Landfill Gas Facility

Landfill Gas Project Generates Green (Renewable) Power

In 1983, long before the benefits of "green" energy and the negative effects of greenhouse gases such as methane were realized, the Monterey Regional Waste Management District developed one of the first landfill gas-to-electric energy plants in the nation. Methane and carbon dioxide gases are byproducts of the anaerobic decomposition of refuse in the landfill. The District's landfill gas system now collects 610 million cubic feet of gas per year (about 50% methane and 50% carbon dioxide) from refuse buried since the Monterey Peninsula Landfill opened in 1966.

EMCON Associates designed the original well field and promoted the project. Perennial Energy, Inc. designed and installed the first engine generator system. The project was developed by Palmer Capital of Chicago and financed by the Bank of New England.

In 1986 the MRWMD acquired the engine system, and EMCON purchased the gas rights and collection system. In 1994, the project was expanded. A new 3,200-sq.-ft. building was constructed to house up to four engine generators and switchgear equipment. A third generator was installed, enlarging the overall production capacity of the facility to 2,100 kW. The expansion of the project enabled the District not only to produce enough power to meet all of its own needs but also to generate a greater surplus of electricity to sell to P G & E. The 1994 expansion of the project was designed by District staff, the Paul Davis Partnership, and Applied Power. It was constructed by Daniels and House Construction.

The MRWMD was the first in the U.S. to use Austrian-made Jenbacher engines. They were installed in 1997, 1998 and 2002. These engines are designed to burn landfill gas and are used extensively in Europe and other parts of the world. In early 2006 the District replaced the first engine with a new CAT 3520 landfill gas engine which delivers twice the amount of electricity over the original engine.

Currently, the system collects more than 1.5 million cubic feet of gas per day from a 120-acre area containing refuse buried for nearly 40 years. It includes 41 horizontal and vertical gas wells in the active areas of the landfill. Instruments monitor each well and collect data to allow maximum production and ensure minimum gas emissions from the landfill to the environment. As part of the District's environmental monitoring program, probes have been installed to detect migrating landfill gas.

The project's four generators now provide approximately 4.6 megawatts of clean alternative power, meeting all of the District's own power needs and supplying electricity for nearly 4,000 homes. Heat exchangers capture waste heat from the radiators and send it to District buildings for heating and to produce hot water. By using its own power, the District saves approximately $230,000 per year. During the fiscal year 2006-07, gross revenues from electricity sales totaled $1.75 million. Total power produced since 1983 is over 320 million kilowatt-hours and total project revenues have surpassed $17 million.

The District is a "Partner" in U.S. EPA's Landfill Methane Outreach Program. The electricity generated by the project is classified by the state and federal authorities as renewable or "green" energy. In 2007, the project received the Gold Excellence Award from the Solid Waste Association of North America in the Landfill Gas Utilization category.

Monterey Regional Waste Management District

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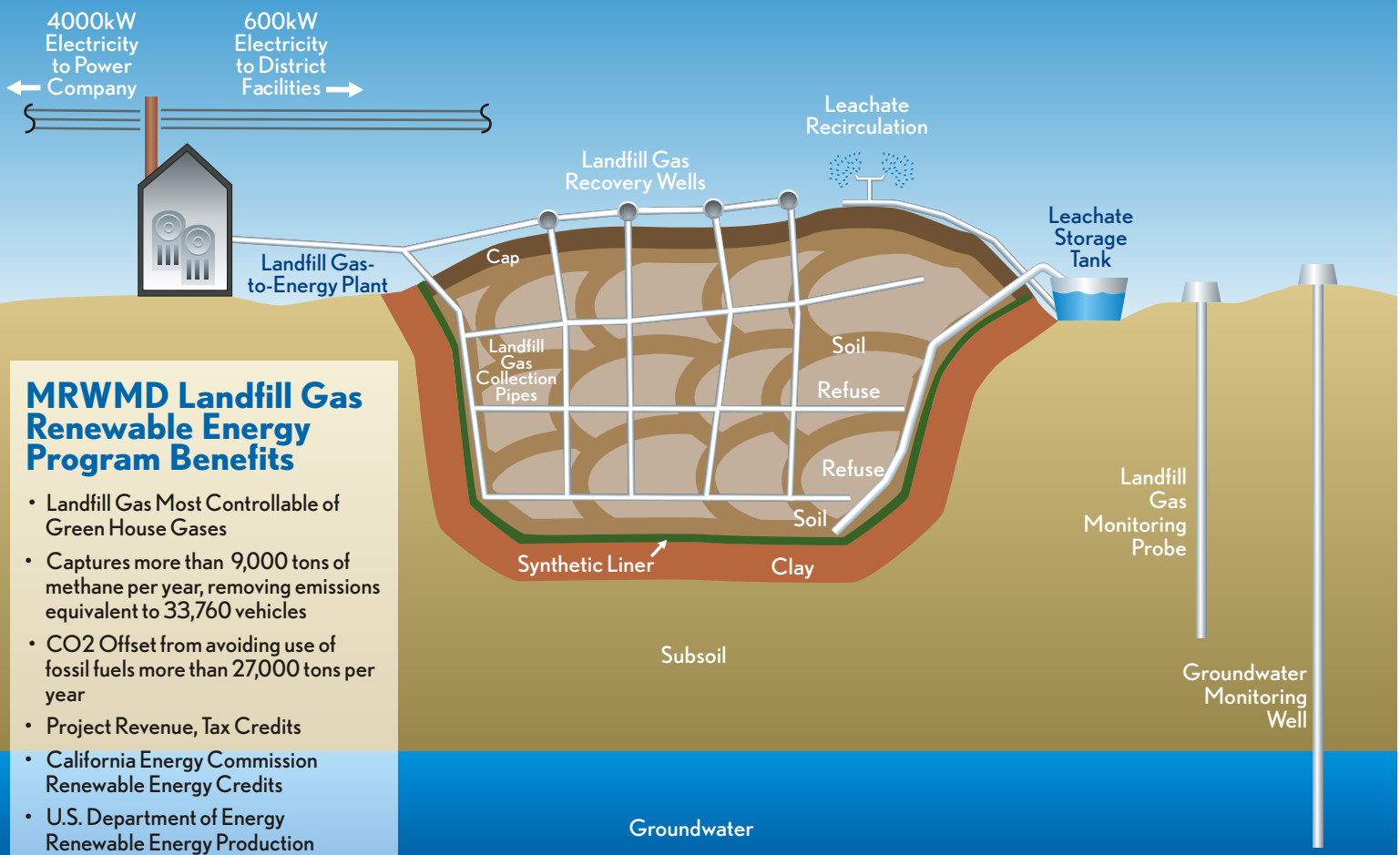
MRWMD Landfill Gas-to-Electricity Facility

How the Monterey Peninsula Landfill Works



MRWMD Landfill Gas Renewable Energy Program Benefits

- Landfill Gas Most Controllable of Green House Gases
- Captures more than 9,000 tons of methane per year, removing emissions equivalent to 33,760 vehicles
- CO2 Offset from avoiding use of fossil fuels more than 27,000 tons per year
- Project Revenue, Tax Credits
- California Energy Commission Renewable Energy Credits
- U.S. Department of Energy Renewable Energy Production Incentives

Twin trailer mounted generators were first installed in 1983.

Staff measure landfill gas flow, composition and check for potential gas migration.

LFG building today showing waste heat recovery radiators.

Printed on 100% recycled, 100% post consumer waste, processed chlorine-free, using soy-based inks.