George Boyhan and his competent associates are certainly to be commended for keeping the huge Dade County Plant operating so well. When the plant first opened, they were faced with an absurdly-low processing fee, and their current processing fee of just over $5 per ton is still too low. But by "sweat equity" they have kept the plant working — at design capacity.

George and his crew have also done the best job in the industry in producing and selling by-products. He seems to have accounted for all of the incombustibles in the waste stream. As I read his paper, he is reporting some 250,000 tons per year of incombustibles produced and sold. He processes about a million tons per year, so he produces some 25% incombustibles, including boiler ash. At his previously-reported moisture content of 25%, this would amount to about 33% incombustibles on a dry basis for the received material.

This is almost identical with what we had earlier observed in Albany. Before passage of New York State's "bottle bill," the average incoming material contained about 23% moisture, and produced about 26% ash on an as-received basis. These values are also close to what we had earlier measured in Delaware. In the spring of 1984, after the New York "bottle bill" had been in effect for some six months, the ash has apparently been reduced by some 3%. As an interesting aside, the "bottle bill" has clearly reduced the aluminum in the incoming material by about 50%. Sale of recovered aluminum beverage containers from the Dade County Plant yields revenues of perhaps $600,000 per year. If Florida were to enact a "bottle bill," this could have serious economic consequences for George Boyhan's operation.

I am puzzled at the apparently low amount of electricity produced per ton received. Some of George's sales literature states that the first million tons processed at Dade County produced 400,449 MWh of electricity. This amounts to only 400.5 kWh per incoming ton. Yet each incoming ton contains about 4700 Btu/lb. So George's overall station heat rate seems to be about 23,500 Btu/kWh. Yet George's plant is equipped with relatively efficient boilers and turbines which should result in a station heat rate of maybe 16,000 Btu/kWh.

In George's process, substantially 100% of the combustibles report to the boilers in the form of high-quality RDF. The real question is this: "Where's the beef?" In processing the first million tons, did you have to landfill a lot of combustibles? Or did your turbine fail for some protracted period during which time you condensed a lot of steam? Or what? Even the relatively inefficient mass-burn systems produce more electricity per incoming Btu than is reported in your sales literature. Did your sales literature contain a misprint? Maybe, for instance, the plant sold 400,449 MWh, and used, maybe 150,000 MWh in the plant.

Our company has been, and remains, committed to an RDF solution as opposed to a mass-burn solution, and we agree with most of George Boyhan's comparisons of the two processes. We consider, though, that the front-end RDF process must be kept simple and inexpensive — even at the expense of losing a few of the by-products to the
landfill. We still believe that the major challenge of the industry is to keep capital costs low, and we find it difficult to justify the economics of plants of any kind that cost in the range of $100,000 per daily ton of capacity.

**AUTHOR'S REPLY**

With respect to the discussion by Anthony R. Nollet of Aenco, Inc., Albany, N.Y., Mr. Nollet assumes incorrectly that each ton of incoming material has 4700 Btu. The fact is that the Dade facility has the most heterogeneous waste delivered anywhere and this has been confirmed by consultants and competitors alike. The waste includes not just household garbage but trash meaning white goods, stoves, refrigerators, air conditioners, industrial and commercial waste, including garden clippings and other extraneous materials. The plant receives a considerable amount of noncombustible material for example, drywall and insulating materials as well as a considerable amount of sand, grit and glass. The system does remove ferrous and non-ferrous and a considerable amount of the sand, glass and grit, but not all. Out of a million tons delivered, approximately 125,000 tons are removed providing a balance of about 875,000 tons. There is additionally approximately 2½% of so-called non-processables, meaning engine blocks, gas tanks, propane tanks and the like. The net amount to be processed is approximately 849,000 tons. If one calculates assuming 400,449 Mwh and a boiler efficiency of 70% the average Btu would be 3710 Btu/lb and at 65% efficiency approximately 4000 Btu/lb. This is based on a machine water rate of 10.2 and 1080 Btu per pound steam. The low generation is strictly due to the extreme amount of extraneous solid waste with either low or virtually non-existent Btu coupled with high moisture which severely depresses the Btu per pound. This simply goes to confirm the extreme diversity and low Btu nature of much of the material received.

It is clear that if the facility was handling only the normal household garbage delivered to virtually all solid waste plants the facility could easily produce 550 kW per incoming ton. There are very few if any plants that could handle much less process either the quantity or nature of materials delivery to the Dade facility.