RESOURCE RECOVERY AND CODISPOSAL
IN AUBURN, MAINE

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This paper offers an insightful and well-detailed retrospective of the development of the Auburn, Maine resource recovery system. The authors fairly point out a number of the complexities involved in planning and implementing waste-to-energy projects, as well as some of the major institutional and technical obstacles which must be dealt with by project planners. Nevertheless, the Auburn experience would seem to offer an example of how sound planning and a solid political commitment can bring about resource recovery, while avoiding many of the implementation pitfalls experienced by other projects. Especially of interest was the discussion of the RFP which was prepared to procure Auburn’s facility. This is an instructive demonstration that a detailed, specific and well-structured RFP will result in receiving serious and responsive proposals from system vendors.

Discussion by
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An integrated approach to the solution of several problems for a relatively small community and its environs has been presented. Solid waste disposal, sludge disposal and energy recovery are all addressed. The growing environmental awareness of industry and its cooperation in the solution of community environmental problems is illustrated. The authors have shown how mutual trust and understanding can be developed to implement an obvious “best technical approach” to resolve environmental and economic concerns in Auburn, Maine.

The parameters which the contract between Pioneer Plastics and Auburn addresses are clearly defined. The responsibilities and risks for both parties have been assessed and the method of cost allocation appears to provide adequate revenues for amortization of debt and for payment of operation and maintenance costs. Additionally, the industry is provided with energy at a fair market price.

Likewise, the RFP for construction of the facility appears to have clearly defined the nature of the project, the terms of the proposed contract and the method for evaluation and selection of the contractor. It is evident that the city carefully screened its consultants and selected those with experience and excellent qualifications to advise them throughout the development of this resource recovery and codisposal program.

In the paper, mention is made of on-going full-scale codisposal testing of Consumat units at North Little Rock, Arkansas. Since codisposal is an area of increasing interest among municipalities and their consultants, a supplementary paper detailing the results of the North Little Rock codisposal
studies using modular controlled air incinerators should be presented as quickly as possible.

Discussion by

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This paper is a discussion of the development of a waste-to-energy system in Auburn, Maine. There are many excellent points to commend the paper to a reader who desires to implement a small system.

Perhaps key to any system is the identity of the quantity and quality of resource (municipal waste), the market or markets available and the technology to bridge both.

The quantity and quality of resource is the key to the engineer system designer. The only real way to determine these elements is by physical measurement. To use averages or to count trucks and assume uniform loads and compaction generally leads to overestimation of the quantity of waste. Overestimation leads to facilities that are too large and expensive.

Facilities should be large enough but not too large. Perhaps the first element of estimation should be the availability of the conversion equipment. For instance, from studies of European facilities, waterwall combustion can be expected to be available 85 to 90 percent of the time, 8 to 10 percent of the total time is required for scheduled outages and 2 to 5 percent is the experience with unscheduled outages. The actual operating time is 60 to 65 percent. What do these figures mean? Simply that if the facilities were designed for maximum utilization (85 percent) 20 percent of the capital requirements could be eliminated. Since capital amortization is 50 percent or more of project costs in the early years of project life, the real economics can be improved by 10 percent simply by using the facilities to their capacity.

The cries are obvious. My waste occurs every day. How do I get rid of it? In retort; what are you operating, a waste disposal system or an energy supply system? Both are income producers, both important. Today the attitude is that the system is a waste disposal system. Is this the appropriate orientation. Yes, if you are interested in a public work; but, no if a business orientation is desired. No business builds a production facility to supply more product than can be sold in the foreseeable future unless it is in a risk business and foresees large potential returns on investment. Municipal waste to energy is not operated by high risk takers nor does it have high potential rates of return.

This naturally leads to the market side of the equation. At this stage in development it is desirable that the energy user be arranged as a base load. There are different ways to accomplish this. Where industrial process steam is supplied, the user can continue to use his existing heat source to accommodate the peaks of his needs or even more desirably may have a reasonably uniform daily load. When cogeneration or district heating is the market, the boilers can either float on the thermal inertia of the district heating system or upon the demand of the local electric grid.

Auburn recognized the maximum that everything goes somewhere, and therefore arranged for a disposal process for rejects from the waste to energy system. The reject mechanism chosen was an environmental landfill. Some potential use mechanisms are also available. The most viable seems to be for the ash from combustor to be used as road or fill material. Some recovery and recycling of ferrous metals has been attempted with generally poor results. Some investigation is being considered for use of aluminum from ash in the magnesium production cycle.

The economic data cited in the paper is not entirely complete nor clear. Making some assumptions, the overall economics appear excellent. The project capital costs is $3.28 million. A reasonable capital recovery factor is 0.1 or $328,000 per year. The net operations and maintenance cost is $429,555, therefore, the total plant costs for the first year is about $760,000. The energy user is committed to the purchase of $836,000 in steam per year (15,000 lb/hr X 8760 hr/yr X $6.36/lb). Thus, the profit is a seeming $76,000 per year. The unknowns in the equation are the actual bond cost which can be 25 to 50 percent above construction cost and whether the user has agreed to a 365 day year for steam usage or something less which reduced guaranteed income.