

# Case Study



## Cogeneration and Grease Receiving Project

City of Millbrae, California  
Water Pollution Control Plant



### Background

The City of Millbrae owns and operates a Water Pollution Control Plant (WPCP) to serve its 21,000 residents. More than 50 years old, the WPCP had a small 75-kW internal combustion electrical generator fueled by biogas from the plant's digesters. The generator required frequent maintenance and replacement parts were difficult to obtain. The City also faced other significant costs to modernize and update various plant processes.

### Solution

Working with the City of Millbrae, Chevron Energy Solutions created a solution that featured engineering

design, procurement, and turnkey construction of a cogeneration system and grease receiving facility that serves both electric and thermal treatment loads. The new cogeneration system is a 250-kilowatt natural gas (methane) and biogas-fired microturbine generator system that includes a fuel treatment and blending facility.

Included in the project is a new grease receiving station. The grease, a commercial kitchen byproduct, is received from hauling companies and added to the facility's digester. This action results in a significant increase in digester biogas production. The increased biogas (mostly methane) is a free source of additional microturbine fuel.

Other facility upgrades consist of a new compressed natural gas storage facility with the capacity to power the cogen system for 24 hours if both natural gas and biogas are lost, a treatment system for removal of H<sub>2</sub>S and siloxanes, a thermal recovery heat exchanger, sludge heat exchanger, backup hot water heater, new facility switchgear, and ancillary electrical equipment and controls.

### PROJECT FEATURES

- Self funding
- Guaranteed cost and savings
- Turnkey project and construction management
- Streamlined development, design, and implementation
- Efficient use of taxpayer dollars
- Encourages responsible grease disposal
- Reduces greenhouse gas emissions

The new cogeneration system runs in "island mode," replacing a 34-year-old diesel standby generator and enabling it to serve critical plant operations in the event of a utility blackout.

### Benefits

This project delivers multiple benefits to the City of Millbrae.

- Project is funded by energy savings and new tipping fees that pay for several million dollars worth of planned facility



- improvements at no cost to the City's ratepayers
- The cash flow model includes all costs associated with routine maintenance, emergency repair, and renovation of electricity generating equipment
- Upgraded system increases production of green power to 80% and provides the City with a source of electric power that is independent of the utility grid
- City collects new revenue in the form of tipping and disposal fees from grease hauling companies
- Anticipated \$200,000 rebate
- Facility allows for lawful and responsible disposal of grease and reduces the emission of greenhouse gases which benefit the environment

## QUICK FACTS

City of Millbrae, California  
Water Pollution Control Plant

### Cogeneration and Grease Receiving Project

Project Value	\$5.5 million
Project Scope	<ul style="list-style-type: none"><li>250-kilowatt dual-fuel microturbine</li><li>Thermal recovery heat exchanger</li><li>12,000-gallon grease storage tank</li><li>Compressed natural gas storage</li><li>Fuel treatment system</li><li>Digester mixing process improvements</li></ul>
Project Partners	City of Millbrae - owner/operator Chevron Energy Solutions - project developer/ prime contractor Kennedy, Jenks - project design and engineering D. W. Nicholson - project construction contractor

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