



**MIDWEST
CHP
APPLICATION
CENTER**

In Partnership with
the US DOE

distributed generation in landfills

Onyx Seven Mile Creek Landfill

2.73 MW DG Application

Project Profile

Quick Facts

Location:

Eau Claire, Wisconsin

Prime Mover:

3- Waukesha Reciprocating Engines

Total Generating Capacity:

3 MW Gross

2.73 MW Net

Operation Date:

March 2004

Utilized Fuel:

Landfill Gas (methane)

Energy Impact:

Renewable Energy Source

Enhances Region's Power

Implementation Cost

\$5,000,000 (~ \$1,700 / kW)

Partnership Between:

Dairyland Power

Onyx Waste Services Inc.

Eau Claire Energy Cooperative

Project Overview

Onyx Waste Services, Inc. is the owner of the Seven Mile Creek Landfill. The Eau Claire Energy Cooperative is the local power company that provides reliable and affordable electricity, propane gas, and related energy services to over 9,500 members, including the landfill site. Dairyland Power is a wholesale producer of electric power which services 25 electric distribution cooperatives (including Eau Claire) and 20 municipal utilities.



Seven Mile Creek landfill

A partnership between Onyx Waste Services, Eau Claire Energy Cooperative and Dairyland Power was formed to create a renewable energy source to enhance the region's power supply. Dairyland Power owns the distributed generation equipment located at the landfill site. The methane gas collected from the landfill is sold by Onyx as fuel for the DG system. The power generated at the site is interconnected into the electric grid and becomes a part of the Dairyland power network. The power generated is credited towards the renewable energy requirements required in the State of Wisconsin. This is a win-win situation for all in the partnership.

The landfill / DG system was designed and installed by Ameresco, a national leader in the development of landfill gas – to – energy projects. The system has a 3 MW capacity which includes 3 Waukesha reciprocating engines driving three 1 MW generators. The landfill generates electrical energy 24/7 with an average availability of 95%. This system generates 22,694,000 kWh per year. The project lowers state energy costs and accounts for 0.4% of Dairyland's requirements.

The Partnership

- Onyx Waste Services, Inc.: Owns and operates the landfill. They also supply methane gas from the landfill site.
- Dairyland Power: Owns the DG equipment, purchases the methane gas, and produces electricity from a renewable resource.
- Eau Claire Energy Cooperative: Distributes power to its cooperative members.

Benefits of CHP

- Meet State Renewable Energy Requirements
- Improve Electrical Reliability
- Provide Clean Energy Source
- Utilize an Opportunity Fuel



Three 1 MW Waukesha Reciprocating Engines

Providing Clean and Reliable Energy

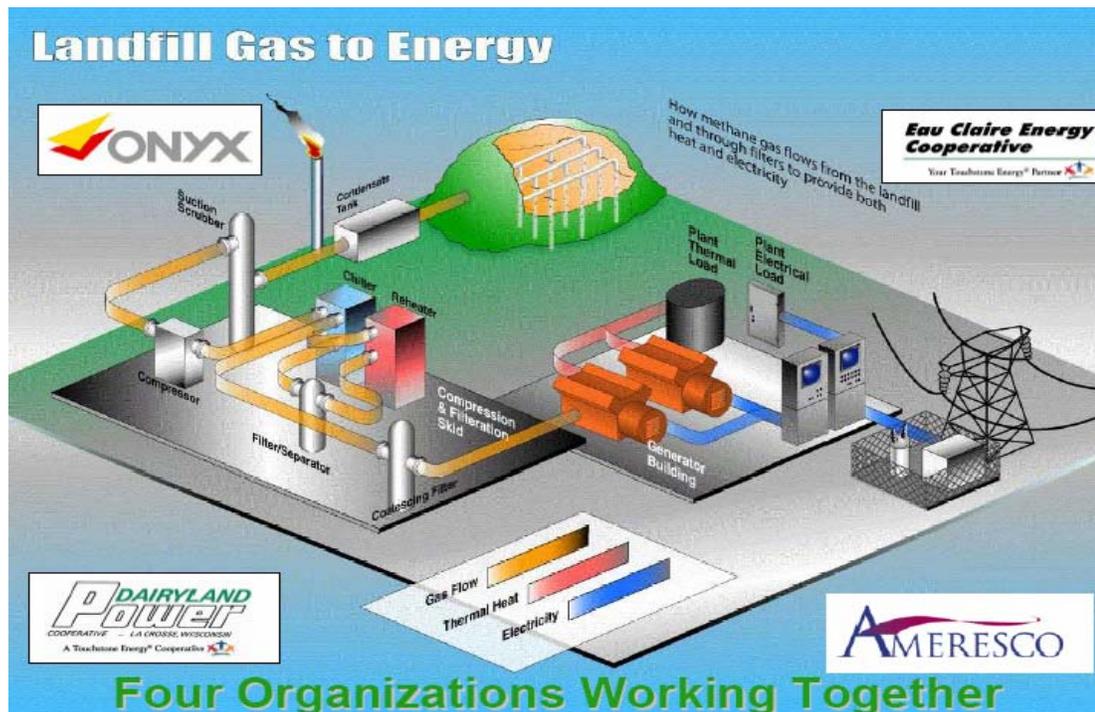
- Air quality will be enhanced by harnessing the methane gas as a “green” fuel rather than flaring it to the atmosphere
 - This program will result in 13,000 less tons of coal burned (equivalent to removing over 26,000 polluting cars from Wisconsin’s roads) per year, improving air quality through reduced emissions.
- The facility produces a net 2.73 MW output from the 3 engine - generators on a 24/7 basis.
 - The electricity from the units can power the equivalent of approximately 2,600 homes.
 - The landfill is capable of providing fuel to generate up to 5 MW (potential expansion)

U.S. EPA Honors Ameresco and Dairyland Power for Landfill Gas Work

Every year, the U.S. Environmental Protection Agency (EPA) Landfill Methane Outreach Program (LMOP) recognizes noteworthy landfill - to - gas energy projects that have made significant contributions to the industry by using methane as a renewable resource to generate electricity, heat, hot water, and benefit the environment. In 2004, the Oynx Landfill project was recognized with awards issued to both Ameresco as “Industry Partner of the Year” and to Dairyland Power as “Energy Partner of the Year”

"Now, this is progress. We are making the world a cleaner place simply by making the electricity we all need in our modern lives with this new facility. Cooperative members want more renewable energy in their power supply, and Dairyland is excited to provide the latest in efficient renewable generation to their local energy cooperatives."

- Dairyland Power Cooperative
President and CEO
William Berg



A Schematic of the Dairyland Landfill to Energy Power Station

Heat Recovery / CHP Option:

The main purpose of developing these type projects in many areas of the country is to satisfy renewable energy generating requirements. Therefore, the design employed is often to install a distributed generation (DG) system at the landfill site and interconnect the electric power directly into the local grid. Utilization of the waste heat from the DG system is often times overlooked since there is little use for the heat at the landfill site and it is not practical to transport heat to the nearest thermal energy user (sometimes 1 to 3 miles away).

The Midwest CHP Application Center is encouraging developers of such projects to consider adding a good thermal energy user (hospital, high school, factory, etc.) as a project partner. The methane gas from the landfill can be transported to the end user site where the DG system can be located. Waste heat recovery equipment can then be added (now a CHP system), making full use of the renewable energy (70% to 80% efficiency) from the landfill. Many financial arrangements between the partners are feasible. Several such successful projects exist or are planned in the Midwest.

For further information contact:

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"Turning this great renewable energy idea into reality required the cooperation of many people, working together. Eau Claire Energy Cooperative, Onyx, Ameresco and Dairyland staff pursued this opportunity jointly. As a team, we were able to bring this facility online, on-time for Dairyland members."

- Dairyland Project Manager Tony McKimmy

