CHALLENGE:

Some of the biggest challenges facing the Wastewater industry include reducing operating costs, solving waste disposal problems, and meeting clean air permitting requirements that continue to become more stringent.

FuelCell Energy solutions address these challenges, offering wastewater treatment facilities a clean, affordable, and efficient on-site power generation solution that results in operating cost savings and supports sustainability initiatives.

SOLUTION:

Fuel flexible Direct FuelCell® (DFC®) power plants utilize renewable biogas from wastewater processing to generate on-site power and heat in an economical, highly efficient and sustainable manner. Methane produced in the anaerobic digester is cleaned and directed into the fuel cell to generate electrical power for the water treatment plant. Concurrently, high quality heat from the fuel cell power plant heats the sludge in the digester to facilitate the anaerobic digestion process, which in turn produces the methane utilized by the power plant for a circuitous loop of sustainability.

This combined heat and power (CHP) application leads to very high system efficiencies that support both economics and sustainability programs. As a renewable energy source, biogas is considered carbon-neutral.

The volume of the digester gas produced can vary during the day and seasonally. FuelCell Energy has expertise with automatically blending the digester gas with natural gas as needed, ensuring a consistent and reliable fuel supply to generate continuous ultra-clean power. Based on our experience, the minimum required daily flow to support the fuel requirements of a megawatt-class fuel cell power plant is 30 million gallons of wastewater.
Customer:  
City of Riverside, California

Location:  
Riverside Regional Water Quality Control Plant

Size:  
1.4 megawatt (MW)

Operational Date:  
Fall 2016

Project Highlights

• The 1.4 megawatt fuel cell plant cleans utilizes biogas from the wastewater treatment process to generate carbon-neutral power and heat for the facility
• The City of Riverside, California pays for the power produced under a power purchase agreement (PPA), generating immediate savings, avoiding a capital outlay and eliminating a waste disposal issue
• The continuous power profile of the fuel cells enhances the facility’s energy resiliency with affordable on-site power and supports the treatment process; using approximately two thirds of the biogas generated to produce about one third of the total power needs as well as heat used for the anaerobic digesters
• Avoidance of current and future clean air permitting challenges as fuel cells utilize an electrochemical process that produces power in a manner that is virtually absent of criteria pollutants such as nitrogen oxide (NOx) that causes smog, sulfur dioxide (SOx) that contributes to acid rain, or particulate matter that can aggravate asthma
• Complete turn-key solution whereby FuelCell Energy installed, operates and maintains the fuel cell power plant, including the cleaning and processing of the renewable biogas

"FuelCell Energy provided us with a comprehensive power generation solution that not only supplies our facility with carbon-neutral electricity and heat, but disposes of a waste gas from our wastewater process and saves us money."

- Craig Justice, Deputy Public Works Director
  Riverside Regional Water Quality Control Plant