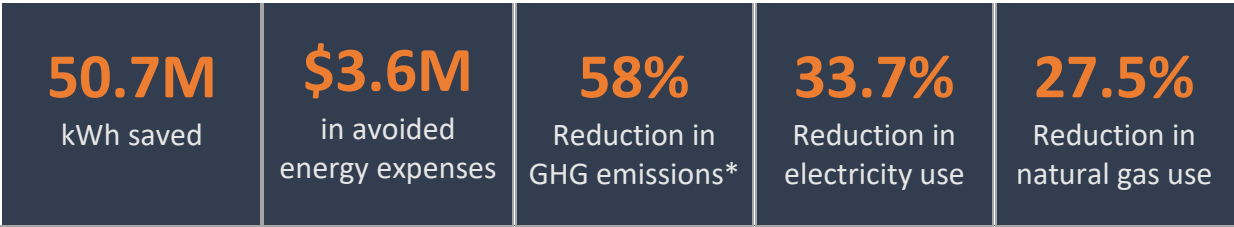




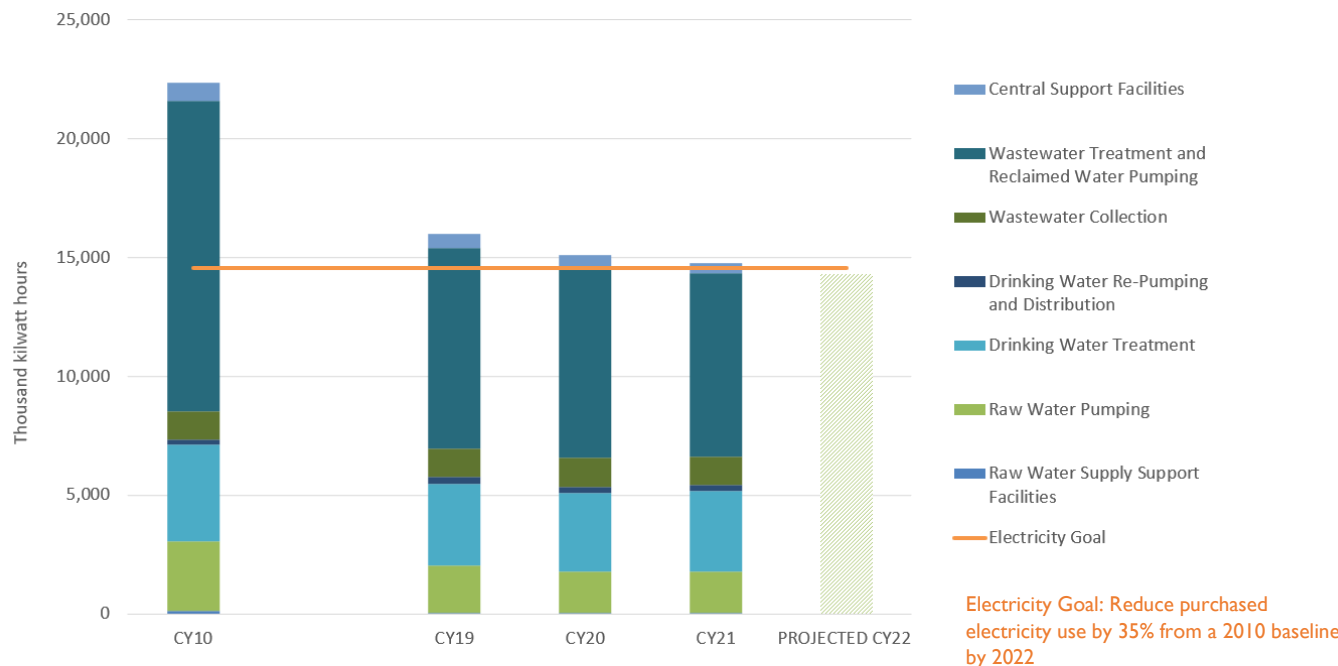
OWASA’s Energy Management Program is a comprehensive and inclusive approach to managing electricity and natural gas use across the organization. Over the past decade, we have made tremendous progress, not just in reducing our energy use and greenhouse gas emissions, but in embedding energy into our decision-making on capital improvements, operations, and maintenance activities. By reducing our use of energy and increasing our use of renewable energy sources, we reduce the environmental impact of our operations, lower operating costs, and improve the reliability of the services we provide.

IMPACT SINCE 2010 BASELINE



*Duke Energy has reduced the carbon intensity of their portfolio by 39% since 2010. OWASA’s energy management efforts are responsible for the other 19% reduction in greenhouse gas emissions.

ELECTRICAL ENERGY USE





INVESTING IN CLEAN ENERGY

Solar array at Biosolids

After a comprehensive analysis and implementation of energy conservation and investment in cost-effective energy efficiency projects, we identified renewable energy as an important strategy to achieve OWASA's energy goals. We have engaged in a series of solar lease projects that, through a public-private partnership, will achieve costs savings in the early years of the program.

In late 2020, our first solar lease project, a 145kW ground-mounted solar PV system was connected to the grid. 2021 saw the addition of two more projects: a 102kW solar array on the rooftop of the Administration building and a 62kW system atop the Operations Center. In 2021, our solar PV systems generated over 258,000 kWh (1.1% of our 2010 baseline energy use) and saved OWASA over \$20,000 in purchased power from Duke Energy. **The \$20,000 in savings were greater than the \$19,100 in pro-rated lease payments made for the systems.** With a full year of production from these three systems, we anticipate that they will generate over 420,000 kWh of renewable energy in 2022.

Next up: OWASA will break ground on our fourth – and largest – solar array at Cane Creek Reservoir in Spring 2022. This 350kW project is projected to produce over 524,000 kWh of renewable energy in its first year of operation. This project will take us across the finish line on our Energy Management Plan electricity goal.

These projects were made possible thanks to solar rebates from Duke Energy and a \$75,000 grant from the Orange County Climate Action Fund.



OWASA Youth Water Academy scholar, Srinath Iyer, analyzed our solar production data for a service-learning project.



Rogerson Drive Pump Station

OWASA's two energy management teams, one at the Wastewater Treatment Plant and the other at the Water Treatment Plant, as well as the CIP Team, completed several key energy-saving projects this year.



SAVING WATER SAVES ENERGY

In 2021, it took over 2,200 kwh of electricity to treat and deliver a million gallons of potable drinking water and another 3,300 kWh to collect and clean a million gallons of wastewater. Simply put, saving water saves energy. In 2021, our Wastewater Team conducted a water audit that identified opportunities to reduce potable water use, including a modification to the Rogerson Drive Pump Station that will save approximately 200,000 gallons of potable water use per month.



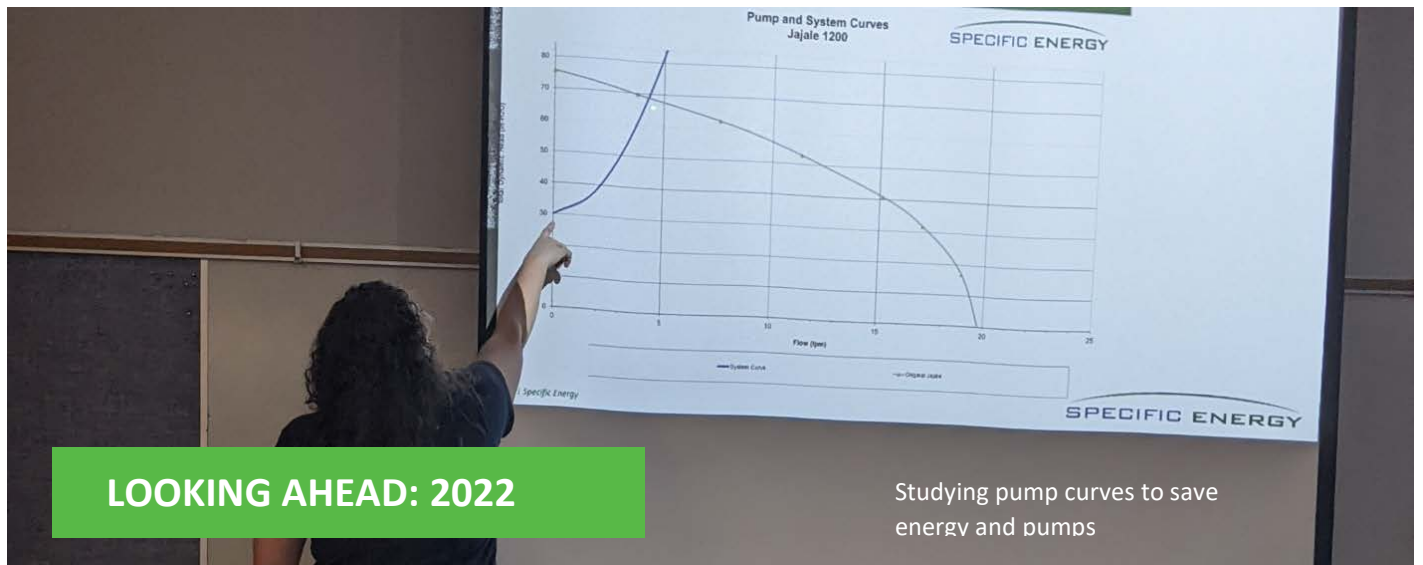
OPTIMIZING PUMPS

A new finished water pump and a new variable frequency drive (VFD) was installed at the Water Treatment Plant that we estimate will save about 90,000 kWh per year. A second dynamic pump optimization tool was installed at the Rogerson Drive Pump Station in early 2022. This tool will help us visualize how efficiently the pumps are running, which can give staff an early warning sign that the pumps are not operating properly and offer recommendations for energy efficiency.



BACKWASHING MORE EFFICIENTLY

Sometimes, saving energy doesn't require a huge investment, just a little ingenuity. In 2021, Wastewater Treatment Plant staff gradually reduced the frequency in which they perform high-energy cleanings of filters. Backwashes were gradually reduced from 14 filters cleaned per week to ten. We estimate that this small change will save about 12,000 kWh per year (which is equivalent to the average annual household energy use).



- The Cane Creek Solar array is projected to generate about 524,000 kWh of renewable energy over the course of a year; this represents about 2.3% of OWASA's energy use in our baseline year of 2010.
- The Wastewater Treatment Plant Master Plan will recommend improvements focused on optimizing treatment and preparing for future needs. We will also consider the operational impacts of co-digestion, which is an economically critical component of a viable biogas-to-energy strategy.
- A new oxidation-reduction potential monitoring program at the Wastewater Treatment Plant has the potential to allow us to turn down the high-energy aeration blowers and increase denitrification.
- An analysis of the non-potable water pumps at the Wastewater Treatment Plant will determine what changes and modifications can be made to this system to make it more energy efficient.
- A preliminary engineering review of wet well mixing strategies at Rogerson Drive Pump Station will consider the capital and operational costs and benefits of alternatives, including energy savings.
- A proposed pump station evaluation of the raw water pump stations at University Lake and Cane Creek will recommend opportunities to operate the pump stations more efficiently.
- Staff continue to build skills through trainings offered through the Dept. of Energy's Sustainable Wastewater Treatment Infrastructure of the Future (SWIFT) Program and through continuing education training on pump hydraulics and optimization.

