



## Sustainability Committee Actions on Climate Change

### Introduction

The CCFPD Sustainability Committee has recently focused on addressing climate change, as it presents a significant threat to the continuing well-being of the preserves. The changing climate threatens the stability of forested and prairie ecosystems. Changes in temperature and rainfall patterns can disrupt life cycles, alter movement patterns, extirpate sensitive species, and facilitate the spread of pests and pathogens. Globally, climate change is the fourth greatest driver of biodiversity loss.

The district can help reduce the impacts of climate change through the choices it makes in daily operations and in long-term planning, as well as through outreach to the community. The committee undertook two projects in response to this threat: 1) estimating and reducing the District's carbon emissions and 2) developing materials for climate change education and outreach.

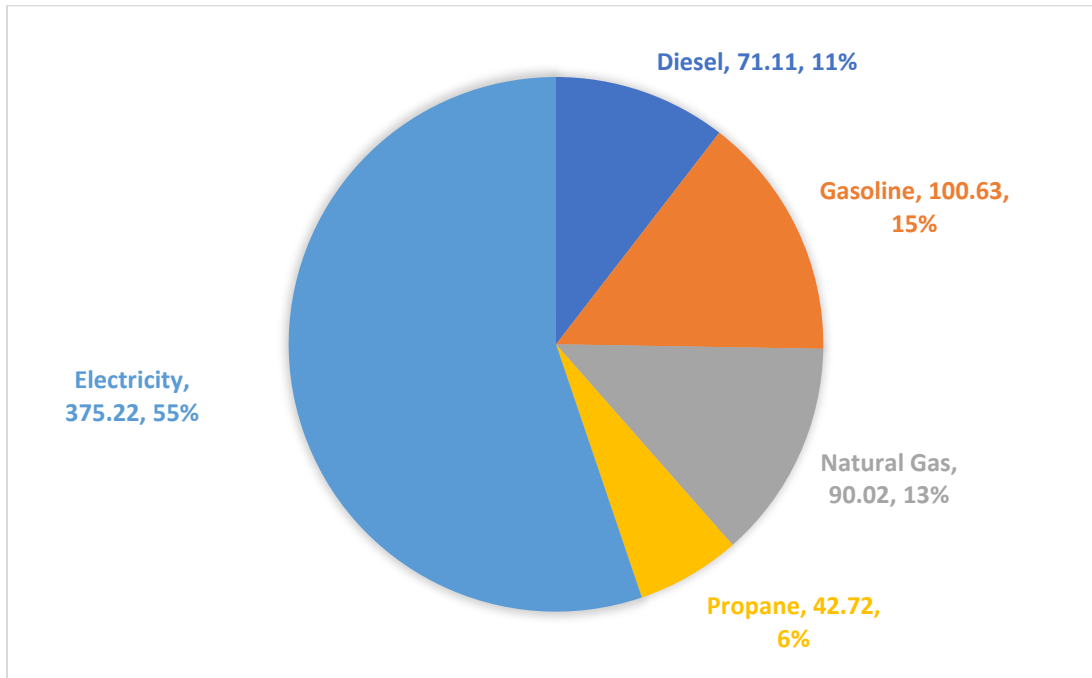
### Understanding CCFPD Carbon Emissions

Most global carbon emissions and most CCFPD carbon emissions result from combustion of fossil fuels. The district uses the energy derived from those fuels to heat and cool buildings, to run vehicles, and to power equipment, from lawn mowers to computers. Fuel usage for the district is routinely logged or metered. These site usage values were collected and digitized for computer analysis. The various uses of energy were then examined both to further understand emissions sources and to develop emission reduction strategies.

Figure 1 shows the relative amounts of carbon emissions resulting from the major fuel types used by the district. Fuel usage values were converted to carbon emission equivalents by use of EPA conversion factors. These data were averaged across seven years for purposes of comparison. In the years shown, electricity accounted for the most energy use and so was the major source of district carbon emissions.

Electricity powers a wide range of items, from outdoor lighting to office equipment. Propane and natural gas are primarily used to heat buildings. Diesel fuel and gasoline mainly power transportation vehicles, and gasoline is also used for maintenance equipment.

**Figure 1.** Average annual CCFPD CO<sub>2</sub> emissions sources between 2013 and 2019 (in metric tons):



## Reducing Carbon Emissions

Electrical power was the largest source of energy and emissions for the district in 2013-2019 (Figure 1). Electricity can be generated in a way that results in very low carbon emissions through use of renewable energy sources such as solar, wind, or hydropower. That fact provided the opportunity for the district to readily reduce carbon emissions through purchase of low carbon electrical power.

Starting in January of 2020, CCFPD began using low carbon renewable electric power provided by an Ameren subcontractor. That power is produced by a wind farm, is placed on the electrical grid, and sold through use of renewable energy certificates (RECs). It replaces standard grid electricity, about 70% of which is produced by burning coal and natural gas with resulting carbon emissions.

The Lake of the Woods Forest Preserve is the only property using power from Ameren, so the purchased renewable energy replaces the typical grid electrical power only at that site. However, more electricity is consumed at Lake of the Woods than both Middle Fork River and Homer Lake Forest Preserves combined, resulting in a significant reduction in emissions from the switch.

**Figure 2.** CCFPD CO<sub>2</sub> emissions between 2013 and 2020 (in metric tons):

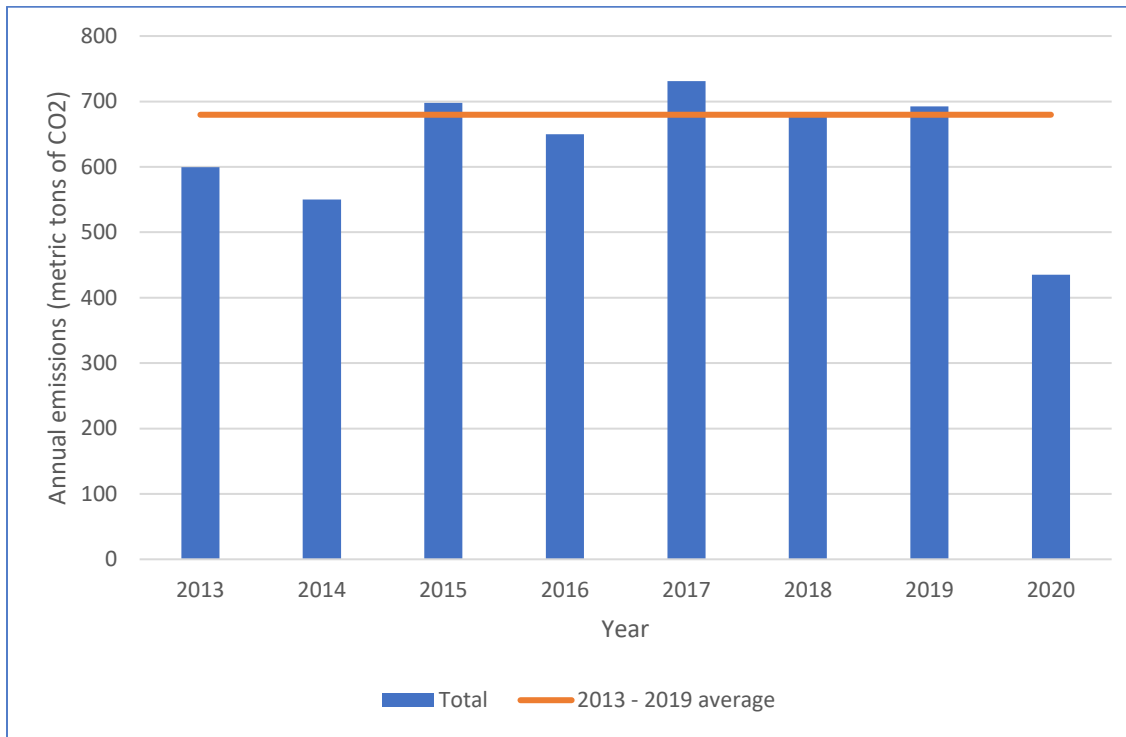
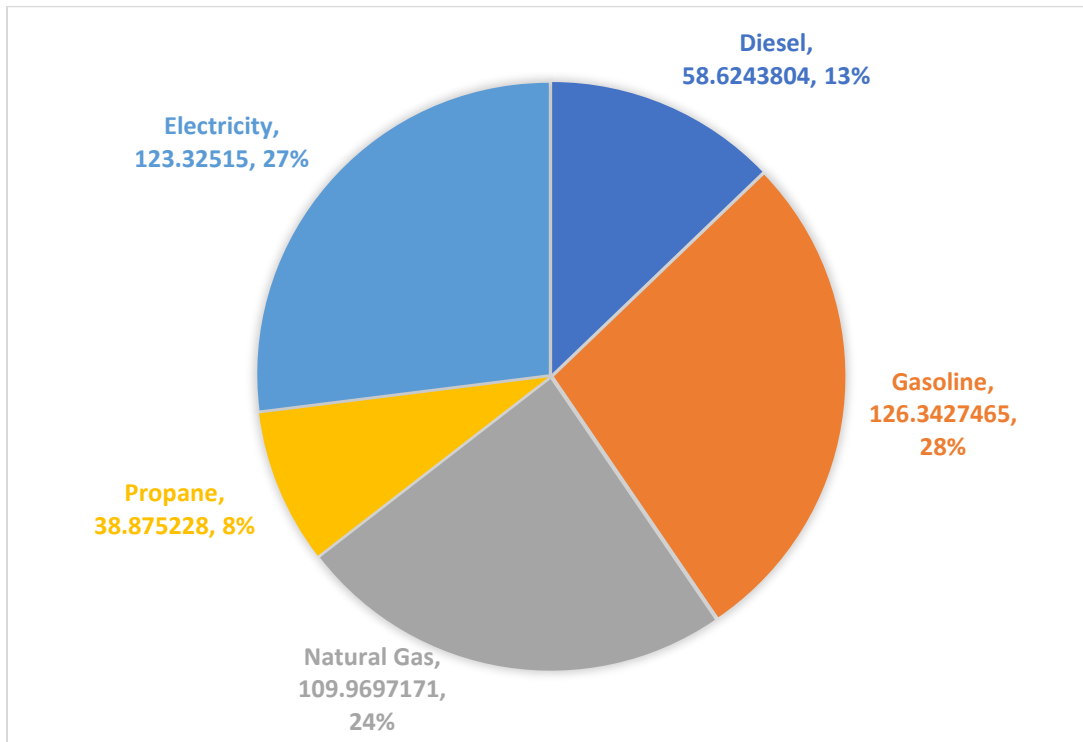


Figure 2 shows the total, district-wide CO<sub>2</sub> emissions between 2013 and 2020. The average annual emissions between 2013 and 2019 was 679.7 metric tons of CO<sub>2</sub>. In 2020, CO<sub>2</sub> emissions were 457.1 metric tons, a 33% reduction in total, district-wide emissions. That is the equivalent of taking 48 passenger cars off of the road for a year.

Emission values for 2020 (Figure 3) differ from the 2013 to 2019 average values in both total quantity and in the proportional contributions from each of the fuel types. Two predominant factors account for the changes shown from Figure 1; one is the purchase of renewable electrical power, which lowered both the electrical emissions and total emissions. Replacement of standard grid electrical power with low carbon power at the Lake of the Woods preserve has a substantial effect on overall emissions, since that preserve is the largest user of electrical power for the district. The other change in 2020 was a decrease in use of the preserve's indoor facilities from COVID-19 related behavior changes.

**Figure 3.** CCFPD CO<sub>2</sub> emission sources in 2020 (in metric tons):



Another effort to reduce carbon emissions from the district was to use Ameren Energy Efficiency Program initiatives funding to upgrade lighting and HVAC units at the Lake of the Woods site. More efficient lighting fixtures were installed at nine locations. Together, those more efficient fixtures will reduce electrical energy use by 65,848 kilowatt hours annually. The more efficient HVAC systems installed will reduce energy use a further 2,210 kilowatt hours annually. Since the energy reduction measures were all installed at the Lake of the Woods Preserve, which is using carbon free electrical power, these energy reduction measures do not count towards reducing district carbon emissions. All the Energy Efficiency Program upgrades were enacted at that site because Ameren provided the funding to help pay for the costs of those improvements.

In January 2020 the committee set a goal of reducing carbon emissions for the district by 5% from the 2013-2019 average in five years. Figure 2 shows that the actual reduction was far greater, but we are aware that 2020 was an unusual year that afforded rare opportunities to cut emissions. We will continue to advocate for additional reductions. The CCFPD can continue to cut emissions by installing more efficient fixtures, modernizing buildings, and by replacing fossil fuel-using equipment with electric equipment.

The committee has also examined adding a solar array to the preserves as another way of lowering carbon emissions. Several array proposals for different sites have been examined. Another option for

use of solar power is to place an array on the District's new nature center, currently in the planning stages. Matching the annual solar output for the array to the energy demand for the building would make it a net zero energy building. Geothermal systems will also be considered for new buildings to further reduce energy demands. Designing and constructing buildings with a low carbon footprint is especially important because of their long lifespans.

Our intention is to keep developing carbon reduction strategies, with the final goal of reaching near zero carbon emissions for the district by 2050. We will also continue to set intermediate goals to serve as checks on our progress toward our final reduction goal. We expect substantial further reduction opportunities will become available as new technologies emerge and as new financial incentives are made available.

The actual carbon footprint for the district extends much further beyond the emission sources included in this report. A complete accounting of the district footprint would encompass the emissions from vehicles used to bring visitors to the preserves, from vehicles used by employees traveling to and from work, to the energy used to grow, process and transport foods consumed on site. These are mostly indirect emissions since they are out of the direct control of the CCFPD. Reducing indirect emission sources involves a community wide effort.

## **Climate Change Education**

The district has long presented educational programs around environmental topics as part of its core identity. The committee is now developing climate change-specific educational materials to help us address that critical topic.

We are developing a program consisting of three parts as an approach to teaching climate change. The first will share what the district itself is doing to address climate change. The second will discuss what climate change is and why we care about it, or why climate change matters. Third, we will provide some suggestions of what everyone can do to help solve the problem of climate change.

The climate change educational materials will be developed as a set of concise statements that can be presented as infographics or with accompanying graphic images. These "small" pieces can then be readily used in a variety of formats, from social media pieces to webpages to poster presentations.

We also encourage the district's environmental educators to fold climate change information into other educational programs to make the topic more relevant to learners. Perhaps the most important thing we can accomplish is to help build conversations around climate change, from which actions should follow.

## **Sustainability Committee Members**

The report represents the efforts of the Sustainability Committee, whose members are Blair Balbach, Stacey Clementz, Mike Daab, Peter Goodspeed, Jon Hoekstra, Jacob Pruiett, Marianne Lippi, Tim Sullivan, and Gregory Walburg.