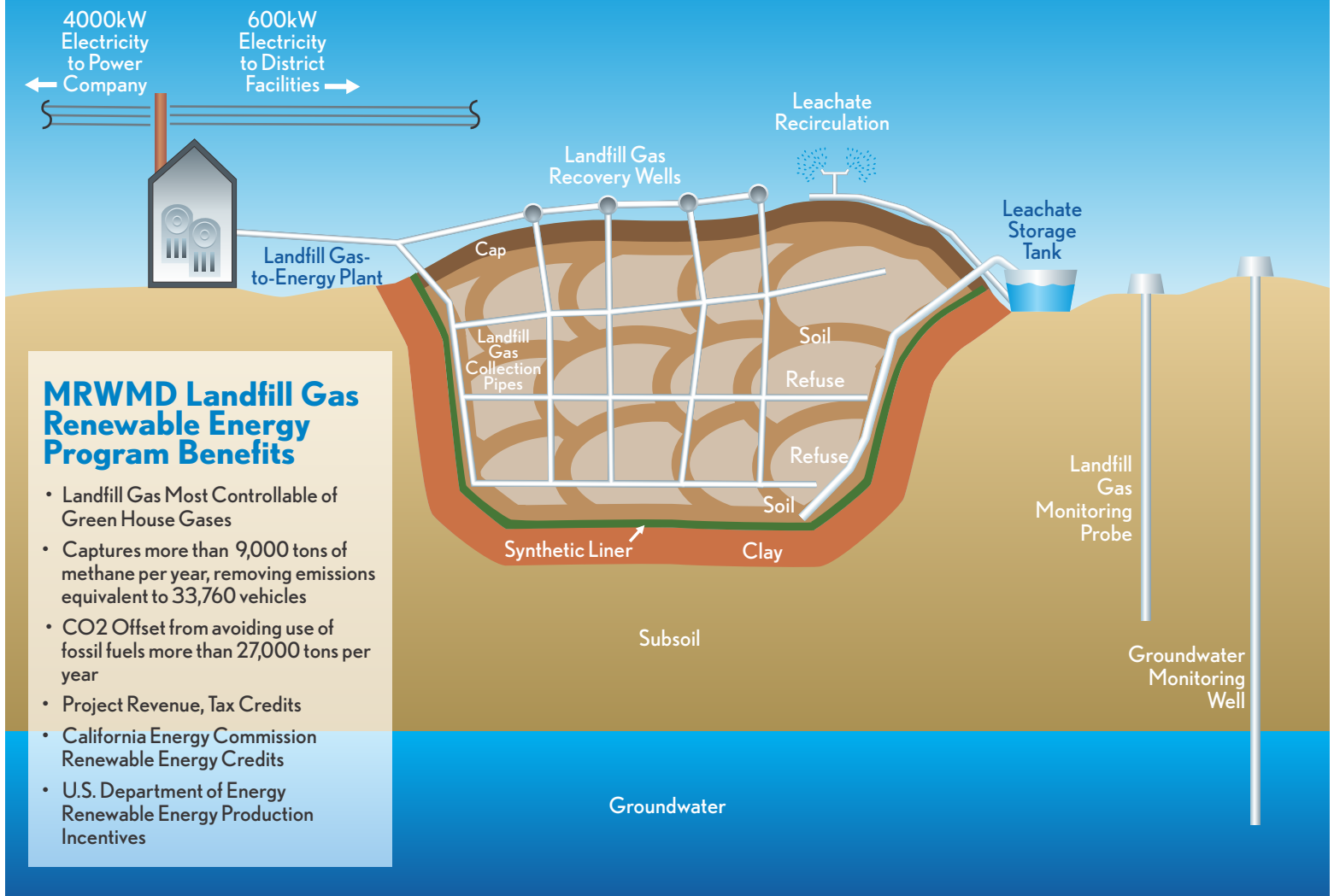


MRWMD Landfill Gas-to-Electricity Facility

How the Monterey Peninsula Landfill Works



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.



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 approximately 920 million cubic feet of gas per year (about 50% methane, 50% carbon dioxide, and other trace gasses) 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 PG & 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 Caterpillar 3520 engine and in 2009 the original Jenbacher was replaced with a Jenbacher GS420 engine; each significantly increasing the electricity produced.

Currently, the system collects more than 2.6 million cubic feet of gas per day from a 120-acre area containing refuse buried since 1966. It includes 63 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, at 1,000 ft. intervals surrounding the landfill.

The project’s four generators now provide approximately 5.0 megawatts of clean alternative power, meeting all of the District’s own power needs and supplying electricity for nearly 4,000 homes. The heat exchangers are designed to 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 \$350,000 per year. Annual gross revenues from surplus power sold currently averages between \$2,500,000 to \$3,000,000.

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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