

MAJOR IMPACTS ON FINANCING WASTE-TO-ENERGY FACILITIES

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ABSTRACT

The Tax Reform Act of 1986 (the "Act") has dramatically impacted the nature of how waste-to-energy projects will be financed. The major factors affecting the impact on the financing structure are the reduction of tax benefits to private companies involved in waste-to-energy projects, the decrease in availability of tax-exempt bond allocations, and the more stringent tests put upon the usage of "governmental purpose bonds." These changes in project economics have had an impact not only on the financing structure of waste-to-energy projects, but also on the project ownership decision by making the economic relationships between municipally owned projects and privately owned projects less distinct. Under most circumstances, a municipally owned project would be more cost effective than a privately owned project. Such a situation may then force a project sponsor to more critically evaluate the risk allocation process and a municipality's risk posture in a municipally owned scenario.

This paper discusses the specific changes in those provisions of the Act which affect the financing of waste-to-energy facilities and the consequences those changes have in the financing and ownership structures of waste-to-energy projects. Specifically, impacts on the individual cost and revenue components of a resource recovery project are highlighted as is the allocation of various project risks to project participants. Lastly, the

resulting trends industry experts expect to occur given recent developments and changes in the solid waste industry are discussed.

INTRODUCTION

The Tax Act of 1986 (the "Act") has dramatically changed the nature of how waste-to-energy projects will be financed. The greatest change may well be a shift from privately owned waste-to-energy projects to municipally owned waste-to-energy projects.

Privatization, wherein a private party provides essentially governmental functions at a profit, covers a wide range of industries. In a broad sense, privatization will remain a mainstay in the solid waste management industry since few municipalities have the expertise to design, construct, operate and maintain the extremely complex systems that comprise today's waste-to-energy plant. On a narrower basis, the financing of privatized projects wherein private parties own and operate waste-to-energy facilities has been severely impacted by the Act. The principal impacts derive from the loss of tax benefits such as investment tax credits ("ITC") and accelerated depreciation periods and further restrictions on the availability of tax-exempt debt financing.

The above discussion does not suggest that privately owned waste-to-energy plants are a thing of the past. On the contrary, privately owned projects will remain

a viable alternative to municipality owned projects, especially in those locations where a history of private waste disposal exists. A major effect of the Act is that privately owned projects may be more costly than a comparably sized municipally owned facility in a given area.

TAX LAW CHANGES

The Act will have a direct impact on waste-to-energy projects particularly as in the economics of the project, project ownership and project operation.

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 decreases to \$100. The current Act further limited this per capita amount to \$75, but increased the lower limit of volume cap to \$250 million. In 1988, the volume cap limitation is further reduced to the greater of \$50 per capita or \$150 million in each state. 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 in the 1984 Act 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 changed 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) Preserves tax-exempt (non-IDB) financing for only those waste-to-energy projects in which the 10% "Trade or Business Use Test and the Security Interest Test" or the \$15 million output facilities test is not exceeded ("10/15 test").

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

(c) Subjects 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.

(d) Subjects 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 exempts all municipally owned waste-to-energy projects from the volume cap.

(e) Permits management contracts (up to 5 years) for operation of municipally owned waste-to-energy plants, 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.

(f) Permits 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: (1) the term of any service contract or lease does not exceed 20 years; (2) the service contractor or lessee has no option to purchase any of the property for other than its fair market value; and (3) the private operator elects irrevocably not to claim investment tax credit or depreciation.

(g) Replaces the 10% "bad money" rule with a 5% rule. As a consequence, at least 95% of all private

activity (IDB) bond proceeds must be used for qualifying cost.

(h) Eliminates the investment tax credit ("ITC").

(i) Extends 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.

(j) Provides 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.

(k) Modifies the maximum personal and corporate tax rates.

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

(m) Eliminates the benefit of positive arbitrage for all tax-exempt securities (expands 1984 Act limitation on IDBs) by requiring a periodic rebate.

(n) Limits all costs of issuance of tax-exempt IDBs to 2%. This includes, at a minimum, underwriters discount, bond counsel fees and printing costs.

(o) Permits 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.

(p) Eliminates 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.

(q) Creates 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 generator (95% 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.

CONSEQUENCES OF TAX LAW CHANGES

The Act, by eliminating ITC, stretching out depreciation periods, subjecting private activity bonds to the alternative minimum tax and exempting municipally

owned facilities, will have a dramatic impact on how waste-to-energy projects are owned, structured and financed into the future. The immediate effect will be that, for those projects not benefitting from grandfathered or transitioned status, municipally owned projects will be more cost effective than privately owned projects. Specific projects may be transitioned as far as the Act is concerned. Discussion of those transition rules was considered beyond the scope of this paper.

Municipalities should examine their ownership options, prospective energy purchasers and project economics in light of the Act. Since a purely municipal project, i.e., one where the municipally owned project sells energy to a municipal user, fares best under the Act, such projects may become increasingly favored. This is especially true since the Act permits long-term management contracts in such cases. Where the energy purchaser is a private entity, the municipally owned project is still favored because of the exemption from state volume cap limitations.

In the case of privately owned waste-to-energy projects, the private sponsor may wish to compare the relative economies of securing taxable debt rather than tax-exempt debt for the project. In this scenario, the private sponsor would compare the tax benefits flowing from using the double declining balance method switching to the straight-line method at a time to maximize the depreciation allowance in the taxable case with the lowered debt service achievable using tax-exempt debt. Where taxable debt and tax-exempt debt interest rates are relatively close, the assumption that the project financed with taxable debt is less economic is not necessarily true. In these cases, tax incentives such as accelerated depreciation may make privately-owned, wholly taxably financed waste-to-energy projects more cost effective than municipally owned projects. These opportunities, however, are rare and are generally for short time periods thereby diminishing their applicability. Municipalities wishing to avoid risk may want to explore the "fully taxable" privately owned project along with the other options.

The opposite case of the fully taxable case is the fully municipal case wherein the project is municipally owned and energy is sold to a municipal user. In this case, all project costs typically qualify for tax-exempt status and revenue bonds (as compared to IDBs) are issued.

For nontransitioned projects, the municipally owned waste-to-energy project is demonstrably more cost-effective than a privately owned project. Even for transitioned projects municipally owned facilities should be carefully considered.

THE OWNERSHIP DECISION

A municipality faced with a landfill crisis and suddenly confronted with a myriad of alternative solutions must critically examine ownership options at the beginning rather than at the end of the decision making process. Too many times, a rational decision making process is sacrificed in the interest of expediency and a municipality finds itself committed to a process or ownership option without having critically examined all the pros and cons of that choice.

Issuers tend to fall into two broad categories, municipalities and authorities or agencies. Traditionally, local governments have been left to bear the burden of solid waste disposal and management. The majority of states offer no financial aid to local governments, although state agencies and employees often serve in an advisory and a regulatory capacity to local governments.

An agency or authority may be created for the specific purpose of controlling and financing waste management within the municipality.

Once an issuer has identified a specific need for a waste-to-energy facility, several decisions must be made. Of the first is a determination of the issuer's risk posture—how much and of what kind of risk can be assumed. The issuer's risk posture, as well as project economics will help to determine another decision, that of the type of project ownership desired. This ownership decision can be the most difficult and significant decision facing the parties involved in a waste-to-energy project. Prior to 1986, privately owned waste-to-energy facilities were prevalent. At that time, vendors had the benefit of various tax credits associated with construction and start-up of the project. However, by eliminating many of the tax benefits, the Act has made the ownership decision much less straightforward and more dependent on vendor and municipal requirements, availability of state private activity bond volume cap and tax benefits, if any. Upon reconciliation of these decisions, the financing structure should begin to take shape.

The two forms of project ownership and the financing options associated with each are described below:

Municipal Ownership

Municipally owned projects may be financed with either governmental purpose bonds or private activity bonds. The specific financing vehicle depends on whether certain tests for governmental purpose bonds imposed by the Act can be met and on the availability of sufficient state bond allocation.

Governmental Purpose Bonds are afforded special treatment under the provisions of the Act. Several criteria must be met if Governmental Purpose Bonds are to be issued. These tests are a 10% Trade or Business Use Test, the Security Interest Test and the \$15 million Output Facilities Test. The Trade or Business Use Test states that not more than 10% of the proceeds from the issue may be used in trade or business operated by a party other than the public entity. The Security Interest Test stipulates that no more than 10% of the proceeds of the issue may be secured or guaranteed directly or indirectly by any interest in property used or to be used by private business. The third test, the Output Facilities Test, mandates that no more than \$15 million of the proceeds of the tax-exempt issue may be used to finance a "nonqualifying" portion of the facility if the bonds are meant to remain as Governmental Purpose Bonds. "Nonqualifying" assets are systems or equipment that do not dispose of solid waste but convert the energy released from combustion of that waste to some useful product. In general, unless electricity is sold to municipal users, turbine generators and associated equipment are considered nonqualifying assets.

If the project "passes" the above-mentioned tests, the "Management Contract Test" must also be applied to determine if the financing is exempt from the use of proceeds limits. If (a) at least 50% of the compensation to a private operator is on a periodic fixed-fee basis; (b) there is no sharing of profits; and (c) the issuer can terminate the management contract, which can be no longer than 5 years in length, at the end of any 3-year period without penalty, then the project qualifies for governmental purpose revenue bond financing.

Structuring the bonds as Governmental Purpose Bonds eliminates many of the restrictions placed on certain tax-exempt bonds under both municipal and private ownership by the Act. The bonds will not be subject to limitations on the use of the bond proceeds and investors will not be subject to the Alternative Minimum Tax ("AMT").

However, if any of the above tests are not met, Private Activity Bonds must be issued. Generally speaking, if the electricity generated by a resource recovery project is sold to a privately owned utility and/or the management contract on a publicly owned project is structured to provide profit sharing and extended contract period incentives to a private operator to operate the plant efficiently, the Governmental Purpose Bond tests would not be met and the project must be financed with Private Activity Bonds subject to the

use of proceeds limits under the Act even though a public entity owns the facility. If the project must be financed with Private Activity Bonds, the following project costs will have to be financed with taxable debt, unless funds are available from other sources: (a) costs of issuance in excess of two percent of the par amount of the issue; (b) nonqualifying portions of the project exceeding 5% of the par amount of the issue; and (c) reserve funds in excess of 10% of the par amount of the issue.

Private Ownership

Generally, privately owned projects are financed with an equity contribution from a vendor or third party and with the issuance of private activity bonds. Tax-exempt Private Activity Bonds are subject to state bond allocation limitations and therefore may be used to the extent bond allocation is available. The Act establishes for each state annual per capita volume limitations on the total issuance of tax-exempt private activity bonds. The volume limitations have been cut in half from those established under the old law from \$150 per capita to \$75 per capita for the last half of 1986 and for 1987 and finally to \$50 per capita from 1988 on. To the extent that sufficient bond allocation is not available, funds from taxable debt or other sources may be utilized. Tax-exempt Private Activity Bonds issued under private ownership are subject to the same use of proceeds restrictions as under public ownership.

Prior to passage of the Act, one of the principal reasons for private ownership of resource recovery projects was that private owners were able to claim significant federal income tax benefits. These tax benefits allowed service charges (tipping fees) to be lower than the payments the participating municipalities would have made under public ownership with 100% debt financing. The Act has significantly reduced benefits to private owners by eliminating the Investment Tax Credit ("ITC"), lengthening the depreciation period and reducing the maximum corporate tax rate to 34%. Projects which were in the planning stages at the time the Act was being drafted and that involved a financial commitment of at least \$200,000 for the financing or construction of a solid waste disposal facility before March 2, 1986 qualify for "Transition Rule" status. Transitioned projects will be eligible for 65% of the ITC and for the depreciation treatment available under the former law. Prior to passage of the Act, personal property (approximately 90% of the facility) financed with tax-exempt bonds could be depreciated over a 5-year period using straight line depreciation.

Trends in Project Ownership Decisions

As a result of general solid waste industry trends and the implications of the Act, industry experts predict the following developments in the area of waste-to-energy financings:

- (a) less privatization of waste-to-energy projects;
- (b) more municipally owned projects;
- (c) more innovative energy user scenarios;
- (d) more costly projects;
- (e) issuance of both tax-exempt and taxable bonds.

The Act will decrease the amount of private equity participation in waste-to-energy financings, thereby increasing the need for long-term debt. General obligation bonds, traditionally issued to finance collection vehicles and landfills, may continue to be used for publicly-owned facilities. However, other public works projects may also use up a municipality's general obligation bonding capacity. Revenue bonds have, in the past, financed both landfills and waste-to-energy facilities and will continue to be used as such for publicly-owned facilities.

Industrial development bonds were previously the principal means with which to finance privately owned facilities. The Act places these bonds under a volume cap and decreases other benefits associated with private ownership. Municipally-owned facilities, even those utilizing private activity bonds, are exempt from the volume limitation cap. The Act can make public ownership and tax-exempt debt more cost-effective than privately sponsored projects. The Act also provides an incentive for private owners to use taxable rather than tax-exempt industrial development bonds to gain savings through accelerated depreciation in appropriate situations.

Landfills and resource recovery facilities will continue to be built, albeit at higher costs and within longer timeframes. Increasing Congressional attention to Environmental Protection Agency ("EPA") programs, hazardous and toxic waste problems and the need for safe and acceptable waste disposal facilities ensures that local government will retain the ability to finance projects on a tax-exempt basis. The projections indicate that providing the financing for these projects will be a \$15-20 billion industry over the next decade.

Although not a primary factor in the compelling need for more waste disposal incinerators, the revenue earned by generating electric energy helps to control the cost of disposal. Under the Public Utilities Regulatory Policy Act of 1978, electric utilities must purchase energy (at avoided costs) from qualified independently owned power plants, of which waste-to-energy plants are notable examples.

FINANCIAL ANALYSIS OF A TYPICAL WASTE-TO-ENERGY PROJECT

Prior to receipt of construction, operation and maintenance bids, and the negotiation of energy prices with energy users, it is difficult to accurately predict the tipping fee at a resource recovery facility. There are, however, some differences in the composition of costs in a publicly and a privately owned facility which can be quantified for the purpose of evaluating the relative costs of public versus private ownership.

The cost and revenue components of a resource recovery project are highlighted in the chart below.

Public and Private Ownership

Costs and Revenues

	Public Ownership	Private Ownership
Revenues	Tipping Fee Energy Sales Interest Earnings Recycled Material Sales	Tipping Fee Energy Sales Interest Earnings Recycled Material Sales Tax Benefits
Costs	Operation and Maintenance Debt Service	Operation and Maintenance Debt Service Return on Equity ("ROE")

Vendors will bid a formula which will be used to calculate the tipping fee. The formula will take into consideration the expected costs and revenues at the facility. The formula will include methods for adjusting the construction costs and operation and maintenance costs for inflation. Several types of formulas can be used; a typical formula for calculating the tipping fee is:

$$TF = DS + PT + (D\&M) \times EF - (S \times ER)$$

where

TF = Tipping Fee

DS = Debt Service (Net of Interest Income)

O&M = Operation and Maintenance

S = County's Percentage Share of *ER*

ER = Energy Revenue

EF = Annual Escalation Factor

PT = Pass-through Costs

This formula can be used to calculate tipping fees for both forms of ownership; however the amount the vendor charges for construction (debt service) and *O & M* may differ under the two ownership forms. Under public ownership, the vendor will not receive the debt service portion of the formula; it will be paid to the trustee for the benefit of the bond holders. Under private ownership, tax benefits and return on equity

are not stated explicitly in the formula, rather, they are usually included in the vendor's bid calculations. Debt service will vary according to the type of financing used and market interest rates available at the time of issuance.

Public Ownership Economics

Under public ownership, the vendor's fee will be the profit on the construction contract amount bid for operation and maintenance costs. The vendor may also get a percentage of the energy sales as an incentive to run the facility efficiently. The County or participating communities will be responsible for making all debt service payments.

The private operator of a publicly owned facility will make profits from the operation and maintenance fees and energy revenue sharing. Debt service costs are likely to be higher under public ownership because bonds will be issued to finance 100% of capital costs. Lower interest rates may be available to publicly owned facilities if governmental purpose bonds are used and this may have a mitigating effect on debt service. Over time, if energy revenues rise faster than O&M expenses, the tipping fee may decline and become lower than private ownership. Pass-through costs are costs which cannot be controlled by the vendor such as utility charges and insurance premiums; these are normally paid by the community. This approach is of mutual benefit to the community and the vendors. The community pays actual cost, without the addition of the vendor's profit, overhead or margins of safety due to pricing uncertainty.

Private Ownership Economics

A privately owned facility may be able to offer lower costs in the initial years due to two factors: lower debt service and tax benefits. The equity contributed by a project vendor reduces the amount of capital cost needed to be financed by debt. The equity can be contributed in several forms, such as a reduction in construction cost and/or a "special credit" reducing tipping fees in the early years of operations.

Offsetting the positive economic aspects of private ownership are the vendor's demand for a high return on equity. The requisite rate of return and the structuring of cash payments to the owners vary widely among projects. The return on equity to the vendor is obtained from four sources:

- (a) tax benefits;
- (b) a share in electricity revenues;
- (c) cash flow from tipping fees; and
- (d) potential residual value.

If the first two sources are insufficient to generate the required return to the vendor, then tipping fees must be increased (assuming the vendor's view of any potential residual value is held constant). Since tax benefits, even under the transition rules, have been significantly reduced by the Act, there is more upward pressure on tipping fees.

It is this effect that can make privately owned projects more expensive than publicly owned projects. The vendors' projected tipping fees will be a function of their specific rate of return requirements, their ability to utilize tax benefits and their assumptions regarding equipment costs, revenue sharing and residual value.

Given various structuring constraints (such as maintaining a debt service coverage ratio of 125%) there could be a cost to the project by having too little or too much of an equity contribution. With too little of an equity contribution, tipping fees must be high enough to cover both a greater portion of debt service and the minimum 125% debt service coverage ratio, producing revenues that generate more than the required ROE. With too much equity contribution, higher tipping fees must be charged to produce a minimum ROE resulting in excess debt service coverage. In either case, project revenues are inefficiently used, requiring the county to charge a higher tipping fee to the participating municipalities. The optimal balance is highly sensitive to project and bond sizing assumptions.

Energy Revenues

The level of tipping fee that must be paid is affected dramatically by energy revenues. As energy revenues increase, the cost of solid waste disposal decreases. This balancing act is evident in the tipping fee formula.

This dependency on energy revenues to offset the cost of waste disposal often finds the waste-to-energy developer and the local electric utility at opposite ends of the table. The utility is required by the Public Utilities Regulatory Policy Act of 1978 ("PURPA") to purchase electric energy from qualified independent generators. However, this purchase need only be at the utility's "avoided cost." The concept of avoided cost has wreaked havoc on waste-to-energy project financings in regions where significant generating surpluses exist. In areas where energy prices are low, waste-to-energy developers (municipally owned or privately owned) try to find alternative users who will pay a higher price for energy. In some instances this may mean an industrial steam user. For many municipal owners of waste-to-energy projects alternative energy users may include waste water treatment systems or

municipal electric utilities. District heating and cooling systems also provide a viable alternative low electric energy pricing.

In some areas of the country, municipalities are arguing that the price paid for electric energy by the local utility should match the cost of energy delivered to the municipality by that same utility. In Connecticut, the local utility is required to pay municipal waste-to-energy projects an energy price equivalent to the retail rate charged that municipality.

Utilities argue that any payment above their lowest avoided cost represents electric consumers' subsidizing the waste-to-energy facilities. The municipalities' argument is that selling energy at avoided cost and buying it back at higher rates (for municipal services) is subsidizing the utility. This area of energy pricing will likely remain a major area of concern.

STRUCTURING CONSIDERATIONS AND RISK ALLOCATION

The issue of risk exposure is perhaps the most sensitive aspect of a resource recovery financing. In every waste-to-energy project, the following risks are present: technological, completion, operational, legislative, waste supply, energy revenue and force majeure. It is the responsibility of all parties involved in the transaction to manage the risk associated with their particular function.

The following is a description of the above-mentioned risks and their relationship to waste-to-energy transactions:

Technological

Waste-to-energy projects have suffered from some notable failures. Because of a heightened sensitivity to this issue on the part of the capital markets, assurances must be given that the equipment will perform as specified. Applying the test for allocation of risk described above, it becomes evident that the equipment supplier is the one that should bear this risk. One of the problems commonly encountered is the reluctance of equipment suppliers to agree to stipulated loss value greater than the value of the equipment supplied. The project sponsor, public or private, must usually negotiate a reasonable value that will enable, at a minimum, the retirement of debt.

Completion

Completion risk is normally borne by the contractor or owner/operator since it is in the best position of

any participant to control the schedule both from the standpoint of creating the schedule and managing it. A fixed price contract with a firm completion date should be the objective.

Operational

The operator of a waste-to-energy project is responsible for competent operation and maintenance pursuant to appropriate industry standards. If the facility is rendered inoperable or its capacity is derated due to the poor performance of the operator, the operator should bear the cost of rectifying his mistakes. Where the operator is the private owner/operator of the facility, the operator is normally expected to take this risk, since it would expect to benefit from performance above contract requirements.

Legislative

The municipality is normally considered to be best suited among all project participants to control legislative risk. Examples of legislative risk are changes in environmental law, tax law and municipal ordinances. In general, private participants expect the municipality to assume legislative risk.

Supply of Solid Waste

The municipality is normally expected to guarantee the contract quantity of solid waste. The municipality may also be expected to bear the risk that the supply of solid waste may not meet contracted requirements. In certain cases, this means that the municipality would be responsible for lost energy revenues resulting from solid waste shortfall. This of course, is a matter for negotiation.

Flow control continues to be a major controversy in waste-to-energy projects. There are three methods of flow control: contractual, legislative and economic. Under contractual flow control, the host municipality and other participating cities (through intergovernmental agreements) contract with the private sponsor to deliver solid waste collected through their own municipal systems or via franchised contractors collecting on behalf of the municipalities. With legislative flow control, municipalities do not necessarily collect or franchise the collection of solid waste. Here, the guaranteed supply of solid waste can be guaranteed only by legislation or ordinance which dictates where and how waste will be disposed. Pursuant to case law regarding municipal "monopolies" as articulated in the recent United States Supreme Court ruling in *Hallie*

v. Eau Claire U.S. Sup. Ct. Case No. 82-1832, municipalities can enact and enforce waste control ordinances (flow control) where there exists a "clearly articulated" state purpose as embodied in appropriate state legislation. The third method of flow control is economic. In this case, the project sponsor, public or private, competes in the marketplace for an adequate supply of waste.

Contractual and legislative flow control are normally acceptable means of guaranteeing solid waste supply, particularly when applied together. Economic flow control is not acceptable unless a creditworthy project sponsor, municipal or private, is willing to guarantee the project and has sufficient creditworthiness to ensure timely retirement of debt.

Energy Revenues

The risk that energy sales will not result in projected levels of revenues is subject to negotiation between the owner/operator of the facility and the municipality. The outcome is dependent upon such factors as the risk preference of the negotiating parties and their ability to negotiate fixed price contracts with energy purchasers.

Force Majeure

Force majeure is the most difficult risk to assign, since the very term suggests that performance under contractual arrangements is expected to be excused in such circumstances. Municipalities and private project sponsors typically will negotiate which entity will bear specific force majeure risks.

Rating Agencies and Credit Enhancement

The financing of a resource recovery project may require credit enhancement to make the financing more attractive to the bondholders. Credit enhancement cannot replace a properly structured financing; it merely introduces a third party, independent of project participants, who will agree to repay debt in the event the project fails to do so. Naturally, these credit sources scrutinize such projects before agreeing as a debt service guarantor. Typical credit enhancement facilities include guarantees, letters of credit (from money center banks) and municipal bond insurance.

Another risk allocation hurdle is the need for a rating by one or both of the rating agencies, Standard & Poor's Corporation and Moody's Investors Service. Both agencies require that either credit enhancement cover the entire debt or that a creditworthy participant

cover each risk. The agencies have adopted a “weakest link” theory in the rating analysis when debt is not covered by some umbrella credit enhancement facility. This theory assigns the project bonds the rating of the weakest participant bearing any material risk. If, for example, all the risk-bearing participants of a particular project are rated AA except for one who is rated BB, then the project bonds would be rated BB, unless bond insurance or other credit enhancement covers that participant’s risk.

Generally the key to allocation of risks is control and reward. In the case of owner/operators, allocation of risk is straightforward. If the municipality expects to own the facility, allocation of risks is more difficult. In the case of privately sponsored projects, the owner/operator will likely accept completion, technological, and certain operational risks. The municipality will, in all likelihood, accept solid waste supply risk, including stipulated payments for waste shortfalls, and certain energy revenue risks. Legislative risk and certain force majeure risks are commonly accepted by municipalities.

An important task in a waste-to-energy project is to assess the creditworthiness of each project participant in relation to the degree of risk allocated to such party. Where the participant is less than creditworthy, efforts are made to enhance the credit of that party through letters of credit, bond insurance, third-party guarantors, parental support agreements and similar instruments. There are circumstances, however, where the issuer and vendor choose to proceed with lesser credits in issuing bonds. In those cases, careful disclosure of all risks must be made to debt holders.

In summary, participating municipalities and vendors will assume the risks that they can each best control. Uncontrollable circumstances will continue to be largely the participating municipalities’ risk. Bond-

holders, in a properly managed issue, will assume little or no project risk.

CONCLUSION

The passage of the Act has had a dramatic effect on the factors involved in financing waste-to-energy facilities. These factors have impacted the manner in which waste-to-energy facilities are financed, as well as the ownership structure they will take. The major factors involved in the decision process are the risk posture of the project sponsor and specific project economics.

As this paper has illustrated, the loss of tax benefits enjoyed by privately owned facilities prior to the passage of the Act has made privately owned facilities less cost effective than municipally owned facilities. Equally restricting provisions of the Act regarding financing waste-to-energy facilities are the private activity bond provisions, the reduction of state tax-exempt bond allocations and limitations on uses of tax-exempt bond proceeds. These provisions have reduced the ability of some issuers to finance significant portions of the project with tax-exempt bonds thus putting more importance on finding funds from other sources.

The general trend in the waste-to-energy industry prior to the Act was that more projects were privately owned because they were more cost effective and the risks required to be assumed by the sponsoring municipality were minimal. Since passage of the Act, there is a new trend forming which is less privatization of waste-to-energy facilities, municipalities assuming a greater portion of project risks, and more costly projects being financed with the issuance of tax-exempt and taxable debt.