

Making Energy at the Southside Wastewater Treatment Plant

By Richard V Wagner

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Building A Greener Dallas



There has been a lot of news recently about Dallas going green. Well, Dallas has been green for quite a while, we just keep getting greener. The City committed to purchase 40 percent of its power from renewable resources and was last listed as second in the nation for local government (Houston purchases more kwh

although we purchase a greater percent) and #12 nationally. Dallas Water Utilities is going to help increase our green power purchase and show that we are serious about staying on top and being the green leader through sustainable projects.

Methane Recapture

The Southside Wastewater Treatment Plant stabilizes and disposes biosolids generated at both of the City's wastewater treatment plants. During the process of stabilizing the biosolids, methane (biogas) is produced as a by-product. Currently, the biogas is flared as a means of disposal, with only a small portion being used to generate hot water for the plant's needs. The Cogeneration project at the Southside Wastewater Treatment Plant will allow the City to recover and utilize the energy contained within the biogas.



be converted by engines into electricity and hot water. The electricity will be sold back to the Plant and the hot water will be returned to the plant's hot water system to be used for heating purposes. The Cogeneration facility will produce approximately 30,000,000 kWh per year that will be sold to the City at a cost of approximately 6.0 cents/kWh; this is significantly less than the 9.0 cents/kWh that we are currently paying.



Motivating Factors

Two key factors led to the development of this project:

1. the City of Dallas has a desire to be the "Green" leader among large cities through sustainable projects and carbon footprint reductions;
2. the rising costs of electricity.

By using the biogas generated at the wastewater treatment plant to produce electricity, Dallas will lessen its impact on the consumption of our nonrenewable natural resources by reducing grid derived electricity needs.

Reducing Air Pollution

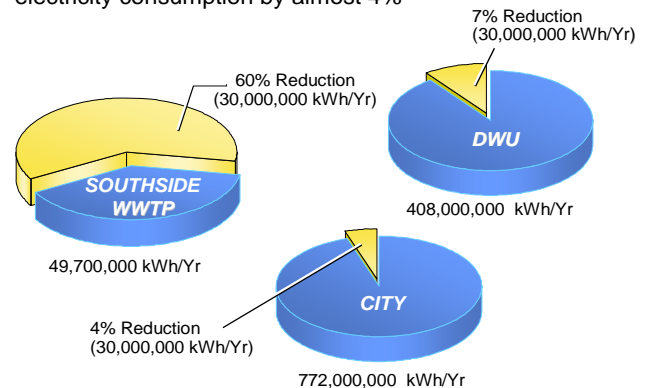
This 30 million kWh per year would have been produced by a coal or natural gas power plant. Coal is a nonrenewable energy source, produced when organic materials decompose and become subject to geological heat and pressure over millions of years. Besides emitting air pollutants like carbon dioxide, sulfur dioxide, nitrogen oxides and mercury when burned to produce electricity, the process of

Cogeneration Project

The Cogeneration project is a twenty year lease agreement between the City of Dallas and Ameresco, Inc., in which Ameresco finances, designs, constructs and operates the cogeneration facility. The City of Dallas will supply the facility with approximately 1.5 million cubic feet of biogas per day which will



As a fuel to generate electricity, DWU's Biogas has the potential to reduce the City of Dallas' total grid derived electricity consumption by almost 4%



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continued

extracting, processing and transporting coal contribute to air pollution. Natural gas extracted from the earth is also a nonrenewable energy source, produced similarly to coal.

Emissions Savings

Based on coal powered electricity, DWU anticipates an annual emission savings as follows:

- Carbon Dioxide - 40,000 tons
- Particulate Matter - 239 tons
- Carbon Monoxide - 22 tons
- Sulfur Dioxide - 11 tons
- Nitrogen Oxides - 2 tons

Payback

The Cogeneration Facility (\$10 million dollars) is privately financed by the energy conversion contractor. The support utilities (\$6 million dollars) needed between the wastewater treatment facilities and the Cogeneration Facility are being financed and constructed by Dallas Water Utilities. The payback on the construction of the support utilities is expected to be approximately 6 years.

An Outstanding Project

The City of Dallas' cogeneration project is an outstanding project because it is taking a previously

unused renewable resource and now using it to generate electricity at cheaper costs than the City is currently paying, all while reducing area-wide emissions and the City's carbon footprint. Second, the public-private partnership set up with the energy conversion contractor allows the City to utilize private capital, making the project feasible where it might not have been otherwise.

Quality of Life Improvements

Once construction of the project is complete and operation commences, the quality of life will improve in the following ways:

- a. The drop in grid derived electricity demands will reduce overall emissions and improve air quality in the region.
- b. The reduced unit price of electricity will help Dallas Water Utilities reduce operational costs while maintaining its level of service provided to the citizens of Dallas.

Future Plans

There is also a grease digestion project underway, that will aim to enhance biogas production and electricity production through the introduction of grease trap waste directly to the Plant's digesters. Currently, grease haulers pick up brown grease, treat it at their facilities and send the remaining solids to the landfill. This project will allow the plant to use the grease on site for energy production and also save landfill space. The project also has the potential to reduce sanitary sewer overflows due to grease blockages.



Artist rendering of the grease digester

