

## NAWTEC17-2318

### BACK TO THE FUTURE: LESSONS LEARNED IN IMPLEMENTING EMERGING TECHNOLOGIES

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#### ABSTRACT

“Energy cost increases are expected to continue.... The impact of these energy cost increases on attractiveness of energy recovery could be significant.”

“A number of new technological developments have been underway over the past few years that are now becoming available as full-scale systems and that are greatly expanding the opportunities for energy recovery from mixed municipal waste.”

These sound like statements from today’s headlines or the latest marketing brochures reflecting the promise of emerging waste management technologies. The reality is that these statements were made over thirty years ago.

Communities planning on implementing any new technology as part of their solid waste management program should proceed with caution. After all, the second quote above was followed by the following statement.

“These systems have generally been developed by firms in private industry as new business ventures. Monsanto, Union Carbide, Devco, Garrett Research and Development (a division of Occidental Petroleum), Hercules, Black-Clawson, Horner-Schiffirin and Combustion Equipment Associates have been some of the most active firms.”<sup>1</sup>

Although many communities relied upon performance and financial guarantees offered by these companies, none of projects developed by them were successful. Similarly, there was a wave of optimism and projects that were implemented in

the 1990’s involving numerous mixed municipal waste biological (i.e., composting) projects that also failed for economic or technical reasons. From these prior experiences, lessons can be drawn to assist communities evaluate the risks and rewards in procuring and contracting for today’s emerging technologies.

The waste being delivered to these failed projects, unlike some of the salespersons, did not go away. These failed projects had to be redeveloped and replacement projects implemented to deal with the daily tide at the curb. A number of consultants, including the authors, started in the solid waste business redeveloping some of these failed initial efforts. From these prior experiences, lessons can be drawn to assist communities evaluate the risks and rewards in procuring today’s emerging technologies.

New thermal conversion, pyrolysis, gasification, and bioconversion technologies are being proposed for projects throughout the U.S. based on experience in North America, Europe, the Middle East and Asia. Many communities have issued RFP’s to include emerging technologies in their integrated solid waste management systems.

To successfully procure and finance a project involving one of these emerging technologies, the project sponsor or developer will need to:

- Locate a politically suitable site for the project;
- Acquire waste supply commitments;
- Develop energy and material sales approaches and agreements;

- Arrange for residue disposal;
- Obtain permits to operate ; and
- Arrange for the financing.

In addition to the above components, the efficacy of the technology and the financial backing provided by the technology supplier are critical to a successful project.

Not unlike the early 1970's and 1990's companies are promoting the advantages and successful applications of new approaches to solid waste management. In doing so, some companies are asking communities to provide a suitable site (usually adjacent to or near an existing permitted landfill or other solid waste management facility), supply waste, dispose of any residue, and assist in the permitting of a new project. The company may take the responsibility to arrange for energy and material markets, obtain the permits, and finance the project. The company's objective is to develop a demonstration of their technology using mixed municipal solid waste, or a portion of the waste stream, in a U.S. community from which it can build its business.

Before entering into long term obligations associated with such arrangements, it is important that a community consider the following:

- How much will it cost to deliver waste to the new facility?
- What impact will it have on the balance of the solid waste management system?
- If the new system does not work, is there an alternative location, both in the short- and long-run to process/dispose of the waste?
- If there are odor or other environmental problems that cannot be mitigated, is there a way to terminate the operation of the facility?
- If the project does not succeed, will the company be responsible for razing the facility and returning a clean site? What other obligations will the company have?
- What are the obligations of the community if the project does succeed?
- What is the definition of success?
- How long must the project be successfully demonstrated before it is converted into a fully commercial operation?
- If this involves an expansion of the project, is the community obligated to proceed?

This presentation compares and contrasts the experiences of the past with the current approaches being taken by firms promoting these technologies and communities implementing them in the hope of learning from our past.. Case studies will be discussed to support the conclusions and recommendations presented.

## REFERENCES

- (1) *Second Report to Congress, Resource Recovery and Source Reduction*, U.S. Environmental Protection Agency, SW-122, 1974.