Biogas Cogeneration Facility

Recent PWD project provides up to 85% of on-site electricity needs with green energy.

In December 2013, the Northeast Water Pollution Control Plant began generating green power. A new facility was constructed to capture methane generated from the existing wastewater treatment process. The captured biogas is fed to four internal combustion engines which can provide the plant with up to 85% of its electrical requirements. Furthermore, useful heat is recovered from the system and used for process heating needs at the plant.

How Biogas Cogeneration Works

Biogas is produced by the anaerobic decomposition of organic matter in a wastewater treatment plant’s anaerobic sludge digesters. Digester biogas is treated to remove impurities before being used as fuel in large engines that generate electric power. Look on the back of this sheet for an infographic detailing the whole process at our facility.

Visitors take a look at one of the four cogen engines.

The Northeast Water Pollution Control Plant biogas cogeneration facility.

In alignment with the City’s Municipal Energy Master Plan, the Philadelphia Water Department developed a Utility-Wide Strategic Energy Plan, establishing energy conservation and greenhouse gas reduction objectives for the Department.
How Biogas Cogeneration Works

Here is a detailed look at the process.

**INPUT**
Wastewater solids are fed to 8 2-million-gallon anaerobic digesters.

**GAS OUTPUT**
1.6 million standard cubic feet per day, 63% methane.

**SOLIDS OUTPUT**
Remaining solids are removed and transported for processing.

**ANAEOROBIC DIGESTERS**

**HEAT EXCHANGE**
Heat from the co-generation engines is used to warm the digesters to 97°F.

**BOILER**
If the heat from the engines is not sufficient to warm the digesters, the boiler acts as a back up.

**COMPRESSION**

**PURIFICATION**

**SAFETY FLARES**
If there is an emergency, these 4 flares can safely burn off excess gas.

**STORAGE**

**ANTI-BODY**

**CO-GENERATION ENGINES**
The compressed bio-gas fuels 4 20-cylinder engines. Each produces 1,417 kilowatts at 13,200 volts and 280 million BTH.

**ELECTRIC OUTPUT**
The electricity produced by the co-generation engines is used in the entire facility.

**NATURAL GAS SUPPLEMENT**
If there is not enough biogas available to run the engines and/or the boiler optimally, natural gas can be blended with biogas to make up the difference.

**PURIFICATION**
Hydrogen sulphide removal.

Siloxane removal.

Siloxane removal.

Siloxane removal.