



CITY OF FLAGSTAFF

CITY COUNCIL REPORT

DATE: March 5, 2026

TO: Mayor and Council Members

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THROUGH: Jenny Niemann, Climate Section Director
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SUBJECT: Municipal Energy and Fuel Trends Overview

At the City Council Budget Retreat on February 5th, questions arose regarding the City's energy consumption and the effectiveness of recent efficiency measures. This report details:

1. Five-year energy and fuel consumption and cost trends.
2. Efficiency project impacts and considerations.
3. Renewable energy strategies.
4. Climate impacts.

1. Five-Year Energy and Fuel Consumption and Cost Trends

Energy Consumption and Costs

City municipal operations are powered by a combination of electricity from Arizona Public Service (APS), natural gas from UniSource, and, to a smaller extent, on-site solar and hydropower allocations. The majority (63%) of energy consumed is used for water and wastewater operations, followed by municipal buildings (29%), streetlights and traffic signals (4%), and parks (4%) (**Fig. 1**).

Over the past five years, municipal energy consumption peaked at 59,945 megawatt hours (MWh) in FY22-23, declined by 8.6% the following year, and was further reduced by 0.8% in FY24-25 (**Fig. 2**). During this period, the mix of energy sources remained relatively consistent, with electricity accounting for 68%; natural gas, 26%; and renewable generation, 6%, on average (**Fig. 2**).

Percentage of Energy Consumption by Operation

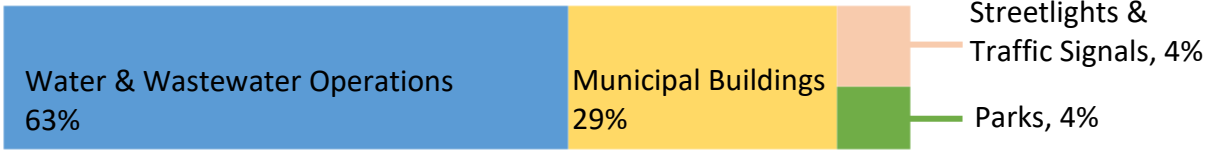


Figure 1. Tree map of total energy consumed by different municipal operations, averaged across five years.

Annual Energy Consumption FY21 to FY25

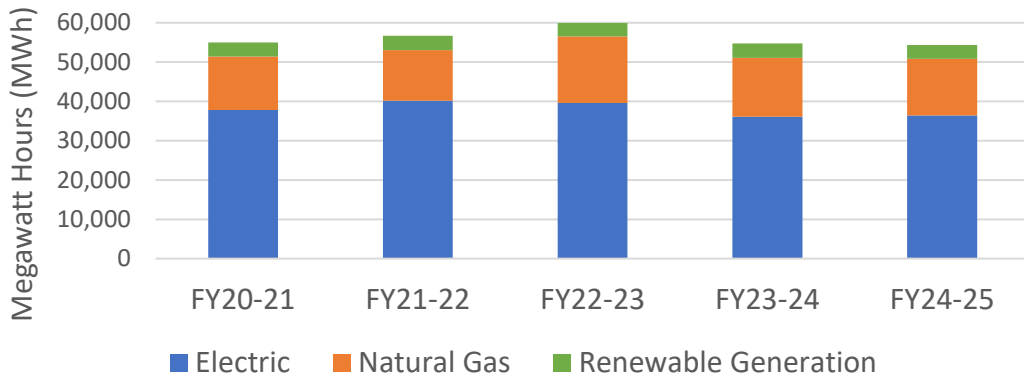


Figure 2. Stacked bar graph of annual energy consumption for municipal operations by energy source for the past five years.

Total annual energy costs have risen in each of the past five years, **reaching more than \$5.9 million in FY24-25, a 31% increase from FY20-21 (Fig. 3)**. This increase was driven by APS rate increases in 2023 and 2024, as well as dry years requiring more energy-intensive groundwater pumping compared to wet years.

Annual Energy Costs FY21-FY25

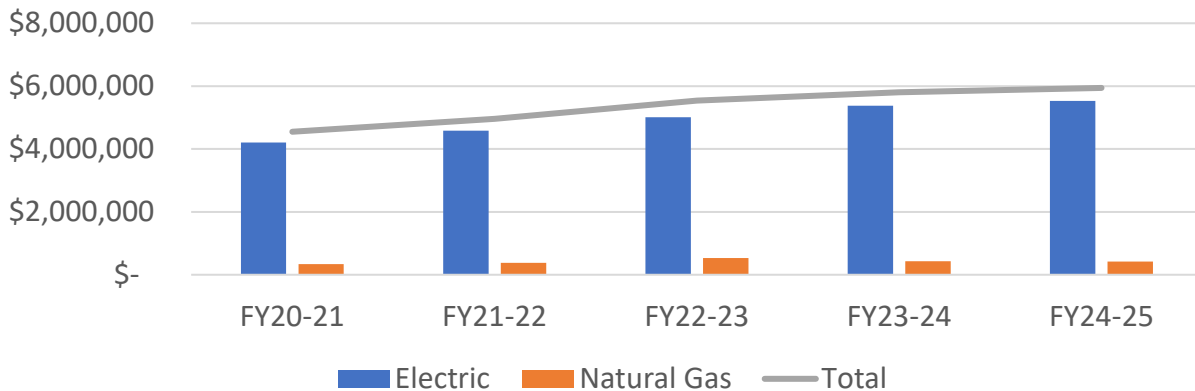


Figure 3. Annual municipal electricity and natural gas costs, with a line indicating the combined cost, for FY21 to FY25.

The Water Services Division bears the lion’s share of municipal energy costs and uses a mechanism called the Water Energy Surcharge to help recover some of these expenses. The Water Energy Surcharge is applied to customer monthly water bills. The table below summarizes revenues collected by the City through this surcharge.

Costs Recovered through the Energy Water Surcharge (USD\$)					
	FY20-21	FY21-22	FY22-23	FY23-24	FY24-25
Energy Costs Recovered	\$1,886,533	\$1,663,045	\$2,196,645	\$2,818,808	\$2,471,266

Fuel Consumption and Costs

Over the past five fiscal years, the City’s fleet consumed between 407,000 and 451,000 gallons of fuel annually (Fig. 4), costing the City between \$1 million to \$1.85 million each year (Fig. 5). FY24-25 saw the overall lowest fuel consumption, with a 4% reduction from the prior year, and a 9.6% reduction from FY20-21. During this period, **fuel costs peaked in FY22-23, declined by 17% the following year, and were further reduced by 20% in FY24-25.**

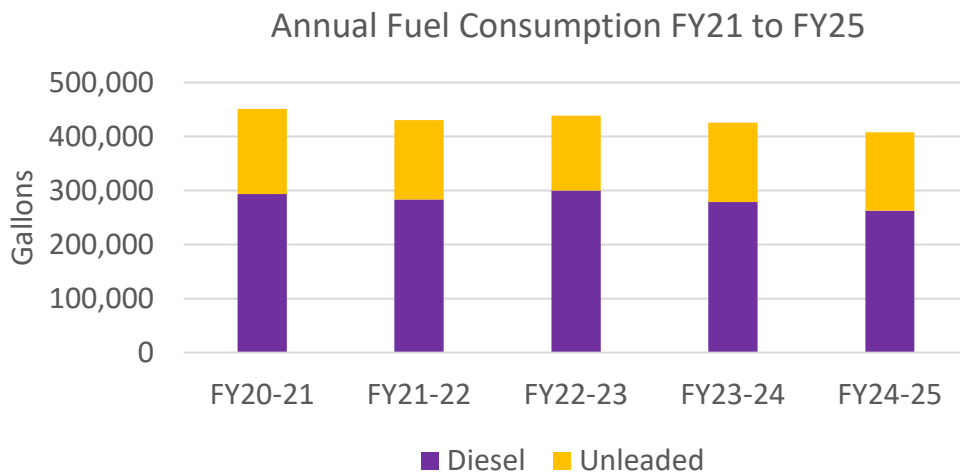


Figure 4. Stacked bar chart of annual City fleet fuel consumption by fuel source for the past five fiscal years.

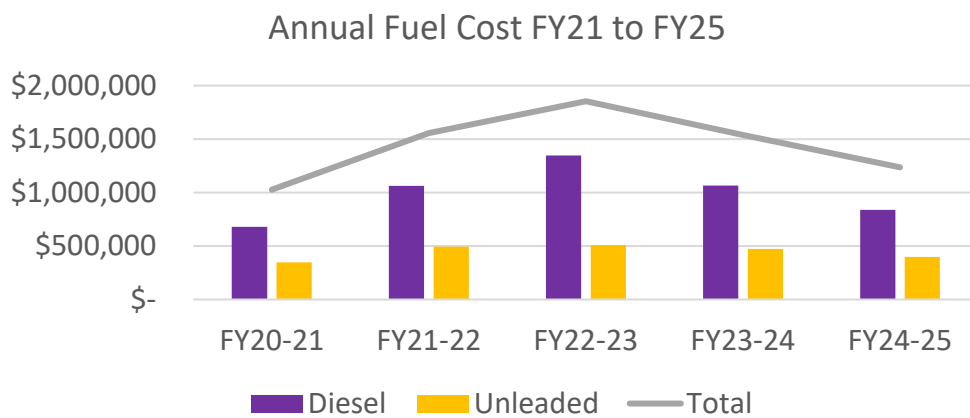


Figure 5. Annual city fleet fuel costs, broken down by fuel type, for the past five fiscal years.

Fuel Cost Vs. Electricity Cost

Electricity remains the most economical way to fuel city fleet. According to the City of Flagstaff [Fleet Electrification Assessment](#), the City can realize over \$3.25 million in savings from electrifying its light-duty non-patrol fleet alone, and \$11.35M over the vehicle lifetime when accounting for viable medium- and heavy-duty electric vehicles in the fleet.

Diesel and gasoline prices fluctuate daily, so to draw a fair comparison, this report uses annualized costs per gallon for diesel, unleaded gasoline, and electricity for FY24-25. Electricity cost is equivalent to \$1.97 per gallon – 28% less than gasoline and 38% less than diesel (**Fig. 6**). To calculate the dollar per gallon electricity (eGallon), the cost of electricity is divided by fuel efficiency and then multiplied by 33.7, which is the energy equivalent of one gallon of gasoline.

Average Cost per Gallon by Fuel Type for FY24-25

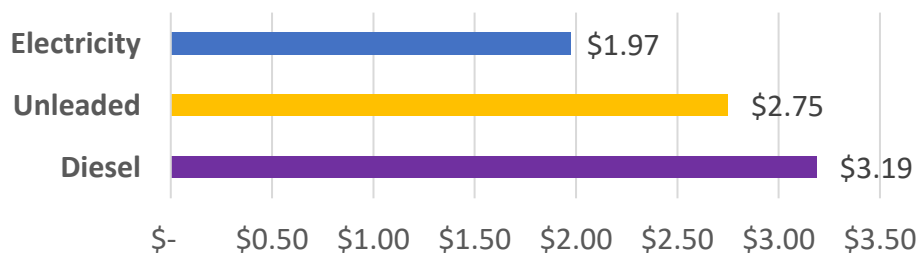


Figure 6. Comparison of cost per gallon for diesel, gasoline, and electricity (eGallon), based on FY24-25 annualized averages.

2. Efficiency Project Impacts and Considerations

The City-wide Energy and Water Conservation Project was completed between September 2023 and August 2024 and included efficiency improvements across 44 city facilities. The table below outlines the specific measures implemented through this project.

Energy Conservation Measure	# of Facilities	# of Fixtures
Interior lighting retrofits to LEDs	43	6,206
Exterior lighting retrofits to LEDs	40	645
Weatherization	30	N/A
Electric vehicle charging stations	4	14 charging ports
Parks irrigation repairs	17	12 master valves/22 flow sensors
Water meter testing	N/A	179 water meters
Energy Management System upgrades	4	N/A
Electric rate switch	1	N/A

There was a 9.9% year-over-year reduction in energy use following the project implementation. However, municipal energy consumption is influenced by numerous factors, including weather conditions, HVAC and mechanical system performance and controls, facility changes, human behavior, and other variables.

The City contract cost was \$4.1 million for this project. As part of the contract, the City is guaranteed to achieve the fiscal savings outlined in the table below (or better) over the next 20 years – **totaling \$6.1 million+ in avoided costs** over the contract term. The guaranteed savings means that if the City were found to have saved less than the guaranteed amount over the year, the contractor would pay the City the difference. With utility rates projected to increase, the City is positioned to realize even greater cost savings.

Guaranteed Savings: Energy and Water Conservation Project

Year	\$ Amount	Year	\$ Amount	Year	\$ Amount
1	\$224,323	8	\$278,675	15	\$347,264
2	\$231,341	9	\$287,521	16	\$358,442
3	\$238,593	10	\$296,665	17	\$370,002
4	\$246,089	11	\$306,119	18	\$381,959
5	\$253,835	12	\$315,894	19	\$394,328
6	\$261,844	13	\$326,003	20	\$407,121
7	\$270,120	14	\$336,454	Total	\$6,132,591

3. Renewable Energy Strategies

The City leverages multiple renewable energy strategies to reduce utility costs and greenhouse gas emissions: on-site solar, Hoover Dam allocation, and Renewable Energy Credits.

On-Site Solar

There are eight solar systems installed on City properties with a combined capacity of 1.68 megawatts direct current (MW DC). The power generated reduces electricity demand and costs. Together, they generate ~2,700 megawatt hours (MWh) annually, **providing roughly 7% of the City’s annual electricity consumption**. Half of the solar systems are City-owned (COF) and are operated and maintained by a contractor. The others are under a Power Purchase Agreement (PPA), where the developer installs, owns, and operates the system.

	Capacity (kW DC)	Renewable Energy Generation (MWh)				
		FY20-21	FY21-22	FY22-23	FY23-24	FY24-25
Wildcat Fixed Ground-Mounted (COF)	231.0	421	418	335	364	360
Rio de Flag Rooftop & Fixed Ground-Mounted (COF)	310.2	461	495	428	434	453
Aquaplex Solar Parking Canopies (COF)	277.2	383	441	407	430	455
Wildcat Tracker 1 (PPA)	285.1	561	551	545	532	396
Wildcat Tracker 2 (PPA)	283.4	524	551	539	564	531
Aquaplex Rooftop (PPA)	93.5	144	144	139	132	137
City Hall Solar Parking Canopies (PPA)	200.5	325	332	272	307	328
Total	1,681	2,818	2,932	2,665	2,763	2,660
% of City Electricity Offset	N/A	7.5%	7.3%	6.7%	7.7%	7.3%

By generating on-site solar energy, the City reduced its annual electricity costs by an average of \$152,000 over the past five years. The table below accounts for annual fees for operation, maintenance, measurement, and verification for City-owned systems.

Renewable Energy Savings from Avoided Costs					
	FY20-21	FY21-22	FY22-23	FY23-24	FY24-25
Annual Savings	\$89,085	\$130,755	\$140,330	\$207,275	\$194,009

Hoover Dam Allocation

The City purchases an allocation of renewable hydropower through a Power Service Contract with the Arizona Power Authority – specifically, up to 172 kW of capacity and up to 375 MWh of energy per month – at a rate lower than APS's electricity rates. **As a result of the Hoover Dam Allocation, the City has saved more than \$227,000 since 2017.** Over the past five years, the Hoover Dam Allocation has reduced utility costs by an average of \$34,736 per year (Fig. 7) and avoided ~470 metric tons of greenhouse gas emissions annually.

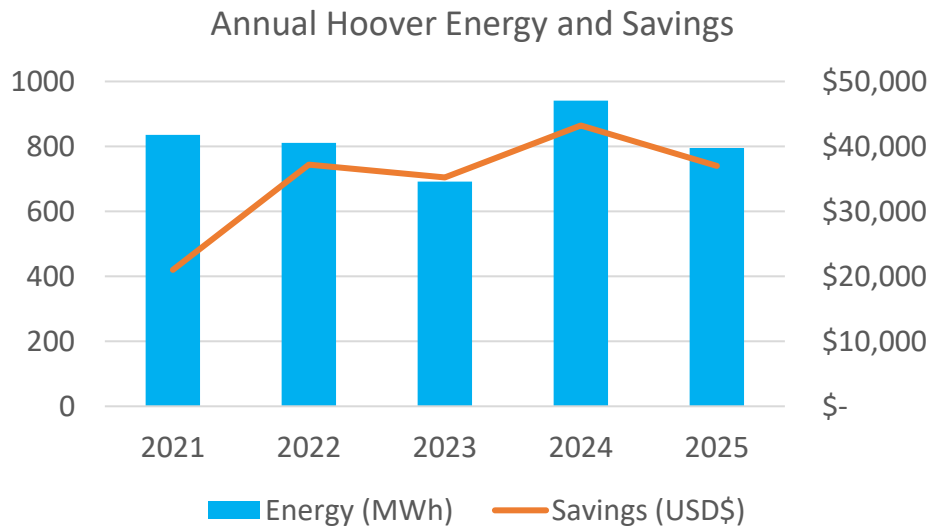


Figure 7. Bar graph showing the annual energy purchased through the Hoover Dam Allocation (in MWh); line graph showing the fiscal savings for the past five years. Note: The Water Year is from October through September.

The City’s Hoover Dam Allocation varies based on annual rainfall and amount of water able to be released from Lake Mead.

Renewable Energy Credits

The City purchases Renewable Energy Credits (RECs) to offset 100% of its annual electricity use, ensuring all electric use qualifies as clean energy. Each REC is equivalent to one megawatt hour of 100% renewable energy delivered to the electrical supply grid. At \$2.50 per MWh, this equates to approximately \$100,000 per year, or an average of 1.7% of annual energy costs. **This investment has had the single largest impact on reducing the City’s municipal emissions – avoiding approximately 15,000 tons of greenhouse gas emissions annually.**

	Annual RECs Purchased and Percent of Energy Costs				
	FY20-21	FY21-22	FY22-23	FY23-24	FY24-25
Annual Cost for GPP (USD\$)	N/A	N/A	\$104,444	\$97,431	\$97,422
% of Total Energy Costs	0.0%	0.0%	1.9%	1.7%	1.6%

Overall, annual savings from on-site solar and the Hoover Dam allocation offset the annual cost of purchasing Renewable Energy Credits.

4. Climate Impacts

The City of Flagstaff is a climate action leader, capable of influencing institutions, businesses, and residents within the Flagstaff community. This section provides an overview of the greenhouse gas emissions associated with powering municipal operations and fueling the City fleet. It does not account for emissions from other municipal operations, such as flaring of methane gas at the landfill and wastewater treatment plants, employee commutes to and from work, and other factors. The report closes with a brief status update on municipal energy and fuel consumption targets in the Carbon Neutrality Plan.

Greenhouse Gas Emissions

In the past five years, greenhouse gas emissions from municipal energy and fuel consumption peaked in FY21-22 at 21,423 metric tons of carbon dioxide equivalent (MTCO₂e) and reached their lowest levels in FY24-25 at 6,581 MTCO₂e – a **69% reduction in emissions (Fig. 8)**. This decrease is primarily due to the City’s purchase of Renewable Energy Credits beginning in FY22-23. Emissions from natural gas, diesel, and gasoline consumption fluctuated moderately during this period but have trended downward in the past two years. In FY24-25, diesel accounted for 40.7% of remaining emissions; natural gas, 39.8%; and gasoline, 19.5% (**Fig. 9**).

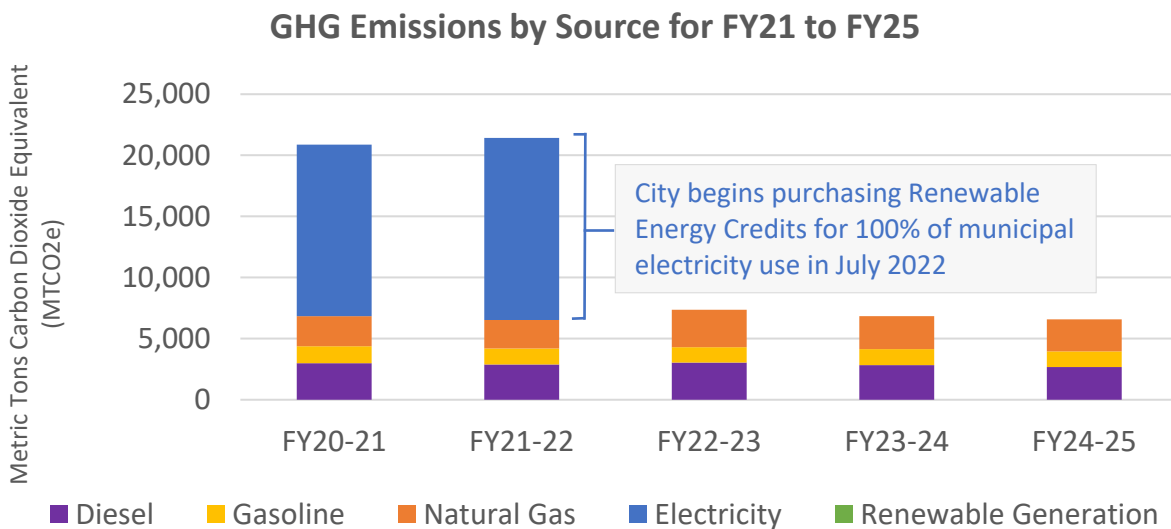


Figure 8. Greenhouse gas emissions from municipal energy and fuel consumption for FY21-FY25.

Annual GHG Emissions from Energy and Fuel FY24-25

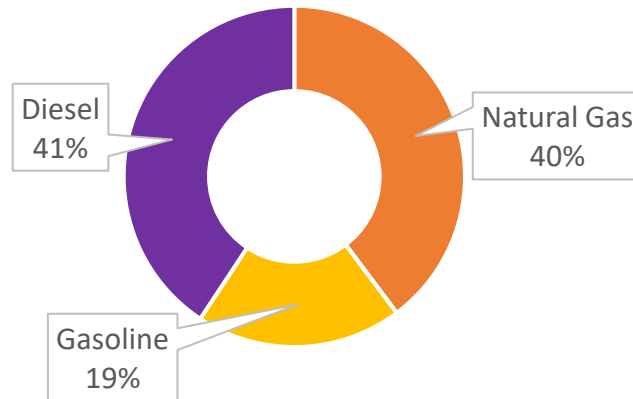


Figure 9. Donut chart of annual greenhouse gas emissions from municipal energy and fuel consumption in FY2024-2025. Percentages do not equal 100 due to rounding.

Progress Toward Carbon Neutrality Plan Goals

The Flagstaff Carbon Neutrality Plan sets several targets for municipal energy and fuel consumption. Below is a summary of key targets and the City's current progress towards them.

Conserve Energy:

Target: 28% reduction in total energy use by 2030, compared to the 2016 baseline.

Current Status: 1.03% reduction in energy use in FY24-25 compared to 2016 baseline. Note: this target does not account for changes in buildings and facility stock, such as the construction of the Core Services campus and the replacement of the Courthouse.

Reduce Natural Gas Use:

Target: 60% reduction in emissions from natural gas, compared to the 2016 baseline.

Current Status: 8.91% increase in natural gas consumption and associated emissions in FY24-25 compared to the 2016 baseline. Similarly, the target does not account for changes in building and facility stock.

Expand Renewable Energy:

Target: 100% renewable electricity for municipal operations by 2025.

Current Status: Target met 3 years ahead of schedule through the purchase of Renewable Energy Credits.

Electrify the Fleet:

Target: 30% of Vehicle Miles Traveled (VMT) to be from electric vehicles (EVs).

Current Status: 16% of the City's light-duty fleet is electric, and one medium-duty vehicle is electric (the Zamboni ice re-surfacer at Jay Lively). The City adopted an EV-first approach for vehicle purchases and is gradually integrating EVs into the fleet as vehicles are replaced. Planning is underway for fast chargers to enable medium- and heavy-duty EVs in the fleet.