FINANCING SOLID WASTE DISPOSAL PROJECTS IN THE 1990s

PHILIP M. CHEN, GINA D. FRANCE AND STEPHEN A. SHARPE
Shearson Lehman Hutton Inc.
New York City, New York

ABSTRACT

Solid waste financing is a dynamic industry with its own particular set of rules and guidelines. The Tax Reform Act of 1986 changed the way projects were financed from the first half of the Eighties to the second half of the Eighties. Dramatic shifts from project financings to system financings, coupled with the economics of such alternative technologies as recycling have created new opportunities as well as headaches.

The purpose of this paper shall be to examine the changes in financing techniques in the solid waste industry and to attempt to forecast the marketplace for financings into the Nineties.

INTRODUCTION

During the last two years of the eighties, the focus of the solid waste disposal industry shifted to alternative disposal technologies and to the problem of ash disposal. Recycling became, once again, a popular notion and its advocates called for recycling of municipal solid waste in quantities that approached Herculean levels. Indeed, the focus of the industry on recycling was reenforced by the attention the United States Environmental Protection Agency (USEPA) was giving to inclusion of recycling as best available control technology in prevention of significant deterioration permits. The message is clear: as we move into the 1990s, planners of solid waste systems must pay heed to demands for a broader view of disposal.

The concept of integrated solid waste management systems is not new. In fact, if one were to examine the means that almost every community has traditionally used to dispose of municipal solid waste, one would find that most elements in what is now called integrated solid waste management has been and continues to be used. These elements include: recycling, composting, and landfilling. The essential change in these systems is that landfilling has become suspect and that waste-to-energy incineration is viewed as a means for reducing our communities' dependency on landfills.

Why are investment bankers interested in this issue? Investment bankers must deal with the ability of communities to raise capital for many infrastructure needs. The seriousness of the solid waste problem is such that communities choosing to ignore the full implications of integrated solid waste management systems may find that their credibility with the capital markets will be affected. Solid waste disposal is fast becoming one of the most critical problems facing every one of our country's communities; from the high density urban centers to the sparsely populated rural areas.

Increasingly, communities are finding that waste disposal is not solved by merely finding an out-of-state landfill or by ignoring the problem. As the cost of

waste disposal increases with diminishing disposal options, more and more communities will find that a greater portion of their budget will be taken by the costs of waste disposal. This will result in an increased sensitivity on the part of potential lenders in assessing the capability of community leaders to cope with municipal problems. This, in turn, can have an effect on the ability of affected communities to raise capital for other infrastructure needs.

Consequently, we urge the leaders of our country's communities to renew their efforts to resolve the solid waste dilemma and to steer a steady course through stormy waters. This paper was prepared to assist municipal decisionmakers in understanding the financing of integrated solid waste management systems and how the various components of that system can affect the financing decision.

The financing of waste-to-energy facilities was dramatically affected by the Tax Reform Act of 1986 (the "Act"). The Act has had far-reaching effects on the various parts of solid waste system implementation. The specific changes in tax treatment will be covered in the Appendix to this paper. This paper is directed toward changes in how municipalities will view waste disposal in the 1990s and how those changes will affect municipal decision making on such issues as disposal methodologies, ownership, energy purchasers, financing and risk allocation.

SOLID WASTE DISPOSAL SYSTEM

Virtually every community examining waste disposal will examine a variety of alternatives, including recycling, waste-to-energy, composting, transfer stations and landfills. Often two or more alternatives will be implemented to work together as a solid waste system. As a result, the concept of an "integrated system" financing is becoming much more frequent.

In an integrated system financing, bonds will be issued to finance one or more components of the solid waste disposal system. For example, a waste-to-energy facility, recycling facility, transfer station and improvements to a landfill could be financed by one bond issue. All of the revenues from the various system components would be pledged to cover the debt service on the bonds. The entire solid waste system must be included in defining system revenues. To extend the example listed above, the system could not be financed if revenues from another landfill within the system were not included since that landfill could "drain" revenues from the facilities being financed.

THE OWNERSHIP DECISION

Many variables impact the decision for public or private ownership, including project economics, financing considerations, past practices and philosophies regarding public or privatized waste disposal services, and legal issues. A full discussion of these factors is beyond the scope of this paper; rather, this paper will define the typical forms of public and private ownership and address a few highlights.

Public Ownership

There are several options for structuring the project under public ownership. At the extreme, in the purest form of public ownership, a municipality could itself design and build a facility, purchasing the required equipment from various suppliers, and operating and maintaining the facility with municipal employees. Because of the staff and technical expertise required to oversee the design, engineering and construction, this option is rarely chosen. More typically, the governmental entity contracts with a private company (a "vendor") that specializes in the waste-to-energy industry. The vendor designs and builds the project, and often operates and maintains it as well. Because the plant is publicly owned, the municipality would have the choice of staffing the facility with its own personnel or subcontracting with an independent company. Most municipalities with publicly owned facilities choose to contract with the vendor that designs and builds the project to operate and maintain the facility through a long-term service agreement because of the long-term operating guarantees available from the vendor. The service agreement provides assurance that the vendor will operate the plant as expected. The vendor will have possession of the facility for the term of the service contract, which typically runs for 20–25 years.

Private Ownership

Like public ownership, there are also several forms of private ownership. At the other extreme end of the spectrum from pure public ownership, a private vendor could design, finance, construct, own and operate the facility without any contracts with a municipality. The vendor would hope to attract sufficient quantities of waste by establishing a tipping fee that is competitive with other waste disposal alternatives in the area and sufficient to earn satisfactory revenues from the facility. This is known as a "merchant" facility.

Because the vendor is subject to a great number of risks, including the potential for flow control legislation

to prohibit the influx of waste to the facility or direct waste to a competing facility, very few merchant facilities have been built. However, because municipalities often receive unsolicited proposals from vendors that resemble a merchant plant, this paper will discuss merchant facilities in more detail later.

The more common private ownership scenario is one in which a vendor contracts with a municipality to design and construct a waste-to-energy facility, and to operate and maintain that facility under a long term service agreement. The facility will not be owned by the municipality; instead, either the vendor selected to design, build, operate and maintain the facility, or an outside investor, holds legal title to the project.

Highlights of Ownership Decision Factors

Future Control of Facility

One of the critical issues to the ownership decision is what happens at the end of the service agreement with the vendor. When the service agreement for a publicly owned project expires, the governmental entity is free to do what it wishes with the facility, including renewing the vendor's contract, contracting with another vendor to operate the facility, staffing the project with public employees, or selling the facility. The municipality will own the facility free of debt at the end of term of the service agreement because the bond maturity is generally coterminous with the service agreement.

Under private ownership, the vendor or outside investor retains ownership of the facility at the end of the service agreement. At the end of the service agreement, the municipality will be faced with three options: *(a)* renew the service contract with the vendor; *(b)* exercise its option to purchase the facility; or *(c)* seek an alternative disposal option. If the municipality chooses to purchase the facility, the acquisition price will equal the fair market value of the facility as determined by an appraisal at the time of acquisition. Important factors in the fair market value calculation will be: *(a)* whether there is an alternative for waste disposal; *(b)* the practical and legal ability of the owner to process other communities' waste; *(c)* whether the plant is then obsolete or other waste disposal technologies exist; and *(d)* how the facility has been operated and maintained. Although there are no legal constraints to the municipality's ability to negotiate contract renewal provisions when the service agreement is initially executed, in the final analysis, the municipality must purchase the facility from the private owner if it wishes to gain control of the facility. If the municipality did not purchase the facility and could not reach agreement with the vendor for future waste disposal service, the municipality could be forced to revisit the entire issue of waste disposal alternatives. Some communities find private ownership unattractive for this reason.

Because of the lack of operating history in this country and because future disposal options cannot be predicted, the actual fair market value of a waste-to-energy facility at the end of the service agreement (typically 20 years) cannot be predicted with absolute certainty. However, there is widespread belief that the residual value is predictable based on the history of "stand alone" small electric power facilities. This belief is based in part on the assumption that the facility will be maintained to a similar standard as a like base load utility facility. Project consulting engineers believe that the waste supply, the burning technology and the electric power market will extend well beyond 20 years.

As a worst case, the individual components of the plant either alone or separately (i.e., the turbine generator or the boiler) will continue to have value. It is estimated that the residual value of the facility may reasonably be 40–60% of the total cost of construction in current dollars, depending on factors such as inflation rates and technological advances. Appraisals of the value of facilities nearing the end of 15 years of operation seem to agree with this general conclusion.

Risk Allocation

Although there has been a generally held view that a vendor may accept more risk in a privately owned project, recent projects have demonstrated that the risk allocation for a publicly owned project with a long-term vendor service contract can be virtually identical to the risk allocation under a private facility.

Control and Responsibility

By contracting for operation by the vendor, it is possible to structure a publicly owned facility for which the municipality would have no more responsibility and involvement than under a privately owned facility. In essence, the municipality's involvement in a publicly owned project for all practical purposes could be limited to being the nominal tax owner of the facility. Both public and private ownership options offer the opportunity for privatized operation.

Some communities initially perceive that public ownership offers the municipality more control over day-to-day operation of the facility. This, in fact, is not true if the facility is operated by the vendor under a long-term service agreement. The terms of the service contract, under either public or private ownership, will establish in great detail the rights and responsibilities of both the municipality and the vendor. The service

agreement will also specify how changes to the envisioned operation of the facility are to be made. Changes outside of the scope delineated in the service agreement will require the consent of both the vendor and the municipality. Consequently, unless specifically stated in the service contract, a municipality could have no more control over a municipally-owned, vendor-operated facility than a privately owned and operated facility. For example, a municipality would not be able to change the facility's operating hours without the vendor's consent under either ownership scenario.

Private Activity Bond Volume Cap Allocation

As mentioned earlier, publicly owned projects, so long as the service agreement meets certain constraints, are not required to obtain state private activity bond volume cap allocation. On the other hand, privately owned projects must compete for volume cap which may at times be relatively scarce and politically assigned to other more pressing needs. Although strategies exist for working around this problem, each of these strategies requires alternative financing scenarios that will increase the cost of the transaction. Because many states have limited volume cap and alternative strategies may increase the ultimate cost of the service, many municipalities are electing public ownership.

Project Economics

The ownership decision will determine how the project is financed: generally tax-exempt and taxable debt for publicly owned projects and tax-exempt debt and equity for privately owned projects. Since both publicly owned and privately owned projects will utilize private activity bonds for financing in most cases, the economics of the project hinge on how nonqualifying costs will be financed. The economic advantage of one ownership option over the other depends upon whether the cost of the equity is cheaper than the cost of the taxable debt. Immediately following passage of the Act, it was predicted that public projects would be cheaper than private projects. However, a strong market for third party equity and a lowering of the amount of equity contributed to a project as well as a lowering of the required rate of return on such equity have occurred since these studies were performed. Consequently, a municipality should not automatically assume public ownership is less expensive. The relative cost depends upon what equity commitment a vendor or third party is willing to make versus the cost of taxable debt.

RECYCLING

There are three basic considerations regarding materials recycling that resource recycling project sponsors must contend with in using a project financing structure, specifically with tax-exempt bonds:

(a) Evaluation of the project's capacity to handle increased capital costs associated with the materials recycling process, if sizable, and any additional labor costs associated with operations and maintenance of equipment, or alternatively, the use of additional workers to hand pick materials from the waste stream.

(b) Scrutiny of the assumptions supporting projected economic returns from the sale of recycled materials, including price escalation on the spot market, the existence of regional buyers, competition, and materials composition in the waste stream.

(c) Determination of the reasonableness of expectations for the performance of the technology itself, the availability of adequate warranties and incentives for equipment suppliers to repair or replace faulty equipment, and the ability of the processing and burning system to handle sufficient volume of solid waste if materials recycling efforts are discontinued.

The estimation of materials recycling revenues as a component of resource recovery and recycling project financings raises some concerns about the predictability of such arrangements for credit purposes:

(a) Long term contracts (over 5–7 years) for the purchase of recycled materials are not common practice and short term prices are known to fluctuate in response to changing energy prices, the availability (or lack) of acceptable substitutes, supply increases (or decreases) or technological advances in the use of mixed-grade recycled materials.

(b) Potential changes in the waste composition over time, which would reduce the availability of materials for recycling. Bottle and can legislation, which requires separation and return of glass, plastic bottles and aluminum cans before entering the waste stream, can have an impact on project economics.

(c) Technical feasibility of innovative recycling. Everyone would like to pioneer the latest in high technology to address a critical need such as waste disposal, but only if it is a relatively sure thing.

Project sponsors have taken the following approaches, each of which may be found satisfying to some, but not all, institutional lenders:

(a) Use of or plan to use handpicking for removing some materials.

(b) Proven capability to burn waste if materials separation is not feasible, i.e., substituting an alternative plan for operating the facility.

(c) System redundancy, i.e., excess capacity to process waste through the recycling equipment so that, if one process line was down for maintenance, the others could still function.

(d) Guarantee of the facility operation or its operating revenues.

When financing resource recovery and recycling projects, the capital markets are focused on the stability and reasonableness of the revenue stream over the term of the bonds as an important indication of the project's feasibility. Cash flow analyses where recycled materials are a factor are a necessary test of the availability of adequate revenues. Acceptability of a project in terms of structuring and selling debt depends on total revenue of the project, including the extent to which there are certain energy prices or flexibility to increase energy revenues or tipping fees in order to cover debt service expenses. In a project where energy revenues are based on oil or gas prices, fluctuating sales of recycled materials may further enhance or strain the project's overall return. In other words, a project with either certain energy prices, or make-up provisions for cost increases or shortfalls due to lower energy revenues to be passed through to user fees, may be viewed on a credit basis as being strong enough with these factors in hand to withstand variability in revenues from the sale of recycled materials. Conversely, where the project is dependent solely on revenues from the sale of recycled materials, the variability of such revenues may negatively impact on that project's credit analysis.

How does materials recovery and recycling affect sizing and structuring resource recovery recycling projects? First, the cost of the equipment and associated financing costs add to the enormous long-term cost which must be paid back by the project's earnings over a typical 20–30 year period. Second, the concerns and skepticism of some institutional investors may force the project's economic projections to withstand sensitivity analyses which may very well assign no value to materials revenues.

The term "sensitivity analysis" refers to careful examination of projected revenues in terms of a project's responsiveness to changing economic assumptions, such as changes in inflation, waste availability, increased equipment downtime, lower materials prices, and transportation costs. The benchmark in terms of whether a financing participant accepts the risk of financing a resource recycling project is whether the project, under normal operating assumptions, satisfies a "coverage ratio"—which is defined as the net operating revenues available for debt service (after expenses) over debt service. A 1.25× ratio, which means that the recycling project's ascertainable net revenues are 125% greater than debt service, provides a comfortable cushion of available revenues should an unexpected event occur. Ascertainable revenues may be found in such arrangements as a base price recycled materials purchase contract, an agreement with the sponsoring municipality to cover all cost of the project or with creditworthy guarantees from a project participant that a minimum floor price for recycled material can be achieved.

From a community's perspective, these sensitivity analyses are important estimates of the range in tipping fees that could occur if a project cannot achieve the projected level of materials sales or prices.

With growing interest in materials recycling by both users and providers of solid waste disposal services and buyers of recycled materials, a willingness to develop and invest in resource recovery and recycling facilities is expected to emerge. Still viewed conservatively by risk-adverse institutions, current projects have to face a suspicious audience, and in some cases may have to secure financing with vendor/owner guarantees to make contributions to cover shortfalls or system failures. Developments in the processes and equipment designed for resource recycling here and abroad (primarily in Europe and Japan), have encouraged more consideration of materials recovery in solid projects in evidence; the specific assumptions and concerns presented here assume major importance in getting the project financed.[1]

COMPOSTING

In many respects the credit analysis for composting projects is very similar to that for recycling. Without a guarantee of market prices for the compost, it is difficult to assign any credit for revenues from the sale of the compost. The one benefit that compost has that recycling does not is that compost can generally be used by someone even if it has to be given away. Consequently, one normally would not penalize a composting project by requiring consideration of the cost of landfilling material that can not be sold or given away.

The best credit structure for composting projects may be the one that is used for waste-to-energy proj-

[1]Note: Ann C. McCullough, a former Shearson Lehman Hutton Inc. Vice President contributed to portions of this section.

ects. In many waste-to-energy projects, the municipality carries the entire cost of operating and maintaining the project, including the cost of debt service. To the extent that there is revenue generated by the sale of electricity from the facility, the municipality is given a credit against their payment of the service fee. In a composting project, the service fee could be similarly structured.

LANDFILLS

Landfills have traditionally been financed either with sponsor's equity or through commercial bank debt. While many landfills will continue to be financed with sponsor's equity, an increasing number are being financed as projects. At the same time, commercial banks are noticeably backing away from financing landfills due to certain lawsuits involving environmental risks arising from mismanagement of landfills and the banks' liability for such events. Even though the lawsuits involved landfills constructed prior to the new standards adopted by many proposed future landfills, the banks have been reluctant to even look at such projects.

As a consequence, nontraditional methods for financing such projects have arisen including venture capital and nonrecourse project financings.

FINANCING OPTIONS IN THE NINETIES

At present, solid waste-to-energy projects are financed in a variety of ways. At one end of the spectrum, the project can be municipally owned and financed with either general obligation or tax-exempt revenue debt. At the opposite end of the spectrum the project could be financed entirely from a private sponsor's equity. Between these two extremes, the combination of equity and debt is largely a factor of ownership and municipal requirements. Other factors including the sponsor's creditworthiness, project economics, sponsor's preference in financing, availability of tax benefits and availability of state private activity bond ("PAB") volume cap will enter into that decision making.

The typical waste-to-energy facility is financed on a nonrecourse or limited recourse project finance basis, wherein the cash flow and net worth of project sponsors are not pledged to the repayment of debt. Consequently, the repayment of debt and positive project cash flow are dependent solely upon revenues generated from tipping fees, electric sales and material recovery, if any.

Publicly owned projects are generally financed with a combination of tax-exempt revenue bonds and taxable debt. Taxable municipal bonds are most commonly used to finance the facility costs which do not qualify for tax-exempt debt ("nonqualifying costs") and costs of issuance and development in excess of 2% of the tax-exempt bond issue, which also do not qualify for tax-exempt financing. Nonqualifying costs generally total 10–20 % of the facility cost. Generally the same governmental entity will issue both the tax-exempt and taxable bonds. Of course, other forms of taxable financing such as bank loans or possibly loans from the vendor, could be used. In addition, a municipality may wish to use general funds or special reserves to pay for nonqualifying costs. Special reserves, for example, may be funded from tip fee surcharges from current landfill operations.

Traditionally, privately owned projects have been financed with a combination of tax-exempt project revenue bonds issued by the sponsoring municipality and equity contributed from the project vendor. Equity is generally used to finance the nonqualifying costs. Tax benefits, together with project revenue sharing and the residual value of the facility at the end of the service agreement, provide the vendor with a return on its equity investment.

Until the passage of the Act, privately owned projects financed with debt and vendor equity were considered the most economic alternative and hence the prevalent form of ownership and financing structure. However, the Act has since eliminated many of the tax benefits previously available to private owners, thus reducing the economic advantage of privately owned projects.

Privately owned projects may also be financed using "third party" equity, i.e., equity from a source other than the vendor or the municipal sponsor. Third party investors often have a greater appetite for the tax benefits generated by the project and/or a lower rate of return on such equity investment than the project vendor. The net result for a project is lower tipping fees than would have been available using vendor equity.

A further focus of this paper is an examination of methodologies for financing nonwaste-to-energy facilities such as composting and recycling projects. Since many of these projects will not be automatically eligible for tax-exempt financing, this paper discusses, among other things, traditional methods for financing projects from straight equity to venture capital.

Corporate Assets

The most straightforward method of financing privately owned solid waste disposal projects is by use of corporate assets. Stated more bluntly, pay for the acquisitions and/or capitalized asset with cash—in bankers' words: equity. Although this flies in the face of the prevailing notion that a good project can always find backers thereby minimizing the project proponent's financial exposure, self-financing of projects can oftentimes make a tremendous amount of sense. This is especially true where the company or developer is attempting entry into a new territory or into a new industry. This is also the easiest path when a new technology is being introduced.

Obviously, this is not an option that will be available to every one. Where it is available, serious consideration should be given to its use. There are, however, certain aspects of financing projects that require equity or some meaningful substitute for equity. For example, to assure the continued interest of the private owner/operator of solid waste projects in continuing its obligations to the municipality to provide contracted-for services through the period of the contract, municipalities have required the posting of considerable equity by the owner. This equity was used in combination with debt to purchase the land and capital assets necessary for the project.

Another area where equity is invariably required is in the early stages of project development of a project. This front end of project development is the period of most difficulty for raising any form of nonsponsor derived funding. The term "nonsponsor derived" is used intentionally. Nonsponsor derived equity is the situation where the sponsor does not have to use its own cash or put up its net worth to guarantee debt.

Noncorporate Assets

When your corporate larder is less than overflowing or when your treasurer is particularly tightfisted, exploration of other means to finance privatized projects are in order. In this situation, any one of several combinations may prove useful in amassing the capital needed to make projects happen. Noncorporate money can come from a variety of sources: joint venture equity, venture capital, bank loans, bridge financings, taxable municipal debt, corporate debt, passive equity, limited partnerships, and tax-exempt bonds.

Each of these sources of money have their positive and their negative factors. A general statement is that the earlier you need outside capital, the greater that capital will cost you both in terms of revenue and control. A corollary to the above statement is that the less project credit you can muster to attract outside equity or debt, the better prepared you should be to give up both revenue and control. There is even a point in the early stages of a project's development where it is virtually impossible to obtain outside funding.

Venture Capital

One of the exciting developments in recent months is the interest that venture capital is showing in the privatization of municipal projects. In the past, true venture capital has been limited in the high technology areas where substantial returns could be had for relatively small outlays of cash. In those situations, venture capital was often available at very early stages in the development of an idea. Recently, venture capital is beginning to turn its Midas touch toward low technology projects, perhaps in response to the perception that such low technology projects can, in certain instances, generate substantial cash flows or in response to a reduction in the availability of more traditional high technology opportunities.

However, these venture capitalists are finding out that project development marches to its own drum and the infusion of money does not necessarily result in acceleration of the project. Coupled with permit risk, normally not present in high technology investments, the long lead times of projects can discourage many venture capitalists interested in the transition to low technology investment. The venture capitalist who spends the time to learn and understand the privatization field often can be a valuable participant in the development of a project.

The venture capitalist is looking for substantial returns on his or her capital. This is normally justified because of the risk that the project may or may not be successful. Since the venture capitalist stands to lose the investment in those circumstances and because other funding sources are reluctant to take even the risks venture capitalists take, payment at elevated levels of return may be justified.

There are, however, some venture capitalists that in reality are merely investment funds. In these situations, the fund managers are limited in their ability to take risk to the degree that they are unable to commit funds at early stages of a project. Project sponsors should be careful to determine how much risk a venture capitalist can take before spending too much time and effort.

LEVERAGED LEASES

Leveraged leases are still available for certain projects. Bearing in mind that the typical leveraged lease is fueled by tax benefits, the Tax Reform Act of 1986 (the "Act") has drastically lessened the value of these benefits. This was achieved by lengthening the depreciation period for different classes of assets, abolishing the investment tax credit ("ITC") and by reducing the maximum corporate tax rate.

Where the project is funded, in the main, by tax-exempt debt, the available tax benefits associated with that debt have been reduced to the extent that the benefits are substantially less. For example, the depreciation period for the different classes of property has been lengthened. Coupled with the straight line depreciation method used for calculating depreciation, the value of tax benefits particularly in the early years of the project is lessened. On the other hand, assets financed with taxable funds can be depreciated over shorter periods and with double declining balance depreciation. This combination restores the benefit of these factors to the early years of operation where their impact could be more appreciated.

TRADITIONAL PROJECT FINANCING

Traditional project financing sources include construction loans and permanent financing. These sources may be utilized separately or structured together depending upon the project stage, economics, risks, and the longer term goals of the project sponsors.

In general, project financings may be structured as recourse, nonrecourse or partial recourse obligations. As applied to privatization of municipal projects, nonrecourse or only limited recourse debt obligations are the natural goal. Funding sources evaluate the viability of the project on its own merits without reliance on "deep pockets" to help repay debt if projected cash flow does not materialize in accordance with earlier expectations. The availability of such funding is therefore dependent upon a project's economic viability, the financial structure and risk sharing arrangements from construction through long term operation. Should the project default on its obligations, recourse is generally limited to the assets of the project itself. Construction loans or credit enhancement for bond financings are provided most often by commercial banks, finance companies, or thrifts. These financial institutions share certain risks associated with the construction stage of a project. As distinguished from permanent lenders, a construction lender has a shorter term view (1–3 years) and does not undertake market or operating risk on the project. Once the project has been completed according to specifications, the construction lender expects to be repaid by refinancing with a permanent lender. Refinancing may be left open until project completion or a take-out commitment may be arranged before constructions starts. Permanent lenders are not interested in construction. Instead, they take the long-term position of a project's market, operating and cash flow characteristics. The term can range from 10 to 25 years depending upon the life expectancy of the project and the source of funding. Funding or credit enhancement for permanent financing is available from pension funds, insurance companies, surety companies, commercial banks and other financial institutions with comparably matched long term sources of cash. Commercial banks will usually not exceed ten years maturity whereas pension funds and insurance companies offer longer periods.

Construction and permanent funding sources can be structured and committed back-to-back before the project is launched if project sponsors, investors or construction lenders are unable or unwilling to take a chance on refinancing. Without a permanent funding source in-place, project sponsors take the risk that the market for permanent financings may be too costly or not available at the completion of financing. In the solid waste disposal industry, this is generally not acceptable and back to back funding is advised. Typically through a triparty agreement, a permanent lender commits to repay the construction loan when the completed project is turned over at a preagreed acceptance stage. Obtaining this type of take-out commitment can often be a critical factor in obtaining construction funds.

Many variations of the foregoing can be tailor-made for project financings where separate entities are expected to fund the construction and long term operations of a project. Construction and permanent financing can also be provided from the same source. Often obtained through commercial banks, there are clear advantages to dealing with fewer parties in a combined construction and permanent financing. A minor drawback is that refinancing is usually eventually required. This is due to higher principal amortization and lower leverage following project completion from a lender who has been involved since construction started, hence a more conservative profile. When a project is generating cash flow, new sources of permanent financing can offer more aggressive terms than the original lenders who were initially looking at a hole in the ground.

Due to the wide range of capabilities of lenders and differing interest in project financings, it is always important to 'shop around' with a manageable number

of both domestic and foreign lenders in order to obtain the most favorable terms and also to take advantage of their expertise. Choosing the right lender with the best experience can often add value and savings for the project.

Before approaching any lender, sponsors first pull together all the project development information and plans into a coherent and comprehensive privatization/business plan (the "Plan"). The key factors which lenders initially want to understand and assess include: the project, project sponsors and participants, construction costs, management, cash flow projections, proposed financing structure, source of repayment, and market risks.

At the construction loan stage of project development, the Plan will generally have already evolved. However, the sponsors may need to significantly re-evaluate the Plan if they had not previously contemplated lenders' risk aversion and limitations. The fact that lenders do not participate in the higher economic returns sought by the equity investors means that their lower "fixed" returns based upon interest margins must be assured. Accordingly, lenders focus on the downside risks. This means they are particularly concerned with mortgage and security interests in the project and the appraised values compared with loan values.

To create these assumed values, the project must first be constructed within a budget and be capable of perfo ming within the designed parameters. Construction risks are unique with cost overruns, completion delays and performance problems all too common a dilemma. A project can be rendered unsuccessful before completion if the budget or contractor or both get too far off track.

It is therefore a standard part of any traditional project financing construction loan to mitigate these risks through the contractual undertakings of the construction companies who are responsible for getting the job finished. A fixed-price (or guaranteed maximum price), turnkey construction contract with single point responsibility can serve to limit cost overruns by having a single contractor assume the risk.

To cover problems related to completion delays or performance, the construction contract should contain liquidated damages payable by the contractor relating to at least the debt service obligations if the project is delayed or when completed, does not entirely satisfy the original design parameters.

Additional support to this risk sharing form of contract can be created by holding back a retainage (up to 10 percent) from the usual monthly progress payments to the contractor until final completion is achieved. Performance and payment bonds add another level of security to lenders and sponsors alike, especially if a contractor's financial condition is not golden.

In obtaining sources of permanent financing, the focus shifts from nuts, bolts, brick and mortar to cash flow. The long term project viability from a permanent lender's viewpoint is based upon the following:

(a) relatively assured revenues sources
- *(1)* power sales agreement
- *(2)* waste disposal contracts
- *(3)* long term leases
- *(4)* service agreements

(b) operating and expense control
- *(1)* experienced management
- *(2)* adequate maintenance program
- *(3)* operating contracts
- *(4)* industry comparables

(c) debt service capacity
- *(1)* cash flow coverage in excess of required debt service
- *(2)* cash reserves for contingencies
- *(3)* interest rate sensitivity
- *(4)* amortization period

(d) security interests
- *(1)* loan to value ratio
- *(2)* quality and marketability of assets
- *(3)* insurance
- *(4)* alternatives in bankruptcy scenario

DEBT FINANCING

Debt financing of solid waste disposal projects is a mainstay of this industry. Since each project may have differing requirements for tax-exempt financing it was considered beyond the scope of this paper to address all the variations of tax-exempt financings.

Tax-Exempt Bonds

There are several types of tax-exempt bonds that a municipality can use to finance a waste-to-energy project.

General Obligation Bonds

General obligation bonds are tax-exempt securities which pledge the full faith and credit and taxing power of the municipality as the security behind the debt service on the bonds. General obligation bonds are generally viewed as the most secure form of financing and, consequently, would provide a project with the lowest interest rates.

However, general obligation bonds are not typically used to finance large capital projects such as waste-to-energy facilities. Alternative financing structures enable the municipality to: *(a)* avoid placing its full faith and credit on such a sizable financing; *(b)* preserve the municipalities general obligation debt capacity; and *(c)* avoid the need for voter approval of the bond issuance.

Project Revenue Bonds

Project revenue bonds are generally used to finance waste-to-energy projects. Tax-exempt project revenue bonds are supported by the revenues generated by the waste-to-energy facility (tipping fees, energy sales revenues and recovered materials revenues). There are two types of tax-exempt project revenue bonds:

Governmental Purpose Bonds ("GPBs")

GPBs may be used to finance publicly owned projects that meet certain structural criteria. GPBs may be used only if:

(a) the project is publicly owned;

(b) essentially all of the project's energy output is sold to a publicly owned utility; and

(c) the term of a service contract with a private operator is 5 years or less, and the service agreement meets certain other conditions.

Although GPBs are not subject to many of the restrictions the Act places on private activity bonds, most waste-to-energy projects violate one or more of the criteria listed above and thus are financed with private activity bonds.

Private Activity Bonds ("PABs")

PABs are subject to certain restrictions under the Act but allow a municipality to sell energy to an investor-owned utility and/or to enter into a long-term service agreement with the project vendor, thereby obtaining project guarantees and a project risk allocation between the municipality and the vendor that is comparable to the risk allocation for a privately owned project. It should be noted that publicly owned projects financed with either PABs or GPBs are not subject to state bond cap allocations, so long as the service agreement with the vendor meets certain rules. (GPBs are never subject to bond cap requirements.)

In states where bond cap allocation is scarce, this ownership exemption from bond cap allocation may lead municipalities to choose public ownership. PABs are the only tax-exempt financing alternative for privately owned projects. State bond cap allocation must be available in order to finance a privately owned project with PABs. If sufficient bond cap allocation is not available, taxable debt may have to be used instead of tax-exempt debt.

Taxable Municipal Debt

Since passage of the Act, taxable municipal bonds ("TMBs") have become more common in financing waste-to-energy projects. As mentioned above, TMBs are often used to finance nonqualifying costs in a publicly owned project. In many states, TMBs are taxable at the federal level but tax-exempt at the state and, often, at the local level. Accordingly, in those situations the use of TMBs may still result in interest cost savings to the issuer and project proponent.

TMBs may also be used for privately owned projects if tax-exempt bond cap allocation is not available, if the equity contribution is not sufficient to cover nonqualifying costs or if taxable debt is less expensive than vendor or third party equity.

TMBs have also gained acceptance as an alternative to the tax-exempt debt component of a privately owned waste-to-energy project. In such instances, the higher interest rate costs affiliated with the taxable debt may be partially or completely offset by the greater tax benefits derived from more aggressive depreciation schedules allowed for equipment financed with taxable debt. Obviously, TMBs are more attractive during those periods when the yield on taxable municipal debt is relatively close to the yield on comparable tax-exempt debt.

TMBs have gained considerable interest since the enactment of the Act and as the magnitude of the changes contained in the Act is appreciated. Although certain states do not, as yet, permit TMBs, the majority do. As far as the waste-to-energy market is concerned, TMBs present opportunities for financing certain projects in part or in their entirety. Some of the applications of TMBs replace previously tax-exempt fundable items such as financing of issuance costs where the two percent limitation is exceeded; financing extra costs incurred during current refundings of previously issued debt; and financing reserve funds in excess of ten percent. Other uses of TMBs include financing of projects on a wholly taxable basis; financing of nonqualifying portions of projects by municipal owners; and financing of "equity" contributions by private owners.

PROJECT RISK ALLOCATION

Project financing requires that the risks be allocated between public and private project participants. The

corollary to this rule is that all risks must be allocated. If a risk is unallocated, the bondholders are exposed to the loss of their investment if the risk comes to pass. Bond investors lend money based on the credit quality of borrowers and, generally, should not be expected to suffer loss upon the occurrence of specific risks of construction and operation of a particular project. In addition, tax-exempt bond issues are initially sold and thereafter traded in the public markets. Entry to these markets at a reasonable cost required a credit rating from one or both of the major credit rating agencies. These rating agencies generally will not provide a rating if a material risk is unallocated.

Under either ownership scenario, the vendor should accept the completion and technological risks and the responsibility of operating the facility correctly so as to meet certain performance standards. The municipality would typically be expected to accept risks associated with the solid waste supply, including payments for a shortfall in quantity. As a general rule, the municipality would also be expected to assume the risk of force majeure events (risks that cannot be controlled or anticipated and that cannot be insured against) and risks of changes in law that affect the facility's ability to operate.

It may be possible to have the vendor assume certain risks normally borne by the municipality. The municipality should be aware, however, that there will be a price, often substantial, affiliated with transferring such risks. In addition, the municipality should be realistic about what the vendor is likely to accept. It is highly unlikely that a vendor would assume force majeure risks for the life of the project. The vendor may, however, be willing to assume force majeure risks during construction (for a price).

CONCLUSION

Financing waste disposal projects in the Nineties will, in many respects, be similar to how such projects are financed today. The major difference will be in the means by which projects such as landfills, recycling and composting will be analyzed in the future. Until certain aspects of these projects are resolved, the traditional use of debt financing as experienced in the waste-to-energy facility financing may not be readily available. The authors believe that more enterprise fund-integrated solid waste disposal system financings may be seen in the Nineties.

Notwithstanding the authors' belief that enterprise fund-integrated solid waste disposal system financings will become increasingly the means by which many solid waste disposal facilities will be built, the need to better understand other forms of finance was deemed to be instructive. Accordingly, this paper details how traditional project financing may be of help to developers of solid waste projects, both private parties and municipalities.

APPENDIX

Although the Tax Reform Act of 1986 (the "Act") was discussed extensively in an earlier paper by authors from Shearson Lehman Hutton Inc. delivered at the Solid Waste Processing Conference in 1988, the particulars of the Act are still relevant to developers of these projects in the nineties. Because of the importance of this Act, we have reproduced this discussion in this paper as an Appendix. The Act has had a direct impact on how projects, in particular waste-to-energy projects, will be financed.

Pre-Act Tax Law

Most waste-to-energy facilities are financed with a combination of equity and debt. Pursuant to Section 103(b)(4)(E) of the Internal Revenue Code (the solid waste exemption), tax-exempt Industrial Development Bond ("IDB") financing is presently available for the debt portion of resource recovery projects.

The Internal Revenue Service ("IRS"), however, limits the use of tax-exempt IDBs for resource recovery facilities to the period when the solid waste being processed is "valueless." Consequently, tax-exempt financing is available for resource recovery facilities only to the point where a valuable or useful product is produced. Bond counsel generally defines this point as the production of steam in a solid waste disposal boiler. Equipment and facilities, and associated land, that *use* the steam (i.e., heat distribution systems or electric generating equipment) do not normally qualify for tax-exempt financing. (The exception to this rule is where the "back-half" of the project, i.e., the energy user, is a tax-exempt entity.)

The Deficit Reduction Act of 1984 (the "1984 Act") further limited the availability of tax-exempt IDBs by subjecting the issuance of private activity IDBs (including those for resource recovery financings) to state volume caps. Each state's annual cap is $150 per capita or $200 million, whichever is greater. After 1986, the per capita amount decreased to $100. The 1984 Act also made tax-exempt financing more expensive by disallowing arbitrage. This meant that revenue from reinvestment of unspent bond proceeds in the construction

and capitalized interest accounts cannot be used to lower the principal amount of the bonds, thereby resulting in higher debt service for the project.

A third change was the loss of Accelerated Cost Recovery System depreciation ("ACRS") over appropriate ACRS periods. However, the effect of that loss was probably not significant since straight line depreciation over appropriate ACRS periods continued to be allowed, which still resulted in relatively fast depreciation of an asset.

Tax Legislation Under the Act

The Act modified tax treatment of waste-to-energy facilities both from the tax-exempt bond standpoint and from the tax benefits standpoint.

Among other things, the Act:

(a) Changed the designation of IDBs to "Private Activity Bonds" ("PAB").

(b) Preserved "governmental purpose" tax-exempt (non-PAB) financing for only those waste-to-energy projects in which the 10 percent "Trade or Business Use Test and the Security Interest Test" or the $15 million output facilities test is not exceeded ("10/15 test").

(c) Permitted "private activity" tax-exempt bonds for any waste-to-energy facility exceeding the 10/15 test, whether municipally or privately owned, as a specific PAB exemption.

(d) Subjected interest earnings on all private activity bonds (except qualified 501(c)(3) bonds) issued after August 7, 1986, to the alternative minimum tax. This includes waste-to-energy facilities failing the 10/15 test whether municipally or privately owned.

(e) After 1987, subjected private activity bonds, including privately owned waste-to-energy facilities to a $50 per capita or $150 million per annum volume cap in each state. On a positive note, the Act specifically exempted all municipally owned waste-to-energy projects from the volume cap.

(f) Permitted private management contracts (up to 5 years) for operation of municipally owned waste-to-energy plants financed with Governmental Purpose Bonds ("GPB"), where the energy is sold to municipal users as long as:

(1) at least 50% of the compensation to the private manager is on a periodic, fixed-fee basis;

(2) no sharing of profits; and

(3) municipality may terminate the contract at the end of any three year period without penalty.

(g) Permitted long-term management contracts (greater than 5 years) for operation of municipally owned waste-to-energy plants that fail the 10/15 test as long as: *(a)* the term of any service contract or lease does not exceed 20 years; *(b)* the service contractor or lessee has no option to purchase any of the property for other than its fair market value; and *(c)* the private operator elects irrevocably not to claim investment tax credit or depreciation.

(h) Replaced the 10% "bad money" rule with a 5% rule. As a consequence, at least 95% of all private activity (PAB) bond proceeds must be used for qualifying cost.

(i) Eliminated the investment tax credit ("ITC").

(j) Extended the depreciation period for solid waste equipment financed with tax-exempt debt from 5 years to 10 years; depreciation is calculated on a straight line basis.

(k) Provided that the depreciation period for solid waste equipment financed with taxable funds will be 7 years; 5 years for biomass property. Facilities in this class are depreciated by the double declining balance method, switching to the straight-line method at a time in which the depreciation allowance can be maximized.

(l) Modified maximum personal and corporate tax rates.

(m) Eliminated the interest deduction by commercial banks for carrying tax-exempt securities acquired after August 7, 1986.

(n) Eliminated the benefit of positive arbitrage for *all* tax-exempt securities (expands 1984 Act limitation on PABs) by requiring a periodic rebate.

(o) Limited all costs of issuance of tax-exempt PABs, financeable with tax-exempt debt, to 2%. This includes, at a minimum, underwriters discount, bond counsel fees and printing costs.

(p) Permitted letter of credit fees (like bond insurance premiums) to be treated as an interest expense to the extent the fees represent a charge for transfer of credit risk.

(q) Eliminated the exemption for ethanol and certain steam generators. This is generally considered to be applicable only to steam generators built to burn refuse derived fuel that is sold on the open market. Dedicated boilers built to burn waste at a waste-to-energy facility are still qualified under the solid waste disposal exemption.

(r) Created a category of private activity bonds for hazardous waste disposal:

(1) Exempt facilities must be either land incineration or entombment.

(2) Exempt facilities must be used by the public rather than the owner or related party (95 percent or more of net proceeds must be used with respect to facilities for use by persons other than the owner as operator of the facility).

(3) Hazardous waste definition does not include radioactive waste.

Key Words: Economics; Financial/Financing; Full Service; Integrated System; Ownership; Procurement