

Energy Dispatch

From the Energy Information Service

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ENERGY RECOVERY IN METRO-DADE COUNTY

Introduction

In a draft report issued by the Metropolitan Dade County Planning Department, it is reported that Dade County depends almost entirely on oil, natural gas, and nuclear fuel to meet its energy needs. Consequently, one of the energy policies proposed by the Commission is that "The recycling of materials and products should be encouraged when the recycling process is economical, energy efficient, and environmentally sound". Two energy recovery projects, one old and one new, which embody the goal of this policy are described below.

Digestion Gas Recovery at the Virginia Key Wastewater Treatment Plant

In fiscal 1978, an average of 408,000 cubic feet of digester gas was recovered from the anaerobic digestors at the Virginia Key Central District Wastewater Treatment Plant. This plant is a 71 million gallons per day modified activated sludge plant. Anaerobic digestion is a process in which microorganisms convert organic sludge produced at the treatment plant to a gas mixture containing about 70% methane. Besides reducing the amount of sludge requiring ultimate disposal, the digester gas generated in the process can be used as an energy source.

At the Virginia Key plant, the digester gas, with a heat content of 720 Btu's/cubic feet, is treated, stored and burned in internal combustion engines which drive blowers that supply air to the activated sludge tanks. While the activated sludge process typically is the major consumer of energy in a wastewater treatment plant, almost all of the energy required for this process at the Virginia Key plant is supplied by the digester gas. The theory of cogeneration is put into practice at this plant, as the waste heat from the water-cooled engines is used to heat the anaerobic digestors.

With No. 2 fuel oil priced at \$.60 per gallon, it is estimated that about \$453,000 per year (755,000 gallons/year) are saved in fuel costs.

Resource Recovery by the "Wet" Process

In April, 1979, construction began in Dade County on the largest resource recovery facility in the U.S. to incorporate the "wet" processing approach to energy recovery from waste. In this approach water is added to the waste stream to form a slurry. The slurry is then treated using processes developed for the pulp and paper industry, such as centrifugation, screening, thickening, and dewatering. The fuel that is produced contains from 20-50 percent moisture and has a heating value of about 3000-5000 Btu's/lb.

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About 3000 tons of municipal solid waste will be processed daily at the Dade facility, which has a reported capital cost of 165 million dollars. This cost includes boilers for burning the fuel, which will produce steam for electrical generation. In addition, steel, aluminum, glass, and mixed nonferrous metals will be recovered.

From the perspective of financing, two innovative approaches were used. First, a state law exempted the County which owns the plant from having to pay sales tax on the purchase equipment, thus sharing about 4 million off the capital costs. Secondly, the plant will be financed by state general obligation pollution control bonds with a County guarantee to repay the bonds from plant revenue.

It is estimated that, at full capacity, the plant will generate enough electricity each day for 41,000 homes or about 7% of the residential customers in the County.

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