

Trash

St. Louis will burn rubbish
to generate more electricity

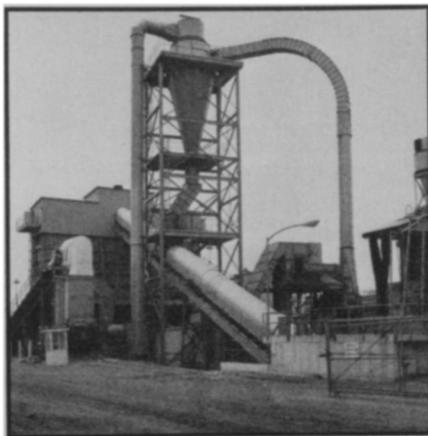
by Marjorie Mandel



Photos: Union Electric



Raw refuse headed for the hammermill.



Once shredded, trash is separated by an air classifier into burnable and unburnable (metal, glass, etc.) material.



Usable trash is conveyed to boiler.

Trash is piling up all over the United States, millions and millions of tons of it a year. We are running out of places to dump it. Even the ocean, long used as a dump by coastal communities, no longer seems to be a bottomless sink.

And dumping seems more and more an uneconomic way of disposing of trash. Trash contains substances that can be burnt to provide energy and substances that can be recycled as raw material for manufacturing. A society faced with various shortages is beginning to look into its garbage cans for help. A large project of this sort is under way in St. Louis.

By mid-1977, the St. Louis metropolitan area plans to become the first region in the United States to use essentially all of its solid waste to generate electricity. Thus it hopes to solve its solid waste disposal problem, eliminate the need for incinerators and landfills and save millions of dollars in fuel costs.

St. Louis's Union Electric Company announced plans on Feb. 28 for a system that will generate approximately six percent of the company's power from solid waste. The company anticipates that the system will be able to handle the 2.5 to 3 million tons of solid waste produced annually in the city of St. Louis and six adjoining Missouri and Illinois counties.

"The project is the real first of its kind," according to Union Electric President Charles Dougherty. It will be built without governmental subsidy, and the \$70 million of private capital for the system and the \$11 million annual operating costs will come from the heating value of the solid waste, sale of recyclable materials sorted from the waste before it is burned, and dumping fees. About two and a half pounds of solid waste are required to substitute for one pound of coal in the electrical generation process.

Union Electric's decision to develop a regional Solid Waste Utilization System follows its evaluation of an experimental prototype system, the Energy Recovery Project, which has used about 200 tons of city garbage a day mixed with coal to generate electricity since mid-1972. The prototype was a joint project of Union Electric, the city of St. Louis and the Environmental Protection Agency (EPA). The \$3.3 million prototype was funded by a \$2.2 million EPA grant and matching local funds.

Under the plan, Union Electric will establish about half a dozen collection-transfer centers in the metropolitan area which will receive solid waste from private and public haulers and transfer it to closed containers for rail shipment to processing facilities.

From that point, the proposed system will operate much like a large-scale

expansion of the prototype. At present the Energy Recovery Project processes about 200 tons of residential trash daily—about 30 per cent of the city's total—through a large hammermill. The new system will have a daily handling capacity of 7,000 to 8,000 tons and will most likely not be limited to residential trash. "There may conceivably be some industrial wastes we may want to take a second look at," Dougherty said.

After shredding in the hammermill, the shredded material is dropped down a large vertical wind tunnel, or air gravity separator. The heavier materials drop through an air jet onto a conveyor belt and then pass through a magnetic system that selects out the ferrous materials, which comprise about five percent of the total waste.

The ferrous metals are run through a machine that shapes them into small nuggets that are sold for \$20 a ton to a southern Illinois steel company for use in place of iron ore in blast furnaces. There are 150 pounds of recoverable steel in every ton of solid waste.

The nonferrous materials, such as aluminum, copper and glass, are trucked to a small landfill on the shredding facility site. The lighter materials which do not drop through the air jet are blown upward into a storage bin. Odorless, colorless and looking very much like confetti, they are loaded onto trucks and hauled 18 miles to Union Electric's Meramec plant in St. Louis County. There they are fed by a pneumatic system into the 140-megawatt boiler along with pulverized coal to generate electricity. According to Union Electric engineer David Klumb, the Energy Recovery Project is the only trash-to-electricity project in the nation that converts garbage to fuel using this shredding process.

Alan Molitor, city project engineer with the Energy Recovery Project, sees the trash-to-energy system as economically feasible as well as environmentally acceptable. "The concept behind the project is basically so very simple that it's natural to ask why someone hasn't implemented it before," Molitor said. "The environmental movement and the increasing national energy demand have all helped to make trash-to-energy systems an idea whose time has come," he continued. "Coal has tripled in price, and we've realized that materials we were throwing away have become valuable."

Union Electric's plan must be approved by the EPA, but Dougherty anticipates easy approval by that agency. Arsen Darnay, EPA assistant deputy administrator for solid waste management programs, has consistently urged cities to consider using solid waste as a fuel to generate electricity.

Darnay said the nation could save 150 million barrels of oil a year if 70 to 80 percent of large metropolitan areas' solid waste was burned in systems like Union Electric's.

Dougherty said that the company does not expect opposition to the project from local environmental groups. But Ben Senturia, executive vice-president of the St. Louis Coalition for the Environment, said there are a "number of unanswered questions" about the project and added that he does not view trash-to-energy systems as a "long-range solution" to solid waste disposal problems. "The trash-to-energy project is essentially an incinerator and incinerators have created serious air pollution problems throughout the country," Senturia said. "Testing of the system to determine what air pollutant concentrations exist has been delayed. The system is presently being touted around the country with no available data on what it is putting into the air."

Dougherty said that "no major pollutants" result from burning trash in the system. The sulfur content of the burnable solid waste is about one tenth of one per cent, which is equivalent to the sulfur content of low sulfur fuel oil, according to Union Electric engineers. "The only possible added pollutant may be some increased particulates, but tests have indicated that their effect is minimal," Dougherty said. EPA and Union Electric have been evaluating the prototype's environmental impact, and results of their testing are expected to be available soon.

Senturia also criticized the project for "still representing the 'burn or bury' approach to solid waste disposal" because it does not recycle paper, ceramics, glass and other resources from the trash. But Molitor anticipates that as soon as the technology for recovering these nonferrous materials from solid waste is perfected, such a "total recovery system" could easily be grafted onto the Union Electric system. The system depends heavily on the 40 to 50 percent of the solid waste's total heating value that comes from its paper component, which makes paper an unlikely candidate for recovering and recycling. Dougherty is optimistic that Union Electric will find a ready market for all the recycled materials the expanded system can recover. St. Louis Mayor John Poelker and St. Louis County Supervisor Lawrence Roos have both expressed "enthusiastic support" for the Union Electric project. Poelker said he sees the project as a "wave of the future" and a prototype for trash-to-energy systems that will be copied by other American cities. "A system utilizing trash to generate electricity seems to be the way to go," he said. □