RESOURCES RECOVERY & ECONOMIC DEVELOPMENT

STEPHEN S. PASSAGE
Port Authority of New York and New Jersey
New York, New York

and

GARY BRIAN LISS
United States Conference of Mayors
Washington, D.C.

ABSTRACT

This paper discusses the possible marriage of two concepts, resource recovery and economic development. In particular, it describes the industrial development program of the Port Authority of New York and New Jersey, which will attempt to reverse the flight of manufacturers out of the New York-New Jersey Metropolitan Area by creating competitive business conditions in central city industrial park/resource recovery facilities. Resource recovery will facilitate the program by providing lower cost energy and a supply of "raw" materials to the park tenants.

INTRODUCTION

Resource recovery refers to a broad range of technologies which seek to recover energy and/or materials from the solid waste stream. Resource recovery facilities generally refer to capital intensive, "high technology" systems designed to recover energy and materials through a variety of mechanical, chemical and thermal processes. Energy can be recovered in the form of steam, electricity or gaseous, liquid or solid fuels. Materials which can be recovered include ferrous, aluminum, glass and possibly paper. Source separation programs generally refer to labor intensive, "low technology" collection and processing systems which recover materials before they are discarded into a common waste stream. Source separation methods include the use of recycling centers, curbside collection programs and the use of intermediate processing centers.

Solid waste disposal is no longer simply an environmental headache, it is also an opportunity for creating jobs. Traditionally, resource recovery programs have developed in response to a crisis in solid waste disposal. When a city recognizes it has a disposal problem, it should also stop to assess whether there are other problems that could be solved simultaneously. Economic development can be stimulated by resource recovery programs when there are multiple opportunities for marketing the recovered energy and materials. Other local problems which could be addressed simultaneously with the disposal problem include:

1. Local Reinvestment — benefit the local economy by retaining recovered energy materials

2. Unemployment — provide employment opportunities for unskilled and semi-skilled workers, especially minorities and women

3. Sludge Disposal — process sewage sludge with solid waste

An axiom of resource recovery implementation has been to “identify your markets first.” By identifying markets at the outset of a project, technologies can be designed to produce the type of product desired. In many areas of the country, there are a number of energy and material markets which can be utilized to develop a successful resource recovery project. This is particularly true in the major metropolitan areas where the pressures are greatest to develop resource recovery due to the large quantities of waste, the unavailability
of disposal sites and the concentration of industrial activity.

For resource recovery to act as an effective economic stimulant, the recovered products must be concentrated. In many existing resource recovery projects the recovered energy is dispersed throughout the electric utility grid contributing only slightly to the region's economic vitality. Industries which are energy intensive, however, may be able to decrease their cost of production through the purchase of "dedicated" energy from a resource recovery facility. Willingness to stay in an area (industrial retention), to expand capacity, or to invest in new facilities could be the basis of selecting the industrial markets.

The concept of regional reinvestment should be considered carefully in examining materials markets. Although the commodities markets are national, and even international, in scope, a region could benefit if it chose to sell recovered materials to local industries. By generating "raw materials" in the same location as the ultimate market, industries can decrease their transportation costs. If transportation costs are a significant cost of production, a company might invest in a new manufacturing facility nears its market if a sufficient quantity of materials were recovered at an appropriate quality.

One way to maximize the economic development potential would be to develop urban industrial park/resource recovery facilities. These industrial parks developed in the heart of urban industrial areas would be designed to attract industries related to resource recovery. Industries which are energy intensive, especially process steam users, would be sought. The primary manufacturing industries most easily fit this description. Industries that require glass, metals or paper as their input might be attracted to the parks.

Although the concept of urban industrial park/resource recovery facilities is relatively new, precedent exists in the development of resource based industrial parks. These are industrial parks which have been designed to maximize the inter-industry linkages which exist in a given area, centered around the availability of a primary raw material. In Houston, Texas for example, a petrochemical complex uses petroleum as the first link in an interrelated chain that includes the products manufactured from petroleum and products which are needed to extract the petroleum. Support industries are also included as integral parts of this complex.

The Port Authority of New York and New Jersey

The Port of New York is the only major port in the United States that lies between, and hence is affected by the differing rules and regulations of, two states. After three centuries of conflict over the operation of the port, the Port of New York Authority was created in 1921 by compact between the states of New York and New Jersey, with the consent of Congress, as the first bi-state Authority. Its functions include promoting and protecting the commerce in the Port District, an area roughly defined as a circle with its center as the Statue of Liberty and a radius of 25 miles (40 km). The governor of each state appoints six of the twelve members of the governing Board of Commissioners, subject to confirmation by the respective state senates. The Commissioners are appointed on a staggered basis, to six year terms. The actions of the Board are also subject to veto by each Governor.

The Authority must be self supporting, without access to the tax revenues or credit of the states or the municipalities of the Port District. It must obtain the funds necessary for the construction or acquisition of facilities upon the basis of its own credit, its reserve funds and its future revenues. The Port Authority has developed, constructed and operated such major facilities as the World Trade Center; Kennedy International, La Guardia, and Newark International Airports; the George Washington Bridge; the Holland and Lincoln Tunnels; Ports Newark and Elizabeth; and several bus and truck terminals. Its total investment in facilities at the end of 1978 was $3.8 billion. Gross operating revenues in 1978 were $544 million. The Authority's bonds are rated A by Standard & Poors and are backed by the revenues of all its facilities.

New York City was generally impervious, until the 1969 recession, to the urban blight that affected other large established cities beginning in the 1950s. Despite a lack of raw materials, New York City was, and still is, the major manufacturing city in the United States. Manufacturing employment, however, peaked in the region during the Korean War. Overall, the decline was slight for the region until 1969, only 5 percent overall. Within the region, however, the declines were not uniform. By 1969, manufacturing employment in the cities of Newark and Jersey City had fallen over 30 percent and in New York City more than 20 percent. Suburban manufacturing increased 15 percent to somewhat
offset losses in the central cities. Newark and Jersey City suffered these losses to a greater extent, because nonmanufacturing employment did not replace the losses, unlike New York which witnessed significant increases in the advertising, financial, legal and other service industries.

During the 1960s, the above phenomenon was actually viewed with favor by regional economists who were glad to be rid of “dirty” manufacturing jobs and felt that nonmanufacturing jobs could increase indefinitely. The region was affected strongly by the 1969 national recession, however, and has not yet fully recovered. Regional nonmanufacturing employment reached a plateau in 1969 and is still less than the 1969 level. The decline in manufacturing accelerated to the point that manufacturing employment in the region in 1975 had declined by 25 percent since 1969. The central cities suffered even more; Jersey City and Newark lost an additional 30 percent of their manufacturing employment between 1969 and 1975; New York City lost 40 percent during that period. Manufacturing employment in 1975 in each of the three cities was less than 50 percent of the 1953 totals. The absolute decline was greatest in New York City (600,000 compared to 25,000 and 40,000 respectively) but Jersey City and Newark suffered more relatively.

The Port Authority concentrated on the transportation infrastructure of the region and generally left the economy to the private sector. As a self-supporting Authority unable to pick up and “move to the Sun Belt”, the Port Authority viewed the region’s economic stagnation with alarm and began to look for remedies in conjunction with other governmental bodies. Its Planning and Development Department has the responsibility for advising the Authority’s Executive Director on broad policy matters including the development of programs and projects to strengthen the economic base of the region.

As early as 1971, the Port Authority published an Industrial Development Guide to the New York-New Jersey Metropolitan Area in an attempt to have industrialists consider this region as a place for producing and marketing their goods. In June 1973 the Regional Studies Section of the Planning & Development Department prepared a report entitled “Industrial Recycling Parks”: “Opportunity for Regional Economic Growth” which recommended the “organization of industrial recycling parks . . . as a means of assuring . . . continued economic growth and . . . environmental quality” using the “recovery and reprocessing of urban waste via resource recovery as the salient feature”[1] It was hoped that “advent of large scale recycling may mean that the many resource-oriented industries would no longer find it advantageous to locate near the mine . . . but would, in time, move to the metropolitan centers, which would become the new sources of industrial raw materials”[2], a very ambitious concept.

In March, 1974, the Planning and Development Department recommended a full evaluation of the feasibility of a program of industrial land development. Such a study began in September, 1974 and examined four topics: the marketability of the concept, the potential difficulty of acquiring large tracts of land, the financial consequences of such a program and the institutional considerations involved.

In January, 1976, the Industrial Development Feasibility Study was published with the recommendation that a full time industrial development project team be established to conduct a more detailed study including discussions with appropriate government officials, the selection of specific sites, a more intensive research of the marketability and an investigation of energy cost and availability. These recommendations were formally approved by the Authority’s Board of Commissioners in February, 1976.

Three marketing surveys were conducted as part of the Feasibility Study: What Industry Needs, the Market for Space in Existing Structures, and an Industrial Parks Survey. What Industry Needs was based on interviews with executives of 266 firms which had located or expanded manufacturing facilities in this region between 1969 and 1974. A general conclusion was that large tracts of land (over 100 acres, 405,000 m²) were required if the central cities were to create an environment similar to that existing in the suburbs. Security, off street loading, utilities etc. which can be provided in a small (1-2 acre, 4000-8000 m²) plot of land in suburbia are impossible to provide in the middle of blighted cities. The surrounding environ simply overwhelms any attempt to provide such conditions.

In the face of a highly competitive business (it has been estimated there are 50,000 industrial parks in the country) and conditions that have resulted in the flight of 500,000 jobs in 25 years, a public effort was required to stem the hemorrhaging of the region’s base. It was also believed that a Port Authority role would be desirable be-
cause fiscal pressures precluded other governmental bodies from acting effectively and because the Port Authority has staff with the necessary planning and marketing skills. The Port Authority's relative independence from changing political administrations gives it the continuity required for such a long term effort.

The Port Authority's program is aimed at generating new manufacturing jobs in the region and thus restoring the economic base. The disposal of solid waste is a major problem in the region but is not a responsibility of the Port Authority. Thus, resource recovery, although environmentally preferable to current disposal methods of landfilling and incineration, is of interest to the Port Authority only insofar as it fosters its economic development efforts. Even before the oil crisis of 1973-1974, energy costs in this area were viewed as a deterrent to the location of new manufacturers, especially in New York. For a variety of reasons, it was believed that neither of the local utilities, Consolidated Edison (Con Ed) and Public Service Electric and Gas (PSE&G), would be able to reduce energy costs in the foreseeable future. Resource recovery was viewed as a means of providing lower cost energy (steam and electricity) using a "local fuel" and equally important, providing "raw materials" (recovered ferrous, glass, aluminum and possibly paper) to companies that would build plants within the park, reducing transportation cost considerably, a factor that usually works against materials recycling. The availability of steam and recovered materials creates a seller's market for at least part of the park.

In 1974 and 1975, various resource recovery vendors, selling mass burning, refuse-derived-fuel and pyrolysis systems were approached concerning the Port Authority's concept. It soon became very apparent resource recovery technology was still evolving and that cost projections changed at a much faster rate than inflation. Performance guarantees were also very soft due to the lack of operating experience in this country. In 1976, the Port Authority's Engineering Department was asked to conduct an in-house investigation of resource recovery in the context of an industrial park. In September, 1976, it issued a report, Energy Utilizing Solid Waste. The basic conclusion was that on site power generation utilizing solid waste could provide electrical energy at 4¢ or less per kilowatt hour (kWh) with a competitive tipping fee. Such a price compared favorably with Con Ed's average industrial rate of 7.3¢/kWh and even PSE&G's at 4.3¢/kWh.

An independent marketing consultant, the Fantus Company, was retained in August, 1976 to examine three specific sites and the surrounding neighborhoods, to select target industries suited to those cites, to outline conditions that would be required to successfully attract such target industries and how to go about attracting them in the face of similar conditions available elsewhere. Their report, completed in the summer of 1977, found that the concept of urban recycling parks in the New York Metropolitan Area was feasible if competitive conditions are established and if an aggressive marketing campaign is waged.

In August, 1977, Alan Sagner became Chairman of the Board of Commissioners, the Authority's governing body, and Peter Goldmark, Jr. was appointed Executive Director, the Authority's administrator on a daily basis. Briefings of Sagner and Goldmark were followed by a formal presentation to the Board of Commissioners in November, 1977. During this period of additional study, extensive discussions were held with public officials at the state and local level concerning the program. When the Port Authority begins a new program such as construction of the World Trade Center or the takeover of the bankrupt Hudson and Manhattan Railroad (PATH), identical "enabling" legislation is passed by the two states of New York and New Jersey. Formal enabling legislation, introduced in Spring, 1978, was passed and signed into law in August, 1978. The legislation enables the Port Authority to participate in industrial development activities, which were defined to include resource recovery facilities, and included a number of prerequisites.

When the enabling legislation was passed, the Port Authority created a line department (the Industrial Development Department) to prepare the Master Plan and participate in industrial development projects where feasible. The Industrial Development Department presently consists of approximately 30 professionals divided into six sections, physical planning, resource recovery, operations, marketing, finance, and government and community liaison. It can also draw on the resources of other Port Authority departments, which include a 1000 member Engineering Department.

The Port Authority was required to adopt a Master Plan, prepared after consultation with assorted public and private persons or organizations, prior to actual implementation of an indus-
trial development program. The master plan was to contain, inter alia, the location of potential projects, project costs and benefits, possible job generation and a schedule of commencement. It was not in itself, a commitment by either the Port Authority or any municipality. Any site in the Port Authority District could be considered subject to the restrictions that in the City of New York a site had to be designated by the Mayor, and in New Jersey only municipalities that qualify for urban aid assistance are eligible (there were 19 as of July, 1979).

In July, 1979, the Master Plan was formally adopted by the Board of Commissioners. Of the 17 sites in New York and New Jersey which were studied, six appeared to offer potential for development as Port Authority industrial parks: Charleston in Staten Island, Hunts Point in the Bronx, Spring Creek in Brooklyn, Doremus Avenue in Newark, Greenville Yards in Jersey City and North Avenue in Elizabeth. The actual acquisition and development of any site by the Port Authority requires a number of additional efforts including agreements with the host municipality on such matters as tax arrangements, off site improvements, resource recovery etc, more detailed site specific engineering, economic, environmental and marketing analyses. Negotiations with the municipalities began in December, 1979, to determine which sites will be developed first, and may take as much as six to nine months to complete. It is anticipated that one, and possibly two, sites would be developed in each state in the first generation of industrial parks beginning in 1981.

Engineers from the Port Authority and the Power Authority of the State of New York (PASNY), a public utility which entered the downstate New York area in the mid seventies, visited over thirty resource recovery plants in 1977 and 1978 attempting to sort out conflicting, and often contradictory, claims about the economic and technical aspects of various resource recovery systems. In June 1978, five engineers (three from the Port Authority, including the author, and two from PASNY) visited twelve European solid waste disposal plants in Switzerland, Germany and France. The goal was to inspect European plants which had been operating over a number of years. All of the plants were of the mass burning type, a mature technology, which could be applied with predictable performance, although major problems still exist. Any attempt to evaluate the economics of the European plants was deemed impractical due to the public ownership and operation of the plants and the priority placed on refuse disposal, not on energy recovery.

In July, 1978, the Port Authority retained Ebasco Services, William F. Cosulich Associates, Pope, Evans & Robbins & Dr. Hans Nissel to assist it in its resource recovery studies. In November, 1978, an Overview of Resource and Energy Recovery from Municipal Solid Waste was issued by the Authority's Engineering Department, updating the 1976 report. Again the extremely dynamic quality of solid waste as a fuel was emphasized with the result that severe technical snags develop in pilot and operating systems in that the performance throughputs and/or efficiencies adversely impact the economic evaluations. Nevertheless, under proper conditions, resource recovery could provide economical energy and materials. It was determined that the "selection of a particular process is dependent upon the timing of the decision to proceed. A resource recovery facility with RDF combustion in a dedicated boiler is an emerging technology . . . Should an immediate decision be deemed necessary (1978), considering the size of the required initial investment and the extent of the long-term contracts for MSW and the sale of electricity, the proven technology aspect of mass burning should control. However, if an immediate decision is not essential, within a year or two there may be sufficient evidence resulting from the operation of specific resource recovery facilities to justify a re-evaluation . . . " [3].

In December, 1978, the Port Authority submitted a preapplication, under the President's Urban Policy Program, to the United States Environmental Protection Agency to study three separate resource recovery projects located in possible industrial parks in Brooklyn, Newark and Jersey City. The preapplication was submitted with the explicit support of the Cities of New York, Newark and Jersey City and the counties of Essex and Hudson in New Jersey. The actual application was submitted in July, 1979 and was awarded in September. The projects are directed to finding solutions to solid waste disposal problems in ways that would directly encourage urban economic development.

Ultimately envisioned as a three-phase study totaling approximately $1,500,000, Phase I will take approximately three months and cost $217,000. Waste quantity and composition is virtually unknown in New Jersey, where refuse is collected by private haulers, primarily and disposal fees are based on volume, not weight. As of Janu-
ary 1980, the Authority has advertised a Request-for-Proposals to conduct the composition study. A significant effort will be undertaken on the two tasks of market analysis and source separation, which are considered very important to the Port Authority's goal of attracting manufacturers which would use process steam and recovered materials, to its industrial parks. Codisposal of sewage sludge and solid waste is also of interest to the Port Authority since four of the six potential sites are immediately adjacent to existing sewage treatment plants. If most of the park's tenants operate on a single-shift basis, using steam at night from the resource recovery facility would help the facility's energy load factor. The possibility of capital grants for a codisposal facility will also be explored.

In November, 1979, William F. Cosulich Associates Inc., was retained to prepare a preliminary report on the technical, economic and environmental feasibility of codisposal. The Port Authority is very concerned about the economic feasibility of resource recovery and has developed a computer model with over 100 variables to examine various scenarios as negotiations with municipalities, utilities, vendors and tenants progress.

NEW YORK CITY

The City of New York is proceeding with its own solid waste management plan. A comprehensive plan had been prepared in June, 1977, by Leonard S. Wegman, Inc., and the EPA Resource Recovery Task Force to deal with all of New York's waste, estimated at over 20,000 tons/day (18,100 t/d) by constructing as many as twelve resource recovery facilities over the next decade. When Mayor Koch took office in 1978, he began a review of the previous plan which was about to proceed with a small project in upper Manhattan. After a three-month review, the plan was put on hold and two consultants were retained to review the plan. They recommended the City proceed with a single project in view of the difficulties of implementation before going ahead with other projects.

In September, 1978, the City received a $750,000 grant from the Department of Energy to implement a resource recovery project. The grant was used to retain three consulting firms to assist the Resource Recovery Task Force, a group of Sanitation Department and Environmental Protection Agency employees. Before the City can proceed, certain laws must be repealed by the State legislature, which failed to do so before the 1979 summer recess. It is anticipated the City will issue a Request-for-Proposals sometime this spring for a 3,000 ton/day (2,700 t/d) plant located in the Brooklyn Navy Yard, which would generate steam for sale to Con Ed. In December, 1978, the City of New York submitted a preapplication, which was accepted, to the U.S. Environmental Protection Agency, with the Port Authority, PASNY and the Urban Development Corporation (UDC) for a grant of $1.2 million to begin a second project in the Bronx.

Two other projects are being considered in New York City. Combustion Equipment Associates and the UDC issued a preliminary announcement that they would study the construction of a resource recovery facility in the South Bronx; and, PASNY, after much political debate, has filed an application to build a 700 MW power plant in Staten Island that would burn coal with refuse-derived fuel.

NEW JERSEY

In New Jersey both the Department of Environmental Protection (DEP), and the Department of Energy have some responsibility for solid waste. Chapter 326 of the Laws of 1975 became effective in July, 1977, and essentially transferred control of solid waste planning from the city level to the district level (the 21 counties and the Hackensack Meadowlands Development Commission (HMDC) because the cities were too small to implement resource recovery projects on their own. The largest city, Newark, generates only 500 tons/day (450 t/d). Each district in Region I, the northeastern portion of the State, was required to prepare a solid waste management plan by the summer of 1979, which would then be approved, revised or rejected by the Commissioner of the New Jersey Department of Environmental Protection. Upon approval, the plan has the force of law and any future solid waste facilities must conform to the plan.

As of January 1, 1980 the plans from Region I (Essex, Hudson, Union, Bergen and Passaic Counties and the HMDC) had been returned to the districts for modification by July 1, 1980. Essex County's Board of Freeholders had voted to use a possible Port Authority industrial park located in Newark as its preferred long-term solid waste disposal solution in its Solid Waste Management Plan. Hudson County voted to send its waste to a possible Port Authority park in Jersey City. Union County recommended a solution sending its waste to a possible Port Authority park located in
require each municipality to dispose of 10 percent of its waste at the baler to achieve full capacity. The purpose of Chapter 326 was to transfer control of solid waste planning to a level of government, the country, which was thought able to affect the transfer from the current practice of landfill to the environmentally preferable method of resource recovery. Despite control of the planning process by the county, the cities are responsible for the disposal of solid waste and will be hesitant to switch from cheap landfilling to resource recovery. After the DEP approves the district plans in 1981, the difficult part of implementation will begin (the putting together of site-specific projects and contract negotiations with the many municipalities required to supply even one 2,000 ton/day (1,800 t/d facility).

New Jersey faced a more immediate problem of what to do with its waste between the end of 1979, when the HMDC intended to close the remaining landfills used by the Group I counties, and the mid-eighties, the earliest possible start up of any resource recovery facilities. The existing landfills are cheap (the disposal fee is 75¢/cubic yard or $3-4/ton ($3.30-4.40/t) and there was considerable political pressure by the counties to keep them open during the interim. (The landfills have all exceeded their original design capacity.) In November, 1979, the DEP issued Proposed Rules concerning the Interdistrict Flow of Solid Waste to deal with the problem of interim disposal.

The HMDC’s attempt to create some interim capacity by building a 1,000 ton/day (900 t/d) baler (with an ultimate capacity of 2,000 tons/day (1800 t/d) has been approved, in a recent decision by the Board of Public Utilities (an independent agency under the New Jersey Department of Energy which regulates solid waste disposal rates, among other matters) to charge a disposal fee of $8.70/ton ($9.59/t). The HMDC is attempting to require each municipality to dispose of 10 percent of its waste at the baler to achieve full capacity.

Another possibility, the construction of a separate resource recovery facility in Newark by Combustion Equipment Associates has begun after two years of law suits and wrangling between Newark, Essex County, the DEP and CEA. Ground was broken earlier this year, but construction will not be completed until 1982 at the earliest. The construction of the Newark facility will proceed slowly until CEA’s plant in Bridgeport, Connecticut, completes its shakedown period.

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Key Words
Economic Development
Industry
Materials Handling
New Jersey
New York
Refuse

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