CHAPTER 9 REDUCING OUR CARBON FOOTPRINT AND GREENHOUSE GASES

In the face of opposing environmental challenges, addressing climate change by reducing and remediating greenhouse gas levels and transitioning towards renewable energy sources is imperative.

Obj. 1 - Transitioning to 100% Renewable Energy Sources





Renewable Energy

Renewable energy is energy derived from natural sources that are replenished at a higher rate than they are consumed.

Types of renewable energy include:

Geothermal Energy



Solar Energy



Wind Energy



Bioenergy

Hydropower

Importance of Switching



Energy Security -

Diversifying energy sources enhances resilience and helps mitigate the geopolitical risks that come with the dependency on fossil fuels



Switching to renewable energy sources can create jobs and help foster innovation within the city, helping to stimulate economic growth.





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The switch towards renewable energy can help preserve the natural environment by helping to mitigate the negative impacts of energy production, including air and water pollution.

Obj. 2 - Reducing and Remediating Greenhouse Gases to Sustainable Levels

What is the

What are Greenhouse Gases?

What is a **Carbon Footprint?**

Greenhouse Effect?

It is a natural process that keeps the Earth warm by trapping greenhouse gases in the atmosphere, without which the Earth could not support life.



U.S. Environmental Protection Agency (2023). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2021



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Carbon Dioxide (CO2) - The most prevalent greenhouse gas, caused by burning fossil fuels, deforestation, and other industrial processes.

Nitrous Oxide (N2O) - Released

primarily from agricultural and industrial activities, burning fossil fuels, and solid waste.

Fluorinated Gases - Fluorinated gases are produced through various household, commercial, and industrial processes and play a role in stratospheric ozone depletion.

Methane (CH4) - A much more potent greenhouse gas with a much higher heat-trapping ability than CO2. Methane is released during the production and transportation of fossil fuels and from livestock and other agricultural practices.

A measure of the amount of greenhouse gases, that are released into the atmosphere as a result of human activities, such as transportation, energy production, and industrial processes.

It is usually measured in units of carbon dioxide equivalents (CO2e) and expressed in metric tons of CO2e per year.

Average Carbon Footprint - 2019



- Individual (US) 16 tCO2e
- Individual (Globe)- 4.8 tCO2e

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CITY OF

Obj. 1 - Transitioning to 100% Renewable Energy Sources

The Vision

Our city envisions a sustainable future where greenhouse gas emissions are minimized. We'll achieve this by increasing solar panel adoption, expanding tree cover and green spaces, promoting electric vehicles, educating the public on energy reduction, and encouraging healthy, sustainable diets.

The Solutions

Education & Persuasion

- Partner with local schools and institutions to create and promote educational materials on reducing personal carbon footprints by lowering the amount of red meat consumed, buying locally sourced products, or reducing vehicle-miles traveled. Tier 1
- Provide incentives to local companies who offer carpool programs or those who promote the use of public transit for their workers to get to the office. **Tier 2**
- Partner with local organizations and businesses to create an urban gardening group to provide necessary items such as seeds and/or composting bins to the public; and to encourage



- Incorporate quality design compatible with the character of the city, sustainable/green incentives, flood zone area, and base flood elevation compliance in housing design standards. **Tier 1**
- Food waste education (Eliminate food insecurity, and carbon footprint), nose-to-tail butchering, and the importance of being strategic, encouraging donations to reduce food waste, creating a restaurant best practice targeted at reducing food waste, and encouraging restaurants to conduct food
- Conduct a right-size vehicle fleet analysis with increased fuel economy (and acquisition plan) to determine the most optimal mix of pooled, sized, and assigned vehicles with the most efficient fuel sources. Seven (7) or more years of age should be the standard for vehicle replacement. Ensure employee training and the installation of electric vehicle support equipment are considered in the analysis. **Tier 2**
- Research and adopt a city vehicle idling policy with corresponding educational materials to reduce fuel



Laws & Mandates

- Explore changes to the city's land use regulations that would promote Urban Agriculture. Tier 1
- Explore changes to the city's land use regulations that facilitate neighborhood connectivity by connecting sidewalks and multi-use paths that lead to City parks and require new development and redevelopment to accommodate bicycle and pedestrian facilities and connections to existing development through the

• Consider innovative methods to manage stormwater volumes, such as green building and infrastructure practices, basin retrofits, and adopting more stringent stormwater management regulations. **Tier 2**

1. Identify and prioritize land use regulations changes developed due to the aforementioned planning and analysis. **Tier 3**

- Promote the use of more sustainable products, such as biodegradable straws, bags, packaging, and containers as a means of reducing waste. **Tier 1**
- Encourage housing that supports sustainable development patterns by promoting the efficient use of land, conservation of natural resources, easy access to public transit or other efficient modes of transportation, access to services and parks, efficient design and construction practices and the use of renewable energy resources. Tier 1

Inducements & Incentives

• Help developers utilize provisions of the Affordable Care Act, such as the Green House Gas Reduction Fund, Commercial Buildings Energy Efficient Tax Deductions, HUD Dollars towards creating energy efficiency, and the Renewable Energy Investment Tax Credit (REITC). Tier 1

the creation of gardens on private properties within the city. **Tier 2**

 Provide tax break incentives to local businesses and restaurants that compost, have a garden, and use ecofriendly products. Tier 3

Services & Capacity-Building

- Conduct an inventory of city operations and community-wide greenhouse gas emissions within two (2) years, establish appropriate reduction targets in the inventory, and continue with updates every (5) years thereafter. **Tier 1**
- Conduct a tree canopy cover study and identify areas where the city can plant more trees. Tier 1
- Prioritize the creation of a healthy city tree canopy in the land use regulations. Tier 1
- Within two (2) years of completion of the inventory, develop greenhouse gas reduction. Tier 2

waste audits. **Tier 2**

- Develop diversion programs to keep waste out of landfills. Tier 2
- Implement transportation, mobility, and capital improvement plans that promote compact mixed-use development patterns accessible through multimodal transportation options. Tier 2
- Work with the York County Planning Commission, the York Area Metropolitan Planning Organization, and other partners to develop a baseline estimate of vehicle miles traveled and nonautomobile mode share countywide and downscale to the city level to adopt short, mid-range, and long-term goals for vehicle miles reduction. **Tier 2**
- Research and develop outreach materials to increase awareness of the relationship between prolonged vehicle idling, particularly for heavy duty trucks, and related greenhouse gas emissions. Tier 2

- costs and reduce municipal greenhouse gas emissions. Tier 2
- Balance traffic flow, speed, and street design character, by implementing a Complete Streets ordinance. **Tier 2**
- Explore converting empty and vacant lots into community gardens or landscaped areas with native plants and trees. **Tier 3**
- Consider requiring a percentage of alternative fuel off-street parking spaces in the city's Land Use **Regulations in the Central Business District and Employment Center District.** Tier 3
- Collaborate with other local, county, and state governments to evaluate the feasibility of increasing alternative fuel sources such as biofuel, methane, electric, and or solar in government and/or private sector fleet vehicles. Tier 3

use of striped or buffered/marked bicycle lanes, cycle tracks, parallel off-street paths and/or other dedicated facilities. Tier 1

- 1. Explore implementing regulations that promote a ban on single-use plastics from businesses and promote the use of disposable eco-friendly packaging. Tier 1
- 1. Implement green standards and regulations to require housing construction and rehabilitation to provide durable, adaptable, healthy, and energy-efficient homes. Tier 1
- 1. Develop land use regulations that support and encourage residential urban agriculture. **Tier 1**

Obj. 2 - REDUCING AND REMEDIATING GREENHOUSE GASES TO SUSTAINABLE LEVELS • Undertake energy and • Promote the use of

The Vision

Our city is committed to a sustainable future powered entirely by renewable energy. We'll simplify zoning regulations for renewable energy access, ensure affordability and equity, achieve self-sufficiency, expand geothermal power, increase LEED-certified buildings, transform vacant lots into green spaces, and seamlessly integrate renewable energy solutions throughout the city.

The Solutions

Education & Persuasion

- Create an outreach campaign on how residents and business owners can implement simple solutions to become more energy efficient and save on power bills. Tier 1
- Ensure local schools and organizations are implementing educational programs to teach students about the importance of renewable energy and climate change mitigation. Tier 1
- Create a program that provides subsidies to help cover the initial cost of switching to renewable energy sources. **Tier 3**
- Consider adopting Land Use Regulations that provide incentives for installing solar arrays on rooftops and other impervious spaces and remove any barriers to their installation. **Tier 3**

Inducements & (<u>0</u>) Incentives

• Promote the use of cooler roof systems with reflective coating materials. **Tier 1**

renewable energy, such as solar, wind, bio-diesel, energy storage technologies, micro-grids, community battery storage of electric power, and solar car charging stations. Tier 1

Services & Capacity-Building

• Complete a renewable energy feasibility study on all city facilities to identify opportunities for renewable energy projects to power municipal operations, minimize disruptions from major storms and weather events by coupling renewable energy with backup power storage, and establish a renewable energy target for municipal operations. Tier 1

water audits of city-wide operations and facilities, such as streetlights; such an analysis should include a capital retrofit program with a return on investment analysis. Tier 1

- Develop and employ a program to prioritize installing solar panels on city-owned and operated buildings. **Tier 2**
- Construct electrical vehicle (EV) chargers within municipality parking lots. Tier 2
- Develop and implement a city-wide composting program that supports residential and commercial composting projects. **Tier 2**



 Collaborate with local, state, and federal Strategic Partners to advance renewable energy goals through new programs, adoption of best practice programs, pursuit of grants for project and policy research, and policy implementation. Tier 1

• Conduct a study to identify empty and vacant buildings that are wasting energy within the power grid. **Tier 3**