

Grate and Boiler Technology Assessment for a New WTE Plant in the U.S.

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Abstract

The Olmsted County Waste-to-Energy Facility (WTE) is in the process of expanding the facility capacity. The original facility began commercial operation in 1987 and consists of two 100 tpd units, equipped with Riley boilers and Takuma grates. The plant was built during the construction boom for WTE plants in the U.S. At that time there were some industry leading technologies, and also were many other players in the field offering European, Japanese, as well as U.S. technologies for the combustion of MSW. The industry has changed since those exciting times when nearly every city and urban county in the country would at least consider WTE. Years of industry stagnation caused by a number of events and trends resulted in the merger, bankruptcy, or pull out of WTE engineering firms in the U.S. market. Today there are only a handful of technologies used and an even smaller fraternity of private operating companies.

Many private and publicly operated WTE facilities continue to operate successfully and recently several are in various stages of facility expansion or new plant development. Olmsted County started this process three years ago laying the groundwork for a facility expansion to double its capacity. Currently, the County is in the engineering phase of the expansion and expects to begin construction in 2007. The engineering effort includes consideration of commercially available combustion technologies and procurement of this equipment. This paper looks briefly at the historical availability of grate and boiler technologies and the findings of the County's assessment of technologies available in the U.S. market.

Introduction

The Olmsted County Waste-to-Energy (WTE) Facility (Olmsted) is located in Rochester, Minnesota. In 1983, the need was identified to find an alternative to landfilling and a WTE facility appeared to be the best alternative. Olmsted wanted an environmentally sound, socially acceptable, and economically feasible solution to its solid waste problems. The County decided on mass burn technology as the best alternative for their project. The site chosen allowed the facility to produce electricity and to sell steam for nearby Federal and County

buildings. Groundbreaking for the original facility occurred in September, 1985 and commercial operation started in 1987.

The Facility consists of two 100 ton per day (tpd) mass burn boilers. The facility was built as a field-erected plant with the traditional tipping floor, pit and crane, grate and boiler systems, ash handling, and air pollution control systems as shown in Fig. 1. The plant operates in a cogeneration mode delivering steam to a district energy system and also generating electricity with a back pressure turbine and a condensing turbine.