use of solid waste as a fuel by investor-owned electric utility companies

proceedings: EPA/Edison Electric Institute Meeting

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USE OF SOLID WASTE AS A FUEL

BY INVESTOR-OWNED ELECTRIC UTILITY COMPANIES

Proceedings: EPA/Edison Electric Institute Meeting

This report (SW-6p) was prepared from minutes of the meeting held March 5 and 6, 1975, in Washington, D.C.
by ROBERT A. LOWE

U.S. ENVIRONMENTAL PROTECTION AGENCY
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PREFACE

The U.S. Environmental Protection Agency and the association of investor-owned electric utility companies, the Edison Electric Institute, sponsored a meeting in Washington on March 5 and 6, 1975, to discuss the factors affecting a utility company's decision to use solid waste as a fuel. This paper presents a summary of the discussions that took place at that meeting.

The meeting opened with a keynote address, presented by Dr. Donald D. Dunlop, Vice President of Florida Power & Light Company. Dr. Dunlop served as chairman of the meeting. There followed four concurent workshop sessions: (1) Technical Aspects; (2) Air Pollution; (3) Economics and Financing; (4) Contract Negotiating and Contract Terms.

The summaries of these workshops presented in this publication reflect the major topics discussed at the meeting, although they are not intended to provide a comprehensive discussion of those topics. The name of the utility official who served as chairman for each workshop is included in the proceedings.

The meeting was attended by over 100 persons, including almost 50 persons from over 40 utilities. About 35 Federal, State, and local government officials participated in the conference. A list of attendees is presented at the end of this paper.

It became apparent to me at this meeting that, in the interval since the previous EPA/EEI Conference held in December 1973, government and utility officials have acquired a better understanding of the concept

of firing solid waste as a supplementary utility boiler fuel. Government officials have come to appreciate the utility's apprehension about firing a new fuel whose combustion properties and effects on boiler operations and air emissions are not fully documented. Government officials are also learning that, to an electric utility, reliable electric generation takes priority over solving a community's solid waste disposal problem and that each utility has its own special characteristics, equipment, and problems that must be understood and accommodated.

Most utilities have recognized the advantages of accepting processed waste: a stable supply of fuel at a net price comparable to other fuels, and the appreciation of the public in performing a service to the community. Utilities are now generally willing to cooperate with governments to study the local feasibility of the concept, to initiate large scale trial firings, and to enter into long-term contracts to accept solid waste fuel.

This mutual understanding of benefits and problems is very encouraging and indicates that utilities and governments will be able to work cooperatively to implement systems where feasible. Both groups are to be commended for their constructive and professional approach to energy conservation and better solid waste management.

But, as Dr. Dunlop points out in his address, not all the problems are solved. And, in response to Dr. Dunlop's challenge, a utility-industry task force is being formed, with EPA serving in an advisory capacity, to propose solutions to the broad problems while the dialogues between communities and utilities continue at the local level.

--ROBERT A. LOWE
Office of Solid Waste Management Programs

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KEYNOTE ADDRESS: ELECTRIC UTILITIES AND SOLID WASTE: WHAT ROLE SHOULD WE PLAY?

by Donald D. Dunlop, Vice President, Florida Power & Light Company

The presence of each of us here this evening says very clearly to me that utility involvement in the solid waste business is here: the only question is what form shall it take and how deep shall the involvement be?

This evening I would like to do a modified technology assessment of solid waste handling as I see it, particularly with respect to its relevance to the utility industry. Following this I would like to make a suggestion as to what we, the utilities, ought to do in order to get on top of this problem.

Introduction

With every human being disposing of about 4 to 5 pounds per day of solid waste, our increasing population tells us very clearly that we have a problem. Municipalities, strapped for money and technological expertise, are increasingly faced with the problem of what they should do about solid waste. Recent technological successes in the area of burning solid waste to generate electricity have intrigued many in our society; and the increasing cry is that utilities have a social responsibility or role to play in this problem. I feel we must develop a positive response

to this overture from society rather then pointing out the many problems that would be faced with our involvement and the difficulties that we would encounter. Perhaps the most important thing I think we need to do is to decide jointly what we want. I increasingly hear pleas from those in the environmentalist movement asking, "What do you want, utilities?" I am often embarrassed that I cannot say what it is that we want; so this evening, let's see if we can't review the problem, and I'll try to interest you in a potential solution to the problem.

Information

Before attempting to solve any problem obviously we need to gather some facts. The question is, just what information do we need to know about solid waste? Simply stated, we need a systematic appraisal of alternative solid waste disposal approaches which take account of all the costs involved. In table one, I have made an effort to summarize what these costs are:

Relevant Costs of Alternatives
Solid Waste Disposal Systems

A. Dollar Costs

1. Collection costs
2. Transportation costs
3. Processing costs
4. Reclamation costs
5. Land costs
6. Cost of money (value of alternatives foregone)

B. Energy Costs

1. Construction and operation of collection and disposal equipment
2. Construction and operation of recovery facilities
3. Value of energy regained through combustion
4. Relative energy requirements in use of recycled vs virgin materials

C. Resource Costs

1. Amount of raw materials reclaimed in processing
2. Amount of raw materials lost in disposal or combustion
3. Value of converted materials

D. Environmental Costs

1. Social/economic values
2. Air, water and land pollution
3. Land use considerations

Source: (An Analysis of the Role of Energy in Solid Waste Utilization and Disposal: A Plan for the State of Florida, 2/14/75.)

We, as utilities, need to become fully aware ourselves that State and local government planners know the relative advantages and disadvantages associated with each of the many alternative schemes which are being proposed to deal with solid waste. For example, they need to know the following:

- Which process is most energy efficient?
- Which process creates the most useable energy?
- Which process has the greatest engineering compatibility with the needs of the electric utilities and the customers they serve?
- What long-term contractual commitments in terms of prices availability, input resources, financing, tax provisions and the like might electric utilities need if their relationship is to be an equitable one for both sides over the long term?

Electric utilities themselves need to explore very thoroughly the whole problem of financing solid waste disposal and help governments develop creative financial approaches for a variety of special situations.

Frankly, gentlemen, I was a little disappointed in talking with those most knowledgeable of the technology and economics of burning solid waste that there did not appear to be a unanimity of opinion on the question of a viable tax climate: indeed, in some cases, the question had not been carefully thought through.

Taxes are not the only incentives which might be required in order to make the projects economically viable. Certainly the capital gains treatment, investment tax credits, accelerated depreciation provisions, perhaps depletion allowances, and other factors are certainly relevant; however, there is also the question of discriminating freight rates in rail, truck, and ocean shipping. There are also restrictions on the type of carrier: U.S. vs foreign flag and union vs non-union that may have an effect on the economics of a particular project. Then finally, there are the production, safety, performance, and procurement standards imposed both directly and indirectly upon us by both Federal and State government.

Project Format

Fortunately or unfortunately, the technology has developed to the point where we might expect a liquid, solid, or gaseous fuel to be produced from waste or the waste may be burned directly to produce steam. In each case we have a myriad of technological questions which must be answered before we will be able to determine which of the variables is most appropriate to any given situation.

What Shall We Do?

In the past few minutes I've attempted to highlight the situation as it has been explained to me by those much more knowledgeable than I in the business. I hope this description is a reasonably accurate one of the information that I have been provided. The question now is, what actions should we begin taking as electric utilities?

Throughout my discussion with the experts, one theme has predominated. That is, that the economic question is completely unresolved.

I'd like to propose an industry task force approach to solve the problem. I think the task force should be interdisciplinary and decidedly problem oriented and have the objective of working with specific government agencies to make specific quantitative proposals to get things moving in their areas of responsibility

and authority. I think the membership should consist of electric utilities only, however, I think EPA, EPRI, vendor trade organizations and perhaps others should be represented on an advisory committee.

I think the authority of the task force should be to investigate, to recommend and to report to the Administrators of ERDA, FEA, EPA, and the Director of Internal Revenue. To further assist our cause, it would be useful to submit our findings to the governors of the several states as well as to the Congress of the United States and the news and information media.

Having submitted its report, I think the task force should be charged with the responsibility of doing the necessary contact work to make certain that its recommendations are implemented. I think we would be extremely remiss as an industry if we continue to say "I don't know" when we are asked what will it take to make industry municipality cooperation in the area of trash disposal economically feasible?

Mr. Young of EEI and Mr. Hickman of EPA, I challenge you to accept my recommendation. Set up the task force, and let's stop talking about the solid waste problem. Let's solve it.

TECHNICAL ASPECTS SESSION

David L. Klumb, Chairman

The Technical Aspects Session began with a summary of Union Electric Company's (UE) area-wide system in St. Louis, described by David L. Klumb, Chairman of this session and general manager of UE's Solid Waste Utilization System. There followed a summary of the energy recovery activities in the several communities that were represented. Finally, three of the largest boilermakers offered their observations.

Union Electric Company's System

UE has designated its subsidiary, Union Colliery Company (UC) to design, build, and manage a system that will: (1) accept 8,000 tons per day of raw solid waste at transfer stations; (2) process the waste at the Meramec Plant (2,000 tons per day) and at the Labadie Plant (6,000 tons per day) to recover fuel, magnetic metals, and other materials as markets develop; (3) burn the fuel fraction in existing boilers as a supplement to coal; and (4) dispose of the residue in an acceptable manner. UC is a wholly-owned subsidiary of UE. UC has placed orders for about $25 million worth of equipment, including air classifiers, hammermills, storage silos, and containers.

Each processing line will be designed to handle 100 tons per hour. Each line will include a 2,000 hp primary shredder, a 1.250 hp secondary mill, 600 hp for air classification, and 400 hp in conveyors and feeders, for a total of 4,250 hp excluding transfer stations and transportation. Solid waste will provide up to 20 percent of the boiler heat input. Waste fuel will be cut off automatically if the boiler load drops below 75 percent of capacity in order to maintain the proper flame temperature and to get good combustion of the waste.

UC plans to sell the burnable fraction of the processed solid waste to UE at the equivalent cost of other fuel. UC is currently unregulated. UC intends to comply with solid waste regulations and expects UC's competition to do the same. UC has obtained approval from the Missouri Environmental Improvement Authority to finance the project through environmental improvement bonds and has filed a petition with the U.S. Internal Revenue Service asking for a tax-free ruling on the bonds. The IRS petition was filed November 6, 1974, but no ruling has been issued. Start-up is scheduled for March 1977 at Meramec and in June 1977 at Labadie.

UE is no more worried about solid waste corrosion than they are about coal corrosion; it is considered a dollars and cents issue, not a "stopper." Particulate emissions have not yet been clearly defind (see section on Air Pollution). As to particulate size of the shredded fuel, UE will shred the waste to 90 percent less than 1 inch. With respect to pneumatic pipelines, UE is concerned with pipe erosion and the weight

of the pipes on the boiler structure. To solve these problems, UE is considering the use of ceramic-lined fiberglass pipes. However, the cost of this pipe is higher than plain carbon steel, schedule 40 pipe; and no decision about pipe material has been made to date.

Status Reports on Other Systems

Ames, Iowa. Construction is nearly complete on this $2.8 million, (including boiler modifications) 200-ton-per-day system. The primary boiler is a tangentially-fired suspension unit; two stoker-fired boilers will serve as back-up. Commercial operation is scheduled for Summer, 1975. The system is patterned after St. Louis: first stage shredding to 5 inches; magnetic separation; second stage shredding to 1 1/2 inches; air classification; heavies to a Combustion Power Company aluminum magnet, followed by screening to recover glass.

Fuel will be prepared eight hours per day, five days per week. A 500-ton storage bin allows 24-hour operation. The project is financed through 5.3 percent general obligation bonds. Fuel value will be based on current coal costs.

The tangentially-fired boiler was manufactured by Combustion Engineering, Inc. The waste fuel will be inserted just above the top coal nozzle. By way of comparison, at Meramec UE fires solid waste through the middle of five nozzles; UE is now considering placing the firing nozzles higher and directing the waste fuel downward. Waste fuel will replace 10 to 20 percent of the coal. The unit is equipped with electrostatic precipitators.

The spreader stokers were manufactured by Riley and have waste-fuel nozzles placed 5 feet above the spreaders. Overfire air will be added through additional nozzles just below the waste-fuel nozzles. The units are equipped with mechanical cyclone air pollution devices. The U.S. Energy Research and Development Administration (ERDA) has funded a $40,000 study of the air emissions from the stoker units.

Monroe County, New York and Rochester Gas & Electric Co. Monroe County has begun a one-year effort to design a $25 million, 2,000 ton-per-day system to recover fuel, magnetic metals, and non-magnetic metals. The plant, expected to go into operation in three and a half years, will consist of primary shredding (6-inch particle size); magnetic separation; rotary drum air classifier; heavies to a trommel for recovery of glass and nonferrous metals.

Rochester Gas & Electric (RG&E) has limited boiler capacity for waste. Boilers will be retrofitted to handle high quality waste as 30 percent of heat input. The system will concentrate on maximizing the quality of the fuel, which will represent 50 to 60 percent of the weight of the incoming raw solid waste. RG&E is considering having a final shredding to about a 1-inch particle size just before injection into the boiler to minimize the chances of fire or explosion.

RG&E's fuel specifications call for moisture content, less than 25 percent; particle size, 100 percent less than 1 inch; and ash

New York City. The City has engaged Horner & Shifrin, Inc., to develop a preliminary design for a processing plant and boiler modifications for a system to produce shredded fuel and burn it in Consolidated Edison's oil-fired Arthur Kill boiler (unit 20). This is a front-fired boiler manufactured by Babcock & Wilcox.

Power Authority of the State of New York (PASNY). PASNY has issued specifications for a new boiler to burn either coal or oil in combination with 4500 tons per day of prepared solid waste. The waste fuel would provide up to 30 percent of the boiler's heat input.

Comments of Boilermakers

Babcock & Wilcox. B&W noted that ignition of the waste fuel must come from the heat provided by the burning of the primary fuel. To burn in suspension the waste particles must have a surface-to-mass ratio such that they can absorb heat, ignite, and burn in the time period they are in the furnace. Shredded newspaper will burn in suspension, but the dense, heavy material such as wood, leather, citrus rinds, etc., will end up in the ash pit without burning. They would have to be pulverized to burn in suspension. To distribute the waste fuel more evenly throughout the furnace, B&W is considering the installation of a burner instead of just a nozzle where the waste fuel enters the furnace.

Cyclone Furnaces, says B&W, worked beautifully when wood bark was burned with coal (wood bark provided up to 50 percent of heat input) by the International Paper Co. B&W expects that a cyclone-fired boiler

could handle waste at 50 percent of heat input adequately if the fusion temperature of the ash in the waste is such that the ash will remain liquid at the temperatures existing in the Cyclone Furnace and the primary furnace.

Combustion Engineering, Inc. CE reported that European experience in burning municipal refuse as a fuel in utility type steam generators has been with a relatively large percentage of total heat fired from refuse. Significant high temperature corrosion has been experience on furnace wall tubes and high temperature superheater sections when fired in combination with oil. When fired in combination with coal, corrosion has not been a major problem.

The Europeans utilize only grate firing and burn unprepared refuse. This method of firing results in a constantly changing reducing and oxidizing atmosphere which is conducive to high rates of metal wastage on high temperature steam generator heating surfaces. There is no complete concensus as to the corrosion mechanism other than it being a high temperature liquid phase phenomenon.

The United States' approach to burning municipal refuse in utility type steam generators has been with prepared refuse and in quantitites which represent a smaller percentage of the total heat fired. Additionally, pneumatic firing of prepared refuse in a tangential firing system assures operation with an oxidizing atmosphere in the furnace. These basic concepts offer distinct advantages over the European method of firing municipal refuse and have been satisfactorily proven at the Meramec Station of Union Electric Company.

Based on this experience, CE has no reservation on firing prepared refuse in combination with coal. With oil, however, CE would recommend a more cautious approach until sufficient experience is obtained in establishing the affects of potential corrosion on unit availability.

Units designed initially for coal are generally suitable for retrofitting for refuse firing with minimum modifications. More extensive modifications would generally be required to retrofit units designed initially for oil and gas only, as provisions for bottom ash removal would be required. CE recommends that a complete study be made on a unit to unit basis to define additional parameters which would affect satisfactory operation when firing prepared refuse.

Foster-Wheeler. F-W manufactured Union Electric Company's Meramec Unit 4 and will modify it to burn solid waste as part of UE's area-wide system. Unit 4 is an opposed-fired boiler. Waste-firing nozzles will be installed in the front of the boiler, 30 feet above the existing bank of fuel burners, and in the back of the boiler, 10 feet above the existing bank of fuel burners. The front wall nozzle will be directed downward toward the hot core of the fire; the rear wall nozzle will fire horizontally. To transport the waste fuel into the boiler, one to two pounds of air will be used for each pound of fuel.

Regarding corrosion, F-W suspects that metals in the waste may be the cause.

General Comments

Mr. Klumb pointed out that, even with shredding and air classification, there is not complete homogenization of the waste fuel. Moisture content, ash content, and heating value vary considerably from day to day.

The boiler manufacturers expect that the higher temperatures in newer boilers will permit increases in the rate of firing solid waste fuel.

On the subject of particle size, Mr. Klumb indicated that particle size specifications are largely subjective. The main reason for requiring a smaller nominal particle size (90 percent less than 1 inch) is to reduce the occurence of oversize particles and to provide more complete burnout than has been experienced with the 1 1/2 inch nominal size used in the prototype.

AIR POLLUTION SESSION

Sam C. Brown, Jr., Chairman

This session began with a summary of the results of the air emission test conducted by Midwest Research Institute for EPA and by the Union Electric Company in Fall 1973. Following a discussion of the test results and test procedures, the applicability and requirements of Federal and State air pollution standards were discussed.

Results of the 1973 Air Emission Tests at St. Louis

James D. Kilgroe, of EPA's Control Systems Laboratory, summarized the St. Louis/Union Electric Refuse Firing Demonstration Air Pollution Test Report. This report presents the results of air emission tests performed independently by Midwest Research Institute (MRI) and by the Union Electric Company (UE) from October thru December, 1973, as part of the Environmental Protection Agency's (EPA) comprehensive evaluation of the St. Louis demonstration project. (This project is being conducted by the City of St. Louis, UE, and EPA to demonstrate the use of prepared solid waste as a supplementary fuel in a coal-burning electric utility boiler.) MRI employed the EPA approved testing method to measure particulate and gaseous emissions. UE employed the American Society of Mechanical Engineers testing method to measure particulates only.

Based on the MRI tests, it appears that most gaseous emission (sulfur oxides, nitrogen oxides, and mercury vapor) are not significantly affected by combined firing of waste and coal. Hydrogen Chloride may be increased by about 15 percent.

The mass concentration of particulates at the inlet of the precipitator was in the same range for all coal and coal-refuse tests. The firing of refuse resulted in changes in the electrostatic precipitator operation as characterized by increased sparking rates and decreased power levels. These changes in operating characteristics were coincidental with performance losses on the UE tests but not on the MRI tests. It is concluded that ESP performance losses on the UE refuse resulted from a combination of increased gas flow rates, and particle composition charges--plus possible non-optimum precipitator settings. All of the performance losses on the UE coal-refuse tests may not have resulted from refuse firing. Changes in coal firing conditions may have played an equally important role.

The ESP performance data for the UE and EPA/MRI coal tests did not agree. This apparent shift in baseline conditions may have resulted from (1) the pre-test history of refuse firing, (2) performance changes not related to refuse firing or (3) differences in outlet grain loading resulting from the different test methods used. Therefore, the quantitative effect of refuse firing on ESP performance cannot be established on the basis of the October-December, 1973 tests.

The report recommends that further tests be conducted to complete the characterization of particulate emissions and to support the development of Federal and State air emission control standards. In response to this recommendation, a second series of tests, conducted independently by EPA and UE were initiated in late 1974 and are expected to be completed by mid-1975.

Several of the workshop participants, in commenting on the Fall, 1973 tests, made the following recommendations for consideration in planning future tests:

1. that more data are needed to indicate what ESP design changes are needed for improved performance. This includes correlations of ESP efficiency with sulfur emissions, moisture content of the waste and coal, gas flowrate, and inlet loading.

2. that a portable model precipitator be installed at Meramec to avoid the problems associated with the location of test ports in the existing ESP ductwork.

3. that, if additional air pollution control is necessary, it may be more economical to install a mechanical cyclone collector ahead of the ESP.

4. that optimizing the ESP collection plate rapping cycle may improve ESP collection efficiency.

Federal and State Regulations

Under the authority of the Clean Air Act of 1970, on December 23, 1971 EPA issued Standards for Performance of New Stationary Sources (usually referred to as New Source Performance Standards, or NSPS) for fossil-fuel fired steam generators and for incinerators.

These standards set emission limitations for all "new sources" of each type of source. A "new source" is defined as a source, the construction or modification of which commenced after August 17, 1971. (Reference: Federal Register, Vol. 36, No. 247--December 23, 1971, pages 24876 - 24895.)

Sources for which construction or modification commenced on or before August 17, 1971, are considered to be "existing sources," to which State and local requirements apply. The question arose as to whether retrofitting an "existing" fossil-fuel steam generator constituted a "modification," thus bringing the source within the coverage of the NSPS. On June 14, 1974, the NSPS were amended specifically "to clarify that the performance standards for steam generators do not apply when an existing unit changes to accommodate the use of combustible materials other than fossil fuel as defined in Section 60.41 (b)." (Reference: Federal Register, Vol. 39, No. 116--June 14, 1974, pages 20790-20794 .) Similarly, Federal new source performance standards for incinerators do not apply when an existing unit changes to accommodate solid waste. (Reference: Official interpretation by Richard D. Wilson, Director, Division of Stationary Source Enforcement, EPA, in a letter dated November 29, 1974, to Nicholas Humber, Director, Resource Recovery Division, EPA) Therefore, existing sources that are retrofitted to burn solid waste in combination with fossil fuel remain under the State Implementation Plans, which are designed to meet natural ambient air quality standards.

Another question also arose about the standards for "new sources" that are either originally designed or subsequently modified to burn solid waste in combination with fossil fuels. No determination has been made as to whether the NSPS for steam generators or for incinerators do or do not apply. EPA's Office of Air Quality Planning and Standards is currently doing analyses to decide whether a new standard for combined firing can or should be promulgated.

Any utility (or other operator of a fossil fuel steam generator) that requires further information or clarification should write directly to EPA's Regional Offices or to Richard D. Wilson, Director, Division of Stationary Source Enforcement (EG-341), U.S. Environmental Protection Agency, Washington, D.C. 20460.

ECONOMICS AND FINANCING SESSION

Carlyle W. Fay, Chairman

Firing solid waste fuel is not a technical problem but an economic one. Firing waste is economically possible in many cases, and investor-owned utilities are a viable market.

Some utilities are willing to purchase waste-derived fuel at a break-even price. Their objective is not to make money; fuel riders preclude this by requiring utilities to pass any fuel cost savings or increases to the rate payer. Nor is it the utilities' objective to lose money for firing waste fuel, because the utilities' first responsibilities are to rate-payers and stockholders.

The value of the waste-derived fuel is a function of the cost of the utility's fossil fuel and the quantity of fossil fuel replaced by the waste-derived fuel. For example, if a utility is buying coal at $.50 per million Btu's (British thermal units), and if one ton of waste-derived fuel contributes six million Btu's to the boiler's heat requirements, then that ton of waste-derived fuel is valued at $3.00 (six million Btu's times $.50 per million Btu's). The value of the waste-derived fuel should be the usable energy measured by the amount of fossil fuel saved by burning waste-derived fuel. The value of the waste-derived fuel may be discounted (reduced) by additional costs that the utility

must incur in order to fire the waste-derived fuel. These costs include operating and maintenance costs and the amortization of capital for plant modifications.

The majority of utilities will not and do not care to make money by burning solid waste. However, some utilities, such as Union Electric Company, are considering the creation of profit-making subsidiaries to process solid waste to recover fuel and other materials. These utilities view solid waste processing as a risk venture that may provide a profit and that also serves the public interest in creating a solution to the solid waste problem.

The major economic question is the capital investment: who pays for it and who assumes the responsibility for it?

There are indirect economic benefits from firing solid waste. First, the utility is assured of a small but steady supply of fuel. Secondly, by firing solid waste, the utility earns a certain measure of political or public relations benefits. Conversely, some utilities are motivated to fire solid waste in order to avoid adverse public reaction that would result if the utility refused to fire solid waste.

In the opinion of the utilities that attended this session, the state public service commissions, which regulate investor-owned utilities, probably do not object to utilities firing solid waste provided that:

1. the reliability of electric generation is not impaired,
2. the utilities' ability to acquire capital is not jeopardized, and
3. the net cost to the rate-payer is not increased.

If utilities proceed into the business of operating plants to process waste, the public service commissions probably would not oversee this new line of business. However, they would want to be assured that this new function is not subsidized in any way by utility rate payers.

CONTRACT NEGOTIATING AND CONTRACT TERMS SESSION

Eugene C. Bailey, Chairman

Agreements between communities and utilities can provide for the use of solid waste as an energy source in three ways:

1. The utility accepts the raw solid waste, processes it, uses the fuel, sells other products, and arranges for the disposal of residuals. Example: Union Electric Company.
2. The utility accepts or buys prepared waste-derived fuel that has been processed by a community or a private company. Examples: Commonwealth Edison Co. (Chicago), Wisconsin Electric Power Co. (Americology, Inc./Milwaukee), Rochester Gas & Electric Company (Monroe County).
3. The utility purchases steam or electricity. Examples: Baltimore Gas & Electric Co. (Baltimore), Long Island Lighting Co. (Hempstead, N.Y.).

Many factors influence the final choice of details of any agreement, including what body has collection responsibility and whether it is public or private; and the location of electric generating plants and waste processing plants.

Prices for waste-derived energy should be tied to the price the utility pays for alternative (fossil) fuels on the basis of Btu's replaced. This should be modified (discounted) by the

incremental costs to the utility for firing the waste fuel. In at least three cases (Chicago, Milwaukee, and San Diego), the price that the utility pays for the fuel will be determined after a six-month trial period, during which a history of operating and maintenance costs will be established. Contracts should be re-examined periodically to update cost and price terms.

Both parties should be prepared to provide maximum, long term operability of the jointly-chosen system without threatening the future operations of either party. Neither party should expect to make a profit.

Goodwill and cooperation between supplier and user are essential if agreement on details is to be reached. The support of top management of both sides is equally important. Both sides must understand the economic, technical, and political priorities and concerns of the other. For example, utilities must be permitted to refuse to accept waste-derived fuel at any time for good cause, such as emergency maintenance on the boiler or boilers designated to fire the waste-derived fuel. While goodwill and cooperation by individuals and organizations are essential, they do not obviate the need for precise contract terms to specify the responsibilities and entitlements of each party.

Conference Attendees

James Abert	National Center for Resource Recovery, Inc.
Eugene Bailey	Commonwealth Edison Company
A.J. Banks	Ebasco Services, Inc.
James L. Barker	Development Sciences, Inc.
C.R. Beyer	Federal Energy Administration
Ralph J. Black	OSWMP, EPA
Shelley M. Bostick	Tennessee Valley Authority
Sam C. Brown, Jr.	Virginia Electric & Power Company
Robert E. Butz	Public Service Electric & Gas Company
Peter Cambourelis	Raytheon Service Corp.
Howard Christiansen	Monroe County, New York
Douglas E. Clark	Baltimore Gas & Electric Company
R.T. Combs	Virginia Electric & Power Company
J.J. Cordaro	Louisiana Power & Light Company
M.J. Corson	Rochester Gas & Electric Corporation
John Copeland	OAQPS, EPA
Michael DeBonis	EPA, Region II
Alton Donnell	Federal Power Commission
Donald Dunlop	Florida Power & Light Company
George Elder	State of Georgia
Jerry Elmonson	Public Service Co. of Oklahoma
Carlyle (Bud) Fay	Wisconsin Electric Power Company
Richard Fenton	City of New York
Val A. Finlayson	Utah Power & Light Company
P.H. Forster	Dayton Power and Light Company
Edward Fowlkes	Federal Power Commission
Ira L. Freilicher	Long Island Lighting Company
A.M. Frendberg	Babcock & Wilcox
Robert B. Freitas	Hawaiian Electric Company, Inc.
Raymond Giglio	Central Maine Power Company
J.M. Gulbronson	Foster Wheeler Corporation
Thomas Hamill	City of New York
G.L. Heins	Consumers Power Company
Harvey Hershman	National Center for Resource Recovery, Inc.
Lanier Hickman	OSWMP, EPA
Kenneth Higbie	Bureau of Mines, Dept. of Interior
Joseph Hodder	New York State Electric & Gas Corporation
Robert Holloway	OSWMP, EPA
Ronald C. Holmes	Minnesota Power & Light Company
Case Houson	San Diego County, California
Merlin Hove	Ames Electric Utility
James Lee Hudson, Jr.	Tampa Electric Company
Nicholas Humber	OSWMP, EPA

Gil Jackson	National Center for Resource Recovery, Inc.
Andrew C. Johnson	Public Service Electric & Gas Company
Warren Kane	Iowa Public Service Company
Hugh B. Kaufman	OSWMP, EPA
James Kilgroe	CSL, EPA
Paul E. Klisiewicz	Northeast Utilities
David L. Klumb	Union Electric Company
Joseph Kovago	Atlantic City Electric Company
Herman Leibovitch	Union Electric Company
Ira Leighton	EPA, Region I
Steven Levy	OSWMP, EPA
Steven Lingle	OSWMP, EPA
Robert A. Lowe	OSWMP, EPA
James S. Luker	Southern Indiana Gas & Electric Company
Robert Mauro	American Public Power Association
Joseph Mullen	Combustion Engineering
T.F. Mitchell	DeKalb County, Georgia
D. Bruce McClenathan	Delmarva Power & Light Company
Martin J. McCormick, Jr.	Philadelphia Electric Company
William McKinney	District of Columbia
Stephen Naeve	Houston Lighting & Power Company
A.J. Ormston	Florida Power Corporation
Arthur Padrut	Wisconsin Public Service Commission
Robert C. Paladino	Edison Electric Institute
Howard R. Palmer	Dayton Power & Light Company
S.L. Pernick, Jr.	Duquesne Light Company
Howard Poppleton	Bureau of Mines, Dept. of Interior
W. Porter	Wisconsin Solid Waste Authority
Robert Randol	OSWMP, EPA
Robert A. Riscica	Consolidated Edison Co. of New York, Inc.
Jacqueline Rogers	Montgomery County, Maryland
Charles V. Runyon	Ohio Edison Company
R.H. Schultz, Jr.	Virginia Electric & Power Company
J.J. Scoville	Potomac Electric Power Company
Roland Schmidt	State of Maryland (Air program)
Bill Schremp	EPA, Region III
Paul Sheehy	Lowell, Massachusetts
Harvey Shell	State of Missouri (Air program)
Alan Shilepsky	OSWMP, EPA
Elmer Simmons, Jr.	Cincinnati Gas & Electric Company
John Skinner	OSWMP, EPA
Bernhard H. Smith	Combustion Engineering, Inc.
Robert B. Smith	Jersey Central Power & Light Company
Robert H. Sowyer	Pennsylvania Power & Light Company
Charles L. Steel	Arkansas Power & Light Company
David B. Sussman	OSWMP, EPA
Wayne Sutterfield	City of St. Louis, Missouri
John M. Telesh, Jr.	Orange & Rockland Utilities, Inc.

John P. Thomas, Jr.	City of Tulsa, Oklahoma
Nelson R. Tonet	Duquesne Light Company
Robert R. Watson	Pennsylvania Power & Light Company
George C. Wiedersum	Philadelphia Electric Company
Cliff Willey	Maryland Environmental Services
Bill Williams	DeKalb County, Georgia
Jim Wilson	EPA, Region V
Nathan L. Wilson	Delmarva Power & Light Company
H.J. Young	Edison Electric Institute
Robert Zralek	City of Chicago
Morris Zusman	Federal Energy Administration

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