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# Resource Recovery Plant Implementation:

## Guides for Municipal Officials

## RISKS AND CONTRACTS

This guide (SW-157.7) was compiled
by Robert E. Randol

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## PREFACE

This volume is intended to aid states, municipalities, and private industry in their efforts to achieve fair and equitable agreements for the implementation of resource recovery systems. The document is organized into five chapters:

- The first chapter, "Resource Recovery Risks and Contracts: Introduction," describes the purpose of this volume as providing guidance to efforts in resource recovery by sharing information and insights from three pioneering projects.

- The second chapter, "Risks In Resource Recovery," describes the nature of risks and risk management, and their implications to contracting for a resource recovery project.

- The third chapter, "The Effect of Risks on Contractual Relationships: Some Case Study Experience," discusses the diversity of contractual relationships that may be created to implement resource recovery. Case studies of Milwaukee, Bridgeport, and Nashville show how perceptions of risk and the willingness to assume, manage, or share risks result in different contractual relationships.

- The fourth chapter, "Resource Recovery Risk Allocations," summarizes some of the specific ways in which risks were allocated among the participants in the Milwaukee, Bridgeport, and Nashville projects. The chapter concludes with a listing of certain types of contract provisions which appear to have general applicability for managing, allocating, or sharing the risks associated with a resource recovery project.

- The fifth chapter, "Contracting For A Resource Recovery Project: Insights From Three Pioneering Projects," provides some observations on how the acquisition approach to resource recovery influences the specific terms and conditions that are negotiated and recorded in a legally binding contract.

- The sixth chapter, "Conclusions," points out that risks are highly manageable and contracts can be successfully and expeditiously negotiated provided that there is early recognition in the implementation process of the key issues which must be negotiated and recorded in a contract.

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The EPA project director for this guide has been Robert Randol. He has been assisted by a project team from Development Sciences Inc. (of East Sandwich, Massachusetts) composed of:

- James Barker (Project Director)
- John Culp (Deputy Project Director)
- Rita Ballou
- Charles Flinkstrom
- Morton Gorden
- Janet Kinahan
- Philip Mulvey
- Ora Smith (Consultant)
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## EXHIBITS

# CHAPTER I

# RESOURCE RECOVERY

# RISKS AND CONTRACTS: INTRODUCTION

Other volumes in this series of guides on the implementation of resource recovery projects have focused attention on the many technical, financial, and institutional considerations which require serious attention before a recovery project can be launched. This volume addresses a function which rests between planning for a system and groundbreaking for a recovery facility. It addresses the management of risk and the development of contracts among organizations whose participation is critical to the initiation and successful operation of the project. Such contracts can cover, among other things:

- The purchase of a facility
- The construction and operation of a facility
- The acquisition of solid waste for processing
- The sale of products

Resource recovery contracts are written agreements which document the substance of negotiations among participating parties. They also record the outcome of attempts of all parties to seek equitable allocation of the project's risks. Preparing for, and carrying out, negotiations of recovery system contracts tests the soundness of the entire system planning and acquisition process. It also tests the ability of different organizations (which have different constituencies) to develop a sound basis for entering into agreements.

The contractual process is demanding, final, and far-reaching in its implications. Contract negotiators may commit their constituencies to responsibilities which extend far into the future.

Although the contractual process culminates the system implementation process, project success requires that contract formulation issues be addressed early to forestall activities that might sidetrack start-up of a system. The design of the contractual process--including the sequencing of events and timing of decisions--must reflect the styles of the key organizations, and must lead efficiently to negotiated agreements which stand the test of time and the scrutiny of financial and legal counsel.

The contractual process must identify the risks associated with a project and allocate these risks to those parties who are best able to manage them. The contractual process must also develop legal instruments which accurately reflect the agreements reached among the participants in the project, and which protect the parties from possible future misinterpretations. Finally, the contractual process must not jeopardize the good faith and trust developed among the participants during negotiations and system selection.

Case studies of the recovery projects underway in Milwaukee, Bridgeport (Connecticut), and Nashville have underlined the intense creative efforts required to establish contractual relationships which support the needs of all participants. Hopefully, the lessons learned, and the legal and institutional mechanisms developed during each case, will help the implementors of new projects to avoid pitfalls and to select mechanisms which are most appropriate to their situations. It is in this spirit of sharing the experiences and contributions of those who converted the Milwaukee, Bridgeport, and Nashville projects from plans to commitments that this document is written.

The sequence of events that precede the signing of contracts for a resource recovery system reflects how the project is organized and how its managers decide to proceed toward implementation. In resource recovery, as in other programs of public and private interest, progress during a project often is attributable to the perseverence and hard work of a few individuals--the "prime movers" of the project. The Milwaukee, Bridgeport, and Nashville projects were fortunate to have had such individuals pressing for closure and action-taking.

In the examination of the three cases, it has become clear that very different postures toward legal and institutional agreements can be taken which still result in successful conclusion of the contractual process. Future negotiators will have to make similar fundamental choices such as who shall bear the risks of unexpected failure and reap the benefits of unexpected success.

The participants in the Milwaukee, Bridgeport, and Nashville projects ultimately determined what legal and institutional formulae were best for their respective cities. However, amid the diversity of these three experiences, there are methods and processes which have general applicability. Before elaborating on the three cases, it is important to identify some of the risks which these and other projects must face. The next chapter outlines the more important risks in resource recovery.

# CHAPTER II

# RISKS IN RESOURCE RECOVERY

Decision makers earn their reputations, and compensation, by taking action in the face of uncertainty. They know that there exists some probability, great or small, that the ultimate result of the action could be undesirable.

For example, an automobile manufacturer may decide to invest in the development of a new engine even though it recognizes that: (1) production of the engine may not prove to be technically feasible; or (2) consumers may not buy automobiles which are powered by it even if the engine operates beyond expectations. Still the manufacturer may decide to accept these technical and market risks if there is a reasonable opportunity to improve his competitive position in the marketplace.

People and organizations take risks because they want the positive outcome of their actions and can probably live with the negative outcome. Insurance companies, and individuals who buy tickets in a state lottery, are classic examples of risk-takers. The insurance company wants the premium but not the claim; the individual wants his ticket to be drawn. To a point, each is prepared to suffer the consequences of the undesirable outcome. Where the "point" is depends on the financial base of the decision makers as well as their ability to cover their bets.

Thus, risk is the possibility that an action may produce an undesirable outcome. This outcome has a value (often negative), a probability of occurrence, and a consequence to the action-taker. If risk is avoided by not taking the action, the potential benefits of the action are also foregone.

## Risk Management

Risk in a resource recovery project is managed in two ways--through reduction and allocation. Risk can be reduced by working to prevent or ameliorate those events which might lead to an undesirable outcome. An insurance company, for example, can require the installation of a sprinkler system to prevent the destruction of a building by fire.

However, total project risk can never be reduced to zero. The remaining risks and their potential effects must be allocated between the project participants in some fashion. One common approach is to allocate reduceable risks to the party most able to control them. Another approach is to have more than one party share the large and irreduceable risks, so that the impact of possible undesirable outcomes can be spread so as not to critically hurt any single party. For example, an insurance company may sell part of a policy it writes to other insurance companies.

Of course, a risk cannot be reduced or allocated effectively unless the primary decision-makers understand what they are dealing with. For example, a director of a project in which more than one organization is participating, before deciding on how to handle a risk, needs to know the answers to certain questions:

- What is the source of the risk? What event, series of events, or actions on the part of various organizations or bodies, might lead toward a situation which could be undesirable for the project or for an individual participant in the project?

- What is the consequence of the risk? If the undesirable situation does occur, how will the project be affected? Which participants in the project will be hurt the most, and by how much? Will they be able to survive the situation?

- What is the probability that the undesirable situation will occur? Are each of the events and actions leading up to the situation really possible, or even likely to occur? Are there ways to prevent their occurrence? How do the consequences of the situation compare to its likelihood of occurrence, e.g., is a very serious situation also very unlikely? How important is avoidance of the direct consequences of the situation, regardless of its likelihood?

- Which of the project participants is best able to reduce the risk? Who is most experienced in preventing this type of situation from occurring, or in ameliorating its consequences should it occur? What compensation is appropriate for assuming the responsibility for reducing and accepting the risk?

- What mechanisms can be used for the sharing or allocation of the risk among project participants? Which mechanism best suits the needs of the participants? Which mechanism is most consistent with the various participants' abilities to manage the risk?

Do resource recovery project directors need to be concerned about risk? Yes, but their concern should be focused on identifying the risks faced by their projects, and then on building into the project sound methods for reducing and allocating each of them. Some resource recovery projects are most appropriately compared to new business ventures which depend on unproven technologies, which rely on a raw material of variable quality and questionable supply security, and which plan to produce goods that, a priori, have no proven market. This may sound risky, and it is, but not so risky that public and private organizations operating in good faith cannot establish equitable means for dealing with the uncertainties so that the larger interests of their constituencies are served by utilizing a heretofore neglected resource. The payoff, in other words, is worth the risk. What, then, are the risks in resource recovery?

## Examples of Resource Recovery Risks

Because of the newness of resource recovery as a function of public administration and as a business activity of private industry, and because of the uncertainties associated with recovery technology, costs, and markets, any particular project faces a large number of risks. The most important risks are those which affect:

- Waste Stream: The quantity and quality of waste for processing.
- Facility Construction and Operation: The cost of constructing and operating the system.
- Marketing: The revenues from the sale of recovered products.
- Disposal: The ability to dispose of solid waste and recovery residuals in an environmentally acceptable manner.

Experience to date indicates that the situations and risks which most concern participants in recovery projects are those which most seriously impact one or more of the above four categories. This is true because all but a few of the major risks bear directly on project economics and system reliability. Thus, project directors should pay particular attention to managing, allocating, or sharing the risks of:

- Changes in waste tonnage and waste composition. These changes can seriously affect the potential revenue stream from the sale of recovered products.
- Increases in the investment required to bring a recovery system on-line. These increases may cause dump fees to escalate to unreasonable levels or may have major financial impacts on the facility owner.
- Escalation of dump fees caused by inefficient operations, inflation of operating and maintenance costs, or inappropriate bases for changing the fees (e.g., cost indices which do not represent the true cost of operating a recovery facility).
- Unreliable system performance (e.g., excessive downtime and/or inconsistent output quality). This can have major impacts on the ability to market output, and can result in the need to landfill the solid waste.

- Catastrophic events, such as storms, sabotage, or labor strikes. These uncontrollable events can partially or totally destroy a facility, or can cause serious interruptions in operations.

- Cancellation or nonrenewal of contracts for the purchase of recovered products. This could jeopardize the economic viability of the project and thus cause major increases in dump fees or major financial losses by the operator.

Exhibit 1 presents a more complete list of risks which parties contracting for resource recovery should at least be aware of. The risks are categorized according to the recovery system element which they impact (e.g., waste stream, facility construction, facility operations, marketing, or disposal).

This lengthy list of risks is not presented to discourage parties from entering into resource recovery projects, although that may be its first impact. Rather, it is designed to prepare participants for some of the uncertainties surrounding resource recovery. These uncertainties are often learned slowly, with difficulty, and at a great expense to the project implementation process. At some point in the implementation process, the project's risks, and their allocation, will become major issues for negotiation among participants. These issues require resolution before fair and equitable contracts can be developed.

Decisions about how to deal with the uncertainties associated with each element of a resource recovery project help determine the project organization and the broad assignment of responsibilities for managing or participating in the management of various risks. These decisions also lead toward definitions of the specific conditions under which the various parties assume liability for the risks. The next chapter discusses how attitudes about the source, consequence, probability toward the occurrence, management, and sharing of risks influence the basic structure of contractual relationships among participants in a recovery project.

## EXHIBIT 1

### CATEGORIES OF RESOURCE RECOVERY RISKS

| | RISK AREA | EXAMPLES | PRIMARILY AFFECTS: NET COST OF OPERATIONS | PRIMARILY AFFECTS: ABILITY TO DISPOSE OF WASTE EFFICIENTLY |
|---|---|---|---|---|
| WASTE STREAM | Waste Composition | Changes in the composition of the waste stream can: (1) lower the fraction or quality of combustibles or recoverable materials and thereby reduce the revenue potential per ton of input; or (2) increase the unprocessable wastes to be landfilled and thus increase the net cost of operations. | X | |
| | Waste Quantity | Reductions in waste quantity can: (1) increase the cost to process each ton of waste (because of the fixed costs associated with facilities and equipment); and (2) decrease total annual revenues and, therefore, return on fixed investment. | X | |
| | Jurisdiction Withdrawal | If a jurisdiction decides to discontinue delivery of waste to a recovery facility, all the consequences of a waste quantity change plus the possibility of discontinuing recovery operations are felt by other participants in recovery operations. | X | |
| | Competition from Processing Alternative | If a processing alternative attracts some of the waste that could have been processed by the recovery facility, then the consequences are the same as those for a waste quantity change. If the processing alternative is "superior" to the current system, then an opportunity to participate in more efficient processing of waste may be foregone. | X | X |
| FACILITY CONSTRUCTION | Delays | Delays in the completion of construction and in the start-up date can cause cost overruns in the project and necessitate the continued use of obsolete or undesirable disposal methods. Delays also result in an inability to deliver the anticipated output of the recovery plant to customers. | X | X |

EXHIBIT 1

(continued)

CATEGORIES OF RESOURCE RECOVERY RISKS

| | RISK AREA | EXAMPLES | PRIMARILY AFFECTS: NET COST OF OPERATIONS | PRIMARILY AFFECTS: ABILITY TO DISPOSE OF WASTE EFFICIENTLY |
|---|---|---|---|---|
| FACILITY CONSTRUCTION (continued) | Contract Suspension | Suspension of a construction contract has the same consequences as construction delays. | X | X |
| | Increased Capital Costs | Increases in the cost of equipment or materials during the facility construction phase can cause the cost to process each ton of waste to increase as a result of the increased fixed cost. If these increases are large enough, the entire project may be jeopardized if additional financing cannot be secured. | X | (X) |
| | Site Availability | If it proves difficult to find and acquire a facility site that is environmentally suited to recovery operations: (1) the project may be delayed; (2) the cost of operating may be increased, especially if the site is distant from the source of waste and/or the buyers of output; or (3) the project may be jeopardized. | X | X |
| FACILITY OPERATIONS | System Reliability | Excessive downtime for the recovery system may result in foregone revenues from materials or fuels that otherwise would have been recovered and sold. Inferior quality of recovered materials could result in lower prices per unit and, therefore, reduced revenues. Either event could lead to cancellation of contracts for the purchase of output. Either event also could require temporary use of a less desirable means of waste disposal. Outright system failure would have a substantial impact on the organization responsible for financing the project. | X | X |

EXHIBIT 1

(continued)

CATEGORIES OF RESOURCE RECOVERY RISKS

| | RISK AREA | EXAMPLES | PRIMARILY AFFECTS: NET COST OF OPERATIONS | ABILITY TO DISPOSE OF WASTE EFFICIENTLY |
|---|---|---|---|---|
| FACILITY OPERATIONS (continued) | Economic Frustration | Should the participants in the resource recovery project find it impossible to operate at a reasonable cost, the project may be jeopardized with the consequences of: (1) having to find alternative means for disposing of the waste; (2) discontinuing or revising whatever services relied upon the output of the recovery facility; and (3) satisfying debts to project financers. | | X |
| | Inflation | Inflationary forces may increase operating costs faster than revenues are increasing, thus causing the project's net cost to increase. In addition, if allowable cost increases are tied to a national or state cost index and the index changes faster or slower than actual costs, then one or more participants in the project may suffer economically. | X | |
| | Labor Productivity | Reductions in the productivity of labor may cause the operating cost of the project to increase or could result in an inability to process the targetted tonnage per day. The latter consequence would result in lower output of materials and reduced revenues. | X | X |
| | Hazardous Wastes | Should explosive, radioactive, or chemically dangerous wastes find their way to the recovery facility, the health and safety of the project's labor force and the safety of the facility itself may be jeopardized. This could result in unscheduled downtime or even cancellation of operations. The consequences could include lost revenues, increased costs, interrupted production, and temporary use of alternative disposal methods. | X | X |

EXHIBIT 1

(continued)

CATEGORIES OF RESOURCE RECOVERY RISKS

| | RISK AREA | EXAMPLES | PRIMARILY AFFECTS: NET COST OF OPERATIONS | ABILITY TO DISPOSE OF WASTE EFFICIENTLY |
|---|---|---|---|---|
| FACILITY OPERATIONS (continued) | Legislation and Regulations | Certain legislation, especially that which could affect waste stream composition (e.g., "Bottle Bills"), waste quantity (e.g., mandatory source separation), or facility design (e.g., pollution control standards), could result in decreased revenues or increased costs per ton of waste processed. In the extreme case of removing a large portion of the recoverable fraction from the waste stream, the economic viability of recovery sub-systems may be jeopardized. | X | |
| | Waste Stream Quantity and Composition | Discussed under "Waste Stream" risks. | | |
| | Storage Capacity | If the storage capacity for incoming waste or outgoing materials is not sufficient to handle emergencies (such as shut-downs, storms, etc.), then waste may have to be diverted to alternative disposal. This could affect project costs and revenues. | X | X |
| MARKET | Competing Materials Prices | Reductions in the price of primary fuels and/or secondary materials may drive down the prices for the recovered fuels and materials, thus reducing project revenues. If these reductions force the project into a period of economic frustration, operations may have to be discontinued. | X | (X) |

EXHIBIT 1

(continued)

CATEGORIES OF RESOURCE RECOVERY RISKS

| | RISK AREA | EXAMPLES | PRIMARILY AFFECTS: NET COST OF OPERATIONS | PRIMARILY AFFECTS: ABILITY TO DISPOSE OF WASTE EFFICIENTLY |
|---|---|---|---|---|
| MARKET (continued) | Substitutability of Recovered Product | Due to changes in production processes, recovered fuels and/or materials may in the future be less substitutable for primary fuels and materials. Although most trends are toward recovered materials, some are not (notably power generation where the overall trend is toward nuclear plants). The more likely event is that the specifications required of recovered fuels and materials by buyers could exceed a recovery facility's ability to produce. In either event, the revenues of the recovery project could be reduced and some of the output may have to be landfilled. | X | X |
| | User Incremental Costs | Buyers of recovered materials or fuels may have to make unanticipated investments in order to use them, or their operating costs may increase as a result of their use. These cost impacts may be reflected in the price that the user is willing to pay for the products--or in demands on the recovery project for user-based investments--thus affecting the recovery project's cost and/or revenues. | X | |
| | Shipment Size and Frequency Requirements | Most producers require that raw material shipments be scheduled over regular intervals and sized according to their production schedules. Deviations from these requirements by suppliers can cause production problems. If a recovery project cannot consistently meet the delivery requirements of its buyers, then its marketing contracts may be cancelled. This would affect project revenues and could put the project in jeopardy. | X | (X) |

EXHIBIT 1

(continued)

CATAGORIES OF RESOURCE RECOVERY RISKS

| | RISK AREA | EXAMPLES | PRIMARILY AFFECTS: NET COST OF OPERATIONS | PRIMARILY AFFECTS: ABILITY TO DISPOSE OF WASTE EFFICIENTLY |
|---|---|---|---|---|
| MARKET (continued) | User Specifications | Requirements by users of recovered fuels or materials for consistent quality could affect: (1) the operating cost of the recovery project; (2) the price paid by buyers per unit of output; or (3) the duration of the contract between the project and the buyer. In the extreme case of inability to meet specifications, the project may find its marketing contracts cancelled. | X | (X) |
| | User Location | A change in the locations of one or more buyers of recovered materials or fuel could affect the net price (net of transportation costs) per unit of output and (in the extreme case) the ability of the recovery project to service the buyer. In either event, the revenues of the project would be affected. | X | (X) |
| | User's Financial Condition | If the buyer of recovered fuel or materials goes out of business or is unable to pay for deliveries, the project's revenues will be correspondingly diminished. | X | |
| | Legislation and Regulations | Changes in freight rates and rate structures could result in higher transportation costs (and, possibly, lower net revenues) or in cost discrimination against a recovered fuel or material. Either event could affect both the demand for and price of recovered materials and fuel. | X | X |
| | Contract Duration | Marketing contracts may elapse before the investment in the recovery facilities is recovered. This could place the project in a precarious position should the operator be unable to renew the contract or find new buyers. | X | |

EXHIBIT I

(continued)

CATEGORIES OF RESOURCE RECOVERY RISKS

| | RISK AREA | EXAMPLES | PRIMARILY AFFECTS: NET COST OF OPERATIONS | PRIMARILY AFFECTS: ABILITY TO DISPOSE OF WASTE EFFICIENTLY |
|---|---|---|---|---|
| DISPOSAL | Site Capacity | The capacity of the disposal site for residuals from the recovery operation, and for unprocessable wastes, may run out before the end of facility operations thus causing a need to find an emergency disposal site (probably at extra cost). | X | X |
| | Legislation and Regulations | Regulations may be implemented which require design changes for landfills (e.g., liners to prevent ground water pollution). This would increase the cost of recovery system operations. | X | |
| | Site Location | A change in the location of the site for landfilling residuals could increase operating costs by requiring a longer haul from the recovery facility to the landfill. | X | |

# CHAPTER III

## THE EFFECT OF RISKS ON CONTRACTUAL RELATIONSHIPS: SOME CASE STUDY EXPERIENCE

The previous chapter pointed out the situations and risks which can most seriously impact upon a resource recovery project.

Naturally, each individual project has different amounts of risk associated with it, depending upon type of technology, local markets, control of the waste stream, cost uncertainties, and so on. Also, different cities and companies will have different perceptions about the relative importance of various risk areas, as well as about the probability that certain events will occur. In turn, their perceptions will affect both the specific allocation of risks among the various parties involved in a project and the structure of the contractual relationships.

This chapter provides examples of the diversity of contractual relationships which may be created to implement resource recovery, and deals with the broad assignment of responsibilities for the five general areas of risk listed in the previous chapter.

Considerable variations exist in resource recovery contracts because of differences in the parties' willingness to assume risk and in their ability to manage the various types of risk if they eventuate. These differences, as noted, depend largely on the particular organizational and institutional characteristics of the agencies engaged in resource recovery projects. To illustrate, case studies were undertaken in Milwaukee, Bridgeport, and Nashville. As a result, there is a better understanding of how assignment of responsibilities varies in different circumstances. Accordingly, these cases provide some guidance to others contemplating a resource recovery project.

The resource recovery projects of Milwaukee, Bridgeport, and Nashville were chosen because, among them, they included:

- Different institutional forms;
- Different financing mechanisms;
- Different kinds of technological applications to resource recovery;
- Different local market conditions;
- Different contracting and bidding processes;
- Existence of signed contracts, if not actual construction and operation.

The main features of these three resource recovery projects are summarized in Exhibit 2.

In Milwaukee, the City's Department of Public Works (DPW) had three interrelated concerns regarding the implementation of a resource recovery facility:

- The need to dispose of the City's solid waste (including nonrecoverable wastes and residues from recovery operations) at all times, irrespective of whether or not the resource recovery facility was capable of long-term operation.
- The desire to avoid increases in the operating budget for disposal and to avoid capital costs involving technologies that, over time, either might not work or might become obsolete.
- The existence of state-mandated competitive bidding procedures which would delay the construction process if the City undertook responsibility for construction of a facility. More importantly, these procedures could seriously jeopardize the DPW's ability to efficiently operate the system because competitive bidding and associated city budgeting procedures could seriously delay procurement of replacement equipment should it be required.

The Common Council (buttressed by studies of both the Department of City Development and the Office of the Comptroller) was concerned about risks associated with municipal financing: revenues from recycled materials could not be determined before experience at the local level was available; and considerable risks were associated with a technology that had not been proven in the long run. Consideration was given to utilize state authorized, but untried, "public improvement bonds" which would have avoided bondholder risk. However, upon advice of bond counsel along with indications of a potential law suit, this form of public financing was dropped from consideration.

As a result of these considerations, the Americology Division of American Can Company agreed to own and finance construction of the resource recovery system, to process all of the City's solid waste, and to be responsible for operating the system and marketing recovered materials and fuel. Recovered solid fuel will be sold to Wisconsin Electric Power Company (WEPCO). Recovered metals and glass will be sold to other divisions of American Can. The City retains the right to buy the facility from American Can at any point during the fifth to tenth years of operation. In addition, the City will receive a small share of the revenues derived from the sale of the fuel as a partial offset to the guaranteed dump fee which it will pay to American Can.

The contractual relationships displayed in Exhibit 3 show how Milwaukee's perceptions regarding various risk issues affected the broad assignment of responsibilities between it and American Can.

In Bridgeport, the Connecticut Resources Recovery Authority (CRRA) has acted as an initiator and as a facilitator of the resource recovery project. By law each CRRA project must be financially self-sufficient, although the state is committed to cover the worst case of meeting debt service should revenues prove to be inadequate. CRRA will finance (through revenue bonds) and own the Bridgeport resource recovery system, and also will own both the municipal solid wastes accepted into its system and all recovered products. The facilities, similar in design to those in Milwaukee, will be built and operated by Occidental Research Corporation (OXY).

Because of its peculiar institutional form, CRRA has had to identify all risks which would affect the project's ability to be financially self-sufficient and has had to shift those risks as much as possible to the other participants--the nine participating municipalities and OXY. The municipalities and OXY, in turn, have negotiated limits on their liabilities and rewards for their exposure to the project's risks.

The municipalities will participate in project revenues, are guaranteed that their dump fees are fixed (subject only to inflationary increases), and have an upper limit on their liability for increases in processing costs caused by forces outside the control of any of the participants.

OXY accepted limited liability for risks associated with the design, construction, and operation of the project, and for marketing the nonfuel products. In addition, they demanded a reasonable profit for the managerial, scientific, and technical services provided to CRRA.

Exhibit 4 displays the complex allocation of responsibilities resulting from the diverse concerns of the contracting parties in order to limit exposure to risks. Bridgeport provides a good example of a publicly owned and financed recovery project which is privately operated and in which the particular contractual relationships reflect the needs of the sponsor (CRRA) to transfer most risks to those participants who are best able to manage them.

In Nashville, the decision to construct a centralized system for supplying downtown buildings with steam and chilled water was made prior to the decision to use solid waste as the source of fuel for the facility. The system involves conversion of unsegregated wastes to steam and chilled water in waterwall incinerators and chillers, as well as a distribution system to municipal, state, and private office buildings.

A private, not for profit corporation--the Nashville Thermal Transfer Corporation (Thermal)--was created to finance, own, construct, and operate the project and to market the energy. As in the other two recovery projects, Thermal must depend upon revenues from the sale of products to maintain its financial integrity and to meet debt service requirements. However, unlike Milwaukee and Bridgeport, Thermal operates like a utility in that it allocates its full cost of operations to its customers according to their consumption of steam and chilled water. Thus, it has attempted to pass on all operating risks to its customers and all catastrophic risks, including failure of operations, to its bondholders.

Because of the heavy public involvement in the creation of Thermal, in participation on its board of directors, and as its steam customers, the metropolitan government in the Nashville area (Metro) guaranteed delivery of waste to the Thermal facility at no dump fee.

As can be seen in Exhibit 5, the contractual relationships in Nashville are a good deal more traditional and less specific than in the other two projects.

This brief description of the Milwaukee, Bridgeport, and Nashville projects shows how the major assignment of responsibilities for resource recovery risks flows from the diversity of contexts and perceptions operating in any given locale. While each new recovery project will be unique in its own complexities, participants should have many options to choose from among the diverse methods already in existence for organizing a project and for broadly assigning responsibilities.

Equally important is the specific substance of the broad assignments of roles and responsibilities contained in a legal document. It is the contract which spells out the limits of liability and the conditions under which the numerous risks associated with resource recovery will be borne by each of the parties.

The next chapter briefly describes the specific allocations of risks associated with the broad contractual relationships outlined for each of the three cases.

EXHIBIT 2

SYNOPSIS OF RESOURCE RECOVERY CASE STUDY ELEMENTS

| | | MILWAUKEE | BRIDGEPORT | NASHVILLE |
|---|---|---|---|---|
| SYSTEM SUMMARY | Recovery Facility | Dry mechanical processing with classification and separation to produce solid fuel, ferrous, aluminum, and glass. Fuel is supplement to coal-fired boiler. | Dry mechanical processing with classification and separation to produce dried solid fuel, ferrous, aluminum, and glass. Fuel is supplement to oil-fired boiler. | Waterwall incineration and heat exchange process to produce steam and chilled water. |
| | Processing Capacity | 1,200 tons per day. | 1,300 - 1,600 tons per day. | 720 tons per day. |
| | Equipment Redundancy | Dual primary shredders. | Dual primary shredders. | Standby gas- or oil-fired package boiler. |
| | Recovery Facility Investment | $14 million, excluding transfer stations and site acquisition. | $30 million, excluding transfer stations and site acquisition. | $13 million, including distribution system, excluding site acquisition. |
| | Facility Owner | American Can Company (City has option to buy). | CRRA. | Thermal. |
| | Financing Mechanism | Private (by American Can Company). | Special obligation bonds (backed by make-up obligation of the State of Connecticut). | Revenue bonds. |
| WASTE STREAM | Contract Between | City and American Can Company. | CRRA and nine (9) municipalities. | Thermal and Metro Government. |
| | Contract Duration | 16 years. | 22 1/2 years. | 30 years. |
| | Minimum Tonnage/ (% of Waste Generated) | 250,000 TPY (100% of all nonhazardous solid wastes). | 374,000 TPY (100% of all processable wastes). | 263,000 TPY (30%). |
| | Dump Fee | Fixed, except for inflation escalator and provision for two renegotiation periods. | Fixed (with guaranteed payment except for: inflation escalator; sharing of "excess" recovery revenues and profits; and pass-through of unusual system costs outside the control of CRRA or Garrett. | None. |
| | Optional Disposal | American Can landfill at lower dump fee. | None, except in emergency. | Metro landfills. |

EXHIBIT 2
*(continued)*
SYNOPSIS OF RESOURCE RECOVERY CASE STUDY ELEMENTS

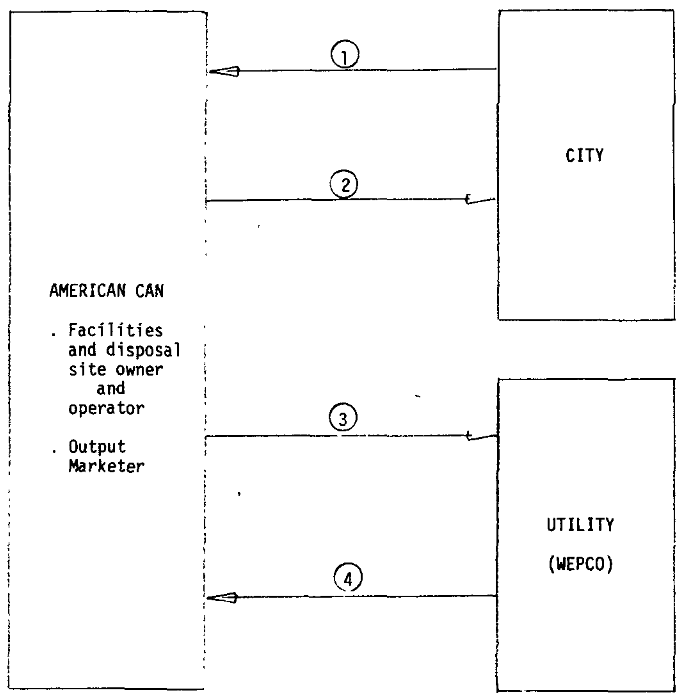
| | | MILWAUKEE | BRIDGEPORT | NASHVILLE |
|---|---|---|---|---|
| FACILITY CONSTRUCTION | Contract Between | City and American Can (part of amalgamated agreement). | CRRA and OXY (part of amalgamated agreement). | Thermal and I. C. Thomason (for design).<br>Thermal and two (2) construction contractors. |
| | Competitive Bid ? | No. | No. | Yes. |
| | Delay Penalty ? | Yes. | Yes. | Yes. |
| | Performance Penalty ? | Yes (performance bond posted). | Yes (Occidental Petroleum assumes limited liability). | Yes (performance bonds posted by construction contractors). |
| FACILITY OPERATIONS (including marketing) | Contract Between | City and American Can (part of amalgamated agreement). | CRRA and OXY (part of amalgamated agreement). | Not applicable. |
| | Duration | 15 years (effectively, because of waste contract). | 22 1/2 years. | Thermal is obligated to operate for 30 years. |
| | Revenue to Operator | Dump fee plus receipts from sale of fuel and materials plus tax reimbursement. | Part of dump fee and part of receipts from sale of fuel and materials which exceed minimum guaranteed to CRRA. | Receipts from sale of steam and chilled water. |
| | *Profit Limitation ?* | *No.* | Yes, excess profits are shared with CRRA and municipalities. | No profit (steam and chilled water are sold to users on an actual cost basis). |
| | Revenues Shared ? | Yes, with City from fuel sale receipts. | Yes, minimum revenue per ton is credited to the municipalities; *revenues above minimum are shared* with CRRA and municipalities. | No. |
| | Backup Disposal Responsibility | American Can. | CRRA (operated by OXY). | Metro. |

EXHIBIT 2
(continued)
SYNOPSIS OF RESOURCE RECOVERY CASE STUDY ELEMENTS

| | | MILWAUKEE | BRIDGEPORT | NASHVILLE |
|---|---|---|---|---|
| PURCHASE OF OUTPUT | Contract Between | American Can and WEPCO (fuel); interdivisional American Can Company transfers (materials). | CRRA and: United Illuminating (fuel); Glass Container Corp., MC&P, and Reynolds Aluminum (materials) | Thermal and: Metro, State, and private industry. |
| | Duration | 17 years (WEPCO), if tests are successful. | 22 1/2 years (United Illuminating) if tests are successful; 5 years (materials). | 30 years. |
| | Basis for Price | Price of primary fuel per million Btu. | Fuel: price of primary fuel per million Btu (sliding scale). Materials: negotiated price with guaranteed minimum. | Operating cost plus debt service plus contingency. |
| | Revenue Offset | Incremental O & M and capital costs incurred by WEPCO. | Fuel: incremental O & M and capital costs at United Illuminating. Materials: transportation cost. | None. |
| DISPOSAL OF RESIDUALS | Contract Between | City and American Can (part of amalgamated agreement). | CRRA and OXY (part of amalgamated agreement). | Thermal and Metro. |
| | Duration | 15 years. | 22 1/2 years. | 30 years. |
| | Disposal Cost | Absorbed by American Can as an operating cost. | Included in OXY's operating costs. | Incurred by Metro (Metro is responsible for disposing of all residuals). |

## EXHIBIT 3

## SUMMARY OF MILWAUKEE CONTRACTUAL RELATIONSHIPS




1. To deliver all nonhazardous solid waste to transfer stations; to pay dump fee and property tax credit; to make facility sites available; to make transfer stations available

2. To finance facility; to start operations on time and according to specifications; to market output; to share revenue from fuel; to dispose of residuals and nonprocessable wastes; to sell facilities to City; to assign landfill site title to the City

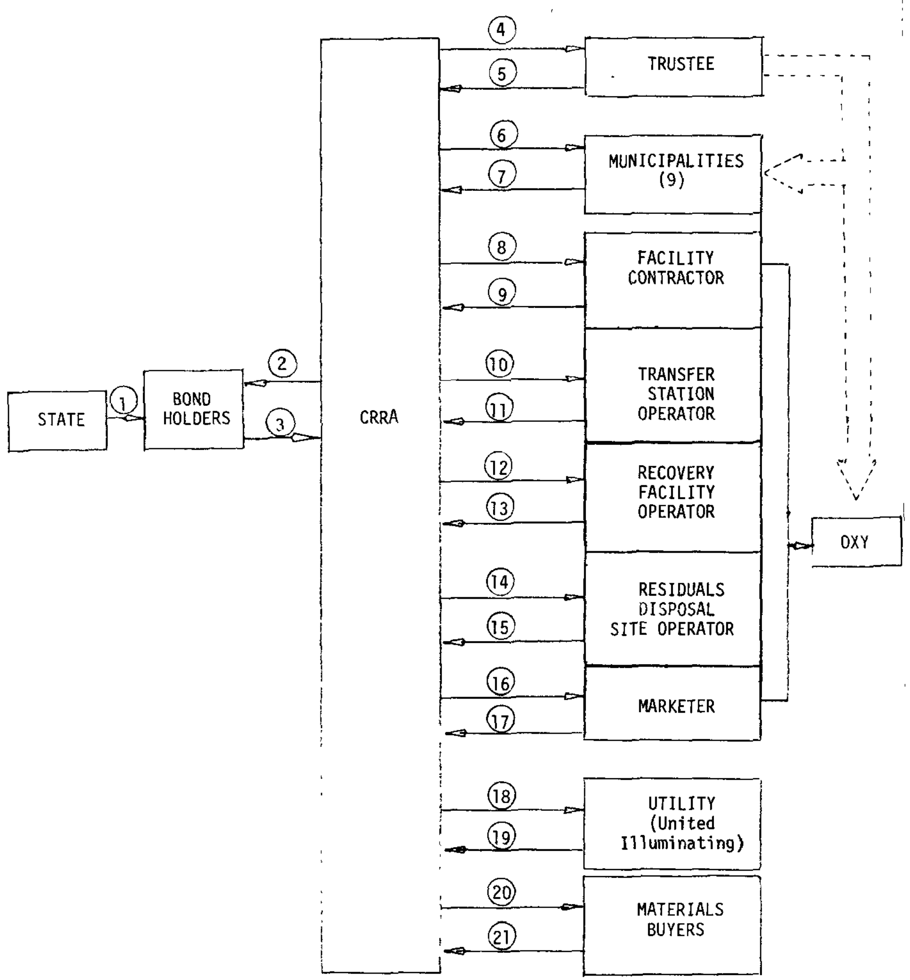
3. To pay for incremental operating and capital costs; to deliver fuel to specifications

4. To accept and pay for fuel; to dispose of bottom ash; to buy fuel receiving facilities

Note: [A]—▷[B] indicates a promise of [A] to [B]

EXHIBIT 4

SUMMARY OF BRIDGEPORT CONTRACTUAL RELATIONSHIPS

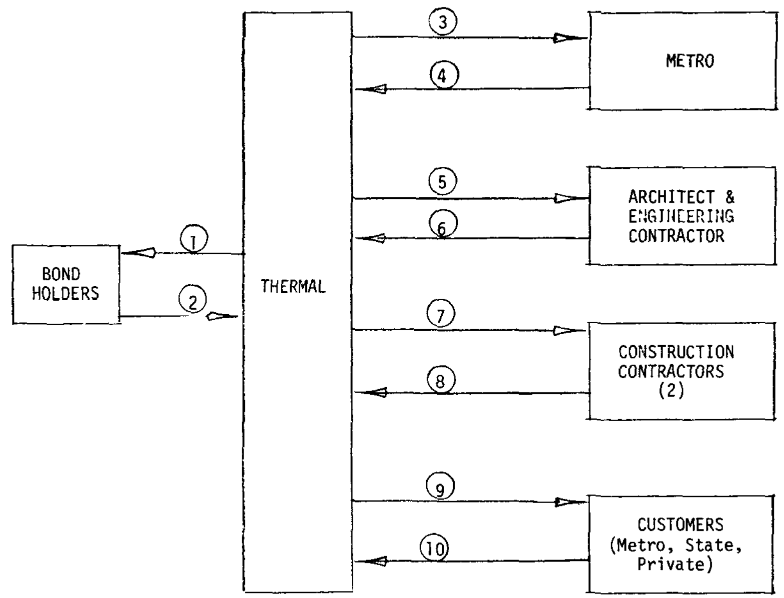



1. To pay debt service, if necessary (make-up obligation)
2. To pay debt service
3. To purchase bond
4. To make all revenues available for allocation
5. To manage accounts and disburse revenues according to formulae
6. To take waste; share excess revenues and profits; to limit dump fee
7. To deliver processable waste to transfer station; to pay dump fee; to pay overruns on transfer station construction
8. To pay construction and equipment costs; to make site available
9. To construct and start operations on time and according to specifications; and to absorb overruns (up to a fixed amount)
10. To cause delivery of processable waste by municipalities; to pay operating fee
11. To screen and store waste and deliver it to recovery facility
12. To pay operating fee; to allow use of excess revenues/profits for unusual capital costs
13. To process accepted wastes; to absorb up to fixed amount unusual incremental operating and capital costs; to share excess profits
14. To make disposal site available
15. To dispose of residuals and/or unprocessed waste
16. To allow sale of output
17. To market and deliver output; to pay minimum revenue; to share excess revenues
18. To deliver fuel to specification; to pay for buyer's incremental operating and capital costs
19. To accept and pay for fuel; to dispose of bottom ash
20. To deliver materials to specification
21. To pay for materials

Note: [A]→[B] indicates a promise of [A] to [B]

EXHIBIT 5

SUMMARY OF NASHVILLE CONTRACTUAL RELATIONSHIPS




1. To pay debt service
2. To purchase bond
3. To accept and process waste
4. To deliver waste to facility; to dispose of residuals; to provide rights-of-way for distribution pipelines
5. To pay fee
6. To design and specify facilities, and to supervise construction
7. To provide facility site and rights-of-way, to pay construction and equipment costs
8. To complete construction on time, for fixed price, and according to specifications
9. To deliver steam and chilled water according to specifications
10. To pay allocated cost of producing and delivering steam and chilled water

Note: [A]→[B] indicates a promise of [A] to [B]

## CHAPTER IV

## RESOURCE RECOVERY RISK ALLOCATIONS

The previous chapter showed the diversity of broad contractual relations resulting from the different concerns and perceptions of risks in Milwaukee, Bridgeport, and Nashville. This chapter summarizes some of the specific ways in which risks were allocated among the actors involved in these three projects. Based upon the case analyses, the conclusion can be drawn that certain types of specific allocations have general applicability to any resource recovery project.

For purposes of comparison and brevity, the participants in each case have been typified as the <u>sponsor</u> of a resource recovery system, the <u>construction contractor</u> for the system, the <u>supplier</u> of waste, the <u>processor/marketer</u> of waste and recovered products, and the <u>buyer</u> of recovered resources. (In some cases, the sponsor of a recovery system may also be the supplier and processor/marketer of the waste and recovered products.) Each participant has primary goals and a willingness to assume and manage certain kinds of risks. For example, a processor's goals could be to secure long-term delivery to the system of all processable municipal solid wastes and to charge the full cost of operating the recovery facility. He would not be willing to assume responsibility for the delivery of waste to his facility, however, since he has no control over its collection. While, in general, the processor would be willing to accept responsibility for the operations of the recovery facility, he can be expected to insist upon limiting the risks associated with his responsibilities. Circumstances such as changes in the quantity of waste available for processing can be due to events that the processor cannot reasonably prevent or control. In those instances, the processor wants to be relieved of some of his obligations.

Tradeoffs are required among the participants in order for each to achieve his goals and to protect against those risks that he cannot effectively manage. Establishing these tradeoffs is what contract negotiations are about. The contract itself is the legal record of the terms and conditions, i.e., the risk allocations, agreed to by each participant. In some cases, especially where inherent risk is high, participants may never be able to agree upon a contract.

A summary of negotiated risk allocations made in Milwaukee, Bridgeport, and Nashville is shown in Exhibit 6. The exhibit does not reveal the risk-mitigating forces at work in each of the cases; nor does it describe the nuances of agreed-upon risk allocations and their detailed contexts. The reader is urged to study the companion Technical Appendix to <u>Resource Recovery Plant Implementation: Guides for Municipal Officials - Risks and Contracts</u>, which contains a detailed analysis of the contractual agreements involved in the three case studies and provides more details on the events of each case that led up to the contracts.

Examination of Exhibit 6 and the more detailed analysis contained in the Technical Appendix indicates that certain types of contract provisions can be applied generally to managing, allocating, or sharing the risks associated with a resource recovery project. For purposes of exposition, it is useful to group these various provisions according to how they enable each of the five participants to meet his primary goals.

The <u>sponsor's</u> goal is to implement a recovery facility that will operate according to specification for a known price by a particular time. In order to protect against risks that would affect his ability to achieve his goals, he might require from the construction contractor:

- Fixed price construction contracts;
- Guaranteed delivery dates for a fully operational facility;
- Independent testing and evaluation of the facility operation prior to delivery and acceptance of the facility;
- Performance bonds or other collectible liability protection in case the construction contractor is unable to meet the delivery date or to deliver a facility that operates according to specifications;
- Liability protection provided by the design engineer to compensate the purchaser for any faulty design or specifications.

The <u>construction contractor's</u> goal is to construct the facility according to specifications within a realistic and reasonable time period at a price that permits him a reasonable profit. To protect against those risks that could affect his ability to achieve this goal, he might require from the sponsor:

- Periodic payments for work in progress;
- A fixed fee;
- Relief from his obligations to meet the delivery date where situations occur outside of his control, such as a work stoppage at equipment suppliers;
- Right to terminate work without liability where the sponsor fails to meet payment schedules or fails to secure necessary legal or permit approvals.

The <u>supplier's</u> goal is to secure the long-term disposal of solid waste, and materials recovery from it, at a reasonable cost. In order to protect against those risks that could affect his ability to achieve this goal, he might require from the processor/marketer:

- A long-term (15-30 year) contract for the disposal and processing of solid waste;
- Disposal of all solid wastes delivered to the processor;
- Acquisition of an environmentally approved disposal site or sites capable of meeting disposal needs on a long-term basis;
- Fixed dump fees, with adjustments only for inflation;
- Minimum days and daily hours for operation of the facility for acceptance of delivered waste;
- Rights to require other periods of operation in cases of emergency;
- Maximum storage capacity for delivered wastes;
- Minimum recovery efficiencies for various products, e.g., metals, glass, and fuel or energy;
- Participation in revenues from the sale of recovered products;
- Guaranteed revenues or fair market value from the sale of recovered products;
- Performance bonding or other collectible liability protection for unreasonable amounts of facility downtime;
- Assumption by the processor of all maintenance, operating, and capital replacement costs of the facility;
- Insurance provided by the processor against damages to the facility;
- Right of termination for nonperformance by the processor.

The processor/marketer's goals are to receive sufficient quantities of processable waste from the supplier, to charge the full cost of operations and marketing, and to realize a reasonable profit. In order to protect against those risks that could affect his ability to achieve these objectives, the processor/marketer might require from the supplier:

- Long-term contracts for the delivery of waste;
- Guaranteed annual tonnages to be delivered;
- Guaranteed payment of dump fees whether or not delivery is made;
- Establishment of dump fees that cover all operating and maintenance costs, local property taxes on all facilities and equipment, and a reasonable profit;

- Automatic annual adjustment in dump fees due to inflation;

- Rights to adjust dump fees or participation in revenues from the sale of recovered products in the event that there are significant changes in the composition of delivered wastes which affect either the cost of operations or the ability to live up to the terms of the marketing agreements;

- Rights to adjust dump fees in the event that increases in operating and maintenance costs exceed the annual rate of inflation due to events outside of the processor's reasonable control;

- Deduction of the cost of marketing (may or may not include transportation costs) from revenues from the sale of recovered products prior to establishment of the dollar amount to be shared with other participants.

Similarly, the processor/marketer, in order to protect against undesirable risks, might require from the buyer:

- Long-term contracts for the purchase of products (marketing contracts for materials tend to be of shorter duration, e.g., five years, than those for fuel);

- Guarantees of annual minimum amounts of recovered fuel or products that a customer will accept;

- Pricing of recovered fuel based upon the price per Btu of the fuel that it supplements.

The goal of the <u>buyer</u> of recovered products is to obtain a quality product that will not interfere with his normal production operations. He will require of the processor/marketer:

- Guarantees that products meet specifications;

- Reimbursement, in the case of buyers of recovered fuel, for any incremental capital and operating costs associated with its use;

- Rights of termination (in the case of buyers of recovered fuel) at any time if there is a likelihood that the burning of supplemental fuel has caused or would cause damage to the utility boilers, or if the plant utilizing recovered fuel is shut down because it is substantially more expensive to operate relative to other plants in the utility's system (the concept of economic dispatch);

- Assumption of the delivery cost of the materials or fuel.

All contracting parties want to be relieved of their obligations without liability or with firm limits on their liability whenever they are prevented from fulfilling the provisions of a contract as a result of events beyond their control. Such uncontrollable events are referred to as force majeure. What constitutes force majeure may vary from situation to situation, depending upon negotiations. However, at a minimum it would include acts of God, war, civil disorders and riots. Not only does the definition of force majeure vary, but the limits of liability do as well. In Bridgeport, for example, because force majeure is broadly defined, the nine participating municipalities wanted a firm limit set on how high the dump fee could rise as a result of this risk. The result was that under no circumstances would the dump fee be higher than 190 percent of the fee charged in the year preceding the one in which a force majeure occurred.

The types of risk allocations used in the Milwaukee, Bridgeport, and Nashville projects may be generally applicable to the acquisition and implementation of other resource recovery systems. These three cases also provided useful insights concerning the entire process involved in obtaining an operational project. These insights are discussed in the next chapter.

EXHIBIT 6

MECHANISMS FOR ALLOCATING RESOURCE RECOVERY RISKS

| RISK AREA | TYPES OF RISK ALLOCATION MECHANISMS | MECHANISM USED IN: | | |
|---|---|---|---|---|
| | | MILWAUKEE | BRIDGEPORT | NASHVILLE |
| WASTE SUPPLY AND DISPOSAL | Supplier guarantees delivery of minimum annual tonnage. | X | X | X |
| | Supplier has option to haul waste directly to landfill at lower dump fee if processor cannot process it. | X | | X |
| | Processor guarantees to accept and process waste. | X | X | |
| | Processor guarantees disposal of process residuals and availability of emergency landfill. | X | X | |
| | Supplier guarantees disposal of process residuals and availability of emergency landfill. | | | X |
| FACILITY CONSTRUCTION | Contractor guarantees construction of operational facility for fixed price. | Indirectly | | X |
| | Contractor guarantees construction of operational facility for fixed fee. | | X | |
| | Contractor has right to terminate if construction costs exceed certain agreed-to amount. | | X | |
| | Contractor guarantees construction of operational facility by fixed date and pays delay penalties thereafter. | X | X | X |

EXHIBIT 6

MECHANISMS FOR ALLOCATING RESOURCE RECOVERY RISKS

(continued)

| RISK AREA | TYPES OF RISK ALLOCATION MECHANISMS | MECHANISM USED IN: | | |
|---|---|---|---|---|
| | | MILWAUKEE | BRIDGEPORT | NASHVILLE |
| FACILITY CONSTRUCTION (continued) | Sponsor provides site for facility. | X | X | X |
| | Sponsor does not accept facility until independent tests show that it is operational according to specifications. | X | X | |
| | Sponsor guarantees payment schedule for work in process. | | X | X |
| | Sponsor has right of termination if delivery date is not met. | X | | |
| FACILITY OPERATION | Supplier pays fixed dump fee, subject only to adjustments for inflation and forces outside the control of the processor. | X | X | (no dump fee) |
| | Supplier guarantees payment of dump fee whether or not he delivers waste. | X | X | |
| | Supplier's dump fee is increased according to an established price or cost index (e.g., Consumer Price Index). | X | X | (no dump fee) |
| | Processor shares percentage of revenues from sale of output with supplier. | X (limited) | X | |
| | Processor guarantees fixed amount of revenues to be shared with supplier. | | X | |
| | Processor's maximum profit is fixed, with surplus shared with supplier. | | X | (no profit) |

EXHIBIT 6

MECHANISMS FOR ALLOCATING RESOURCE RECOVERY RISKS

(continued)

| RISK AREA | TYPES OF RISK ALLOCATION MECHANISMS | MECHANISM USED IN: | | |
|---|---|---|---|---|
| | | MILWAUKEE | BRIDGEPORT | NASHVILLE |
| FACILITY OPERATION (continued) | Supplier's dump fee is renegotiated or adjusted up or down if waste composition or quality changes. | X | X | |
| | Supplier's liability for operating or capital cost increases due to forces outside the control of contracting parties is limited. | X | X | |
| | Processor's liability for operating or capital cost increases due to forces outside the control of contracting parties is limited. | X | X | |
| MARKETING OF OUTPUT | Processor guarantees product quality. | X | X | X |
| | Processor guarantees product volume and/or delivery schedule. | X | X | |
| | Buyer guarantees that price paid for fuel will be equivalent to the price per Btu of primary fuel. | X | X | |
| | Buyer guarantees to pay minimum price per ton for materials. | unknown | X | |
| | Processor agrees to discount price for fuel if volume purchased and/or price of primary fuel increases. | | X | |
| | Processor agrees to pay for incremental costs incurred by buyer of fuel. | X | X | |

EXHIBIT 6

MECHANISMS FOR ALLOCATING RESOURCE RECOVERY RISKS

(continued)

| RISK AREA | TYPES OF RISK ALLOCATION MECHANISMS | MECHANISM USED IN: | | |
|---|---|---|---|---|
| | | MILWAUKEE | BRIDGEPORT | NASHVILLE |
| MARKETING OF OUTPUT (continued) | Buyer of fuel agrees to buy receiving facilities from processor after successful completion of testing. | X | | |
| | Buyer agrees to accept and pay for minimum amount of recovered fuel or material. | X | X | X |
| | Buyer agrees to covenant anyone who should acquire his facilities to his contractual obligations with the processor. | | | X |

# CHAPTER V

## CONTRACTING FOR A RESOURCE RECOVERY SYSTEM: INSIGHTS FROM THREE PIONEERING PROJECTS

Up to this point, attention has been focused on how the attitudes of recovery project participants toward risk affect the allocations of the project's risk to the various contracting parties. The intent in this chapter is to record some aspects of the implementation process which informed and involved individuals feel are salient to the issue of contracting for resource recovery systems. This chapter shifts the focus to how the entire implementation approach, stretching from original recognition of a need for a resource recovery system to final system implementation and operation, influences the substance of risk allocations discussed earlier.

Amid the diversity of the Milwaukee, Bridgeport, and Nashville experiences, there are useful insights which might be applied elsewhere. These early veterans of resource recovery offered a number of thoughts for the next wave of negotiations. These thoughts, combined with the observation of the case analysts, help to synthesize the experiences of the three projects into useful information. The observations from the three projects tend to fall into four topical areas:

- Institutional and Organizational Factors
- Financing
- Project Economics
- Contractual Process

### Institutional and Organizational Factors

The particular institutional and/or organizational arrangements which characterize each of the three cases result in part from decisions about the particular method of procurement to be utilized. In turn, decisions on the procurement method influence the form and scope of contracts which involve the municipality or the project sponsor. Procurement is accomplished either on a nonnegotiated (competitive bid) or negotiated (competitive or sole source) basis. There are three basic procurement approaches: conventional, turnkey, and full service.* Nashville is an

* For a full discussion of the various procurement methods see: Office of Solid Waste Management Programs, U. S. Environmental Protection Agency, Resource Recovery Plant Implementation: Guides for Municipal Officials - Procurement and Interim Report, Washington, D. C., 1975.

example of the conventional acquisition approach with nonnegotiated procurement. Both Milwaukee and Bridgeport utilized the full service approach but with contrasting ownership options. Milwaukee, as noted previously, will have private ownership by American Can. Bridgeport expects to have public ownership by CRRA. However, Bridgeport preserved the option of private ownership throughout the acquisition process with the understanding that each proposal would have to be reexamined if such an option became a serious consideration.

The three recovery projects illustrate that:

FULL SERVICE WITH PRIVATE OWNERSHIP

- The full service with private ownership approach as used in Milwaukee, requires only a single contract between the City and the successful proposer because the system supplier, not the municipality, will own, operate and finance the system and will provide a service--solid waste disposal and resources recovery--not a facility or system to the municipality.

- Full service with public ownership, as in Bridgeport, involves contracts for the design, construction, and operation of the resource recovery system and, in many cases, contracts with the purchasers of recovered products because the system supplier provides not only a service but also a facility to the municipality.

FULL SERVICE WITH PUBLIC OWNERSHIP

The full service approach with ownership by a State or regional public authority requires more detailed and complex contractual relationships because responsibility for the system and control over the waste is divided. For example, the State of Connecticut and its municipalities created the Connecticut Resources Recovery Authority, an independent state authority. CRRA, lacking access to the solid waste stream, had to negotiate a contract with municipalities in the region where the system was to be located. Further, CRRA needed to develop contracts with the system supplier and additional agreements covering emergency landfill, residue disposal, sale of recovered products, and transfer station construction and operation. All of these contracts were required because CRRA lacked direct control over the essential elements of the system.

Both types of full service procurement approaches described above normally utilize a negotiated procurement method consisting of competitive proposals by potential system suppliers.

CONVENTIONAL

- The conventional approach, as in Nashville, which typically uses nonnegotiated competitive bids, requires only a construction contract or contracts since overall responsibility for and control over the resource recovery system rests with the municipality, not the system supplier. Complex contractual relationships also result, however, when the municipality decides to implement the project through an entity other than itself. For example, the Metropolitan Government in Nashville created a nonprofit corporation (Nashville Thermal Transfer Corporation), to implement its project. In order to establish the economic feasibility of its system, Thermal negotiated a complex steam and chilled water purchase contract with the metropolitan and State governments and various other users of steam and chilled water.

## Financing

Within the broad form of the contract or contracts necessitated by a particular procurement method, various contract issues, such as project economics, performance standards and guarantees, risk sharing, and financing, exist and must be negotiated. Financing issues must be resolved in order to determine the substance, and, in some cases, the form of the definitive contract or contracts.

Decisions concerning the specifics of financing derive from those concerning the procurement method to be employed. Sometimes two procurement-financing approaches are concurrently undertaken in order to determine whether private financing might be available. This was the situation in both Milwaukee and Bridgeport. However, the final decision on an approach should be made prior to actual contract negotiations in order to avoid delays, and perhaps major renegotiations.

Several general conclusions emerge from experiences in the three projects:

POTENTIAL FOR PRIVATE FINANCING

- It is unlikely that the private sector will be the dominant source of financing for resource recovery projects over the next decade. This conclusion is qualified by the overall cost and liabilities of a particular project as well as the financial strength of individual companies. Obviously, it was easier for Americology to justify to its management the financing of the Milwaukee plant which was under $20 million than it would have been if the project had cost $60 million.

**LIMITS OF LIABILITY**

- The private sector would like to assign upper limits of its financial liability for operation and construction of a project. In Bridgeport, OXY negotiated vigorously for restricting its liability to the first $15 million of losses. In Milwaukee, the City Council agreed to dump fee negotiation clauses if Americology experienced significant losses through unexpected cost increases.

**DECISION ON FINANCING**

- Alternative methods of project financing, and their consequences, should be well understood prior to inviting private industry to bid on the project. The method of financing should be decided upon prior to initiating contract negotiations. For example, Milwaukee entered final negotiations and actually reached agreement on a contract draft with the issue of public vs. private financing unresolved. The city estimates that this lack of resolution possibly delayed their project over 60 days.

**SELECTION OF AMORTIZATION PERIOD**

- The number of years sought for amortizing the financing of a recovery project requires a delicate and difficult balancing among several factors. Primary among these factors are consideration of the effect of the amortization period on the dump fee, relationship to the useful life of the major equipment and facility components, rate of technological obsolence, and uncertainties related to the revenue stream over time from the sale of recovered materials and fuel or energy. The total cost of the project also influences the choice of time period selected for amortization. While no firm rule can be established, it appears that the amortization period should be for as short a time period as is economically practical. In Milwaukee, American Can is financing the project on the basis of 15 years of operation. This means that the project will cease operations prior to the time for replacement of many major equipment items. For example, the engineering estimates of useful life of major components, e.g., shredder housing and shaft; the pins, belts, rollers, chains of the receiving conveyors; air classifiers; cyclones; bag house; etc., ranges between 10 and 20 years. Bridgeport, on the other hand, with a facility similar to that for Milwaukee, will amortize the bond issue over 22.5 years. And Nashville, with a waterwall incinerator and the need for precipitators, has a 30 year amortization period.

**FULL FINANCING OF SYSTEM CONCEPT**

- It is important that the initial financing cover the full cost of the project. Nashville illustrates the problems which can result from inadequate capitalization. The preliminary engineering cost estimates for the design of the project was approximately $24 million. However, revenues from the project's products (remember, there was not a dump fee) supported only a project costing $16.5 million. Therefore, cost-cutting decisions were implemented. Thermal, now, is forced to purchase additional equipment, such as the needed electrostatic precipitators. Installation of extra equipment after a plant is constructed is substantially more expensive. Also, the perception of Thermal's credit worthiness has been tarnished and the incremental financing will prove to be more costly.

**GUARANTEED PRICE FOR PROJECT CONSTRUCTION**

- Adequate public financing is dependent upon establishing a fixed price for the construction of the recovery project during the contract negotiations. Failure to do so can result in unacceptable cost overruns, and in at best, substantial, perhaps terminal, delays in the construction of a project. Bridgeport is a good illustration of the latter point. CRRA's construction contract with OXY provides for a cost plus fixed-fee arrangement. Construction costs in excess of those estimates contained in the contract are to be borne by OXY up to a maximum "net loss before taxes" of $15 million. OXY is entitled to be reimbursed for financing the added construction costs from all project revenues in excess of those which it has guaranteed to pay to the municipalities. Normally 75-90 percent of these excess revenues would be disbursed to the participating municipalities. However, should the additional construction costs exceed the $15 million limit OXY has the right to terminate the construction contract. Subsequent to the signing of the

GUARANTEED PRICE FOR PROJECT CONSTRUCTION (continued)

contracts, OXY developed more detailed cost estimates. These estimates exceeded, by at least $10 million, the total amount of the bond issue CRRA pledged in its contracts with the municipalities. OXY balked at financing the $10 million, and CRRA's Board of Directors saw a spector of OXY terminating with the project only partially built. The result of not having a guaranteed fixed price is that the construction will be delayed by at least six months. New contracts also may have to be negotiated with a different company, not only for construction, but operations and marketing as well, which could further delay the start of construction.

## Project Economics

The specific risk allocations reflected in the terms and conditions of a contract, as well as project financing, are tremendously influenced by the economics of the project. Uncertainties regarding estimates of operating, maintenance, and replacement costs determine both the willingness on the part of the processor to assume these costs and the conditions under which all or part of the costs will be borne by him. Often there is insufficient prior operating and maintenance data available to permit establishment of completely dependable cost estimates, particularly over the long life span of recovery projects. In addition to the above costs, there are debt service costs. These are directly related to the total capital costs of the project, the interest rate, and the amortization period.

The various costs must be paid for from project revenues. There are two major sources of revenues:

- The dump fees charged for accepting and processing municipal solid waste;
- Revenues from the sale of recovered paper, metals, glass, and fuel or energy.

There are real limits to the dump fee that can be charged. While municipalities have shown a willingness to pay dump fees for a resource recovery project which are often higher than current costs of landfilling, they also have demonstrated that they want the dump fee set at a fixed price over the life of the project, subject only to adjustments for inflation. Because dump fees cover only a portion of the total annual cost of a project, the revenues from marketing recovered resources are critical to project economics.

The key component of marketing revenues is the income derived from the sale of fuel or energy. In Bridgeport, for example, the sale of fuel to United Illuminating will account for 80 percent of the marketing revenues, while in Nashville the sale of steam and chilled water accounts for the entire revenue source, since at the moment there are no dump fees. Thus, early establishment of the market for fuel or energy is essential to the financing, construction, and operation of a recovery project.

The use of recovered fuel as a supplement to the primary fuel used in utility boilers has had successful but limited demonstration. Whether recovered fuel can be burned successfully over a long period of time in either oil-or coal-fired boilers is still an unknown, and whether it can be successfully burned at all in oil-fired burners remains to be demonstrated. While there has been a willingness on the part of some utilities to buy recovered fuel, utilities have not universally accepted the concept. Furthermore, there is insufficient operating experience demonstrating that the quality of supplemental fuel can be maintained at a guaranteed level or that a schedule of deliveries can be met consistently. Thus, a considerable marketing effort still is required in order to secure long-term contracts for the purchase of fuel.

Materials derived from mixed wastes are essentially new products in the marketplace--as such, there are certain obstacles that must be overcome before these new materials achieve significant market penetration and acceptance. The first marketing obstacle is that recovered materials must compete with well entrenched virgin and secondary materials distribution systems. Second, there exist some market biases against secondary materials--particularly those derived from mixed municipal wastes. Third, the market for secondary materials has been traditionally volatile, with prices and demand fluctuating wildly depending on conditions outside of the control of the secondary materials distributor. Finally, it has not yet been demonstrated that the quality of recovered materials can be maintained at a guaranteed level or that a schedule of deliveries can be met consistently.

To further complicate an already difficult marketing problem, recovery projects generally seek long-term (5-30 year) contracts for their outputs so that the conditions of their financing, and the commitments to municipalities, can be met. Because of the crucial aspect of product revenues in the success of a recovery project, it is not surprising that some municipalities have turned to private industry for its skills in dealing with the marketing and distribution problems.

The experiences in Milwaukee, Bridgeport, and Nashville provide some insights into some marketing issues that impinge upon project economics:

LOCAL MARKET CONDITIONS

- Early establishment of the local market for fuel or energy is crucial to establishing realistic project economics and the viability of project financing. A thorough knowledge of local market conditions for both recovered materials and fuel is essential to determine performance specifications for a resource recovery system. Specification should be determined <u>prior</u> to design and construction of a facility. If marketing specifications are set after design and construction, additional capital expense, increased operating costs, or lower product prices may be incurred. In addition, a system that produces a full "slate" of products may not be immediately practicable, but a design that provides for modular add-ons can allow flexibility for system expansion when and if market conditions make it economically feasible. This may be true particularly for the recovery of glass and nonferrous metals.

LOCAL MARKET CONDITIONS (continued)

Examples of market condition issues include:

- In Nashville, because of heavy public commitment, Thermal had thirty-year contracts for the purchase of steam and chilled water from county, city, and State agencies. This established a guaranteed market at an early date. This also allowed Thermal to obtain good bond ratings and to know final performance specifications prior to design of the system.

- In Bridgeport, on the other hand, CRRA in the early fall of 1975 had only a memorandum of understanding with United Illuminating for the purchase of shredded fuel. This provides for only preliminary specifications--final specifications are to be established--and a commitment to purchase fuel on a long-term basis only if the R & D phase is successful. Thus, the lack of an actual contract for the purchase of fuel might influence the timing and marketing terms of a bond offering and also the final technical design of the plant.

MARKETING FUEL TO ELECTRIC UTILITIES

- Marketers of fuel to an electric utility must recognize that there are waste-based uncertainties and costs which the utility will require to be borne totally by either the municipality or the private contractor. In general:

  - No extra costs--capital, operating and maintenance--associated with the burning of supplemental fuel will be borne by a utility since they are not in business to solve the solid waste problem. [The proposed Union Electric (St. Louis) project is an exception to this.]

- A period of research and development, the cost of which might be borne by the marketer, is necessary in order to determine the technical feasibility of burning supplemental fuel in boilers designed to burn coal, oil, or natural gas.

**MARKETING FUEL TO ELECTRIC UTILITIES (continued)**

- Anything associated with the burning of fuel which at any time during the life of the project threatens the reliability of the utility's system could be immediate cause for the cessation of burning the fuel.

- The concept of economic dispatch in the utility field is of paramount consideration and can result in a shut-down or reduced loading of the facilities selected for burning of the fuel.

In the Bridgeport project, CRRA provided incentives to United Illuminating to burn fuel through:

- CRRA payment of all capital costs to modify United Illuminating's oil burners so that they can burn fuel produced by the recovery system.

- CRRA payment of the utility's incremental operating and maintenance costs associated with burning the fuel.

- Price and volume discounts, on a sliding scale, for the purchase of fuel whenever the cost of oil exceeds $1.50 per million Btu and/or when the volume purchased exceeds guaranteed minimums.

**MARKETING OF STEAM**

- Solid waste-based public centralized heating and cooling service can substantially reduce overall energy requirements and capital costs associated with the installation of self-contained heating and cooling systems in many individual buildings. Steam is also a product with which the market is much more familiar than refuse-based energy products.

The problems with steam recovery are that it can be implemented only in areas where a facility can be located in close proximity to its customers and that it requires that an additional (back-up) boiler, with its incremented capital costs, be designed and constructed.

PRODUCT SPECIFICATIONS

- Customers for products derived from solid waste will require that the products meet certain specifications. They may require that the recoverer guarantee shipment sizes and frequencies. In the case of steam, customers may insist that the recoverer make provisions for a standby capability to produce steam from traditional fuels.

  Changes in the supply of wastes to be processed and marketed may adversely affect the ability to meet materials and fuel performance specifications, to maintain delivery of guaranteed minimum volumes, and/or to maintain the agreed-upon price for a given quality of product. Changes in waste composition also could result in increased operating costs related to meeting performance specifications or could require additional capital outlays.

## The Contractual Process

The contractual process is an integral part of the overall resource recovery implementation process. For the purposes of this section, the contractual process is defined as encompassing all acts, events, and occurrences from the original conceptualization or formulation of a contractual format for a resource recovery system through the execution and award of a final contract or contracts between the municipality and the system supplier. The eventual form and substance of such contracts will depend upon the final mix of the essential ingredients that make up any resource recovery project--waste, site, markets, technology, process, financing, and procurement method.

The contractual process should not be confused as being separate and distinct from the implementation process. The primary purpose of the contractual process is to consolidate and record in a legal document all prior decisions and agreements that have taken place or have been developed. In essence, the contractual process is the culmination of the process by which a company is chosen to build and possibly operate a facility. The contract finalizes the arrangements and establishes the ground rules for plant construction and operation. It is also the point in the implementation process where the emphasis shifts from study and selection to actual design and construction.

Confusion exists between the implementation and contractual processes because several proposed implementations, unfortunately, have fallen apart during the contracting process following an apparently successful selection of a company by a municipality. Those failures have improperly created the impression that the contractual process is separate and sometimes more difficult and formidable than the original feasibility and company selection process. To the contrary, most problems have surfaced because of inadequate effort in the initial stages of implementation. This has resulted in insufficient problem definition, poor specification of a desired system concept, and a general lack of knowledge of the financial, technical, and organizational implications of a particular implementation approach. A common example of this is the poorly designed request for proposal (RFP) that fails to communicate to potential system suppliers the types of responsibilities (liabilities) the private sector is expected to assume. These misunderstandings or unresolved issues only become apparent in the system selection and contractual process, where they can lead to aborted solicitations or overly long negotiations as the problems separating the contracting parties are defined and resolved.

The successful implementation of a resource recovery system by local governments is a tremendous challenge. Preparing for, and carrying out negotiations tests the soundness of the program concept and the ability of different organizations to work together to resolve their differences and develop a basis upon which to enter into a contract which may last upwards of thirty years.

Some important observations and conclusions about the impact of the implementation process upon the contractual process are:

- The contractual process is an integral part and subprocess of the overall implementation process. It consolidates and records the various and diverse elements of a resource recovery project in a comprehensive and cohesive agreement. As a result, it tests the soundness of all prior decisions, agreements, and understandings.

- An effective and efficient system acquisition strategy consists of detailed research and planning, knowledgeable consideration of key issues, and selection of an acquisition approach and procurement method tailored to fit the requirements of the project and system concept. Thus, it produces an RFP that communicates the municipality's requirements to potential system suppliers in a clear and unambiguous fashion thereby reducing the potential for misunderstandings that might create problems during the contract negotiations.

- The acquisition approach and procurement method selected for a particular resource recovery system will dictate the form and, in large part, the substance of the contract if they have been based upon knowledgeable planning decisions relating to risks, ownership, operation, funding, markets, technology, and economics.

- An effective RFP will produce comparable proposals and expedite identification, negotiation and resolution of open issues.

- Forceful and knowledgeable management of the implementation process is absolutely essential to the development of a workable basis for sound contractual agreement.

Once the municipality has properly organized the implementation process so that it will produce the required data for the contractual process, its focus can shift to the actual functioning of the contractual process. In order to illustrate the points mentioned above and to provide some observations about the contractual process as it moves towards and through contract negotiations, the following insights from participants in the Milwaukee, Bridgeport, and Nashville projects are provided:

COMPETITIVE BIDDING

- Resource recovery is not yet on "off-the-shelf" procurement. Consequently, contractors must be able to combine engineering and R & D skills during the design and construction of a facility. A too tightly specified competitive bid approach may preclude this flexibility and require that the sponsor carry a major burden of risk of system malfunction.

  The City of Milwaukee was able to overcome the statutory requirements for competitive bidding by an opinion of the City's law office that the securing of services for a resource recovery system was similar to that for other professional and technical services. This opinion was subsequently supported through a public hearing by the Common Council to document that there was scientific and technical expertise associated with the bids received for the resource recovery system. In Bridgeport, the legal requirement that portions of the construction work be competitively bid created uncertainty in that CRRA was unable to finalize a particular system supplier's cost estimate until it determined what portion needed to be competitively bid and what the expected cost of such work might be. As a result, the system suppliers shifted the risk created by this uncertainty surrounding the competitive bid requirement back to CRRA.

CONSULTING ENGINEER

- The availability of consulting engineering services throughout the entire process of planning for, and implementing, a resource recovery system is essential. The consulting engineer can, for example, provide a municipality with unbiased advice on the technical and economic feasibility of proposed systems. In Milwaukee, Bridgeport, and Nashville, outside consulting engineers were hired to assist the staffs of the organizations responsible for implementing the recovery projects. In Bridgeport, the consulting engineer is playing a critical role in documenting CRRA's required financial self-sufficiency determination.

SYSTEM PERFORMANCE SPECS

- Early determination of the performance requirements of the resource recovery system is essential to providing meaningful guidelines to prospective bidders and to the proper evaluation of proposals. The technology employed for meeting these performance requirements need not necessarily be specified--this may be better left to the bidder to determine. It may also be appropriate to establish a plan for a modular system in which certain functions (e.g., recovery of glass or aluminum) are added after the basic system has been proven. Potential contractors should be allowed to argue for the implementation of a full system at the outset, but only as an option to their base proposal.

ARCHITECTURAL AND ENGINEERING CONTRACTS

- Where architectural and engineering (A & E) service contracts are used to develop designs for recovery systems so that systems components can be procured from competent vendors, it may be advisable to include in such contracts provisions for at least limited liability of the contractor for the operating feasibility and performance of the facility design.

PRE-QUALIFICATION OF BIDDERS

- Various municipalities have wasted time and money and incurred substantial delays by failing to establish clear and cogent criteria by which to qualify proposers--CRRA and Bridgeport prequalified one bidder on the basis of their technical competence, but later had to require that they joint venture with another firm in order to establish the financial capability to assume the required risks. If a company undertakes the expense and effort to submit a proposal and thereafter the municipality discovers that such firm should not have been qualified to bid, it becomes very difficult, politically and practically, for the municipality to eliminate that company from the competition.

DRAFT CONTRACTS

- In order to clearly communicate to prospective system suppliers its position on key issues, such as ownership, operational responsibility, financing, markets, etc., the municipality could prepare a draft contract, or at least the anticipated major provisions of the contract, and include it as part of the bid documents or RFP submitted to prospective system suppliers. The municipality should require that each proposer respond to the draft contract on a section by section basis. This approach has certain advantaages:

  - It forces public officials to think through the key issues prior to proposal solicitation and to define a preliminary position concerning areas such as risk, operational responsibility, performance standards, and economics.

  - It provides the proposers with explicit guidelines upon which to base their proposals and examine their potential return and risks.

  - It improves the chances that proposals will be comparable and that each proposer specifically understands the requirements of the municipality.

  - It assures that senior management in the proposer's organization (financial, legal and administrative) have reviewed and approved their proposal since a draft contract clearly establishes the responsibilities that the proposer will be required to accept if the municipality selects its proposal.

  - Detailed responses to draft contracts clearly identifies open issues and disagreements, which aids in the analysis of complex proposals and establishes the starting point for final negotiations with potential system suppliers.

  Draft contracts or statements of major contract provisions also have certain disadvantages:

  - Technically and financially qualified firms may decide not to respond because the RFP appears too restrictive and inflexible or will increase the cost of submitting a proposal beyond a reasonable level.

  - It may discourage creative responses that might be in the best interest of the municipality.

- It may create the improper impression that agreement to a draft contract, either explicit or implicit, by a proposer constitutes a knowledgeable and conscious acceptance of the municipality's requirements, particularly if marketing representatives of the proposer conduct the analysis of the draft contract without the consultation of corporate counsel.

DRAFT CONTRACTS (continued)

- Corporate counsel, who may be unfamiliar with the project's background, may not fully understand the financial consequences of the obligations which the municipality requires of the proposer, and, therefore, a basic misunderstanding will arise within the context of apparent approval and agreement between the parties.

- Firms may agree to contractual provisions in the context of proposal evaluation, but later rescind such agreement during contract negotiations. The RFP and draft contract should clearly state those provisions which are absolutely required and non-negotiable.

TIME REQUIRED FOR NEGOTIATIONS

- The contract is the culmination of a long and difficult process. The time required for the negotiation phase of this process largely depends on two conditions: (a) the basis for sound contractual negotiations developed during the acquisition process; and (b) the legal complexity of the project (i.e., the number of contracts and their level of detail). Simplicity, without sacrificing legal protection and the organizational goals of the project, should be sought by negotiators. For example:

  - In Milwaukee, it took almost three years to conclude the entire planning-contracting process, but the City/American Can negotiating teams came to agreement after only 72 (consecutive) days of negotiations. They had decided in good faith to agree, and worked very hard to develop a contract so as to be able to get on with the task of implementing the project.

  - In Bridgeport, completion of negotiations between CRRA and all other parties took between 13 and 14 months. These negotiations were complicated by many events and considerations, including problems in securing a source for the shredded fuel, and difficulty in fixing the limits of OXY's liability; all of which should have clearly been established prior to the commencement of contract negotiations.

TIME REQUIRED FOR NEGOTIATIONS (continued)

The Bridgeport contracting process was also protracted because of the complexity and the number of agreements. The contracts between CRRA and the various parties occurred sequentially--thus requiring that commitments to the nine municipalities affected the terms and conditions in OXY contracts for facility operation and marketing. Negotiations with United Illuminating for purchase of recovered fuel, in turn, had to be consistent with all prior agreements.

DELAYS IN NEGOTIATIONS

- Not only do protracted contract negotiations lead to cost inflation; they can cause recovery project managers to run the risk of changes in political climate or public officials which could jeopardize the implementation of the project on the terms and conditions agreed to.

REDUCING NEGOTIATING TIME

- It is possible to reduce the time spent to complete contract negotiations by proper planning and management of the acquisition process and by being sure that the negotiators can respond quickly and authoritatively to proposals. For example, for negotiations between the public and private sectors:
  - The municipality should designate one person as the chief negotiator and coordinator of contract negotiations for the municipality.
  - The private negotiating team should be comprised of executives who represent senior management and are able to obtain a quick response from top management--generally this should include a representative of financial management, corporation counsel, and an operations-oriented person.
  - The public negotiating team should include representatives of the various departments of the municipal government that will be affected by the project, the consulting engineer, and other technical consultants, as required, such as bond counsel, and the financial consultant. Most importantly, the municipality should have the benefit of legal counsel that is fully versed in tax, corporate, financing, and government law.
  - The public negotiating team must establish procedures that will ensure the timely consideration by the authorized government body of counterproposals made and developments during contract negotiations.

REDUCING NEGOTIATING TIME (continued)

- Where a municipality is involved in a resource recovery project, it is desirable to have operational solid waste personnel represented on the municipality's negotiating team. There are many practical factors involved in the operation of a resource recovery system which should be considered in the contract which only these people can understand and appreciate.

- Both negotiating teams must have mutual respect for one another, and a strong desire to get the negotiations over with in order to get on with the important business of building and operating a resource recovery system.

SEQUENTIAL NEGOTIATIONS

- A procedure whereby qualified bidders are negotiated with sequentially (i.e., in decending order of preference), should negotiations fail with the top bidder, is desirable because:

  - It keeps the pressure upon both parties to complete negotiations within a relatively short period of time.

  - It prevents the private negotiators from having undue leverage during the negotiations as could be the case if alternative firms were not waiting.

  A potential problem with sequential negotiations is that a winner is named and the tendency is to stick with the best choice rather than justify the second best bidder.

  A sequential negotiation procedure was not established following evaluation of the several responses to CRRA's (Bridgeport) RFP for a resource recovery system. As a result the negotiation process appears to have been somewhat more protracted than if there had been no pressure on OXY to conclude mutually satisfactory negotiations as rapidly as possible. However, it should be noted that while Milwaukee did establish such a procedure it did not implement it because they were satisfied with the agreement reached with American Can.

SIMULTANEOUS NEGOTIATIONS

- A procedure whereby qualified bidders are negotiated with simultaneously (two, at most three bidders), and where the municipality selects the best proposal at the end of negotiations, is also worthy of consideration because:

SIMULTANEOUS NEGOTIATIONS (continued)

- It keeps the pressure upon both parties to complete negotiations within a relatively short period of time.

- It prevents private negotiators from having undue leverage during negotiations as could be the case if negotiations were sequential or if alternative firms were not also competing.

- It creates leverage for public sector negotiators in that the companies have an incentive not only to negotiate a fair agreement but also to improve their bid when opportunities present themselves.

Simultaneous negotiations require more work and excellent coordination in order to maintain secrecy and competitive pressure. The major problem with simultaneous negotiations is that the end product (contracts with each company) may be too complex for the governing authority to adequately and properly analyze. It should be noted that there is little experience with this approach and it is not clear how it will work in practice.

# CHAPTER VI

# CONCLUSIONS

Bringing a resource recovery project to construction and operation as expeditiously as possible is critically dependent upon the skillfulness and vigor of public officials in designing and executing the entire implementation process. Managing the implementation process is a challenging--often arduous--task, and there are many pitfalls to be avoided if the process is not to be side-tracked or derailed. The experience of pioneers in resource recovery, however, offers important guidelines for those that follow. These pioneers have shown that the process--from perception of need through to a signed contract--is highly manageable and doable.

Because the contractual process is an integral part of the implementation process, the management of risks and the form and substance of their resolution in a contract is, to a large extent, influenced and shaped by the success or failures of implementation managers. The importance of early implementation decisions to contract negotiations often is overlooked by those entering the resource recovery field because of the attention given to the many problems that occur during contract negotiations and even after a contract is executed. But, as shown by the experience of Milwaukee, Bridgeport, and Nashville, problems, difficulties, and delays encountered during contract negotiations frequently stem from decisions or indecisions that occurred earlier in the implementation process. Recognition of this fact is especially important where full service contracts are contemplated.

Each resource recovery project to be initiated must deal with a common set of factors, even though the end product of the implementation/contractual process--the contract-- will vary in form and substance from one recovery project to another. This variation will arise because perceptions about the probability of a risk occurring and the seriousness of the consequences, should they occur, will differ as a result of diverse economic, political, and legal contexts in which recovery projects are undertaken.

Important factors common to all projects range from the source of the local market for fuel to risks (such as labor strikes and packaging legislation) that affect the quantity and quality of the municipal waste stream. Other factors affecting the form and substance of contracts include choice of procurement (e.g., conventional, full service with public or private ownership, etc.), type of financing including amortization period, and the amount of redundance required to provide systems reliability.

Establishing the liabilities of each party must be done in recognition of his goals and his ability to manage or control certain types of risks. Negotiating these allocations of liabilities, while difficult--even exhausting, can be facilitated by project managers. One way to facilitate negotiations is to incorporate in the RFP documents a draft contract, or the anticipated major contract provisions, in order that potential qualified bidders can clearly understand the key negotiation issues at the time of preparing their proposals.

The three cases analyzed here point to the important contribution that can be made to resource recovery project implementation through a sharing of specific methods for managing risks. The knowledge gained from these pioneer endeavors clearly demonstrates that, no matter how risky resource recovery may seem at the start, equitable approaches to allocating those risks can be reached based upon good faith between the parties.

In conclusion, anticipating the key issues requiring resolution is critical to contract negotiations. The earlier these issues are anticipated by recovery project managers, the more likelihood there is that contract negotiations will be successful and not unduly protracted. The kinds of issues of which managers must be cognizant in embarking upon a resource recovery project have been documented and found essential to successful implementation.

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