



2023 UTILITY SERVICES DIVISION REPORT

Executive Summary

The City of Columbia Utility Services Division (USD) creates and implements demand-side management (DSM), renewable energy, water conservation and educational and outreach programs to advance resource conservation while enhancing utility performance, adoption of renewable resources and customer service. These utility programs and outreach efforts are designed to educate and assist residential and commercial customers in using less electricity and water and advance the City's adherence to its strategic goals and climate initiatives. Saving electricity and water helps the utility extend the lifespan of infrastructure and reduces the amount of resources that the City must produce or purchase. USD uses insight gained through customer outreach programs, one-on-one customer interactions and relationships with the City's key accounts, stakeholders and other City departments to respond to customer needs and market changes.

USD's programming identifies opportunities for customers to reduce energy and water use and lower their utility bills. For residential customers, these programs improve the health and comfort of their homes, reduce energy costs and make the community's housing more affordable. Similar programs designed for commercial and industrial customers help businesses reduce their environmental footprint, improve their bottom line and better position themselves for additional corporate investment.

USD's demand-side management programs until now had been based on the 2012 Integrated Resource Plan (IRP). For future initiatives, the 2021 Integrated Electric Resource and Master Plan (IERMP) has informed Utility Services' decisions by providing guidance as to the development of a new suite of DSM programs.

USD's programs contribute to meeting the City's climate initiatives. In Fiscal Year 2023 (FY2023), USD's programs provided an estimated avoidance of 2,332.16 metric tons of carbon dioxide equivalent (CO₂e). Programming also positively impacts the long-term economic health of Columbia and the surrounding area. In FY2023, customers spent more than \$9.6 million in the local economy on efficiency and renewable energy upgrades, resulting in \$9.73 invested in the local economy for every \$1 USD spent in incentives. Our suite of electric DSM programs has a utility benefit of \$1.55 for every \$1 spent over the estimated useful life of the energy conservation measures.

USD remains committed to its mission of resource conservation and recognizes efficiency as the least cost resource of the clean energy economy, creating immediate savings, reducing emissions and energy burden, improving buildings and bolstering the local economy. Through conservation programming and communications, USD aims to facilitate and incentivize energy and water upgrades and education for all customers.

DSM Program Summary

The following table summarizes DSM program participation from FY2023. Peak, energy and water reduction amounts are cumulative over the fiscal year, so the full impact of

these improvements will be realized in the following years. The incentives cost the utility 2.5 cents per kWh saved over the lifetime of the efficiency improvements. According to ACEEE, the industry average ranges from 2.4-2.8 cents per kWh saved.

Annual Energy & Water Savings						
Residential						
Program	Participation		FY23 \$ Amount	FY23 Peak Reduction (kW)	FY23 Energy Reduction (kWh)	
	FY23	FY22				
Residential Incentives	678	838	\$266,912	282	716,133	
Residential Loans	61	65	\$795,362	-	-	
Commercial						
Program	Participation		FY23 \$ Amount	FY23 Peak Reduction (kW)	FY23 Energy Reduction (kWh)	
	FY23	FY22				
Commercial Incentives	70	87	\$103,879	338	1,827,827	
Commercial Loans	5	1	\$71,300	-	-	
Photovoltaic						
Program	Participation		FY23 \$ Amount	FY23 Total kW Installed	FY23 Peak Reduction (kW)	1st Yr. Energy Production (kWh)
	FY23	FY22				
Photovoltaic Incentives*	125	62	\$491,665	1077	337	1,307,176
Photovoltaic Loans	17	16	\$280,478	-	-	-
Electric Vehicles						
Program	FY23 Participation	FY22 Participation	FY23 \$ Amount			
Residential EV Incentives	13	0	\$6,336			
Water						
Program	Participation		FY23 \$ Amount	FY23 Water Reduction (CCF)		
	FY23	FY22				
Incentives	291	89	\$38,892	6,255		

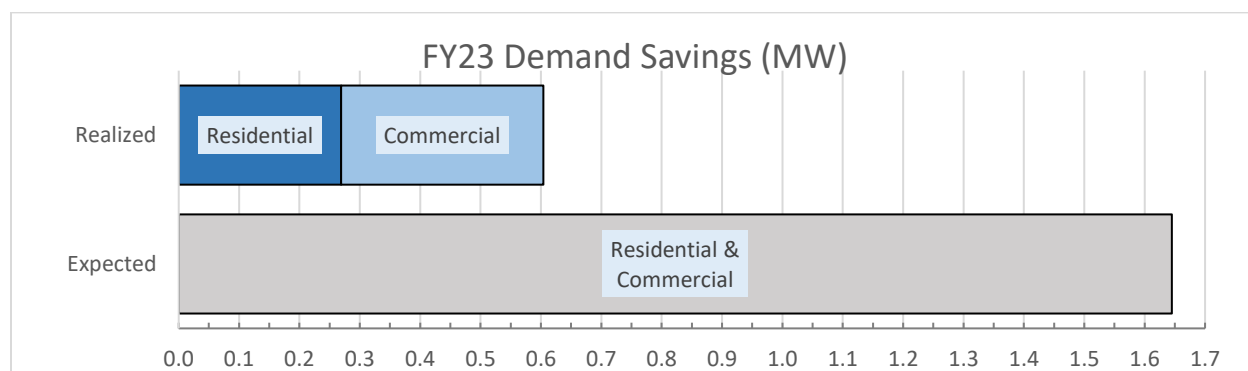
* Peak Capacity reduction at 4-5 pm on 7/31 based on SAM modeling. Energy Reduction is based on SAM modeling.

Participation numbers do not include efficiency kits recipients

[R] = Residential, [C] = Commercial

The 2021 IERMP outlined energy conservation goals of 47,000 MWh and 17 MW of peak load reduction by 2030 through DSM programs. These projections were based on program participation during 2018 and 2019 continuing as a constant through 2030. The two years used as the IERMP baseline were the greatest two years of combined energy conservation by USD programming. Since 2019, market saturation has reduced public participation in the current suite of energy conservation programs.

The chart below represents the potential cumulative demand saving goals from the 2021 IERMP report and the projected demand savings of the DSM programs for FY2023.



Residential Electric Programs

USD encourages residential customers to take a whole-home approach to energy efficiency, first identifying areas of the residence that would benefit the most from upgrades before making targeted improvements. This approach builds consumer confidence in the utility and its partnering contractors who look at each property individually. USD's programs recommend improvements that make the largest impact and are based on deficiencies of customer homes.

To make efficiency accessible to all City of Columbia Utilities customers, USD emphasizes the free energy assessment. A USD employee certified in performing energy assessments visits the home to evaluate the home efficiency, including attic and wall insulation levels, heating and cooling equipment age and efficiency, and window and door operation. One hundred and seventy eight customers participated in this program in FY2023, and USD estimates a peak reduction of 12 kW as a result, with an estimated annual energy usage reduction of 42,677 kWh.

The Air Conditioner/Heat Pump Replacement program is designed for customers who upgrade their heating and cooling systems. USD offers a rebate for the replacement of a cooling unit with an air conditioner or heat pump rated above minimum market efficiency requirements, meaning air conditioners must be a minimum of 14.3 Seasonal Energy Efficiency Ratio 2 (SEER2) and heat pumps 15.2 SEER2 to qualify. Rebates are structured based on the size and efficiency of the new unit and range from \$100-\$1,600. In FY2023, 286 applications for this program were approved for a total rebate payout of

\$147,663, an estimated peak reduction of 207 kW and an estimated annual energy usage reduction of 299,140 kWh.

The Home Performance with Energy Star program, which is focused on a whole-home approach, offers rebates, incentives and low-interest financing to customers for home efficiency improvements, including adding insulation, replacing windows and doors and home-envelope air sealing. USD partners with area contractors to do more thorough home energy assessments beyond what is covered in USD's free home energy assessment, including blower door testing to determine home air leakage and Combustion Appliance Zone testing to ensure safe operation of gas appliances. FY2023 saw 198 customers participate in this program, with a total rebate payout of \$97,991, an estimated peak reduction of 61 kW, and an annual estimated usage reduction of 211,105 kWh. Sixty-one of these customers also utilized the City's low-interest financing for a total of \$795,362, all of which was spent directly on home efficiency upgrades and costs associated with participation in the Home Performance with Energy Star program.

To facilitate a whole-home approach for income eligible households that might otherwise find it cost prohibitive, USD partners with the Community Development Department to offer increased rebates and loan terms to fit each household's situation and needs. Because of significantly increased funding from numerous sources recently, only one home participated in the Enhanced Home Performance with Energy Star Program in FY2023. In FY2023, USD pledged up to \$250,000 over five years to help fund Central Missouri Community Action's Weatherization Assistance Program for City of Columbia Utilities electric customers. The agreement helps ensure that qualifying households can make energy efficiency improvements at no cost. In order to continue to serve the income eligible community and allow USD time to implement programming reform to better meet the needs of our community, efficiency kits were distributed directly to income eligible households. In FY2023, 800 efficiency kits were delivered to households that had received pledges for energy assistance from Central Missouri Community Action and Columbia/Boone County Public Health & Human Services. City of Columbia Utilities spent \$16,108 to create and deliver the kits. Additionally, the income eligible A/C exchange program that is implemented in partnership with the Voluntary Action Center exchanged 15 inefficient window air conditioners for income eligible customers.

USD offers rebates to residential electric customers who install a Level 2 electric vehicle charger in existing or new construction homes. Information collected from this program will assist USD in developing future efficiency programs and assist CWL in identifying EV charge locations. FY2023 saw 13 customers participate in this program, with a total rebate payout of \$6,336.

Commercial Electric Programs

USD designs and implements programming for its commercial and industrial customers with two goals in mind: improve operational performance for customers and reduce peak demand on the utility and its infrastructure. Reducing utility expenditure for the utility's

largest customers will improve their operations and make their local site a more viable option for expansion and investment that drives economic development.

In addition, USD maintains a Key Account Program to aid in the operation of the utility's largest customers while fostering a mutually beneficial relationship. The Key Account Program builds strong relationships and provides prompt service for the City's largest utility customers with the aim of retaining these companies and their employees in our community. The key accounts customers' experiences with the City are enhanced by engagement with the utility, as the program creates efficiency, reduces redundancy and streamlines the customer process. In 2021, the City of Columbia adopted an Economic Development Job Creation Rider (EDJCR), designed to provide financial incentive for new or existing industrial customers within the Water & Light electric service area to help promote economic growth and job creation. USD has taken the lead to promote and develop this program while also promoting targeted resource conservation and efficiency efforts.

The Commercial Lighting Incentive Program offers a rebate for lighting efficiency improvements. Lighting is one of the largest consumers of energy in most commercial properties and is one of the cheapest and easiest ways to reduce utility expenses while lowering the utility peak demand. FY2023 saw 18 customers participate in the program for an estimated annual peak reduction of 297 kW and an energy usage reduction of 1,552,094 kWh. In total, these customers received a total rebate incentive of \$88,096.

USD also offers Air Conditioner/Heat Pump Replacement, Motors and Drives Replacement and Custom Rebate programs for qualifying customers. The Commercial Air Conditioner/Heat Pump Replacement rebate encompasses systems from 6 to 20 tons to include most commercial heating and cooling equipment. Through the Motors and Drives program, customers can upgrade to new, more efficient equipment to improve the reliability and reduce the cost to operate motor-driven equipment. The Custom Rebate Program allows customers to update outdated machinery to new equipment and receive an incentive for lowering their demand. Sixteen customers participated in these programs in FY2023, reducing the City's peak by an estimated 41 kW and energy usage by an estimated 275,733 kWh.

USD offers infrared scans of infrastructure and critical equipment as well as ultrasonic compressed air leak detection surveys to commercial and industrial customers. Infrared scans identify temperature abnormalities of electrical or hydraulic equipment, potentially identifying an issue before it causes a major shutdown and unplanned downtime. USD performs these infrared scans on the entire utility infrastructure annually. Similarly, compressed air leak detection surveys identify leaks in the compressed air system of major industrial customers, pinpointing spots that can be improved to reduce customer energy usage while improving general operation. USD performed 30 infrared scans and two air leak detection surveys for key accounts in FY2023.

Solar

USD encourages the installation of photovoltaic systems through incentives and loan offerings for residential and commercial electric customers. Rebates are offered through a tiered system based on the National Renewable Energy Laboratory's System Advisor Model, shade analysis impact and site specifics to incentivize the installation of systems that offset demand during the utility's expected peak occurrences. To reduce costs for customers and to increase access, low-interest financing of up to \$15,000 for residential customers and \$30,000 for commercial customers is available, given that certain minimum efficiency requirements are met. Additionally, USD maintains a list of solar contractors who are knowledgeable on the requirements and procedures in Columbia.

Rebates for solar installations are structured in a tiered system, with rebate amounts per kW of installed solar decreasing after the first 10 kW. The amount received within those tiers by the customer depends on the presence of shade and the direction faced by the array, with west-facing panels garnering the maximum amounts. Incentivizing the installation of west-facing panels ensures that the utility receives maximum benefit in the form of reduction to the peak, which typically occurs during late afternoons in the summer.

FY2023 saw 125 customers install photovoltaic systems for a total rebate issuance of \$491,665. These installations totaled 1,077 kW, with 337 kW going directly to reducing the utility's peak, and an estimated annual production of 1,307,176 kWh.

Water

USD offers two programs aimed at incentivizing water conservation for residential and commercial customers. The irrigation conservation program incentivizes the upgrading of irrigation appliances, such as sprinkler heads, rain sensors and smart irrigation controls; and the Efficient Flush program incentivizes the replacement of older, less efficient toilets with new WaterSense rated models.

Nineteen customers utilized the irrigation conservation program for a total rebate payout of \$2,782, while the Efficient Flush program had 272 participants who received a combined \$20,002 in rebates. In total, the upgrades made through these programs are expected to reduce the City's annual water consumption by 4,341 CCF. One CCF is equal to 748 gallons. These programs are expected to continue growing as awareness spreads and marketing efforts are increased. USD also provided water conservation kits to 800 income eligible households that had received pledges for energy assistance from Central Missouri Community Action to help reduce the customers' water consumption. City of Columbia Utilities spent \$16,108 to create and deliver the kits.

Education and Outreach

USD conducts education sessions at local schools on energy and water conservation. Staff works with teachers to facilitate these sessions and reach roughly 1,000 children

every school year. USD's educational programs are targeted to the students with activities that will appeal to their age group.

At local events – including the Home Show, the Heritage Festival and the Family Fun Fest – staff members interact with the community and promote energy and water conservation and other Utilities functions. At these events, staff will answer customer questions, provide best practices for energy and water conservation, and make sure the customers are aware of USD incentive programs.

USD also conducts outreach on energy and water conservation and other Utilities functions through traditional and digital media campaigns. Traditional material includes handouts and mailers as well as television and radio advertisements. Through digital media, USD promotes efficiency and incentive programs to thousands of followers on Facebook, X and LinkedIn. Campaigns are also promoted through targeted placement of online ads and search result rankings.

The communications team develops and publishes City Source articles and press releases and acts as the spokespersons for City of Columbia Utilities by responding to media inquiries. The communications team also assists in planning and hosting public meetings as well as performing edits and reviews on various reports and award applications for Utilities.

Future of Utility Service Programming

The 2021 IERMP outlined the energy conservation goals of 47,000 MWh and 17 MW of peak load reduction by 2030. However, the IERMP based these projections on the program participation from 2018 and 2019 continuing as a constant through 2030. These two years used in the IERMP as the baseline provided the greatest two years of combined energy conservation by USD programming. USD has experienced diminishing returns since 2019 in project participation due to market saturation, as most of the existing suite of programs were implemented between 2007 and 2012.

In order to achieve the goals as outlined in the 2021 IERMP, USD has reviewed the existing suite of programs for increased opportunities and efficiencies and is proposing a revised suite of programs with the intent of reviewing programs on a triennial basis. This includes reviewing existing programs and evaluating new programs for rebates and incentives. The proposed revised suite of programs for FY2024 includes:

- Commercial Custom Rebate
- Commercial Daylight Harvesting
- Commercial Variable Frequency Drives
- Commercial Kitchen Equipment
- Commercial Lighting
- Commercial and Residential AC/Heat Pump Replacement
- Commercial and Residential Efficient Flush

- Commercial and Residential Efficient Irrigation
- Commercial and Residential Heat Pump Water Heater
- Commercial and Residential Solar (Distributed Generation)
- Residential Attic Plus
- Residential Efficient Electrification
- Residential EV Charger Rebate
- Residential Home Performance with Energy Star
- Residential Income Eligible Programs
- Residential Smart Thermostat Rebate

Additionally, the Inflation Reduction Act (IRA), has created potential funding opportunities for energy efficiency through the Missouri Department of Natural Resources. The proposed new suite of efficiency programs from City of Columbia Utilities is designed to align with the federal requirements for the IRA, when feasible, to increase incentive opportunities for customers. However, this funding likely will not be available to Missouri residents until 2025 or later.

Conclusion

USD's focus on resource conservation and customer outreach is a reflection of the Columbia community. USD's customer-centric approach to utility engagement positively impacts Columbia by:

- Reducing strain on the utility's infrastructure as the City and surrounding areas grow;
- Improving living and financial conditions for residents;
- Improving operational efficiency and the bottom line for businesses;
- Meeting the City's Strategic goals and climate and environmental initiatives;
- Reducing operational costs for the utility.

With the 2021 IERMP as its guide, USD has developed and proposed a revised suite of programs for potential implementation. The revised suite of USD programming will assist in reaching both City and Utilities goals.

USD remains committed to the mission of creating, evolving, improving and promoting demand-side management programs to improve operational performance. These initiatives were designed and implemented to meet the needs of and improve the outcome for every Columbian.