

# Santa Rita Water Reclamation Center

## Government/Municipal

### The Challenge

Located next to the Animas River in Colorado's San Juan Mountains, the City of Durango's Santa Rita Water Reclamation Facility hadn't been updated since the mid-1980s. It was well overdue for an upgrade to meet growing capacity demands and stricter regulatory requirements. The plant, which uses microorganisms to remove phosphorus, nitrogen, and other organic material from the service area's wastewater, serves a population of around 17,000 residents. That number can nearly double throughout the year with the ebb and flow of tourists, college students, employees, and other visitors to the popular mountain town.

A 2015 assessment of the outdated facility resulted in approval for the plant's overhaul and expansion, and to meet strict environmental regulations. In addition to new anaerobic digesters, primary sludge station, dewatering facility, odor control tanks, and UV disinfection buildings, the project included the addition of two new microturbine generators to provide power to on-site operations and deliver substantial environmental benefits.

### The Solution

Comprised of three Capstone C65 ICHP microturbines (one previously installed on site), the new cogeneration power system generates 195 kW of electricity, supporting some of the site's 2.2

### Power Profile

#### Customer

Santa Rita Water Reclamation Center

#### Location

Durango, Colorado, U.S.

#### Commissioned

2019

#### Fuel

Biogas

#### Technologies

- (3) C65 ICHP Microturbines

#### Capstone Green Energy Distributor

Horizon Power Systems



**The city of Durango takes great pride in ensuring that all of its operations are sustainable, and the wastewater treatment plant is no different."**

— Jarrod Biggs  
Assistant Utilities Director

An aerial photograph of the Santa Rita Water Reclamation Center, showing various industrial buildings, tanks, and infrastructure. The entire image is overlaid with a semi-transparent green filter. The text "Smarter Energy for a Cleaner Future" is written in white at the bottom right.

**Smarter Energy  
for a Cleaner Future**



**Three C65 ICHP Capstone microturbines at Santa Rita Water Reclamation Center convert the methane-rich biogas from the digestion process into clean, reliable and cost effective power.**

MW peak load. As a wastewater treatment plant, the site has a free and renewable supply of fuel from the biogas produced by the anaerobic digesters. These digesters biologically degrade solids, and as microorganisms degrade solids, they produce methane gas (biogas) that is channeled for use to fuel in the microturbines. This microturbine-generated electricity offsets the power used by the other treatment processes as well as a percentage of utility-delivered power.

The two new turbines are grid-connected. Each can produce approximately 65 kW of energy and is equipped with stainless steel integral heat exchangers. With one unit designated as the primary unit, the system is designed to flexibly ramp up and down units based on biogas production. When additional biogas is produced due to greater flow through, additional microturbines can be started. For added flexibility, the CHP system can also be fueled by methane gas and natural gas.

## The Results

Biogas is increasingly used as a fuel in combined heat and power (CHP) systems across the U.S. Wastewater treatment plants that use anaerobic digestion have consistent electric and thermal loads that can support on-site CHP. The digestion process generates a renewable, methane-rich biogas that can power CHP systems. These systems can provide enhanced on-site reliability and resilience, reduce greenhouse gas (GHG) emissions, and lower energy costs for the water treatment facility.

Prior to the installation, the city's on-site energy production effort at the wastewater treatment plant generated approximately 400,000 kWh, which accounted for 12% of the facility's annual energy use. By adding another anaerobic digester and the two turbines, the city increased on-site renewable energy production as a result of the wastewater treatment plant processes.

Beyond the air quality benefits of capturing and using methane as a fuel source, the new microturbine system at the Santa Rita Water Reclamation Center has reduced levels of phosphorous and nitrogen in treated wastewater that otherwise could lead to algae blooms that can suffocate fish. What's more, the system ensures future compliance with regulatory requirements and provides capacity that can accommodate future growth. Without microturbine system, the plant would have to flare the methane gas, which is less environmentally friendly and makes compliance much more difficult.

In 2018, the U.S. Environmental Protection Agency (EPA) nationally recognized the innovation and enhanced performance of the renovated plant. In its overview of plant upgrades and new equipment, the EPA led with a description of the microturbines and anaerobic digesters.

## Capstone C65 ICHP Microturbine



**A C65 provides up to 65kW of electrical power while the UL-Certified C65 ICHP provides up to an additional 150kW of thermal power for CHP and CCHP applications.**