, US
5.1.2: Create a sustainable purchasing policy for County purchasing that promotes and tracks the use of sustainably sourced products and services and considers life cycle impacts.	2023-24	OCA	PUR
5.1.3: Incorporate sustainable materials and waste management requirements into County project RFPs, wherever practicable.	2023-24	PUR	OCA
GOAL 6: REDUCE WASTE AND PROMOTE REUSE.			
STRATEGY 6.1: IMPROVING REPORTING AND MANAGEMENT OF COUNTY WASTE STREAM.			
6.1.1: County-wide recycling program for all County buildings.	2023-24	OCE/BOS	OCA, Precincts
6.1.2: Develop processes and education campaigns to promote waste reduction and recycling in county facilities and operations.	2023-24	OCE/BOS	OCA, PUR, US, Precincts
6.1.3: Audit waste generation across different building typologies.	2023-24	OCE/BOS	OCA, Precincts
6.1.4: Develop a digital platform to promote reuse of County resources and supplies.	2023-24	PUR	OCA, US
6.1.5: Create a composting program pilot.	2025-27	OCE/BOS	Precincts



GOAL 1

REDUCE TOTAL ENERGY CONSUMPTION AND MAXIMIZE SAVINGS.

2030 TARGETS:

- Reduce GHG emissions by 50% across buildings and facilities without the use of offsets.
- Reduce electricity usage by at least 5% per year.

STRATEGY 1.1: INVESTING IN ENERGY-EFFICIENT OPERATIONS AND PROTOCOLS.
STRATEGY 1.2: ENSURING NEW FACILITIES ARE RESOURCE EFFICIENT.
STRATEGY 1.3: INCREASING ENERGY EFFICIENCY AND LOAD FLEXIBILITY AT COUNTY FACILITIES.

Reducing total energy consumption across the building portfolio is a priority for Harris County to maximize savings and reduce GHG emissions. Understanding and evaluating energy use is key to developing smart strategies for optimizing efficiency and improving facility performance. Leveraging proven best practices from counties across the country, facilities will be benchmarked to help set realistic energy consumption goals and identify opportunities for improved operations and future investments. A revolving energy efficiency fund will be developed to finance some of the identified projects and programs. The engagement of facility operations staff and building occupants will improve building performance and comfort.



PRECINCT 4 SERVICE CENTER PHASE I

Using sustainable energy systems, including geothermal wells, ground-source heat pumps, and solar panels to provide the facility with net-zero consumption, the Service Center was awarded LEED Gold certification, the second highest rank possible.

^a Estimated by converting the county's fleet managed by US Department to EVs, including both emergency and non-emergency
• Photo by Talley Landscape

GOAL 1

REDUCE TOTAL ENERGY CONSUMPTION AND MAXIMIZE SAVINGS.

1.1.1: Benchmark energy consumption and provide regular reports.

Often building owners and managers do not have easily accessible information on their buildings' energy use, making energy management challenging. Benchmarking is the practice of tracking the energy use of a building over time and comparing changes to a baseline year and to other similar building types. Benchmarking the entire portfolio of County buildings in EPA's ENERGY STAR Portfolio Manager (ESPM) will allow Harris County to identify opportunities for improved building efficiency, which can result in reduced utility bills. The process will include working with the County's retail electric provider (REP) and other utilities to automatically input electricity, gas, and water use data into ESPM. This allows for a regular "measure, monitor, and report" cycle where building performance is transparent and investment priorities are set based upon measurable data.

1.1.2 Conduct energy audits beginning with high energy intensity buildings.

Energy audits, or energy assessments, are a powerful way to improve the energy efficiency and comfort of a facility. The results of the detailed energy usage and equipment analysis provide recommendations for improvement measures and operational changes in addition to financial analysis for each identified measure. The County will work with a qualified engineer through this process to set specific priorities and develop plans including operational changes or system upgrades that will create significant savings over time.

1.1.3: Create a dedicated energy manager position and revolving energy fund.

A dedicated energy manager position will be created to monitor energy use, assess conservation and energy efficiency measures, and implement programs outlined in the County's Clean Energy Strategy. This position will also establish and manage a revolving energy efficiency fund to leverage savings from efficiency projects to fund additional internal County energy upgrades. This "evergreen" source of capital will be recycled repeatedly to fund future efficiency and clean energy projects. The value adds of an energy manager combined with a revolving fund will provide the County with the in-house technical capability to self-manage retrofits and improve project economics by lowering operations, management, and installation costs and eliminating debt service.

1.1.4: Develop an ongoing training program for building operators to incorporate energy management best practices.

The successful implementation of an energy efficiency program hinges on the technical expertise and skills of facility managers and building operators. A well-trained staff is essential to the high-performance operations of County facilities, many of which have increasingly sophisticated controls. The County will work with industry-leaders that are committed to providing the education, training, industry best practices, and resources for building operators to sustainably manage, operate, and maintain facility assets to the highest performance.

REDUCE TOTAL ENERGY CONSUMPTION AND MAXIMIZE SAVINGS.

1.1.5: Develop an employee education and awareness campaign for energy conservation.

The development of a comprehensive employee education and awareness campaign is key to the success of the County's energy management programs. Engaging staff through an energy conservation campaign by providing tips, resources, and best practices for how they can reduce energy waste, decrease operating costs, and increase competitiveness will help build an energy-saving culture in the County and boost morale. The more employees know, the more motivated they will be to take effective actions at work and at home. Developing this campaign can offer benefits that will assist with goals including developing training programs for building operators to incorporate energy management best practices.

1.1.6: Optimize building automation system (BAS) for all County buildings and pilot a demand response program.

Building automation systems (BAS) integrate data into an energy management system and control various building systems at a centralized location or offsite via an app. Automatically controlling systems, such as HVAC and lighting, can help reduce energy consumption and provide data analytics. Optimization of the BAS will allow the County to pilot participation in a demand response program. Participation will enable the County to play a role in the electric grid operation supply by shifting or reducing peak period electricity usage. This strategy can provide financial incentives including time-based rates and operational savings that can be applied to the revolving energy efficiency fund.



BURNETT BAYLAND GYM

The LEED Platinum Burnett Bayland Gym saves 44% more energy and reduces 57% of its water consumption. In addition, the building treats 100% of its storm water on-site, achieving every water point available in the LEED system.

•Photo by: Kirksey Architecture

GOAL 1

REDUCE TOTAL ENERGY CONSUMPTION AND MAXIMIZE SAVINGS.

1.1.7: Create an inventory of non-electric powered building systems for each facility.

An inventory of non-electric powered systems (space heating, water heating, back-up generator, etc.) across the County building portfolio is important to understanding total energy use. This inventory will help proactively identify and evaluate building systems where the implementation of more modern electric technologies and building automation systems can provide emissions and efficiency benefits. This is an action that can be accomplished internally and will require little to no funding.

1.2.1: Revise facility design guidelines and standards to incorporate solar-ready and EV-ready requirements, adhere to green building certification and Net Zero best practices.

Harris County design guidelines were updated in 2022 to consider reductions in carbon emissions. Further revisions to the guidelines to optimize facility energy use and generation through provisions for solar-ready and electric vehicle infrastructure, green building certifications, and Net Zero best practices will provide a road map to accomplish actions that will help reduce energy consumption, increase operational savings, and enable resiliency and emissions reduction projects such as piloting solar and battery storage projects for critical County facilities.



INSTITUTE OF FORENSIC SCIENCES

The Institute of Forensic Sciences Green features design elements such as natural light, windows overlooking green spaces, ventilation and cooling systems, indoor air quality, and minimal outdoor irrigation. In addition, by applying Low Impact Development (LID) practices on the exterior, the facility conserves water and saves energy.

Photo by:
•Institute Of Forensic Sciences - LJA Engineering

GOAL 1

REDUCE TOTAL ENERGY CONSUMPTION AND MAXIMIZE SAVINGS.

1.2.2: More green space at new facilities.

Enhancing and incorporating green space in new site design can offer multiple co-benefits including achieving LEED credits, reduced energy consumption, habitat protection or restoration, and passive recreation. Integral to a well-rounded site design, green spaces can provide shade, improve air quality, and provide a myriad of mental and social benefits, including improved concentration and public health. Complementing green space and cool pavement applications can reduce the urban heat island effect and carbon emissions. Developing these green spaces can be as simple as low-maintenance, drought-tolerant native vegetation used for landscaping or a more complex, biodiverse green roof that improves the thermal performance of a roof and helps manage stormwater runoff.

1.3.1: Implement ongoing commissioning to optimize building systems.

Buildings need periodic tune-ups to run smoothly. Continuously tracking, measuring, and analyzing the operations of a building over time, in real time, allows for facilities to be operated at peak efficiency lowering energy use and operational costs. Developing and implementing a commissioning plan will enable the identification and resolution of operational issues such as heating and cooling loads, that will improve occupant comfort and manage savings over the life of the equipment across County facilities.

JOINT PROCESSING CENTER

The design of the Joint Processing Center allows Harris County Sheriff's Office to increase supervision of detainees and embraces the use of modern technology to dramatically improve operations. The new Joint County/City Processing Center consolidates all Houston Police Department and Harris County Sheriff's Office intake processing operations into one modern and efficient facility.



Photo by:
•Joint Processing Center - PGAL

GOAL 1

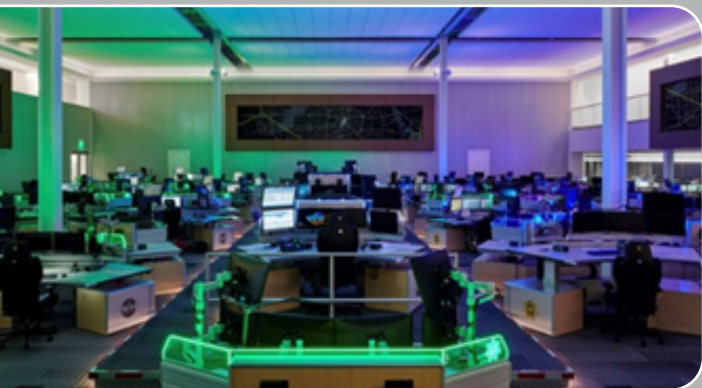
REDUCE TOTAL ENERGY CONSUMPTION AND MAXIMIZE SAVINGS.

1.3.2: Modernize equipment with energy-efficient options.

Energy-efficient facilities improve tenant comfort and health, reduce operational maintenance and costs, and decrease emissions. Retrofitting energy-efficient measures into existing facilities can be accomplished through a whole-building or systems approach, and upgrades can include HVAC, lighting, ENERGY STAR appliances, and more. New technology specifications can range from a specific percentage efficiency improvement for equipment replacement at end-of-life to conducting an analysis to determine the potential savings over the life of the equipment, as systems reach the end-of-life. Implementation of utility conservation measures that take advantage of new technologies also allows for ease of interaction with building automation systems and improves overall efficiency.

1.3.3: Retrofit occupied County building envelopes.

The partition between the inside of a building and the outside is the building envelope. One leading cause for high energy use can be found in gaps in the foundation, exterior walls, doors, windows, and roofing, which allow for thermal transfer to or from the exterior. The building envelope is one of the systems that will be evaluated during the energy audit, which will identify areas of energy loss and opportunities for improvement. The results of the audit will show if the County buildings are losing any heating/cooling through the building envelope. The revolving energy efficiency fund can be used for this action and after completion will offer energy savings that can be put back into the energy fund to finance additional projects.



911 CALL CENTER

The 911 Call Center's building and building systems will operate before, during, and after a hurricane with winds up to 155 mph. In addition, a 400 ft communications tower and an innovative geothermal HVAC system are also featured, along with an on-site Low Impact Development (LID) system for storm water retention.

Photo by:
•911 Call Center - Kirksey Architecture

GOAL 1

REDUCE TOTAL ENERGY CONSUMPTION AND MAXIMIZE SAVINGS.

1.3.4: Upgrade all interior and exterior lighting to LED and automate controls.

Developing a lighting standard and schedule for interior and exterior LED light retrofits will not only result in decreased energy use but also realize savings in labor and materials. LED lights use around 75% less energy, run up to 25 times longer, and generate less heat than traditional lights. Adding networked controls (preset lighting, dimmers, occupancy sensors, etc.) linked to the BAS can also boost energy savings. This package of lighting and controls can provide an immediate reduction in utility bills and a quick return on investment.



GOAL 2

INCREASE USE OF RENEWABLE AND RESILIENT ENERGY SOURCES FOR COUNTY BUILDINGS AND OPERATIONS.

2030 TARGETS:

- Structure a long term 50-100 MW Power Purchase Agreement.
- Develop 20 MW on-site solar + 10 MWh battery storage.

STRATEGY 2.1: DEVELOPING NEW RENEWABLE ENERGY GENERATION.

The County seeks to make a significant impact on renewable energy development, consumption, and availability at every level, including developing additional large energy infrastructure as it continues to be a 100% user of renewable energy. A new retail electricity contract, set to begin in 2023, will include sustainably sourced energy at a competitive market rate and will bridge the County to a longer-term contract for a new solar and/or wind farm. In parallel, the County will also assess on-site distributed energy resources on public facilities. The goal is to develop up to 20 MW of on-site solar and 10 MWh of battery storage by 2025, and eventually reducing

the County's use of grid power. Clean energy funding from the IRA and IIJA help make these types of projects even more financially viable for local governments.

An investment in renewable on-site power generation at the County is an investment in resiliency for the public good of the community. Utilizing the County's low cost of capital for on-site energy projects will help transition energy from an operating expense to a capital investment in public clean energy infrastructure. This approach will, free up dollars in the County's operating budget to go towards other services.



BURNETT BAYLAND GYM

Across Harris County, solar panels power key operational buildings and community facilities. In addition to being a significant contribution toward LEED certification, Harris County's implementation of solar technology will decrease carbon emissions and reduce reliance on traditional energy sources.

Photo by: Kirksey Architecture

GOAL 2

INCREASE USE OF RENEWABLE AND RESILIENT ENERGY SOURCES FOR COUNTY BUILDINGS AND OPERATIONS.

2.1.1: Pilot solar and battery storage projects for critical County facilities and increase the use of cost-effective clean energy sources (solar and geothermal).

Deploying renewable power generation and storage technologies at various Harris County facilities can provide a myriad of benefits including less reliance on the electricity grid, decreased environmental impacts, and improved reliability and resilience. Energy storage can offset the costs by storing low-cost energy and be used when electricity prices are high. As viable projects are implemented, the focus will shift to effectively operating the projects collectively as a network to deliver load flexibility. Piloting solar and battery storage at critical facilities can provide backup to County infrastructure, and some may serve the public directly, ensuring access to services residents need the most. Expanding clean energy deployment may also include feasibility studies of technologies, such as geothermal, energy-efficient gas generators and vehicle-to-building site integration.

2.2.2: Structure long-term Power Purchase Agreement (PPA) with a new solar and/or wind farm.

Solar and Wind Power Purchase Agreements (PPAs) are a financial arrangement in which a utility-scale solar system or wind farm is owned, operated, and maintained by a third-party developer, and the County would purchase the electric output for a predetermined period. This would enable the County to receive stable and low-cost clean energy and could take the place of traditional grid power.

2.2.3: Expand exterior solar-powered lighting.

Solar-powered exterior lighting on roads, parking lots, parks, and buildings can help reduce energy and emissions and improve safety and resilience. By providing power to critical infrastructure and hard-to-reach areas, uninterrupted solar power can improve quality of life while saving \$0.25 - \$0.40 per day per light in comparison to traditional on-grid connected lights.

PARK'S SOLAR LIGHT PROJECT

In July 2022, Partnership Park's Solar Light Project launched plans to install 48 solar power light fixtures. Soon, Harris County Precinct 2 residents will enjoy a safer park and enjoy it well into the evening. The City of Pasadena, Harris County Precinct 2, Precinct2gether, and the Harris County Flood Control District made the project possible.



Photo by: Precinct 2

GOAL 3

SHIFT COUNTY FLEET TO ZERO- OR LOW-EMISSION VEHICLES.

2030 TARGETS:

- Electrify 50-75% of light duty fleet.
- Increase percentage of hybrid and fuel-efficient vehicles.

STRATEGY 3.1: IMPLEMENTING NEW TECHNOLOGIES TO RETROFIT FLEET AND USE LESS FUEL.

Improving the overall efficiency of County vehicles is an essential first step to creating a clean fleet. According to EVolve Houston and eIQ Mobility's 2022 report Electrifying Harris County's Fleet, transitioning 30% of the County's light-duty fleet to EVs would be a cost-effective measure that would reduce total cost of ownership by nearly \$12 million. In addition to reducing operating costs, utilizing clean vehicles (electric, hybrid, or other alternative fuel technology) will help reduce carbon emissions and air pollution.

3.1.1: Expand clean vehicle programs and pilot EV technologies.

Piloting EV and emerging clean vehicle technologies across Harris County departments allows the County to explore diverse fuel sources for different use cases and identify operational efficiencies that could save time and money. Improvements to EV technology, including advanced electric drive systems and

more efficient batteries with longer, extended battery life, make EVs a viable, reliable, and cost-effective option when internal combustion engine (ICE) vehicles require replacement. The development of a formal clean vehicle purchasing and replacement process (see 5.1.1) will assist with strategic procurement of low-emission vehicles.

CLEAN FLEET

In 2020, Harris County Pollution Control purchased 12 all-electric Chevrolet Bolts for pollution control investigators with support from Harris County Universal Services. The County received a grant to offset the cost of each EV by \$2,500 and received some reimbursement funding from the Texas Emissions Reduction Plan for the charging stations. In addition to these 12 EVs, the Harris County Universal Services Department manages 54 hybrid vehicles used across County Departments.



Photo by: Andrew Brady

GOAL 3

SHIFT COUNTY FLEET TO ZERO-OR LOW-EMISSION VEHICLES.

3.1.2: Install EV charging infrastructure and pilot solar-powered EV charging.

Suitable charging infrastructure and levels of charging (e.g., level 2 or DC fast charge) are necessary to meet the duty cycles and daily range requirements of different fleet needs. Connected EV charging could help optimize off-peak time-of-use charging to avoid charging fleet vehicles at the most expensive part of the day while bi-directional charging could offer opportunities to explore vehicle-to-building capabilities that could support critical County functions if the grid goes down. Complementing grid-tied charging with solar-powered EV charging also provides the County with a resilient option to maintain operational use of EVs during extreme weather events.

3.1.3: Consider right-sizing of vehicle fleet and assess life-cycle costs and benefits.

Harris County has previously conducted reports on fleet utilization and assignment. Right-sizing and assessing the current fleet will enable managers to build and maintain their department's ideal vehicle inventory based on usage and expected daily operations. Potential outcomes are optimization of vehicle use, fuel conservation, emissions reduction, and cost savings on energy and maintenance.

3.1.4: Create anti-idling guidance for internal combustion engine (ICE) fleet vehicles.

Reducing vehicle fleet idling will help to protect the most vulnerable (children, aging population, immune-compromised) in Harris County from the harmful effects of vehicle exhaust. Reducing idling can also help to reduce fuel costs—especially given the fluctuation in fuel prices. Implementation could involve approaches to encourage behavior changes and utilize idle reduction technology while accommodating safety considerations and other functional requirements of the fleet operator. Understanding unique departmental needs and the realities of field operations will be necessary to shape this guidance.

3.1.5: Continue inter-agency collaboration and coordination to support EV adoption.

Harris County has since formed an inter-agency EV working group composed of 13 departments that meets monthly to learn about best practices from subject matter experts in the EV and EV charging landscape and to share lessons learned across internal departments. Continuing this inter-agency collaboration and coordination could help to streamline grant applications, share updates on new clean vehicle use cases, and identify efficiencies in EV charging deployment.

GOAL 4

REDUCE EMISSIONS FROM EMPLOYEE COMMUTING.

2030 TARGETS:

- Shift 10% of commuter trips from single occupancy vehicles.
- Increase usage of Metro Q-Card benefits by 25%.

STRATEGY 4.1: ENCOURAGING EMPLOYEES TO REDUCE EMISSIONS FROM COMMUTING AND LOCAL WORK TRIPS.

The likely predominant mode choice for commuting County employees is a single-occupancy vehicle. While there have been increased efforts to expand commuting alternatives for County employees, including safer bike infrastructure in proximity to County facilities and transit subsidies for METRO's services, there remain key data points that are still needed to build a robust clean commuting program that is not only cost-effective for County employees but also is safer and more convenient.

4.1.1: Conduct an employee commuter survey.

A survey is needed to establish a baseline for tracking emissions associated with employee commuting. Types of data captured through this survey include commute mode and frequency and distance traveled. This allows the County to understand commuting habits and

identify incentives or supporting programs to encourage sustainable forms of commuting. Commuter surveys should be administered once a year to track trends and behavior change.



Photo by: Lisa Lin

LOCATION LOCATION LOCATION

County offices in the downtown core are adjacent or within walking distance to many of METRO's frequent light rail, local bus, or Park and Ride services. Combining this with the County's METRO RideSponsor program, employees can leverage a \$60/month transit subsidy and conveniently use METRO services instead of driving their vehicle to work.

GOAL 4

REDUCE EMISSIONS FROM EMPLOYEE COMMUTING.

4.1.2: Expand employee commuting programs that incentivize and encourage alternative commuting modes.

The County has already implemented some programs to encourage alternative commuting, including the OCA Telework Policy and the METRO RideSponsor program. The employee commuter program could be broadened to support carpooling, van pooling, utilizing micro-mobility options, and offering guaranteed ride home benefits. For employees who do not drive to work but still need an option to travel between offices, an electric bike or EV fleet sharing program could also be piloted for County staff to use for business purposes. Promoting active transportation options, such as "Bike to Work" Day, can be tied to employee health and wellness campaigns.



4.1.3: Improve end-of-trip amenities at County facilities.

Traditional end-of-trip amenities refer to providing safe and secure bike parking and shower facilities for bike commuters at their place of work. In addition to these amenities, this could also encompass workplace charging for employees who drive an EV.



Photo by: Precinct 1

IT'S LIKE RIDING A BIKE

Harris County Precinct 1 has constructed many high comfort bike ways for recreational and commuting purposes in Central Houston. These protected bike lanes have afforded opportunities for County employees to safely bike to their downtown office buildings.

GOAL 5

SUSTAINABLE PROCUREMENT AND WASTE MANAGEMENT

2030 TARGETS:

- Increase proportion spent on green procurement.

STRATEGY 5.1: DEVELOPING GUIDELINES AND CONSIDERATIONS FOR GREEN PROCUREMENT.

There is an opportunity to increase sustainable purchasing by reforming the County guidelines on procurement. Green purchasing allows for an increased uptake of locally sourced materials, responsibly sourced products, and goods that can be repurposed or reused. Prioritizing green procurement can help achieve upstream emissions reductions and encourage considerations for embodied carbon. It also helps create a market demand for sustainable products, which can drive increased innovation and competition for environmentally preferred goods.



GENE GREEN BELTWAY 8 PARK

For the Gene Green Beltway 8 Park, over 90 percent of the construction waste generated was recycled and diverted from landfills, and the project used recycled content for columns, benches, ramps, rolling walls, and amphitheater seating. It is a highly utilized, environmentally resilient community park and trail system.

Photo by: Asakura Robinson - Geoff Lyons

GOAL 5

DEVELOPING GUIDELINES AND CONSIDERATIONS FOR GREEN PROCUREMENT.

5.1.1: Establish a formal clean vehicle purchasing and replacement process.

The County currently has 12 electric vehicles in its fleet. Establishing a formal clean vehicle purchasing and replacement process creates an opportunity to replace aging ICE vehicles with EVs. Such a process prioritizes the goals of the CAP and accelerates the transition of the fleet to clean vehicles (see 3.1.1). This also increases the proportional spending on green procurement.

5.1.2: Create a sustainable purchasing policy for County purchasing that promotes and tracks the use of sustainably sourced products and services and considers life cycle impacts.

An increased emphasis on sustainable sourcing and life cycle considerations in the County purchasing policy can curb extraneous waste and decrease the County's emissions. Life cycle analysis assesses environmental impacts associated with the production, distribution, use, and final disposal of a given product, process, or service. Resources could be preserved for longer-term use by avoiding the discarding of resources before they are in poor condition. In product sourcing, the County could seek to direct more funds towards environmentally friendly materials and processing. This must be considered alongside budgetary restrictions and the realistic duration of use of various resources being procured.

5.1.3: Incorporate sustainable materials and waste management requirements into County project RFPs, wherever practicable.

The incorporation of sustainably sourced materials would reduce the County's indirect emissions as well as increase proportional spend on green procurement. Tracking and reporting measures in County waste vendor agreements would improve the County's understanding of the volume of materials being disposed of or diverted from the landfill. Creating proper guidelines for waste disposal across departments would streamline materials management processes and enhance the reporting of metrics.



GOAL 6

IMPROVING REPORTING AND MANAGEMENT OF COUNTY WASTE STREAM.

2030 TARGETS:

- Reduce 50% of landfilled waste from County operations.

STRATEGY 6.1: IMPROVING REPORTING AND MANAGEMENT OF COUNTY WASTE STREAM.

Access to waste and recycling generation data across County facilities is extremely limited. This gap in knowledge provides an opportunity to structure data management and operations in a way that aligns with the priorities detailed in the CAP. By first understanding the County's waste generation, measures can be implemented to reduce overall waste and redirect resources for reuse and repurposing. This will reduce spend on new acquisitions as well as overall emissions associated with landfilling, and it will make the County more efficient in its daily operations.

6.1.1: County-wide recycling program for all County buildings.

To reduce waste sent to the landfill, the County is looking to expand recycling services to all County buildings. Currently, recycling programs are implemented by individual departments, and employees do not have universal access to recycling different materials.

6.1.2: Develop processes and education campaigns to promote waste reduction and recycling in County facilities and operations.

Educating employees and establishing guidelines and reminders that encourage waste reduction are critical to reducing waste across County facilities. Sustainable individual decisions can be incentivized through gamification within offices and rewards for meeting certain metrics. Available recycling programs can be advertised more clearly to employees, and educational materials and posters can also be displayed. Lunch-and-learns may also be utilized to share this information. This would encourage employees to recycle some of the more diverse waste materials, such as electronic waste (e-waste), which may not always be recycled.



RECYCLE FOR THE FUTURE

Harris County Public Health, with Director Robinson's support, launched a recycling program in 2021. The single-stream recycling receptacles are in HCPH break rooms and certain common areas. Plastic, aluminum, paper, and cardboard are collected, and the janitorial staff empties the bins into larger recycling dumpsters outside the building.

Photo by: HCPH

GOAL 6

IMPROVING REPORTING AND MANAGEMENT OF COUNTY WASTE STREAM.

The County can also aim to scale up its efforts to go paperless, which involves reducing paper use and prioritizing digital materials sharing. Smart tablets can be deployed in the field, and prioritizing digital communication will help streamline document sharing and improve operational efficiency (e.g. through the reduced need for scanning, sorting, and storing of paper documents.)

6.1.3: Audit waste generation across different building typologies.

Because the County currently lacks sufficient data on its waste generation, it is important to begin waste stream analysis with an audit of waste generation. This would involve a thorough analysis of the costs and processes of the County's current waste processing vendors, and it would provide a detailed composition of waste stream materials at multiple levels (i.e., building type, department).

Understanding the County's current baseline will allow it to be improved upon, as well as establish areas or departments that have the greatest room for improvement. Without a standardized County waste procedure, it is probable that waste varies significantly across different types of County buildings (i.e., offices, warehouses, prisons). Auditing this waste will allow the tracking and reporting of waste metrics, such as total tons of waste generated annually and percent of waste diverted annually, as well as inform future waste reduction initiatives undertaken by the County.

6.1.4: Develop digital platform for reuse of County resources and supplies.

To encourage the reuse of office materials within the County, such as desks and monitors, a digital platform can be established and used to manage resource sharing. Currently, when County facilities are upgraded, many viable items are either landfilled or put in surplus storage; however, there is not an efficient inventory method for this surplus that allows for County staff to effectively search for what they need. By creating a digital platform for this information, departments can identify whether the items they need are available in County surplus or if a new one must be purchased. This helps reduce landfilled waste by the County and reduces spend on new products.

6.1.5: Create a composting program pilot.

Composting is a way to divert large amounts of organic material and food waste from landfills. Success with county- and city-wide composting programs have been observed across the U.S. in places like Arlington County, Virginia, and Austin, Texas. A composting pilot program would allow the County to determine how to develop a larger initiative. It could begin with designated composting bins in office common spaces, and signs may be provided above these bins with guidelines on what can be composted. There may also be a use for the compost by the County in expanding green spaces for new and existing County buildings.

PATH FORWARD

Now more than ever, accelerated decarbonization to 2030 is feasible as industries retool for clean technology development, and historical federal funding spurs innovation and the widespread adoption of climate action. Acting now benefits the local economy, ensures that County operations are efficient and managed responsibly, and prepares the County for future climate impacts. While the predominant emissions reductions within this CAP will be realized through building improvements, clean energy deployment, and low and zero-emissions vehicles, future iterations of this plan will integrate a more robust carbon accounting of waste diversion, employee commuting, and green procurement.

Implementation: Sustainability Coordinating Council and Annual Review

Development of this plan required an interdisciplinary, collaborative, and coordinated effort. Implementation the plan will require the same. A Sustainability Coordinating Council with representatives from across County departments and agencies will be established to track and guide the implementation of CAP strategies, actions, and results in January 2023. The Council will also provide feedback on successes and barriers to implementation and help recalibrate goals, targets, and timelines as needed with a focus on whether actions can be accelerated or adjusted to achieve greater emissions reductions.

Phase II: Climate Justice Action Plan

As implementation of the internal CAP commences in 2023, the County will begin moving toward a broad-based, community-driven planning effort to engage frontline community residents in an external-facing emissions reduction plan that centers climate justice and equity. This planning effort will bring together community partners, such as CEER and the Jacob and Terese Hershey Foundation, with the County Judge's Office and all Commissioner Precincts as well as County departments such as Harris County Public Health and Harris County Pollution Control Services, to co-create a plan that prioritizes frontline residents who have been most impacted by climate hazards and disasters, connecting them to resources and driving systems change that result in more resilient communities. The combined efforts of the internal and external climate plans will transition Harris County to a more climate prepared, environmentally just, and economically vibrant future.

GHG EMISSIONS INVENTORY METHODOLOGY

This GHG Emissions inventory closely follows the Local Government Operations Protocol v1.1. The organizational boundary will be based on the County’s financial control, rather than operational control, for two reasons. First, included in the inventory is energy usage for NRG Park, whose utility costs are paid by Harris County even though the County has no direct operational control over the facility. Second, operationally, no one individual or department has full authority to implement operating policies across the County and Precincts. Therefore, following what the County has financial control over will inform what will be included in the inventory.

As Illustration 1 indicates below, this inventory includes direct emissions (Scope 1) associated with natural gas utilization in facilities and fleet fuel consumption; indirect emissions related to purchased electricity (Scope 2) as well as waste generation and fuel consumption by Harris County Transit’s fleet, which is not owned by the County (Scope 3).

Note: While the County has purchased 251,042,000 kWh of renewable energy certificates (RECs) annually from 2020-2022, that green power purchase has not been deducted from the County’s Scope 2 emissions. If the County decided to deduct this, it would equal to a reduction of 93,602 MTCO₂e.

For future updates, the goal will be to have more data related to waste, employee commuting, and purchased goods to align with the best practice of expanding Scope 3 emissions in local government emissions profiles. Also, with the consolidation of fleet fuel data under Universal Services, a single dataset for all gasoline and diesel consumption will streamline the analysis for fleet fuels. Finally, data related to natural gas utilization will need to be more accurate as reports from the current database proved to be unreliable, and an estimation of natural gas consumption was used instead.

REFERENCES

- ¹ <https://www.unep.org/news-and-stories/press-release/inadequate-progress-climate-action-makes-rapid-transformation>
- ² Post, M. (n.d.). Popular Annual Financial Report. Harris County Auditor’s Office. <https://auditor.harriscountytexas.gov/PAFR/PAFR%202021%20FINAL.pdf>
- ³ Harris County Office of Management and Budget. (2022). Harris County Road Log Inventory. <http://svpbmdweb01/RoadLog/App/RoadLogInventory>
- ⁴ Harris County. (n.d.). ATLAS - Parks: HC. Retrieved September 22, 2022, from atlas.hctx.net
- ⁵ Harris County Flood Control District. (n.d.). Harris County Has Never Seen a Storm Like Harvey. Retrieved September 21, 2022, from <https://www.hcfdc.org/About/Harris-Countys-Flooding-History/Hurricane-Harvey>
- ⁶ Analyst’s Office email correspondence with Austin Appleton, P.E., ENV SP, Manager, Disaster Recovery, Office of the County Engineer, September 28, 2022.
- ⁷ Analyst’s Office email correspondence with Mark Sloan, Coordinator, Harris County Office of Homeland Security and Emergency Management (HSCOHSEM), September 21, 2022.
- ⁸ Analyst’s Office email correspondence with Shain Carrizal, Sr. Director of Human Resources & Risk Management (HRRM), September 26, 2022.
- ⁹ Kirk P. Watson, Renée Cross, Mark P. Jones, Gail Buttorff, Pablo Pinto, Savannah L. Sipole, & Agustín Vallejo. (2021). (rep.). The Effects of the Winter Storm of 2021 in Harris County. Retrieved September 29, 2022, from <chrome-extension://efaid-nbmnnibpcajpcglclefindmkaj/https://uh.edu/hobby/winter2021/harriswinter.pdf>
- ¹⁰ Erickson, A. P. (2022, September 1). Texas’ heat index could reach 125 degrees over the next 30 years, study finds. The Texas Tribune. <https://www.texastribune.org/2022/09/01/texas-heat-index-study/>
- ¹¹ Erickson, A. P. (2022, September 1). Texas’ heat index could reach 125 degrees over the next 30 years, study finds. The Texas Tribune. <https://www.texastribune.org/2022/09/01/texas-heat-index-study/>
- ¹² The White House (2022, April 4). Quantifying Risks to the Federal Budget from Climate Change. OMB, Briefing Room. <https://www.whitehouse.gov/omb/briefing-room/2022/04/04/quantifying-risks-to-the-federal-budget-from-climate-change/>
- ¹³ Deloitte (2022, June). The turning point – A new economic climate in the United States. <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/about-deloitte/us-the-turning-point-a-new-economic-climate-in-the-united-states-january-2022.pdf>
- ¹⁴ *ibid.*
- ¹⁵ *ibid.*
- ¹⁶ *ibid.*
- ¹⁷ *ibid.*
- ¹⁸ *ibid.*
- ¹⁹ OECD analyses show that well-constructed environmental policies have an overall net benefit, and that most disproportionate costs and unequal distributional impacts can be corrected through the use of proper allocation mechanisms (OECD, 2007). <https://www.oecd.org/cfe/regionaldevelopment/50594939.pdf>
- ²⁰ <https://publichealth.harriscountytexas.gov/Services-Programs/All-Programs/Built-Environment-BE-Program/Climate-Program/Climate-and-Health-Vulnerability-Assessments>
- ²¹ <https://www.nrel.gov/transportation/workplace-electric-vehicle-charging.html>





harriscountytx.gov

(713) 274-1100

1001 Preston St #938,
Houston, TX 77002