

## NAWTEC18-3503

### THE LATEST AND GREATEST ON THE RESURGENCE OF WASTE-TO-ENERGY AND CONVERSION TECHNOLOGIES

**Harvey W. Gershman**

Gershman, Brickner & Bratton, Inc.  
Fairfax, VA, USA

#### ABSTRACT

This presentation will provide a historical perspective on the development of waste-to-energy (WTE) and conversion technologies in the 1970s and 1980s. During this time period, U.S. EPA provided grant assistance to a variety of projects and technologies including refuse derived fuel (RDF) production, RDF combustion, pyrolysis, gasification and anaerobic digestion. This presentation will also provide the latest, up-to-date information about WTE and alternative technologies, including data on costs, and current status of projects developing across North America as they exist in 2010. It will provide a review of WTE technologies as an element of integrated solid waste management systems and highlight some of the advances which have been moved into production units to make WTE environmentally friendly. It will also include a brief look at plants worldwide, followed with a focus on facilities, technologies and companies operating in the U.S. Specific examples of technologies and associated facilities will include:

- Mass Burn
- Modular
- RDF - Processing & Combustion
- RDF - Processing Only
- RDF - Combustion Only

Municipal waste combustors are regulated under the federal Clean Air Act (CAA), originally passed by Congress in 1963 and amended in 1967, 1970, 1977, 1990 and 1995 and 1998. The U.S. EPA may implement and enforce the requirements or may delegate such authority to state or local regulatory agencies. The CAA places emissions limits on new municipal waste combustors. In addition, the 1995 amendments to the Clean Air Act (CAA) were developed to control the emissions of dioxins, mercury, hydrogen chloride and particulate matter. By modifications in the burning process and the use of activated carbon injection in the air pollution

control system, dioxins and mercury, as well as hydrocarbons and other constituents, have effectively been removed from the gas stream.

The presentation will also review the companies offering WTE in the form of alternative technologies being promoted and considered in the U.S., and several recent and current procurements will be reviewed. GBB tracks over 150 different companies offering technologies, facilities and services whose developmental stages range from engineering drawings and laboratory models to full-scale operating prototypes. The presentation will provide an overview of these systems and their status.

Implementation of new WTE projects – whatever technology is selected – will involve local governments in the process because MSW management is a local responsibility. Implementation will involve risks for local government and any private entities involved. A comprehensive review of the risks and challenges associated with implementing various technologies will be provided. The presentation will conclude with key elements to keep in mind when implementing WTE and/or conversion technologies.

The last new MSW-processing WTE facility constructed in the U.S. commenced operations in 1996. Since that time, no new greenfield commercial plant has been implemented. In the past few years, however, interest in WTE and waste conversion has begun to grow, again. This renewed interest in waste processing technologies is due to several factors: successful CAA retrofits, proven WTE track record, increasing cost of fossil fuels, growing interest in renewable energy, concern of greenhouse gases, reversal of the Carbone Supreme Court Case, and the change in U.S. EPA's hierarchy, which now includes WTE. Since 2004, several municipalities commissioned reports in order to evaluate new and emerging waste management technologies and approaches. These will be

summarized. With the passage of the American Recovery and Reinvestment Act of 2009, the U.S. DOE has been working to advance innovative green energy technologies, which can be applied to MSW as well as other bio-feedstocks. DOE has made a number of grant awards to projects where MSW is used as a feedstock. This presentation will summarize the status of these projects and discuss how they should be viewed when considering new projects.

The presentation will also outline policies for governments to consider when considering recycling goals with WTE. This review will be done in the context of environmental and energy considerations as well as public policy considerations. Comments will be included regarding current legislation and regulations, specifically for greenhouse gas emissions, being considered by the U.S. or state governments. The presentation will provide participants with:

- A historical reference for experiences with WTE/alternative technologies in the U.S. in the 1970s and 1980s;
- Latest information on the state of WTE/alternative technologies in the U.S., including their environmental performance;
- A global understanding of current technologies and trends;
- Understanding of the risks and challenges associated with implementing various technologies;
- Understanding the key elements to keep in mind when implementing WTE;
- Suggested policy for recycling and WTE to co-exist as components of a local solid waste system; and
- Comments about current legislation being considered by the U.S. and state governments.