Responding to Climate Changes
City of South Sioux City

Climate change refers to the long-term shifts in temperatures and changing weather patterns. Historically, these shifts are natural but since the late 1800s, more often human activities have been the main driver of climate change, primarily due to the burning of fossil fuels like coal, oil, gas which produces heat-trapping gases. The long-term effects of climate change have included further ice melt, ocean warming, sea level rise, and ocean acidification. On the timescale of centuries to millennia, the magnitude of climate change will be determined primarily by anthropogenic CO_2 emissions. This is due to CO_2's long atmospheric lifetime.

State and federal resources are tackling these changes and requires local governments to review their efforts in responding to disasters and mitigation efforts toward reducing environmental change impacts. Applications for state and federal assistance now requires that local governments adopt planning efforts toward improving the resilience (i.e. of infrastructure), helping prepare for hazards such as wildfires, floods, storms, and droughts exacerbated by climate change while advance projects and strategies that address climate change and sustainability.
Source: https://climate.nasa.gov/; https://www.ipcc.ch/; https://www.epa.gov/climate-change; https://www.un.org/en/climatechange/what-is-climate-change.

The city has incorporated climate change consideration in the planning and delivery of specific design elements that address climate change impacts. The City of South Sioux City has adopted strategies toward reducing climate change and its impact, the use of alternative energy resources, and promoting environmental health. These efforts are outlined below

1. Papio Missouri Hazard Mitigation Plan
FEMA requires that a public entity must have a current Hazard Mitigation Plan in place for Federal funding. The plan identifies the vulnerabilities of public entities to natural and man-made hazards and the measures that can be implemented to reduce or eliminate vulnerability exposure. The Papio Missouri River Natural Resources District serves as a coordinating agency for the development of a multi-jurisdictional multi-hazard plan for a six-county area including South Sioux City, Dakota County.

2. **Use of energy audits and associated implementation strategies**
The city has requested independent energy audits to examine public buildings for assistance in energy strategies that saves energy and money. Some of the strategies the city is employing includes the following.

Lighting – Currently, the city is in the process of changing out its current lighting for LED street lighting as lights need replacing or as new subdivisions are designed. According to NE Public Power District (NPPD), the city has approximately 480 lights yet to be replaced.

Additional insulation for city buildings and changing city building lights to LED is slowly occurring as lights need replacing.

3. **Alternative energy sources**

Solar Farm - With grant funds from the Nebraska Environmental Trust, South Sioux City's was able to implement its Renewable Energy Storage Project in collaboration with NextEra Energy Resources Development (NEER). The project used a combination of grant funds, Federal Investment Tax Credit and cash to fund the $1.56 million project. This project moves the community toward diversification in energy sources.

This project was the first of its kind in the 14-Southwest Power Pool. The City entered into an agreement with NEER who developed, constructed, owns and operates the battery system. NEER Development was chosen because of their stature as the world's largest generator of renewable energy from the wind and sun. This project stores solar energy at the South Sioux City's 2.3 MG, 21-acrea solar farm at 100% during the day and discharges the energy when peak demand occurs. Energy is discharged at 200 kw per hour for four hours.

Renewable energy purchase – The City has bought 51% renewable energy – largest in the state from hydro/solar/wind.

PACE (Property Assessed Clean Energy) – The Nebraska Legislature passed the Property Assessed Clean Energy Act during the 2017 legislative session to encourage energy efficiency and use of renewable energy for the preservation of the health and economic well-being of Nebraska citizens, along with amendments in 2019 LB 23 (collectively referred to as the "PACE Act" and found at Neb. Rev. Stat.§§ 13-3201 et seq.). In response to the PACE Act, the City Council of Omaha passed Ordinance No. 41152 on May 16, 2017, to implement the provisions of the PACE Act to create the Eastern Nebraska Clean Energy Assessment District ("ENCEAD"). South Sioux City took advantage of the PACE Act to fund eligible projects as authorized under the PACE Act and the establishment of a PACE program requiring a city to create a clean energy assessment district, and to create and implement administrative procedures to operate the program in compliance with the PACE Act. In March 2022, South Sioux City has by City Council ordinance created the City of South Sioux City Clean Energy Assessment District ("District"). South Sioux City retains the services of Omaha to administer portions of South Sioux City's PACE program through a mutual agreement. PACE is a financing tool that enables owners of commercial properties to implement projects that will lower their operating costs by improving energy efficiency and by reducing water consumption. It enables long term savings for property owners and promotes the public purpose of energy conservation. The concept is that the cost of installing water and energy-saving improvements is financed over the lifespan of the improvements. The loan is serviced with a special property assessment that is less than the amount of money saved by the newly reduced energy costs.

Geothermal energy is heat within the earth, a renewable energy source as heat is continuously produced inside the earth. People use geothermal heat for bathing, to heat buildings, and to

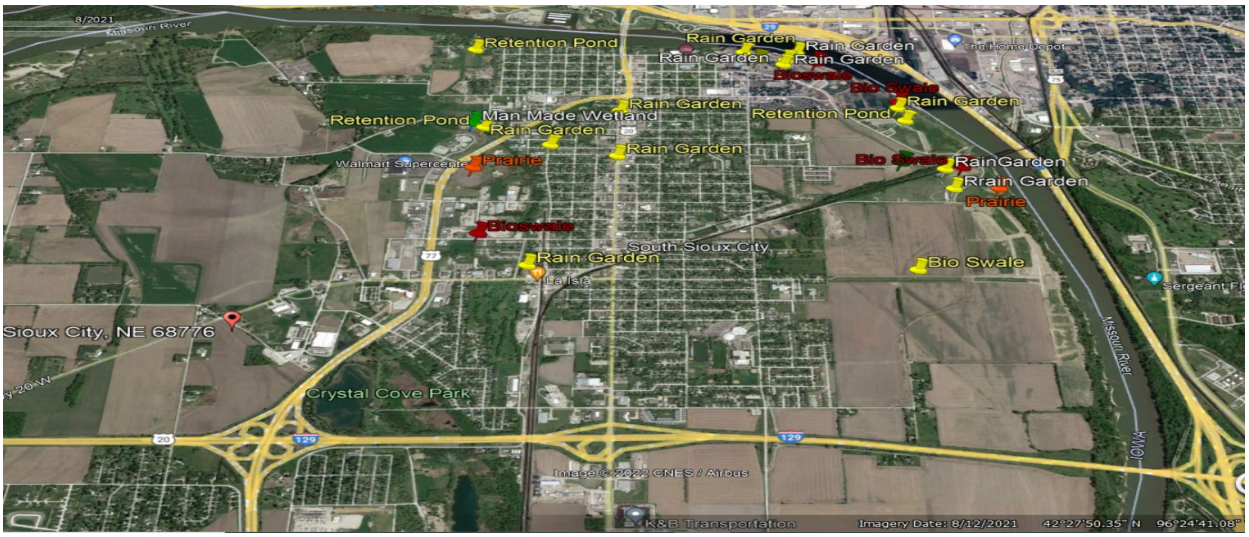
generate electricity. The City of South Sioux City uses geothermal energy to heat and cool three buildings through geothermal heat pumps at city hall, the library, and the tech building.

Electric Cars/Charging Stations - Increased use of lower-carbon travel modes through the installation of Level 2 and DC Fast chargers in 5-sites, 10-portals throughout the city for electric vehicle charging stations with an additional 3-sites and 12-portals pending grant approval. The city expects reductions in transportation-related pollution such as air pollution and greenhouse gas emissions through the increase use of lower-carbon travel modes evidence by reports generated by the EV chargers and comparison data on emission reductions as shown through data collected by the NE University at Lincoln and the Nebraska Community Energy Alliance (NCEA). In addition to charging stations, the city fleet consists of five electric vehicles. The city will continue to address greenhouse study with the University of Nebraska – Lincoln.

4. Bike Trails – Since 2006, the City of South Sioux City has been a Bike Friendly Community, the first in the State of Nebraska. The city has grown its walking / biking trail system to over twenty (20) miles that connects schools and neighborhoods to ensure safe routes to school for youth. Bike trails are required in all new residential subdivisions in the city. The trails also connect to Sioux City IA and North Sioux SD trails via the Veterans Bridge over the Missouri River. The City maintains these trails throughout the year so that they can be used year-round.

5. **Tree Planting** – In an effort to offset climate change, the city has made planting trees a priority. The city has been a Tree City USA award recipient for the last 30-years. Its Park Department has planted between 250-500 trees every year for the last 23-years. To accomplish this, the city has turned farmland into park land, planted trees in existing parks and provided tree-giveaways to any city residents for residents to plant in the city's right-of-ways for the past several years. Dead and dying trees are removed by the park's department. The city's Park Board who advises the Park's Department, is a way that residents have input into the trails, parks and other amenities offered by the city.

6. **Storm water runoff** - The city manages storm water runoff using retention ponds, bio swales, prairie plantings and numerous rain gardens. These projects address storm water runoff and filter the water back into the ground in areas as needed. recharging groundwater aquifers.



A rain garden is a depressed area in the landscape that collects rain water from a roof, driveway or street and allows it to soak into the ground. Planted with grasses and flowering perennials, rain gardens can be a cost effective and beautiful way to reduce runoff from your property. Currently, the city has 12-rain gardens with additional planned sites.

Recharge areas are where surface water predominantly flows downward through the unsaturated zone to replenish an aquifer, allowed to soak back into ground; rather than leave the water to simply run off. These recharge areas allow time for the water to seep back into the soil, eventually reaching aquifers many feet below ground, recharging water that has been removed from these aquifers. South Sioux City currently has four recharge areas with additional areas that are potentially set up for recharge. Bio-swales are vegetated, shallow, landscaped depressions designed to capture, treat, and infiltrate stormwater runoff as it moves downstream. The city has five bioswale areas.

7. **Public Water Conservation**

In January 2019, the city gathered input and examined data as to water resources and conservation efforts that may be needed. This examination resulted in the City of *South Sioux City Water Conservation and Sustainability Plan* that offered analysis of resources currently in place, areas needing improvement and what the city can do but also businesses and residents may be able to do to assist in city-wide water conservation efforts. This tool creates a roadmap so as conversation measures need to be implemented, a readily available plan can be implemented.

8. **Waste Management and Recycling Efforts**

Regional Waste Collection – The City of South Sioux City uses an area garbage disposal company to for municipal solid waste to Jackson NE which owns and operates an ethanol plant built in 2007. In addition to ethanol production, the company also composts and reuse green or yard and food waste to increase composting efforts to increase methane production for use by the ethanol plant. They also serve as the regional collection site of recycling materials.

Recycling – South Sioux City has long been a proponent of recycling activities that improve the natural environment while maintaining the health and welfare of its' residents through more effectively and efficiently materials handling processes. These recycling efforts include but are not limited to:

- Oil burner for use in public works building using recycling oil to heat the buildings. This equipment uses recycle used oil from city fleet vehicles and the collection from residential households. These oil furnaces are used as the primary heat source during the fall and winter months at these facilities.
- Implementation of 64-gallon recycling carts replacing totes, increasing usable recycling materials
- Use of word chipper to create mulch used in city parks, community garden
- Use of recycled tires, crumb rubber used in six city parks
- Bio-char for community garden
- Composting leaves and small twigs for use in the community orchard and two community gardens
- Planting and replanting with an annual goal of 500 trees and supporting Tree City for 23+ years
- State's first cross-laminated timber project in the Community Orchard giving energy to area and building used for classroom
- Smaller efforts used by City staff includes office recycling coffee grounds used on the community orchard in addition to usual efforts (recycle cans, waste)

The City will continue to commit resources toward uses of renewable energy and sustainability efforts as planning for future generations, economic impacts, health of the local environment

and the quality of life for residents. The climate crisis has exacerbated the need for comprehensive planning, inclusive, and evidenced-based efforts.