



CITY OF HENDERSONVILLE

Sustainability Strategic Plan

2024





City of Hendersonville Sustainability Strategic Plan

The City of Hendersonville's City Council recognizes the following core values and beliefs related to sustainability that should be upheld as stated in Resolution R-21-53:

- The City will evaluate the environmental sustainability of all projects and programs while maintaining a solid relationship with residential and business development;
- The City believes that it is our responsibility to protect all our natural resources and the environment through the implementation of sustainable and responsible projects;
- The City must lead by example by evaluating all city operations to ensure they protect or repair the natural environment and are environmentally sustainable; and
- The City will prioritize the protection of existing tree canopy and the development of greenspaces and parks.

In order to implement these values and beliefs, the City has created this Sustainability Strategic Plan which outlines measurable goals and actions to reduce our overall impact on the environment while strengthening our communities, especially those underserved to ensure we have a prosperous future now, and for generations to come. This plan addresses challenges with a path forward on actionable and measurable opportunities to reduce the City's municipal greenhouse gas emissions, GHG.



The five main focus areas for this plan include:

- Energy
- Transportation
- Waste Management
- Land Management
- Water

Within each of these focus areas are specific recommended actions designed to help reach our strategic goal of 30% reduction in greenhouse gases, GHG by 2030. This plan will be updated every 5 years to ensure our actions are ambitious yet achievable.

A Challenge & Opportunity

The principles of sustainability integrate environmental, social, and economical values into solutions to some of the world's biggest challenges: social inequity, environmental health, air pollution, increasing operational costs and more.

For the City of Hendersonville, our community character and way of life is strongly rooted in the natural environment of the Appalachian mountains. As population rates increase, we must look for opportunities to reduce our impact on the environment through integrating sustainability within city planning and operations.

The primary purpose of this Plan is to reduce the overall greenhouse gas emissions for City operations while preserving our environment. While some actions relate more to the community level such as increased bikeability and walkability infrastructure or recycling, This Plan focuses specifically on sustainability goals and actions at the municipal operational level with recommendations for residents, businesses, and community members.

What Does "Sustainability" Mean?

The meaning can vary across different fields and disciplines with three constant principals: economic viability, environmental protection, and social equity. For the City of Hendersonville, we must have smart growth that is both economically sound while respecting our environment for the collective community.

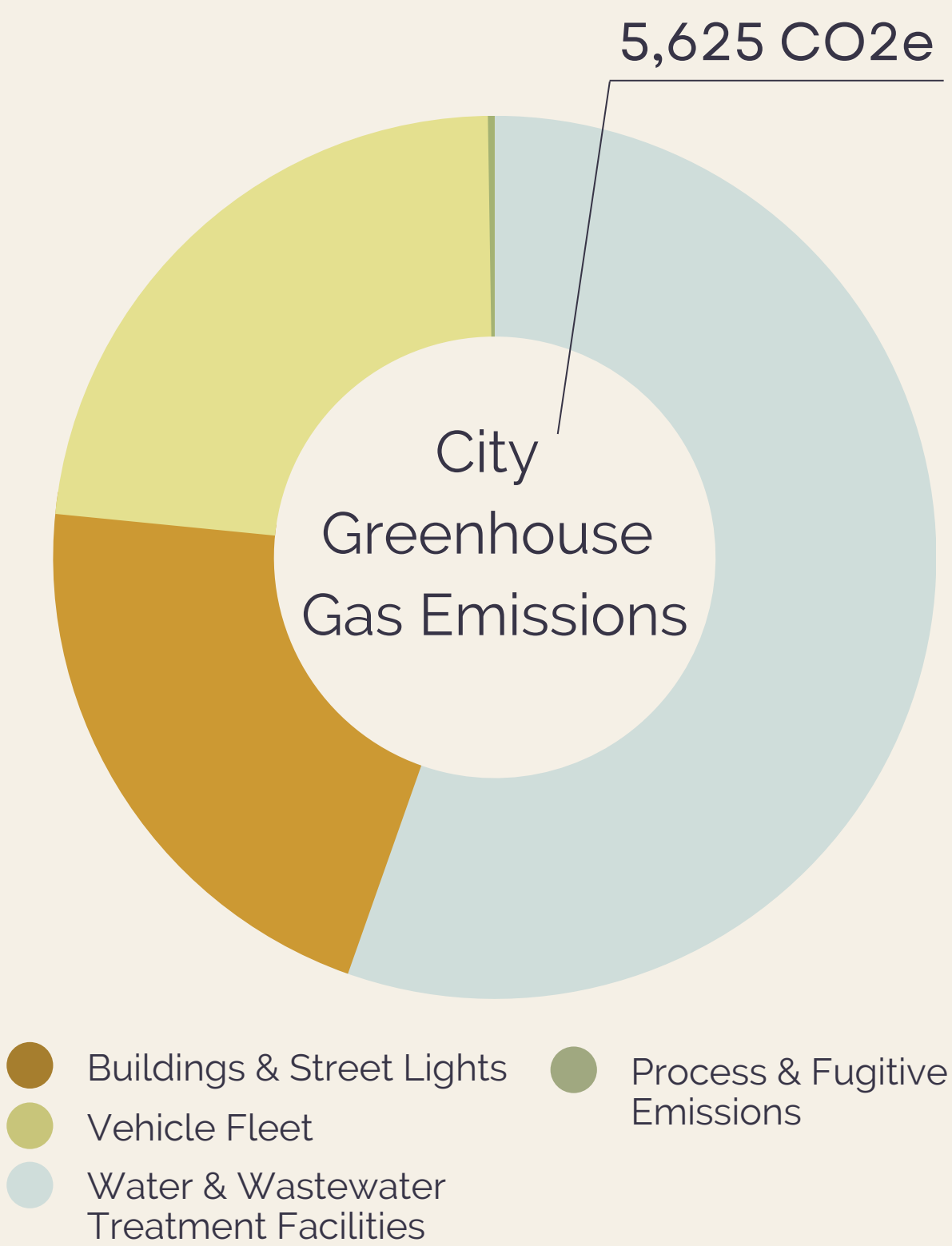
Source:
* 2030 Hendersonville Comprehensive Plan

Greenhouse Gas Assessment

In order to ensure this Plan has measurable results, a greenhouse gas assessment was completed to identify the largest sources of emissions. Assessments like these are commonly used in municipal sustainability planning to provide a benchmark of our starting point and how we would like to improve as we look to the future.

Greenhouse gas emission reduction is a necessary step in ensuring a resilient economy, environment, and community.

GHGs are gases in the earth's atmosphere that trap heat and keep our planet warm enough to sustain life. GHGs include carbon dioxide, methane, nitrous oxide, and fluorinated gases. Since the 1900's, Human activity such as burning fossil fuels has caused a dramatic increase in these gases and the trend has rapidly accelerated in recent years. When too much heat is trapped, overall temperature rises. This results in destructive weather patterns that include flooding, drought, and other natural disasters.



Note:

Water & Wastewater Treatment was calculated for city-wide uses since it is City owned and operated while Buildings & Street Lights and Vehicle Fleet are specific to the municipal operational level.

Solid waste was not included in the GHG assessment since the City does not have tracking on what is produced only for municipal operations. Furthermore, the City does not own or operate the waste transfer station or landfill. Municipal solid waste is also expected to be very small. For informational purposes, the total CO₂e for City-wide solid waste is 2,208 MT CO₂e.

This Sustainability Plan will help the City mitigate these challenges while realizing cost savings and improved quality of life.

For this assessment, 2021 City emissions were used as a benchmark to measure our progress and goals. 2021 is the most recent year where emission factor sets are available for measuring.

What process was used to create the GHG Assessment?

This assessment was completed through ICLEI: Local Governments for Sustainability, which is a global network of more than 2,500 local and regional governments committed to sustainable urban development. ICLEI's ClearPath model was used to complete a local government operations protocol for the quantification and reporting of greenhouse gas emissions inventories.

What was included in our GHG Assessment?



Buildings & Streets

This sector includes the emissions from energy used to operate City owned buildings, streets, lights (owned and leased), and traffic signals.



Fleet

Included are the emissions from on-road and off-road vehicles used for municipal operations ranging from garbage trucks to administrative vehicles for staff. The specific types of fuel and miles are tracked as well as the vehicle size.



Wastewater & Water Treatment

This sector accounts for the emissions from the wastewater treatment process, from pumping water to treating wastewater and drinking water.



Process & Fugitive Emissions

These emissions calculate the amount of methane that is leaking out of pipes during distribution of natural gas.



Solid waste is an important aspect of sustainable practices even though it is not included in the City's GHG assessment based on the reasons found on page 7. As a result, proposed waste reduction actions are included within this strategic plan to ensure we are making strides in reducing the City's solid waste consumption.

How do you measure GHGs?

Greenhouse gases are measured in carbon dioxide equivalent otherwise known as CO₂e. Various greenhouse gases ranging from carbon dioxide, methane, nitrous oxide, hydrochlorofluorocarbons, and more. These gases are then converted to the amount of carbon dioxide in metric tons that would cause the same amount of atmospheric warming.

Energy



Overview

Energy is a necessity to power City operations. However, how we go about using energy and what sources of energy is an opportunity for not only reducing emissions but realizing financial savings in the long run.

While the City has limited authority to alter where our energy comes from, ensuring adequate building efficiency and reduced energy costs should be a top priority. In addition, we must look for opportunities to produce the City's own renewable energy where feasible such as solar energy installations on new and renovated municipal buildings while being an advocate for increased renewable energy supply from our utility providers.

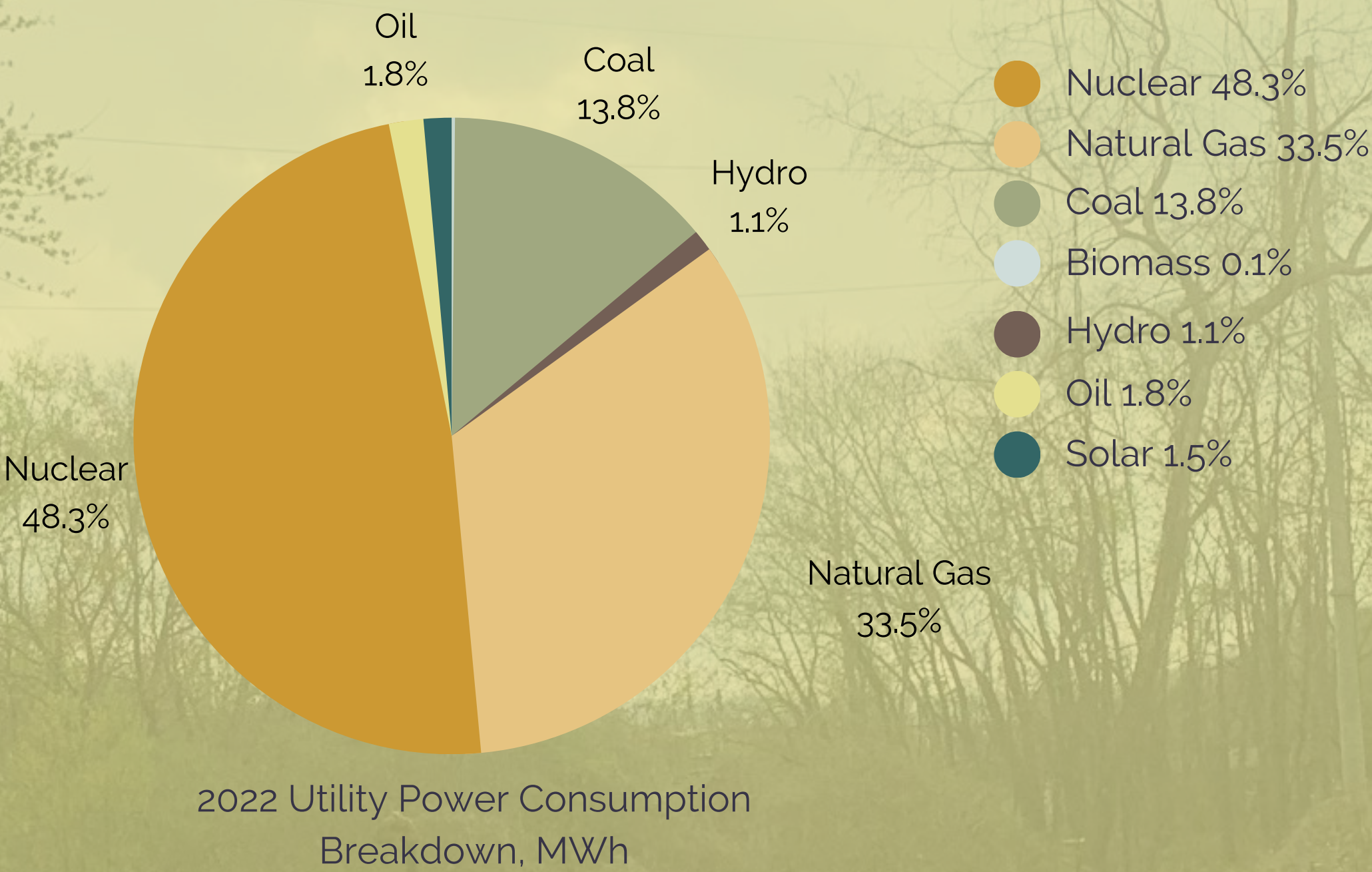
Goal

Reduce energy demand from municipal buildings & increase amount of renewable energy utilized

Actions

- ☐ Achieve 10% Renewable Energy
- ☐ Achieve 15% Energy Savings from Efficiency Upgrades
- ☐ Establish sustainable building policy

The City's current energy utility providers are Duke Energy and Dominion Energy both of which have a goal of being carbon neutral by 2050



Action

Achieve 10% Renewable Energy



Investing in renewable energy sources such as on-site and off-site solar will greatly reduce GHGs while increasing energy independency. As of 2022, Duke Energy sources 2.7% of solar energy with the majority of energy production from nuclear, natural gas, and coal. In order to reach the City's solar energy goal, off-site as well as on-site opportunities should be considered to ensure we bring about a cleaner, more resilient City.

Strategies to reach this action:

- Explore Duke Energy's Shared Solar Program (pending approval) and advocate for and collaborate with Duke Energy to develop more utility-scale renewable projects in our area.
- Assess current City buildings for roof mount solar, parking lots for solar carports, and park property for ground mount solar to see what is feasible and implement a policy to require all new buildings be constructed to accommodate solar panels in the future.
- Leverage Duke's goal of 70% carbon reduction by 2030 in North Carolina to achieve strategic goal while exploring on site-solar and other renewable energy options.

Off-site solar:

A few options exist to increase solar energy including Duke Energy's Shared Solar Program, which is awaiting approval and renewable energy credits, RECs which are readily available. RECs are a certified way to offset energy produced from fossil fuels by purchasing a credit from a renewable energy source which represents one megawatt-hour (MWh) of electricity generated and delivered to the electricity grid from a renewable energy resource. The Shared Solar Program would enable the City to pay for the development and operation of solar facilities (as well as program administration expenses) and in return, receive bill credits for their share of the solar energy generation

On-site solar:

On-site solar options include ground mount, rooftop, canopy, and carport. There is also a requirement with Duke Energy that the maximum power generation at any time for solar cannot exceed the peak demand of the building. Therefore, a building can not be entirely operated by on-site solar.



Estimated costs to implement

Ground mount: \$1-\$2/watt
Roof mount: \$2.50-\$3/watt
Canopy: \$3-\$4/watt
Carport: \$3.50-\$3.70/watt

Payback period for City Hall and City Operations Center for example is 18-28 years with \$7,600-\$11,800 in savings per building each year.

RECs (as of 2021) \$6.60/MWh
Shared Solar: TBD



New Solar Installation While the City doesn't currently have any on-site solar, the new Firestation No. 1 has multiple sustainability features such as heat island reduction with a white roof that reduces the amount of heat absorbed, light pollution reduction by using down-lighting and cut-off fixtures, as well as optimized energy performance. Also included is a 4,000 KWH per month solar voltaic system.

Sources:

* 2022 Solar Feasibility Study by RN&M Engineers

* Environmental America Clean Energy Pathways

* ICLEI USA ClearPath

* Collaborative Solar price quote

Action

Achieve 15% Energy Savings from Efficiency Upgrades



Ensuring energy efficiency begins with assessing the City's current buildings to see what opportunities are available for upgrading or retrofitting to decrease energy usage and associated emissions. Many municipal buildings within Hendersonville are several decades old and are now built to outdated energy and water standards. This is a tremendous opportunity to not only reduce emissions but also to realize financial savings from upgrades.

Strategies to reach this action:

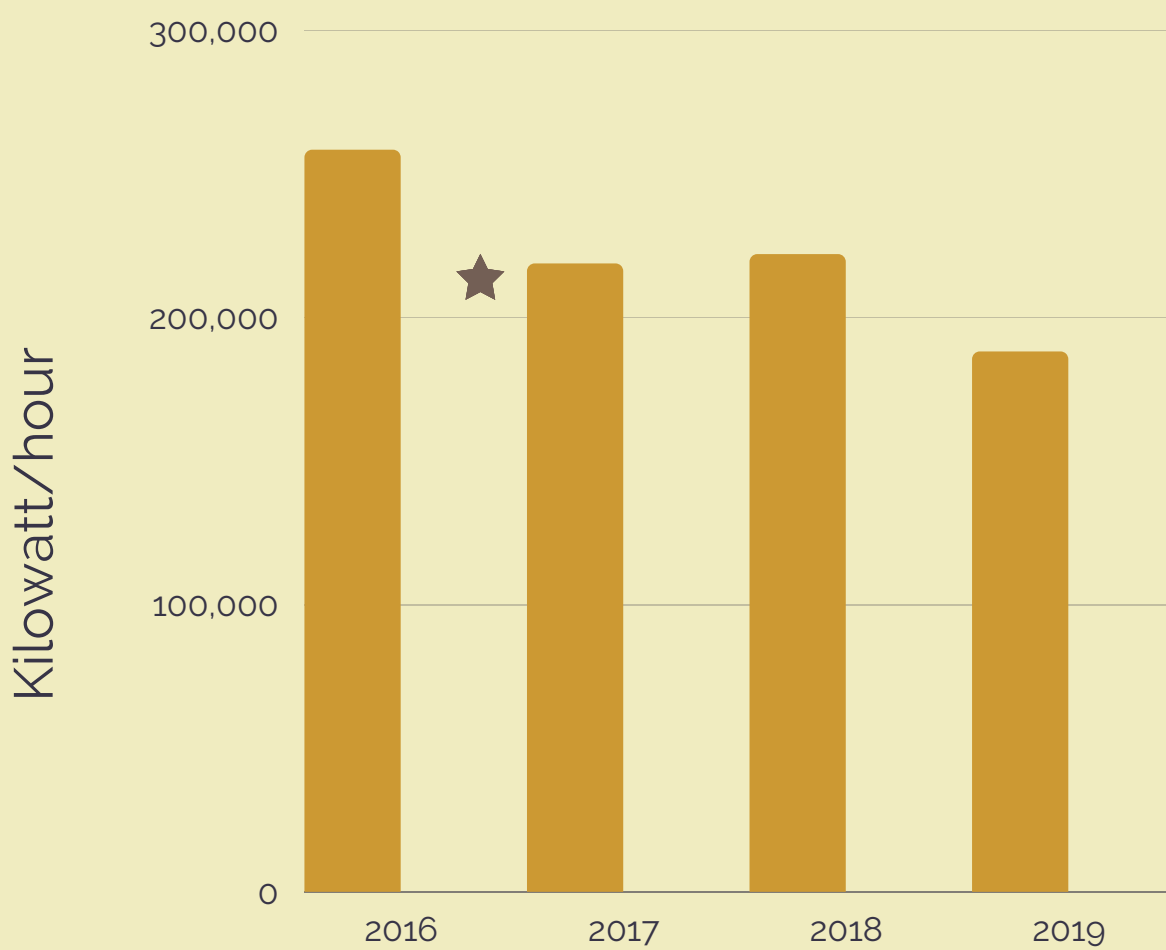
- Partner with organizations that complete energy audits such as Waste Reduction Partners and Duke Energy's Virtual Energy Assessment to see what opportunities for upgrades exist
- Prioritize upgrades that yield the most cost savings and fastest return on investment
- Complete audits at least every five years and consider tracking Energy Use Intensity (EUI) every year.
- Prioritize upgrades for Water & Wastewater Treatment facilities which account for 62.6% of the City's greenhouse gases

Energy efficiency wasn't taken into consideration for North Carolina's building code until 1978. Buildings constructed prior did not include energy standards.

Estimated costs:

At City Hall alone, estimated costs for implementing energy and water efficiency recommendations were \$28,700 with \$3,800 in cost savings per year and a 0.1-5.4 year payback period. This represents one example of the energy and cost savings by upgrading existing municipal buildings. In this example, lighting upgrades were free of charge due to Duke Energy's rebate program. While majority of upgrades will not be free, there is oftentimes a minimal payback period when looking at the biggest energy saving upgrades. A key outlier is Water and Wastewater Treatment facilities which can have significantly higher price points.

Case Study - LED lighting upgrades at City Operations Center, 2017



In the first year after converting all lighting in the City's Operations Center to LED, an \$2,727.08 was saved in 2017.

★ After conversion

Sources:
* U.S. Office of Energy Efficiency & Renewable Energy Building Energy Codes Program * 2018 Waste Reduction Partners Energy Audits
* ICLEI USA ClearPath

Action

Establish Sustainable Building Policy



Throughout this Sustainability Strategic Plan, policy implementation will be essential to ensure our goals are efficiently met. Standard policies also provide a clear understanding of what minimum requirements must be met for municipal buildings and other sustainability practices to minimize emissions.

Often called “green building design,” many features like orientation of the building, roof material, appliances and fixtures chosen, as well as other design and construction plans determine how the building will affect the environment. By making more environmentally friendly choices for our municipal buildings, we can minimize negative environmental impacts while saving money in the long term.

Currently, there is no City policy specifying minimum sustainability or green building measures that all buildings must include. Establishing and implementing a policy with these standards will provide a multitude of emission reduction and cost saving benefits.

Strategies to reach this action:

- Consult best practices from Leadership in Energy and Environmental Design (LEED) and Energy Star standards
- Policy requirements should be rigorous but not cost prohibitive with long term cost analysis planning in mind.
- Ensure policy is updated at least every 5 years to meet new technology improvements.

Estimated costs to implement:

There are no associated costs. Policies should be updated at least every five years to ensure they are up to date with new technology and improvements.

Community Level

Adequate biking and walking infrastructure enables residents, business owners, and our community to reduce their reliance on driving internal combustion engines, thus reducing the overall emissions from the transportation sector. According to the City's 2018 Bicycle Plan, only 0.1% of Hendersonville's working population bikes to work. In addition, 6% of City residents don't have access to a vehicle to drive. When considering the economical benefits, increased biking and walking infrastructure has been shown to increase property value and decrease crime rates. In Western North Carolina, as a hub for outdoor recreation and tourism are integral in our community's way of life. Increasing the City's bikeability and walkability will bring about numerous benefits including increased quality of life, equity, economical, and environmental impacts.

WILL BE COMPLETED AFTER SURVEY INPUT RECIEVED