Chevron Energy Solutions Cogeneration and Grease Receiving Station Projects

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Chevron

- Largest Renewable Energy Producer among global oil and gas companies
  - Wind Farms
  - Solar Installations
  - Largest Geo Thermal Producer

- Chevron invested over $1.5B in clean energy technologies including hydrogen, solar PV, fuel cells and advanced batteries. Over $2.5B more slated.

- Chevron Energy Solutions
City of Millbrae, CA Cogeneration and Grease Receiving Project Background

City of Millbrae owns and operates a Water Pollution Control Plant to serve 21,000 residents.

- 50 years old – Design capacity of 3 MGD
- Small 75-kw internal combustion electrical generator fueled by biogas from the plant’s anaerobic digesters
- Generator required frequent maintenance
- Replacement parts difficult to find
- City faced significant costs to modernize and update various plant processes ($30M)
City of Millbrae, CA Cogeneration and Grease Receiving Background

- City was already successfully operating cogenerator so couldn’t take credit for electricity generated by existing IC engine

- Looked for ways to increase methane production to make larger generation capacity a possibility

- City had some confidence level that addition of grease would increase methane production based on previous historical data

- Once we settled on grease receiving station, city opted to maximize amount of work which could be done on a self funding basis
City of Millbrae, CA Cogeneration and Grease Receiving Project

- $5.5 Million worth of improvements at no additional cost to city’s ratepayers
- Project produced savings and additional revenue from grease disposal fees of $366,000
- Provided increase WWTP utility savings from additional digester produced methane fuel for microturbine
City of Millbrae, CA Cogeneration and Grease Receiving Project Solution

A solution that featured engineering design, procurement, and turnkey construction of a cogeneration system and grease receiving facility.

- Project Value: $5.5M
- 250 kilowatt dual-fuel microturbine cogeneration system
- Thermal recovery heat exchanger
- 12,000 gallon grease storage tank and receiving station
- Compressed natural gas storage
- Fuel treatment and blending facility
- Electrical Switchgear
- New Digester Mixing System
New Grease Receiving Facility

- More than 3,000 gallons of restaurant grease is delivered each day
- Grease disposal haulers empty into the grease receiving station
- Increase in methane production, originally modeled at 30% is actually a 100% increase from pre-project quantities
Gas is used to fuel the new 250KW microturbine cogenerator to produce electricity and plant boiler for heat.

Meanwhile excess heat produced by microturbine warms digester tanks for optimum methane production.
Scope also included:

- A card reading system allows for off-shift unattended operation by grease hauling truckers
- Automatic grease sampling system for tracking purposes
- Tank odor control system
- Truck Washing station
Putting Waste to Energy = Green Power

- Upgraded system increases production of green power to 80% - still increasing
- Provides City with a source of electrical power that is independent of the utility grid
- Disposal of sludge has fallen more than 25% since addition of grease to digesters
- Saves over 1.2 Million pounds of greenhouse gas emissions
- Equivalent of planting 150 acres of new trees

CES President Jim Davis, City Mayor Robert Gottschalk and Alexis Strauss, Director U.S. EPA
City of Rialto, CA Cogeneration and Grease Receiving Project (in design)

A solution that features engineering design, procurement, and turnkey construction of an entire wastewater treatment plant at no new costs to existing ratepayers

- Project Value: $50M
- Replace existing 8 MGD plant with new 12 MGD plant (completed in stages)
- Grease receiving station
- 3 250 kW Fuel Cells fueled by methane from the digesters
- New gravity flow design for plant
Questions

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