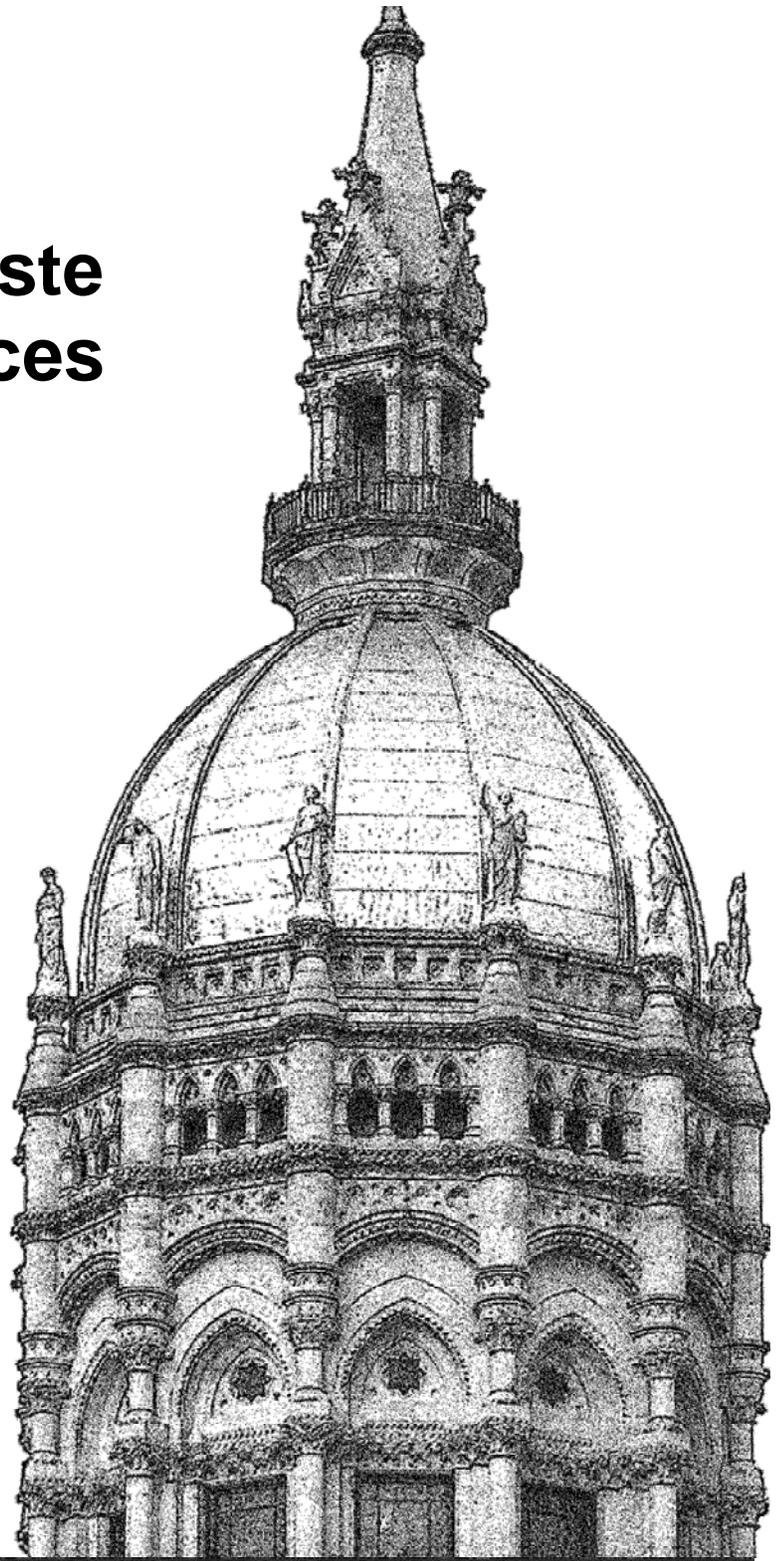


Municipal Solid Waste Management Services In Connecticut

JANUARY 2010



PRI

**Legislative Program Review and
Investigations Committee**

CONNECTICUT GENERAL ASSEMBLY

**CONNECTICUT GENERAL ASSEMBLY
LEGISLATIVE PROGRAM REVIEW AND INVESTIGATIONS COMMITTEE**

The Legislative Program Review and Investigations Committee is a bipartisan statutory committee of the Connecticut General Assembly. It was established in 1972 to evaluate the efficiency, effectiveness, and statutory compliance of selected state agencies and programs, recommending remedies where needed. In 1975, the General Assembly expanded the committee's function to include investigations, and during the 1977 session added responsibility for "sunset" (automatic program termination) performance reviews. The committee was given authority to raise and report bills in 1985.

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LEGISLATIVE PROGRAM REVIEW
& INVESTIGATIONS COMMITTEE

**Municipal Solid Waste
Management Services in
Connecticut**

JANUARY 2010

MUNICIPAL SOLID WASTE MANAGEMENT SERVICES IN CONNECTICUT

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Abbreviations List

- BRRFOC – Bristol Resource Recovery Facility Operating Committee
- C&D – Construction and Demolition Debris
- CASE – Connecticut Academy of Science and Engineering
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
- CRRA – Connecticut Resources Recovery Authority
- DEP – Department of Environmental Protection
- DON – Determination of Need
- DPH – Department of Public Health
- DPS – Department of Public Safety
- ECRRA – Eastern Connecticut Resource Recovery Authority
- EPA – Environmental Protection Agency
- HDPE – High-Density Polyethylene (plastic #2)
- HRRRA – Housatonic Resources Recovery Authority
- IPC – Intermediate Processing Center
- MDC – Metropolitan District Commission
- MSW – Municipal Solid Waste
- NOV – Notice of Violation
- PAYT – Pay-As-You-Throw
- PRI – Program Review and Investigations Committee
- RCRA – Resource Conservation and Recovery Act
- RDF – Refuse Derived Fuel
- RRF – Resources Recovery Facility
- SCRCOG – South Central Regional Council of Governments
- SCRRRA – Southeastern Connecticut Regional Resources Recovery Authority
- SWAB – Greater Bridgeport Solid Waste Advisory Board
- SWDA – Solid Waste Disposal Act
- SWEROC – Southwest Connecticut Regional Recycling Operating Committee
- SWMP – Solid Waste Management Plan
- TROC – Tunxis Recycling Operating Committee
- TS – Transfer Station (*tables only*)
- WTE – Waste-to-Energy

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Executive Summary

Municipal Solid Waste Services in Connecticut

What were nascent efforts by the state two to three decades ago to create and nurture an alternative and more environmentally sound waste management infrastructure have fully matured. Connecticut has a waste management system that has been and largely remains self-sufficient and environmentally sensitive. New challenges, however, face Connecticut as the in-state disposal capacity for municipal solid waste is now constrained, and the Department of Environmental Protection (DEP) has created an ambitious vision and proposal to significantly increase diversion efforts and alter the state's disposal habits by 2024.

At the same time, the conclusion of a number of contractual obligations and the release from particular methods of handling waste in the state are underway. Transitions in ownership of key disposal facilities from the public sector to the private sector have occurred and will continue to occur over the next several years.¹ Long-term contracts that bound municipalities to these disposal facilities are also expiring. Concerns about the impact of these changes on the state's solid waste management system have been raised by the legislature and the Legislative Program Review and Investigations Committee began an examination of certain aspects in May 2008, expanding its inquiry in December 2008.

Study focus. In May 2008, the committee initially approved a study focused on the ownership options and implications of the four resources recovery facilities (RRF) operating at the time in connection with the Connecticut Resources Recovery Authority (CRRA). During a staff briefing in September 2008, the committee expressed interest in other areas of solid waste management policy.

Subsequently, at a December 9, 2008 meeting, the Legislative Program Review and Investigations Committee approved an expanded scope of study to review the full range of municipal solid waste management services -- from trash haulers and transfer stations, through recycling facilities, trash-to-energy facilities, municipal solid waste (MSW) landfills, and ash landfills -- in order to assess whether the services were: 1) adequate; 2) available at a reasonable cost; 3) sustainable; and 4) compatible with state policies and goals. The study was to also explore alternatives to the state's current disposal technologies and the potential uses of ash residue.

Main findings. The findings are summarized below based on the three main questions of the study regarding overall system adequacy, system sustainability, and availability of collection and disposal services at a reasonable cost.

Is the overall municipal solid waste system adequate? The program review committee found that significant progress has been made in achieving certain aspects of the state's waste

¹ Agreements made at least 20 years ago about who would own many of the RRFs after their long-term debts were retired have started to be operationalized.

management goals, especially in reducing the state's reliance on landfills, and in creating and promoting a viable network of resources recovery and recycling facilities. On the other hand, efforts aimed at reducing the amount of solid waste generated within the state (i.e., source reduction), as well as those efforts intended to increase recycling, are not sufficient. In addition, increasing amounts of waste have been exported to out-of-state landfills, which conflicts with state policies.

Are the solid waste management services provided in Connecticut sustainable as currently structured? Answers to this question involve an examination of how the municipal solid waste system may continue as currently structured over the next 20 years, given the projections of increasing waste generation levels of solid waste.

The program review committee found that while in-state disposal capacity would likely exist (through the use of resources recovery facilities), without the use of out-of-state disposal facilities, Connecticut's disposal system would not be sufficient to process the waste generated in the state for the next 20 years. In-state ash disposal capacity is also insufficient to handle the ash produced in state over that timeframe, while out-of-state landfill capacity for MSW and ash is abundantly available. However, the sorting facilities for the most commonly accepted recyclable materials are currently operating far below capacity and infrastructure for other diversion methods is undeveloped.

Are municipal solid waste collection and disposal services available at a reasonable cost? Answers to this question are analyzed in terms of the existence of a competitive market for solid waste collection and disposal services.

The program review committee found that with regard to collection services, the potential exists for improper pricing of those services due to a lack of competition. However, comprehensive data do not exist to properly analyze the MSW collection market.

While competition for in-state disposal services is limited, though, the RRFs that have recently changed ownership have offered contract terms to municipalities that are comparable to, if not less than, out-of-state disposal options and regional tip fees. The long-term trend in market competitiveness is unclear because the disposal market in Connecticut appears to rely on the nearest out-of-state disposal sites and the short-term spot market to provide competition to the only two operators of RRF disposal services in Connecticut. Both of those disposal alternatives, though, carry risks.

Recommendations. The committee approved recommendations intended to address deficiencies in the areas cited above on January 12, 2010, which are listed below. Various options were also developed that the state may want to pursue that are much larger in scope and intended to have a broader impact; these are provided in Chapter X.

- 1. C.G.S. Sec. 22a-241b shall be amended to include provisions for the commissioner of DEP to review the regulations designating items that are required to be recycled at least every ten years beginning January 1, 2011. Should it be determined there is a demonstrated market for the reuse of additional material(s), the commissioner shall adopt by regulation the material to be added to the designated recyclable list.**

2. **DEP shall: 1) review the state's diversion and recycling policies and strategies and 2) develop specific flexible incentive programs after consultation with various stakeholders to assist the state and its municipalities in achieving the state solid waste management plan's recycling and diversion goals. These incentive programs can include incentives for implementation of pay as you throw programs, development of single stream recycling, and development of incentives for improved commercial recycling.**

The programs shall be developed by January 1, 2011, and submitted for review to the committee having cognizance over environmental matters. The incentive programs shall begin on December 31, 2011, and end on December 31, 2016, and contain specific program goals and measures. The department shall provide updates to the committee having cognizance over environmental matters on the impact of the incentive programs and recommend any other strategies to improve recycling and diversion on an annual basis beginning on December 1, 2012, until the programs are terminated.

3. **DEP shall examine the potential costs and benefits to the state, municipalities, and waste generators of the various methods of removing food waste from the waste stream, identify any incentives or guidance the state could provide to develop the necessary composting infrastructure, and report the results to the committee having cognizance over environmental matters by June 1, 2011.**
4. **The current municipal registration requirements for collectors shall be enhanced to include, but not be limited to, the following:**
 - **name and address of applicant/owner, principal partners, and of any manager or other person who has policy or financial decision-making authority in the business;**
 - **identification of any and all subsidiaries;**
 - **names of other towns and states in which collector is doing business;**
 - **type of collection performed (residential, commercial, other);**
 - **type of waste collected (solid waste, recyclables, construction and demolition, yard waste, other);**
 - **location of current and expected disposal areas of all solid waste; and**
 - **any other information required by municipalities to ensure the health and safety of its citizens.**

Each municipality shall provide an updated list of registered collectors and the required information to DEP on at least an annual basis in a format and timeframe prescribed by the commissioner of the Department of Environmental Protection. DEP shall collate the data and provide on-line public access to the information collected. Municipalities not providing the data in a timely manner shall not be eligible for any recycling incentive grants from DEP.

5. **The PRI co-chairs shall request that legislative leadership consider requesting the Connecticut Academy of Science and Engineering (CASE) to evaluate the potential beneficial use of ash residue. Specifically, a CASE evaluation should:**
 - a. **determine how many states allow the beneficial reuse of ash residue and for what purposes;**
 - b. **compare how much residue is actually reused in those states that permit ash residue reuse and for what purposes;**
 - c. **evaluate the potential for the beneficial reuse of ash residue in Connecticut;**
 - d. **examine barriers to the beneficial reuse of ash residue in Connecticut, including barriers to possible adoption by Connecticut state agencies of ash residue as a roadbed material or component in asphalt used in various state-funded infrastructure projects; and**
 - e. **propose cost-effective solutions for the reuse or disposal of ash residue.**

6. **DEP shall study the economic feasibility of a state purchase and hold of potential disposal sites. The study itself should include a discussion and recommendations regarding:**
 - **the entities that are most appropriate to acquire and maintain the sites;**
 - **the costs of acquiring, maintaining, and permitting the sites without use; and**
 - **the conditions necessary that would call for the development and use of the disposal site, including:**
 - **the presence of uncompetitive disposal practices or other unreasonably high disposal costs; and**
 - **the minimum and maximum time frame the land should be held before either use or sale.**

The study shall be completed by July 1, 2011, and the results shall be reported to the committees of cognizance over environmental matters.

7. **DEP should allow and encourage electronic submission of waste tonnage data by solid waste facilities, with a goal of eliminating paper-based submission by FY 2012. DEP should take the following steps to allow electronic submission of data:**
 - **notify solid waste facilities of the option to submit data electronically for the remainder of FY 2010 and of the goal to switch by FY 2012;**
 - **notify solid waste facilities of the range of electronic formats that are acceptable;**
 - **require that electronically submitted data be organized using basic labels for the information to be submitted;**
 - **develop an electronic verification system to replace the current need for signed hard copies; and**

- **reassign staff responsibilities from manual entry of paper-based data to temporarily assisting solid waste facility operators in complying with electronic data submission.**
8. **C.G.S. Sec. 22a-208e shall be amended to include a requirement that solid waste facilities shall report to DEP the collector or transporter of all loads of waste received, except those loads weighing less than one ton.**
 9. **DEP should adopt the following data publishing policy:**
 - **submitted waste tonnage data should be aggregated and made publicly available online in its unaudited form within one month of the deadline for data submission.**
 - **verified data should be made publicly available online on an annual basis.**
 10. **C.G.S. Sec. 22a-228 shall be amended to require the commissioner of DEP to prepare a solid waste management plan revision at least once every 10 years with the next revision to be adopted on or before July 1, 2016. Additionally, the statute should be amended to require that by July 1, 2011, and within five years of submission of a plan, DEP prepare and publish an adjustment to the most recently published plan that includes a comparison of the state's performance to the projections in the plan, revised projections for the remaining duration of the plan, and the status of accomplishment of goals outlined in the plan.**
 11. **A task force shall be created to examine if any changes or refinements need to be made to the statutory role and purpose of CRRA. The task force shall examine: 1) how changes in RFF ownership and affiliation have affected CRRA operations and its influence over waste management compared to its statutory responsibilities; 2) if CRRA is the best mechanism to be the primary contributor to the accomplishment of the goals of SWMP; 3) if so, what type of changes, if any, should be made to CRRA's structure and funding to better address the goals of SWMP; 4) how other waste management authorities contribute to state waste management goals and if any statutory changes are necessary to ensure greater support and promotion of state goals by these entities; and 5) the impact of CRRA's structure and ownership of key solid waste facilities on disposal prices.**

The task force shall consist of 14 members and be appointed by the governor (1 appointee) and the six legislative leaders (2 appointees each) from among various stakeholders from local, regional, and state government entities, industry experts, and environmental organizations. The DEP commissioner or designee shall be an ex officio, non-voting member. The task force shall report its results to the committee of cognizance over environmental matters by June 1, 2011.
 12. **DEP should review its current landfill monitoring practices. DEP should evaluate if the monitoring is performed adequately to protect the public health and**
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environment, and if the monitoring requirements should be reduced, performed in a different manner by the department, or performed by an independent third party that provides results to DEP. The department should estimate any costs of any changes and report its results to the committee of cognizance over environmental matters by January 1, 2011.

Municipal Solid Waste Services in Connecticut

In May 2008, the Legislative Program Review and Investigations Committee approved a study focused on the ownership options and implications of the state's four resources recovery facilities (RRF) operating at the time in connection with the Connecticut Resources Recovery Authority (CRRA). The study was prompted by concerns about the future ownership of these facilities and, specifically, what problems private ownership of a critical component of the state's solid waste management system—resource recovery-- might cause (absent market competition or increased state economic regulation).

Staff presented a descriptive background report on September 23, 2008, about resources recovery facility ownership. While the original study scope focused on the four RRFs connected to CRRA, information about the other two RRFs was included in the report as similar concerns about ownership were raised about them. Regarding all RRFs, the report noted:

- the RRFs were developed and constructed using long-term bonds issued either under CRRA's bonding authority or the statutory authority of municipalities;
- the operating and service contracts associated with these facilities are equally long term, with contract termination dates keyed to the debt retirement dates; and
- agreements made at least 20 years ago about who would own the facilities after the long-term debt was retired are now starting to be operationalized.

At the September 2008 program review committee meeting, many committee members raised questions about and expressed interest in a number of municipal solid waste-related areas beyond trash-to-energy ownership not contemplated in the May 2008 scope. Based on that discussion, the committee co-chairs drafted a more comprehensive scope to address committee concerns, which the committee approved at its December 9, 2008 meeting.

Final study focus. The expanded scope called for a review of the full range of municipal solid waste management services -- from trash haulers and transfer stations, through recycling facilities, trash-to-energy facilities, MSW landfills, and ash landfills -- in order to assess whether the services were: 1) adequate; 2) available at a reasonable cost; 3) sustainable; and 4) compatible with state policies and goals. The study was to also explore alternatives to the state's current disposal technologies and the potential uses of ash residue.

Study Methods

The program review committee and its staff relied on a number of sources and a variety of research methods to complete this study. Specifically, staff analyzed various statutes that govern solid waste management, reviewed national and local literature on the topic, and reviewed best management practices for solid waste. Many interviews were held with representatives of state agencies, regional councils of government, local governments, solid

waste and recycling haulers, various regional solid waste authorities, and trade organizations across the state. Staff also toured resource recovery and recycling facilities as well as municipal solid waste and ash landfills. Data about the solid waste system was gathered from the Department of Environmental Protection, the Connecticut Resources Recovery Authority, Wheelabrator Technologies, Inc., Covanta Corporation, and local governments, and was analyzed by program review staff.

In addition, staff conducted two surveys of samples of municipalities to better understand how the hauling industry functioned in those municipalities. On October 8, 2009, the committee held a public hearing to gather further input on municipal solid waste management services.

Report Organization

This report is organized into eleven chapters. The first chapter provides an overview of municipal solid waste in Connecticut – how it is defined, how it is managed, how disposal capacity shortfall is defined, and how management practices compare to other states. The roles of the government and the private sector in waste management, the planning process, and the components of the waste management system are described in the Chapter II. The next four chapters describe the main characteristics of principal elements of the waste management system: 1) collection systems and transfer stations, 2) recycling facilities, 3) resources recovery facilities, and 4) landfills.

Chapters VII and VIII examine the adequacy and sustainability of the municipal solid waste management services. Chapter IX reviews whether municipal solid waste hauling and disposal services are available at a reasonable cost in Connecticut. Finally, Chapters X and XI present the committee’s findings and recommendations, along with policy options.

Agency Response

It is the policy of the Legislative Program Review and Investigations Committee to provide agencies subject to a study with the opportunity to review and comment on the committee findings and recommendations prior to publication of the final report. A written response was solicited from the Department of Environmental Protection and is presented in Appendix G.

Municipal Solid Waste Overview

Connecticut is very different from the rest of the United States in how it manages its solid waste. Over several decades, the state has completely transformed its approach to solid waste management by virtually eliminating municipal solid waste landfills, mandating recycling, and developing a viable network of resources recovery facilities. However, indications suggest that under current management practices, elements of the infrastructure have reached their capacity. This chapter provides an overview of solid waste in Connecticut. After defining solid waste, it describes the various state trends in waste generation, recycling, and disposal. The trends reveal basic themes that include:

- overall predominant use of resources recovery facilities in Connecticut and a decreasing use of landfills for the disposal of municipal solid waste;
- increasing waste generation within the state, even after accounting for any increases in population;
- stagnant recycling rates that have not surpassed the pace of waste generation;
- declining in-state disposal capacity and an increasing use of out-of-state disposal options - usually landfills; and
- far more reliance on resources recovery than in any other state in the country.

What is Municipal Solid Waste?

Connecticut's statutory definition of *solid waste* essentially refers to any type of unwanted and discarded material in a solid, liquid, or contained gaseous form. *Municipal solid waste* (MSW) is a subset of solid waste. It is defined in statute as solid waste from residential, commercial, and industrial sources, excluding hazardous wastes and special wastes.² Both hazardous and special wastes, such as scrap metal, biomedical waste, sewerage sludge, and bulky wastes (e.g., landclearing and demolition debris), require special handling and disposal.

For the purpose of this study, these special waste streams have been excluded because they are handled and processed differently than typical residential and commercial MSW. The term "waste" is a bit of a misnomer as it suggests all the material is useless. The statutory definitions of both solid waste and MSW include materials that can be and are reused or recycled. Within this document, it will be noted when the term MSW refers only to non-recyclable trash.

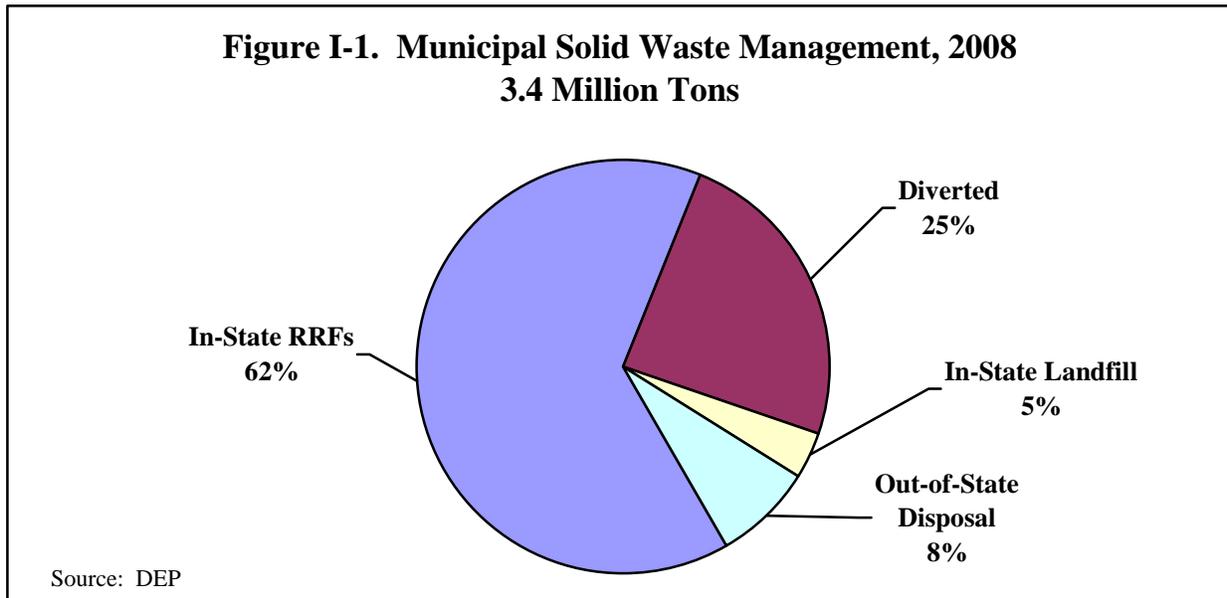
² C.G.S. Sec. 22a- 207(3) and (23)

How is MSW Handled in Connecticut?

Figure I-1 shows how the total amount of MSW in Connecticut in 2008 was handled. The Department of Environmental Protection estimated the total amount of MSW generated in Connecticut in FY 2008 was 3.4 million tons. Sixty-two percent of the waste was disposed of at in-state resources recovery facilities, which are also called waste-to-energy plants. These plants burn trash, which heats water for the generation of steam and electricity. There are six RRFs in Connecticut located in Bridgeport, Bristol, Hartford, Lisbon, Preston, and Wallingford.

Five percent of MSW is landfilled in Connecticut, while 8 percent is disposed of outside of Connecticut (mostly in landfills). Landfill capacity for MSW in Connecticut is virtually nonexistent. As reported to DEP, by 2015 the one remaining Connecticut MSW landfill (Windsor/Bloomfield) will be at capacity and/or closed, at which point all MSW must go to either Connecticut RRFs or be shipped out of state. The amount transported out of state has been increasing from about 27,000 tons in FY 1994 to about 261,000 tons in FY 2008.

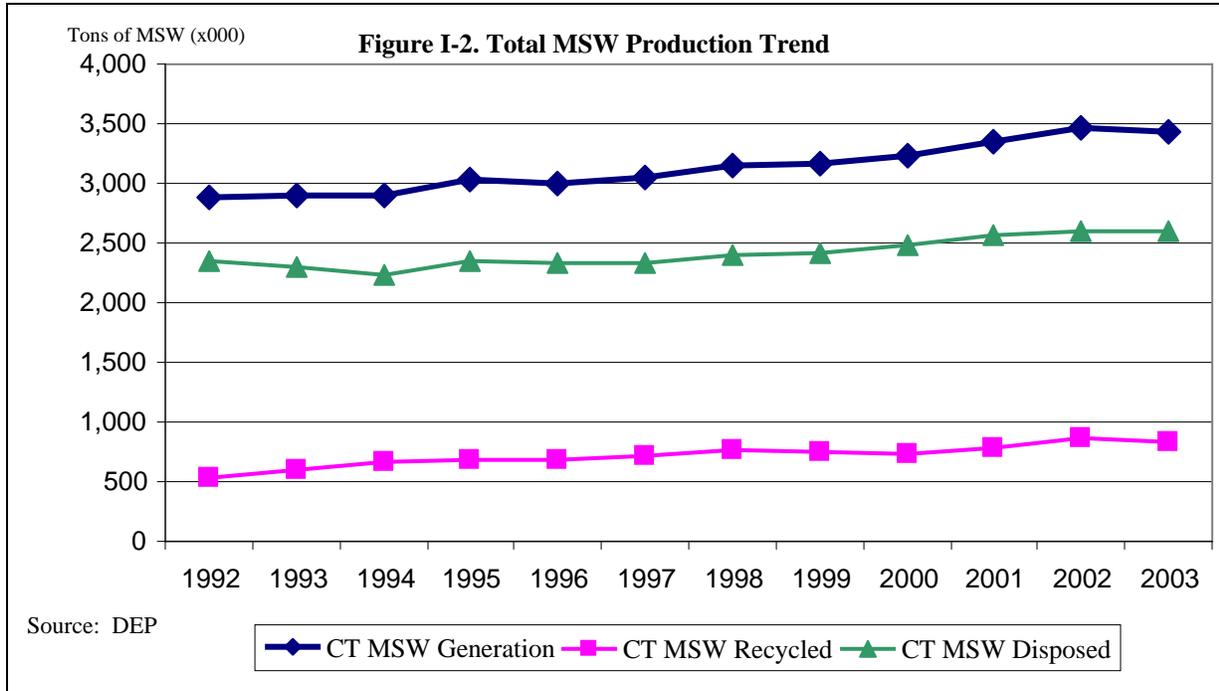
About 25 percent of MSW was diverted from disposal in 2008. Diversion refers to source reduction efforts, composting, and recycling. Typically, the diversion figures collected by DEP do not include estimates for certain parts of the waste stream, such as home composting and material recycled through the bottle bill deposit system. Estimates to capture that part of the waste stream for 2005 were generated by DEP to assist in the production of the State Solid Waste Management Plan (SWMP). Using that more inclusive figure, about 30 percent of MSW was diverted from disposal. Of that, approximately 22 percent was recycled, six percent was organics that were recycled or composted, and one percent was MSW that was grasscycled (i.e., recycling of grass by leaving clippings on the lawn when mowing) or homecomposted.



Trends. Since FY 1993, the total amount of MSW generated in Connecticut has climbed over 500,000 tons, from about 2.9 million tons to 3.4 million tons in FY 2008 (not including

non-reported recyclables). The amount of material recycled has also increased, from about 605,000 tons in FY 1993 to 865,000 tons in FY 2003 – or about 260,000 tons.

While the amount of MSW generated and recycled has increased, the *ratio* of diverted to disposed waste does not appear to have changed, as can be seen in Figure I-2. The percentage of municipal solid waste recycled has increased only slightly over the 11-year period -- from about 21 percent in FY 1993 to 24 percent in FY 2003. Consequently, because the amount of recycling has not kept pace with the quantity of waste generation, the amount of MSW requiring disposal has increased 13 percent from 2.3 million tons to 2.6 million tons.



Many factors can impact the rate of waste generation. One reason for increased MSW generation could be an increase in population. Simply put, more people usually means more trash generation. Between 1993 and 2003, the population of Connecticut increased by five percent. To account for changes in population growth, MSW generation rates can be examined on a per capita basis. The amount of waste generated per person climbed from .88 tons per year in FY 1993 to .99 tons per year in FY 2003. Thus, MSW generation rates have increased in Connecticut even when accounting for population growth.

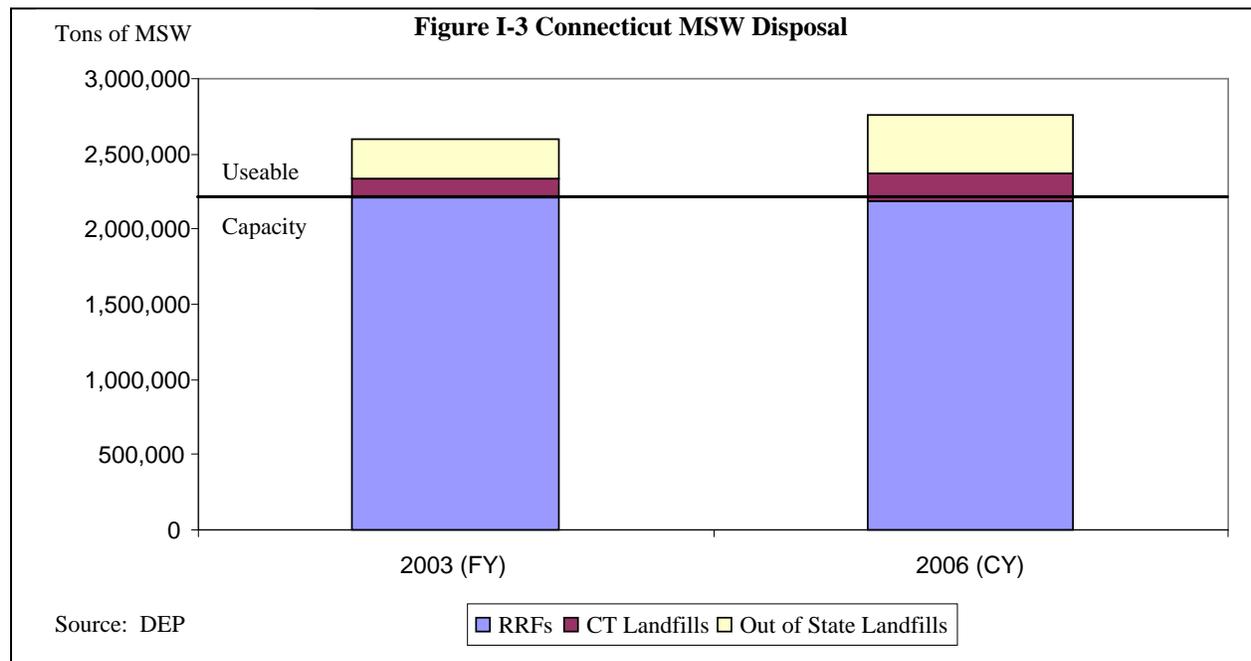
Imports and exports. Connecticut is a net exporter of solid waste. Approximately 33,108 tons of MSW disposed of in Connecticut were imported from other states in 2006, most of which was from Massachusetts (30,890) and New York (2,163). In contrast, Connecticut exported approximately 386,843 tons of MSW in 2006, for a net exportation of about 354,000 tons. The amount of MSW imported has decreased dramatically in recent years as RRF capacity has been filled with in-state MSW and existing in-state landfills have reached capacity. The amount of export has increased heavily since 1992, when there were no reported exports as most municipalities were still relying heavily on local landfills. The amount of Connecticut MSW

exported fluctuated between approximately 246,000 and 387,000 tons during the period from FY 1997 to CY 2006.

What is Connecticut’s Capacity Shortfall?

Connecticut’s capacity shortfall refers to the lack of in-state MSW disposal capability. With no appreciable in-state landfill capacity in Connecticut, municipal solid waste that is not diverted must be disposed at either an in-state RRF or exported to an out-of-state disposal facility. Currently, the six RRFs in Connecticut have a collective permitted capacity of approximately 2.6 million tons of MSW per year, the smallest of which, Wallingford, has a permitted capacity of 420 tons/day, and the largest of which, Mid-Connecticut (Hartford), has a permitted capacity of 2,850 tons/day.

Permitted capacity is a maximum amount not assumed to be actually useable due to maintenance and other operational aspects. So assumptions about how much capacity is actually useable are important. A standard estimate of useable capacity is 85 percent of permitted capacity, which works out to approximately 2,209,000 tons in Connecticut currently, and the actual average tonnage processed at Connecticut RRFs from FY 2000 through FY 2004 (shown as a line in Figure I-3). As noted above, the amount of waste requiring disposal is about 2.6 million tons, meaning the annual capacity shortfall is about 400,000 tons.



The DEP’s 2006 State Solid Waste Management Plan projects that the waste generation rate will continue to climb and the capacity shortfall is expected to grow. The department projects that by 2024 the disposal capacity shortfall will increase to about 1.5 million tons, assuming the current diversion rate remains constant. The plan sets as a primary state goal that the state diversion rate will increase from roughly 30 percent steadily up to 58 percent by 2024, which matches the projected growth in MSW with the current level of RRF capacity. The plan

acknowledges the challenge of that goal, noting that the diversion rate remained relatively stagnant from 1994 to 2003, fluctuating between 22 percent and 25 percent.

How Do Connecticut’s Solid Waste Management Practices Compare to Other States?

Connecticut relies on resources recovery as a way to dispose of its municipal solid waste far more than any other state in the nation. According to the 2006 State of Garbage in America report, Connecticut leads the nation by disposing 64.9 percent of its disposable solid waste using RRFs. Massachusetts at 37 percent is second. Ten states are estimated to send 10 to 28 percent of their MSW to waste-to-energy facilities, while the remaining thirty-eight states each send less than 10 percent to RRFs.

Table I-1 shows how Connecticut’s municipal waste stream is handled in comparison to the national average, the New England average, and other northeastern states. As the table shows, nationwide the average amount of MSW disposed of in landfills was 64.1 percent, over double the amount recycled (28.5 percent), while the amount of MSW sent to RRFs (7.4 percent) was a very distant third.

It should be noted that the comparability and reliability of recycling estimates reported by each state is often problematic. Some states include auto scrap as well as construction and demolition waste when reporting their recycling rates. This 2006 study claims to have adjusted for those anomalies, though estimates still had to be developed for the amount of composting that occurred in some states. Composting is considered a form of recycling.

	Percent of Municipal Waste Stream by Methods of Handling		
	Waste to Energy	Landfill	Recycling
National Average	7.4	64.1	28.5
New England Average	35.0	36.0	29.0
Connecticut	64.9	10.9	24.2
Maine	19.1	46.4	34.5
Massachusetts	37.0	29.2	33.8
New Hampshire	16.1	58.8	25.1
Rhode Island	0.2	87.4	12.5
Vermont	8.8	61.9	29.3
New Jersey	15.1	49.0	35.9
New York	19.5	37.5	43.0
Source: State of Garbage in America 2006, Produced by Biocycle and Earth Engineering Center of Columbia University. All data from 2004, except Connecticut data from 2003			

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Solid Waste Management Participants, Planning, and System Components

The complexity of solid waste management along with the scope of governmental oversight has evolved and increased over the years, as have the number of participants involved in solid waste management. With these changes, solid waste planning becomes increasingly important. This chapter provides a broad overview of who is responsible for solid waste management in Connecticut, the planning process, and components of the waste management system. Subsequent chapters provide further detail. In brief, it can be noted:

- responsibility for waste management rests primarily with state and local governments and the quasi-public sector, but the federal government and the private sector play important roles;
- the state DEP role is primarily planning and regulating; local governments, quasi-public authorities, and the private sector are implementers;
- DEP updated the statutorily-required, state solid waste management plan in 2006 with the assistance of extensive stakeholder input;
- the statewide plan for managing waste is required to be consistent with statutorily preferred management methods, which emphasize waste reduction and recycling over waste incineration and landfilling;
- any action by a person, municipality, or regional authority dealing with solid waste management is supposed to be consistent with the solid waste plan;
- since the mid-1980s, solid waste planning requirements for municipalities and regional authorities have been eliminated;
- because of projected increases in waste generation and the nearly stagnant capacity of current in-state disposal options, the plan calls for nearly doubling the current waste diversion rate of MSW by 2024; and
- waste management strategies are implemented within a very complex waste management system that includes a number of functions: waste generation and separation; collection; transfer; transportation; transformation; and disposal.

Responsibility for Waste Management

Proper solid waste management is a complex enterprise that requires the coordination of a number of different functions and responsibilities including planning, enforcement, the provision of services, and the development of sound financial arrangements and incentives. In Connecticut, the responsibility for solid waste management is divided among a number of entities. Although primary responsibility for the management of municipal solid waste in Connecticut rests with state and local governments as well as the quasi-public sector, it is shared with the federal government and the private sector. Each entity has certain statutory and regulatory responsibilities and limitations.

In brief, the federal government's role in solid waste management is to provide guidance, technical assistance, and regulatory oversight through the establishment and enforcement of certain operating standards and pollution control requirements, chiefly for landfills. State agencies plan, regulate, and implement certain aspects of waste management, while municipalities are required to make provisions for the disposal of solid waste and for the separation, collection, processing, and marketing of designated recyclables generated within their communities. Many municipalities have also formed or joined various regional entities to assist in this effort. A number of private businesses ranging from haulers, recycling facilities, and resources recovery plant operators also carry out important waste management activities. The roles of the governmental entities and the private sector are described in more detail below.

Federal. Federal government involvement in solid waste began with the 1965 passage of the Solid Waste Disposal Act (SWDA). Then, open burning and the use of landfills without health and environmental protections were acceptable practices. The SWDA provided planning and research funds to state and local governments to better manage solid waste.

The Resource Conservation and Recovery Act (RCRA) amended SWDA in 1976, and subsequently in 1980 and 1984. At a minimum, states must adopt RCRA standards for solid waste management. Administered by the federal Environmental Protection Agency (EPA), RCRA prohibits open dumping of waste and mandates strict requirements for the disposal of certain wastes. Significantly, EPA promulgated new standards for MSW landfills in October 1991 requiring the installation of costly technology safeguards, such as liners, leachate collection systems, ground water monitoring systems, and gas vents.

As federal environmental controls tightened, many municipalities across the country were forced to close their dumps and concerns about disposal capacity shortages grew. The number of landfills has decreased dramatically nationwide – from nearly 8,000 in 1988 to about 1,800 in 2007.³ By the mid-1990s, private businesses had taken over much of the disposal business by building large new landfill facilities.⁴

Resources recovery facilities in particular are regulated under federal law, including RCRA, the Clean Air Act, and the Clean Water Act. A RRF is required to obtain air emission and waste water discharge permits as well as monitor and report various air emissions and any discharges that could cause adverse impacts to human health and the environment.

State. In response to increasing environmental concerns and federal regulation as well as decreasing landfill capacity, Connecticut enacted several key pieces of legislation. In 1966, state law changed to prohibit open burning, requiring municipalities to use sanitary landfills instead. While this transition in solid waste disposal was underway, the 1971 Solid Waste Management Act, among other items, required that each municipality “make provisions for the safe and sanitary disposal of all solid wastes generated within its boundaries.”⁵ While fixing municipal

³ U.S. Environmental Protection Agency. *Municipal Solid Waste In The United States: 2007 Facts And Figures*, EPA 530-R-08-010, November 2008. The EPA estimates there were over 20,000 MSW landfills in the U.S. in the 1970s, but some commentators believe that is an overestimate due to poor record keeping by the states.

⁴ See for example, Edward Repa, *Solid Waste Disposal Trends*, Waste Age, April 1, 2000.

⁵ C.G.S. Sec. 22a-220

responsibility, the act in other ways represented the first time a statewide approach to solid waste was contemplated.

By 1973, when it adopted the Solid Waste Management Services Act (not to be confused with the 1971 Solid Waste Management Act noted above), the legislature made several findings, including: *“that prevailing solid waste disposal practices generally, throughout the state, result in unnecessary environmental damage, waste valuable land and other resources, and constitute a continuing hazard to the health and welfare of the people of the state.”*⁶

The legislature went further and established a series of solid waste policies for the state, beginning with the first: *“That maximum resources recovery from solid waste and maximum recycling and reuse of such resources in order to protect, preserve and enhance the environment of the state shall be considered environmental goals of the state.”* Passage of the 1973 Solid Waste Management Services Act identified resources recovery as a favored disposal method in Connecticut, furthering that policy with the establishment of the quasi-public Connecticut Resources Recovery Authority to encourage a regional approach by municipalities using resources recovery.⁷

One of the first statewide recycling initiatives can be attributed indirectly to the beverage container deposit and refund system that began in Connecticut in 1980. Although the system was started as a litter control measure, the collection of clean bottle bill material was incentive to develop markets for those materials, especially certain plastics. The legislature addressed recycling in a more comprehensive manner in 1987 by mandating the separation and recycling of certain items by January 1, 1991. The specific items to be recycled were actually designated by the DEP commissioner through the regulatory process, discussed in Chapter IV.

Solid waste facilities are also required to be permitted under state law. Two separate permits from DEP to construct and operate a RRF must obtain, for example. Generally speaking, the state’s requirements for the permitting of solid waste facilities exceed federal minimum standards.

DEP. Two key state entities have significant roles in overseeing and assisting in the management of solid waste in Connecticut. The Department of Environmental Protection is an environmental planning and enforcement agency that was established in 1971.⁸ Key functions related to solid waste management include: permitting of solid waste facilities and certifying the operators of those facilities; developing and amending the State Solid Waste Management Plan (described further below); and assuring compliance with solid waste management requirements through technical assistance, education, and enforcing environmental laws.

CRRA. The quasi-public authority’s powers are vested in an 11-member board of directors, appointed by the governor and legislative leaders, with two ex-officio members. The governor can also appoint eight ad hoc board members, two representing each CRRA-related RRF, at the request of the municipality in which the RRF is located. Ad hoc members are empowered to vote solely on matters pertaining to the projects they represent.

⁶ C.G.S. Sec 22a-269

⁷ C.G.S. Sec 22a-261

⁸ C.G.S. Sec. 22a-2

A primary statutory purpose of the authority is to implement the state solid waste plan, developed by DEP, and in doing so promote the development of resources recovery projects. As its mission statement declares, the authority "...is to work for – and in – the best interests of the municipalities of the State of Connecticut in developing and implementing environmentally sound solutions and best practices for solid waste disposal and recycling management on behalf of municipalities."

In 1973, CRRA was created on the belief that resources recovery projects and related services could be developed more quickly and with greater flexibility by an independent, quasi-public organization authorized to issue special revenue bonds, than through a state agency structure. The authority developed and at one time oversaw an integrated system that included four of the six resources recovery facilities in Connecticut, two regional recycling centers, five landfills (none of which are in operation), and several transfer stations. One of the original four RRFs (Bridgeport) is now owned and operated by a private entity. The three CRRA-connected RRFs and the Bridgeport RRF handle nearly 80 percent of the municipal solid waste disposed of in Connecticut.

CRRA is required to be self-funded, deriving its revenues from tip fees for trash disposal, the sale of electricity, and the sale of recyclable commodities. While the authority has used long-term municipal service agreements in the past that obliged cities and towns to use a particular RRF, CRRA does not have the power to require municipal participation in any of its projects. Prior to the expiration of the long-term contracts related to the Bridgeport facility, CRRA provided disposal services to 110 municipalities.

Municipalities. As mentioned earlier, each municipality has the statutory responsibility to make provisions for the safe disposal of solid wastes and the recycling of designated items generated within its boundaries. There are a number of ways that municipalities handle this responsibility. Per statute, all municipalities must at least register haulers. Many cities and towns, though not all, provide or contract for garbage collection and recycling services. Collection services are discussed further in Chapter III. By statute, a municipality can designate the area where its solid waste can be disposed of and where recyclables must be taken for processing.⁹ This authority, also known as flow control, is limited in certain circumstances, as discussed in the next chapter. Municipalities have other specific responsibilities regarding recycling, including designating a recycling contact person, submitting an annual report to DEP, adopting an ordinance that requires residents and businesses to recycle, and enforcing that recycling ordinance.¹⁰ Municipalities may also designate people other than police officers to issue citations for violations of waste disposal laws and establish monetary penalties by adopting ordinances related to littering, illegal dumping, or mixing solid waste with recyclables.¹¹

Most of Connecticut's municipalities have contracted directly or indirectly in some way with a resources recovery facility to provide for disposal needs. Aside from contracting with CRRA's facilities, state statutes allow municipalities to individually create an authority or come together in various ways to jointly manage on a regional basis their recycling and disposal

⁹ C.G.S. Sec. 22a-220a

¹⁰ C.G.S. Sec. 22a-220(f), (h)

¹¹ C.G.S. Sec. 22a-226d

responsibilities. These options include: interlocal agreements, individual municipal resource recovery authorities, and regional resource recovery authorities.

Interlocal agreement. Authorized under C.G.S. Sec. 7-339a *et seq*, the law outlines a process to enact an interlocal agreement among towns that includes authorization from each participating town's legislative body, a public hearing, the creation of an interlocal advisory board, and a range of governance procedures. Through an interlocal agreement, 14 municipalities contract with the Bristol Resource Recovery Facility Operating Committee (BRRFOC) to oversee and manage the owner and operator of the Bristol Resource Recovery Facility (Covanta) in providing disposal services. Several of these towns are also served by the Tunxis Recycling Operating Committee, which handles the region's recycling needs.

In addition, the Southwest Connecticut Regional Recycling Operating Committee (SWEROC) is composed of 19 municipalities in the Bridgeport area that have joined together through an interlocal agreement for the purpose of providing regional recycling services. SWEROC and CRRA have entered into an agreement that involves the development and operation of the Stratford recycling center.

Municipal and Regional Resource Recovery Authorities. The creation of regional or individual municipal resources recovery authorities are authorized under C.G.S. Sec. 7-273aa *et seq*. Three large entities operate under the authority of this statute -- Eastern Connecticut Resource Recovery Authority (ECRRA), Housatonic Resources Recovery Authority (HRRRA), and Southeastern Connecticut Regional Resources Recovery Authority (SCRRA). These authorities were established either through the passage of concurrent ordinances in member towns (i.e., a regional resource recovery authority) or by a single ordinance in a single town (i.e., a municipal resource recovery authority). They have broad powers to: acquire property; develop, own, and operate resources recovery projects; and issue bonds. The bonds can pledge the full faith and credit of the municipalities as well as the revenues derived from the operation of any facilities.

ECRRA is composed of one municipality – Middletown. It owns an RRF in Lisbon, which is operated by a private company, Wheelabrator Technologies. The operator is responsible for ensuring there is enough waste delivered to the plant to maintain full operation. Other towns have developed single town resources recovery authorities, such as Mansfield, but no other municipality owns an RRF.

HRRRA has 11 member towns in western Connecticut. This authority does not own an RRF but contracts with a private company (Wheelabrator) to dispose its solid waste at a privately operated facility, typically the Bridgeport or Lisbon RRF, though out-of-state disposal is an option. HRRRA also owns a recycling facility that is operated by a private contractor.

SCRRA is made up of 12 member towns in southeastern Connecticut and was created in 1987. The authority entered into an agreement with CRRA to construct and operate an RRF in Preston. CRRA issued bonds for the construction of the facility and the bonds are secured by service agreements with the participating municipalities.

Joint purchase. In anticipation of the expiration of a long-term contract with CRRA for waste disposal at the Bridgeport RRF Project, the City of Norwalk issued a Request for Proposals for the operation of its transfer station and disposal services in an attempt to acquire these services at a lower cost. Norwalk invited other towns to join in return for covering a portion of the procurement costs. Each town only needed a commitment from the town's mayor or town selectmen as required by local ordinance. After the selection of a vendor, each town was responsible for contracting separately with the winning bidder. Ultimately, five towns entered into separate five-year agreements with a private vendor who provides disposal services.

Some municipalities have joined together in a less formal way to form advisory committees to discuss their mutual interests regarding solid waste management. This includes the Greater Bridgeport Solid Waste Advisory Board (SWAB) and the five-town advisory board associated with the Wallingford RRF. Currently, the Capitol Region Council of Governments is exploring possible governance models for a collective entity to manage the region's MSW, including the creation of a new authority.

A number of other legal options to structure joint municipal action do not appear to have been used by municipalities for the management of solid waste, including shared asset agreements, and metropolitan districts.

Private sector. Commercial enterprises are involved in the full range of solid waste management services. Private haulers are responsible for collecting and transporting significant amounts of the state's waste stream. Significant parts of the state's recycling effort is carried out by the private sector, including the operators of recycling processing facilities and other companies like scrap metal and bulk paper dealers that handle a variety of materials for recycling. Private firms have been involved with the design, development, and operation of all the resources recovery facilities.

Solid Waste Management Planning

The DEP commissioner is responsible for developing a statutorily-required, state-wide solid waste management plan (SWMP) to guide policy and program decision making. The plan must: include specific goals for source reduction, bulky waste recycling, and composting; be developed in accordance with the waste management hierarchy (described below); assess landfill capacity needed for residue from resources recovery facilities and for bulky waste; and develop specific strategies for reducing waste generated in the state.¹² The statutes do not include a specific planning horizon, but DEP has selected a 20-year timeframe. There is no longer any requirement for municipal or regional planning.

Integrated waste management. The State Solid Waste Management Plan utilizes a widely accepted approach for handling solid waste, called integrated waste management. The federal EPA defined and endorses this method, which reduces or manages municipal solid waste through a variety of practices. In Connecticut, the various approaches to solid waste management are listed in statute in a hierarchical, or priority, order of preference:

¹² C.G.S. Sec. 22a-228

1. Source Reduction
2. Recycling
3. Composting of Yard Waste or Vegetable Matter
4. Bulky Waste Recycling
5. Resources Recovery or Waste to Energy Plants
6. Incineration or Landfilling

A graphic depiction of the hierarchy is on page 75 as Figure VII-2.

Source reduction or waste prevention seeks to prevent waste from being generated. Waste prevention strategies include reductions in packaging materials, designing products to last longer, and the use of alternative methods to reduce the toxicity of materials. Recycling involves the collection and reprocessing of materials to make new products or materials, while composting converts organic waste materials into soil additives. Wastes that cannot be reduced or recycled are to be disposed at a RRF or other waste-to-energy facility. Resources recovery facilities reduce the volume of waste (up to 90 percent of volume and about 70 percent of weight) and produce a beneficial byproduct – electricity. For all other waste that cannot be reduced, recycled, or combusted, disposal and containment at a properly designed and managed landfill is warranted. Incineration without energy recovery is a method of combustion that is no longer used in Connecticut.

Adoption process. The current solid waste management plan was adopted in December 2006 and replaced a plan that was 15 years old. DEP engaged in an extensive outreach effort to ensure a wide range of opinions were considered. Beginning in June 2005, DEP offered several ways for various stakeholders to participate in the planning process, including hosting a statewide public stakeholder forum; creating external and internal stakeholder workgroups; presenting to various government, community, businesses, and industry groups, as well as various recycling and waste management groups; conducting telephone and personal interviews with individuals involved in waste management; and maintaining a website with all pertinent information regarding the development of the plan.

As required by regulation, DEP also held three public informational meetings and three public hearings on a proposed plan in July and August 2006. A hearing officer then reviewed the entire record of public hearings and testimony submitted on the proposed plan and prepared a Hearing Officer’s Report, which was submitted to the commissioner for her review. The commissioner signed off on the plan on December 20, 2006.

Plan vision and goals. The December 2006 SWMP covers the period of FY 2005 through FY 2024. DEP notes that compared to when the previous plan was adopted in 1991, “solid waste management has changed dramatically from mainly a state and local issue to one

that is increasingly a regional, national, and global issue.” The plan contains a vision statement and three goals, which are:

- Goal 1: Significantly reduce the amount of Connecticut generated solid waste requiring disposal through increased source reduction, reuse, recycling, and composting;
- Goal 2: Manage the solid waste that ultimately must be disposed in an efficient, equitable, and environmentally protective manner, consistent with the statutory solid waste hierarchy; and
- Goal 3: Adopt stable, long-term funding mechanisms that provide sufficient revenue for state, regional, and local programs while providing incentives for increased waste reduction and diversion.

In support of these goals, the plan identifies eight critical areas that contain 80 recommended strategies. The critical areas include: source reduction; recycling and composting; management of solid waste requiring disposal; management of special wastes; education and outreach; program planning, evaluation, and measurement; permitting and enforcement; and funding. Many of the strategies require changes in the law or additional funding. After three sessions of the legislature since the plan’s creation in 2006, eight of the 80 strategies have been implemented, though little additional money has been allocated for these strategies. Both internal and external stakeholders expressed their opinion to the program review committee that a particularly frustrating aspect of the process is the lack of funding from the legislature to actually implement the plan. This is true even when low cost measures are offered to improve the system.

In the 2009 session, for example, H.B. 5474 as amended by House Amendment A, expanded the types of items for mandatory recycling, required recycling receptacles at common gathering venues (e.g., a sports arena), required municipalities and collectors to offer recycling if they offered MSW pick-up, and limited local zoning restrictions in order to allow greater use of recycling containers. Earlier versions of the bill contained a recycling incentive grant program, enhanced recycling enforcement mechanisms, and other cost items that were removed from the bill via the House amendment. The fiscal note on the amended bill discussed possible cost implications but cited no specific fiscal impact on the state, and identified possible cost offsets for municipalities due to increases in recycling. The bill passed the House but was not raised in the Senate.

Insufficient in-state disposal capacity. As noted earlier, one of the key issues that the plan identifies is the increasing shortfall of in-state disposal capacity – meaning that there is not enough in-state capacity to dispose of all of the waste generated within Connecticut. The plan is premised on the idea that Connecticut should be self-sufficient when it comes to handling the MSW generated within the state. The plan estimates that in FY 2005 about nine percent (327,000 tons) of MSW was shipped out of state, mostly to landfills. If no additional disposal capacity is added and the diversion rate stays the same, the amount of MSW shipped out of state is projected to increase to about 28 percent (1.4 million tons) by 2024.

To resolve this problem, the plan proposes to nearly double the diversion rate (i.e., the amount of MSW reduced or recycled) from about 30 percent to about 58 percent. This strategy is tied to the first and second goals of the plan and with the waste hierarchy.

There are two points to be made about the 58 percent goal. For one, the recycling rate has been stagnant over the last 10 years as the population and per capita waste generation rates have increased. Any increases in the diversion rate would mean the state would have to introduce new or invigorated methods of recycling and source reduction to accomplish this goal. The plan spends a good deal of time discussing various strategies to do that. Second, the goal was developed by determining what diversion rate would be necessary to ensure that no new disposal capacity, such as new RRFs, was necessary; the viability of such a premise was not analyzed.

Implementation. Although implementation of the solid waste management plan is shared by anyone who handles solid waste, the statutes single out CRRA, in particular, as having the responsibility to plan, design, construct, and operate any type of solid waste facility that is "necessary, desirable, convenient and appropriate in carrying out the provisions of the solid waste management plan ..." ¹³ With regard to specific planning responsibilities, the statutes give CRRA the authority to "... assist in the preparation, revision, extension or amendment of the state solid waste management plan..." and "... revise and update, as may be necessary to carry out the purposes of this chapter, that portion of the state solid waste management plan defined as the 'solid waste management system'." ¹⁴ The "solid waste management system" refers to "that portion of the overall state solid waste management plan specifically designed to deal with the provision of waste management services and to effect resources recovery and recycling by means of a network of waste management projects and resources recovery facilities developed, established and operated by the authority..." ¹⁵

CRRA is also required by statute to develop an "annual plan of operations" to aid in the revision and updating of the SWMP. ¹⁶ The CRRA annual plan must be approved by the DEP commissioner and two-thirds of the authority's board of directors. CRRA had not produced an annual plan for several years until the current SWMP was adopted in 2006.

CRRA maintained that it could not produce an annual plan because the prior SWMP plan (1991) was substantially out-of-date. CRRA's current annual plan, which covers FYs 2008 and 2009, was submitted to DEP in February 2008. The plan noted that the SWMP does not include any strategies addressing the "solid waste management system." CRRA developed its own strategies to address this deficiency. In July 2008, DEP found CRRA's plan lacking an overall comprehensive strategy to maintain and improve the waste management system consistent with the SWMP and submitted several questions to the authority. CRRA responded in December 2008. DEP did not act on that response, and the authority's unapproved annual plan expired at the end of FY 2009.

DEP has assigned itself the task of being a significant partner along with municipalities, the private sector, regional authorities, and others in order to assist in promoting and

¹³ C.G.S. Sec. 22a-262

¹⁴ C.G.S. Sec. 22a-264

¹⁵ C.G.S. Sec. 22a-260 (23)

¹⁶ C.G.S. Sec. 22a-264

implementing the strategies in the SWMP. To that end, DEP created the State Solid Waste Management Advisory Committee to assist the department in implementing the SWMP, identifying emerging solid waste issues and solutions, and revising the current SWMP. Membership on the committee is open to all and meets on a regular basis.

The legislature intended CRRA to play a major role in carrying out the solid waste management plan. Equally evident, though, is the fact that the statutes give each municipality maximum flexibility in determining how it wants to manage its own solid waste. No municipality was or is required to join CRRA or any regional authority. As noted above, the legislature also created a number of ways for a municipality to jointly manage its solid waste with other municipalities or go on its own like Middletown did in creating ECCRA.

Because joining CRRA is voluntary, a fundamental question arises as to whether CRRA is equipped to act on a statewide basis. While the responsibility to act on a statewide basis is envisioned in statute, the necessary authority to do so is not. The member towns of CRRA may also question the fairness of having to fund and be liable for solid waste initiatives with potential statewide benefits and use.

In addition, no other resources recovery authority is required to develop a plan of operations and submit it to DEP for approval. In 1971, municipalities and regional entities were required to create their own solid waste management plans that had to be approved by the DEP commissioner by 1975. In 1979, a program review and investigations study noted that only 30 local plans had been approved and found little evidence that any approved plan led to improved solid waste planning.¹⁷ After 1981, only municipalities with landfills that needed to be closed were required to submit plans, though municipalities are allowed to submit their own plans on or after 1987 for approval by the commissioner if they want to vary from the state plan.¹⁸

Other sources of authority to control and guide solid waste management are available to DEP. Under law, any action regarding waste management by any person, municipality, or regional authority must be consistent with State Solid Waste Management Plan.¹⁹ The department reviews all permit applications for solid waste facilities for consistency with the SWMP. In addition to securing a permit, anyone who wishes to build a RRF as well as an ash and MSW landfill must prove there is a need for these facilities and that the new facility will not result in any “substantial excess capacity.”

Further, the DEP commissioner is required to approve solid waste contracts between any municipality or regional authority with any other person, municipality, or regional authority for processing or disposal of solid waste outside of the municipality’s boundaries to ensure that the facilities conform “to recognized standards of public health and safety.”²⁰ DEP reports that this approval process has not been used in the recent past. The commissioner may also issue, modify, or revoke any order to implement the plan.²¹ But the commissioner’s primary role is in

¹⁷ Legislative Program Review and Investigations Committee, *Solid Waste Management*, 1979

¹⁸ C.G.S. Sec 22a-227

¹⁹ C.G.S. Sec 22a-229

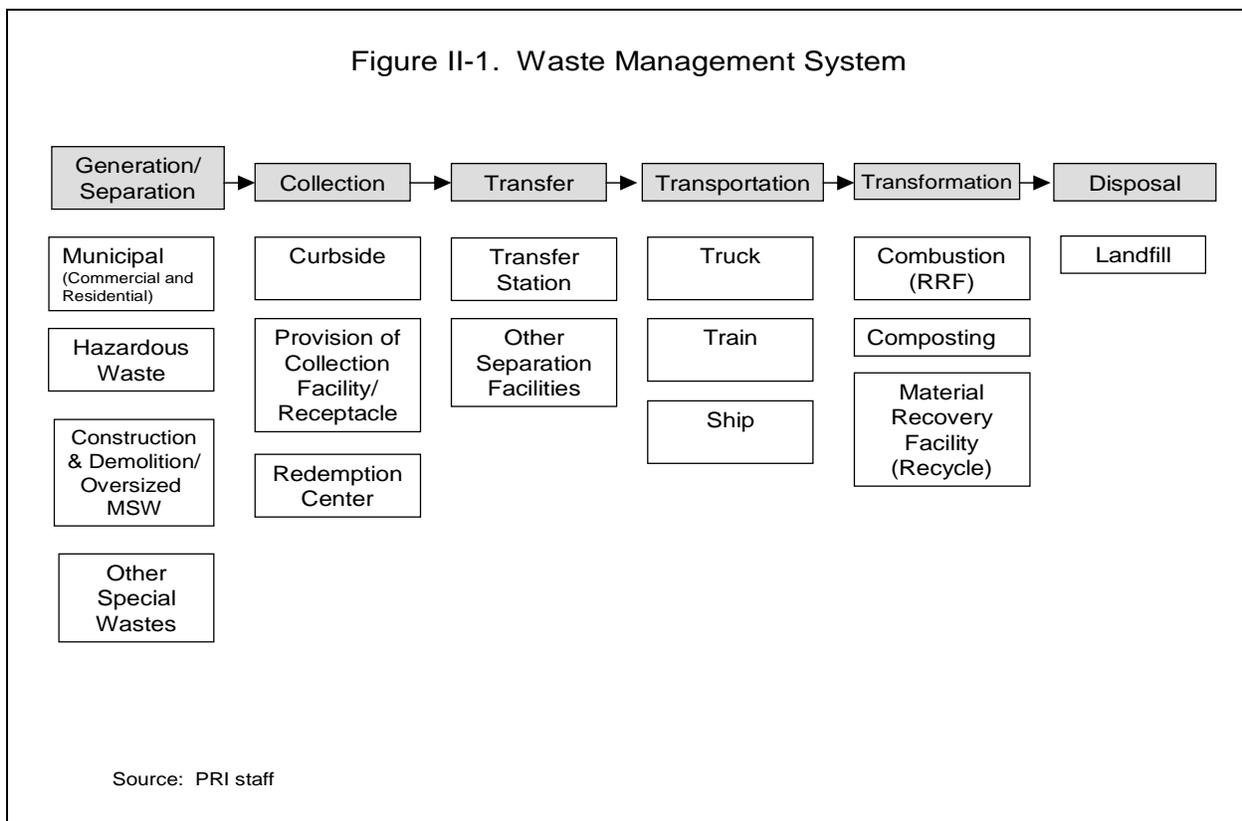
²⁰ C.G.S. Sec 22a-213

²¹ C.G.S. Sec 22a-230

fulfilling planning and regulatory duties (including enforcement); she does not have the authority to direct waste flow, initiate the siting of facilities, or decide in which types of facilities to invest.

Waste Management as a System²²

Integrated waste management strategies are implemented within a waste management system that includes waste generation and separation, collection, transfer, transportation, treatment (or transformation), and disposal. This system is complicated because it is impacted by many decision makers, including local, state, and federal governments, private enterprise, various global markets, and individual citizens. The waste management system is illustrated in a simplified way in Figure II-1.



At a minimum, the system involves a dynamic interaction between and among the several participants as well as their interests, such as promotion of the integrated waste management options discussed above, the application (or not) of different technologies by the various players at each level in the system, accommodation of local government and private customer

²² The concept of a solid waste management system discussed here is not the same as those responsibilities of the Connecticut Resources Recovery Authority outlined in C.G.S. Sec. 22a-260 (23).

preferences, and concerns for cost efficiency, as well as being responsive to changing federal and state laws.

As illustrated in the figure, the waste management system can be thought of as a series of activities between the generation of waste and the final disposal of end products. Each of these activities is separate from each other and can be delivered by different entities. As discussed further below, this separation of services is typically the case in Connecticut. Some activities or all the activities can also be provided by one entity, which is called vertical integration. Further, each individual municipality does not necessarily use or need each service. For example some municipalities may collect solid waste at the curb and deliver it directly to an RRF, forgoing the need for a transfer station. These activities are described briefly below, and addressed in more detail in the next four chapters.

Generation/separation. The first activity in the waste system begins with the generation and separation of solid waste at the source, which encompasses a number of materials and can be classified in different ways. Waste generation includes those activities in which materials are identified as no longer of value. It is at this point where individuals exert the most influence on the system by deciding on what and how much to consume, recycle, and dispose. This initial identification step varies with each individual.

Separation of MSW by the generator has been a requirement in Connecticut since the recycling of certain materials was mandated in 1991. This created a distinct waste stream that required a special type of infrastructure to collect and process, as will be discussed further in Chapter IV. Chief among the changes was the requirement that any generator of MSW manually separate certain material from the rest of the waste stream.

Waste collection. There are many different ways to collect municipal waste. Common methods include: 1) curbside pick up and emptying of containers by a contractor or municipal employees; 2) the provision of a collection facility where the generator brings trash or recyclables; and 3) specially designated redemption centers for recyclables that require a deposit. Waste collection includes the local transportation from a source of waste to the next aggregation point; usually a transfer station, an RRF, a recycling facility, or a landfill. Typically, for commercial accounts the container is a dumpster. Connecticut law allows for the provision of a number of smaller type of facilities that act as collection points for residents to bring their trash and recyclables for disposal, such as a “drop site facility.”

Transfer. Transfer stations are established primarily because it is too costly to transport municipal waste over long distances in typical waste collection vehicles. Waste collection vehicles unload their waste into larger containers and in some cases compactors. Transfer stations are normally constructed to control noise, dust, and odor emissions.

Transportation. Transportation is an important waste management activity whenever a transfer station exists between a waste collector and transformation facility (see below). Waste at transfer stations is reloaded into very large containers and transported by trucks, trains, or ships to a treatment facility or landfill.

Trucks are the most common form of waste transportation in Connecticut. They provide the most cost effective method for the relatively short distances between transfer stations and resources recovery facilities within the state, where most all MSW is handled in the state. Long haul trucking of municipal waste to out-of-state landfills is also an option because of logistical flexibility and has the least fixed assets. Increasingly, rail is being explored an option in Connecticut. Transportation by train of MSW that has been bailed can provide a less costly and more environmentally friendly option over long distances. Norwalk and Stamford are reportedly developing this option for transporting their MSW. Waste transportation by ship or barge is not used in Connecticut and is relatively uncommon in the United States. Certain facilities such as RRFs also rely on providers to transport ash to final disposal.

Transformation. One of the main objectives of waste treatment or transformation is the elimination or minimization of negative impacts of waste on humans and the environment. Major options for waste treatment or transformation include combustion, composting, and the conversion of recyclables into another product.

Disposal. Disposal of waste is the last element in the waste management system. There are currently no combinations of waste management techniques that do not require some landfilling. Some wastes are just not recyclable or compostable. Ash residue is a byproduct of resources recovery facilities that is landfilled. Modern landfills must adhere to much stricter regulations than landfills of decades ago. They do not accept hazardous wastes or bulk liquids. They are required to have gas control systems, liners, leachate collection systems, extensive groundwater monitoring systems, and be properly sited to take advantage of natural geological conditions. Landfills also must be monitored for a period of at least 30 years after closure to detect and minimize any negative environmental impacts.

Under certain circumstance, landfills can be considered a resource. Methane gas can be recovered at some solid waste landfills, though this practice is not widely used in Connecticut due to the small size and age of the landfills.²³ Landfills may also be converted into recreational areas, while other landfills, such as ash landfills, may be “mined” in the future should a cost-beneficial use of ash be found.

²³ Methane gas recovery does occur at the Hartford landfill. Two engines with a total capacity of 1.9 MW are used to convert gas to electricity.

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Solid Waste Collection and Transfer Stations

The collection of solid waste is a critical part of the solid waste management system. Collection begins with containers holding material (both recyclables and other discarded material) that a generator (e.g., resident, business, or industry) no longer finds useful and ends with transportation to a location for processing, transfer, or disposal.

Provisions for solid waste collection are largely a local government responsibility. Basic issues that confront each community in determining the type of collection program it wants include determining the level of service to provide, the appropriate role for the public and private sectors, waste reduction goals, and funding mechanisms. Answers to each of these issues affect the amount of control the municipality wants or has over the ultimate disposition of its municipal solid waste.

This chapter describes various aspects of solid waste collection (or hauling), including the various types of collection systems, basic characteristics of collection practices in Connecticut, legal requirements, system funding, flow control, and problem areas. This chapter also identifies the types of transfer stations and describes their role in the solid waste management system. Based on the discussion below, the following observations can be made about MSW collection in Connecticut:

- the municipal solid waste collection system is complex and varied;
- municipal choices over the level of control they wish to exercise and their amount of participation in solid waste collection impact statewide outcomes for generation, diversion, and disposal of waste;
- absent any contractual agreements or enforceable municipal ordinances, haulers can exercise tremendous discretion over how and where MSW is disposed;
- illegal anti-competitive practices by haulers have been uncovered recently in Connecticut, but various legislative proposals to address this issue have failed; and
- transfer stations provide a link between collection and disposal of waste and processing of recyclables that can provide flexibility to local governments and the private sector in selecting disposal and recycling options.

Types of Collection Systems

Solid waste collection involves the provision of a service that can be provided through the use of various systems. The most common approaches include the following:

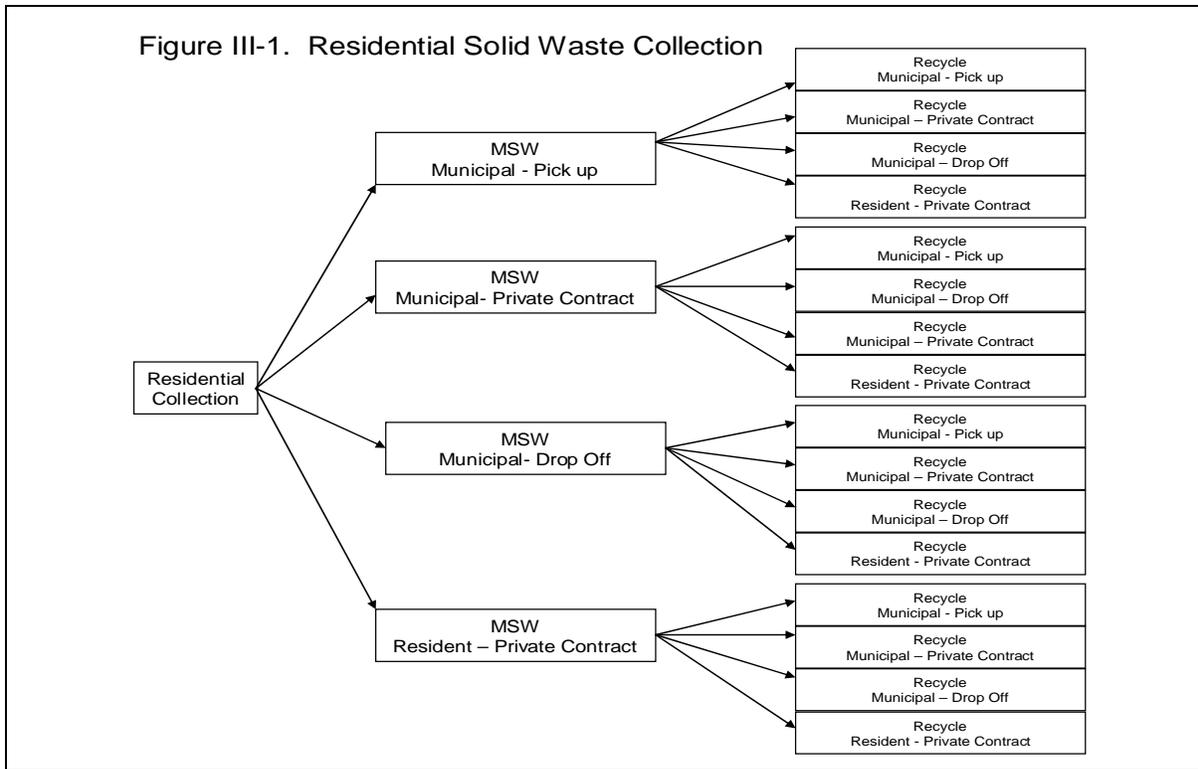
- *Municipal collection* - a municipal department uses its own employees, fleet of vehicles, and other equipment to collect solid waste and determines its level of service;

- *Municipality contracts with private collector* - a municipality contracts for a specific level of service with a private provider to collect waste;
- *Municipal drop off* - a municipality provides a drop off station to which residents bring their trash;
- *Resident contracts with private collector (also called subscription)* - residents directly pay and contract with private trash collectors. Some communities using this approach give residents the complete freedom to choose haulers and the level of service provided; and
- *Combination* - some municipalities may use a combination of public and private options for collection services.

Collection practices in Connecticut. Under state statute, each Connecticut municipality must “make provisions for the safe and sanitary disposal of all solid wastes generated within its boundaries.” It is not entirely clear what “make provisions for” means because, similar to other locally provided services, MSW collection practices vary tremendously among municipalities.

Service levels typically differ depending on the type of customer (i.e., commercial or residential), size of customer (e.g., one household versus apartment building), and type of material to be separated and collected (i.e., recyclables and other waste). In addition, other variables that are not the focus of this report come into play, such as how other waste streams will be handled (e.g., bulky waste), and the technology employed for pick up (automated versus manual).

An example of this complexity is shown in Figure III-1. The figure illustrates 16 possible options that are available to municipalities when considering service levels just for residential collection of MSW (meaning all trash except recyclables) and recyclables. This picture can be further complicated by the fact that different service levels may be provided within the same municipality. For example, some Connecticut municipalities offer municipal pick up of MSW to certain parts of town and not others, while recyclables pick up by the municipality may be offered to all residents or none.



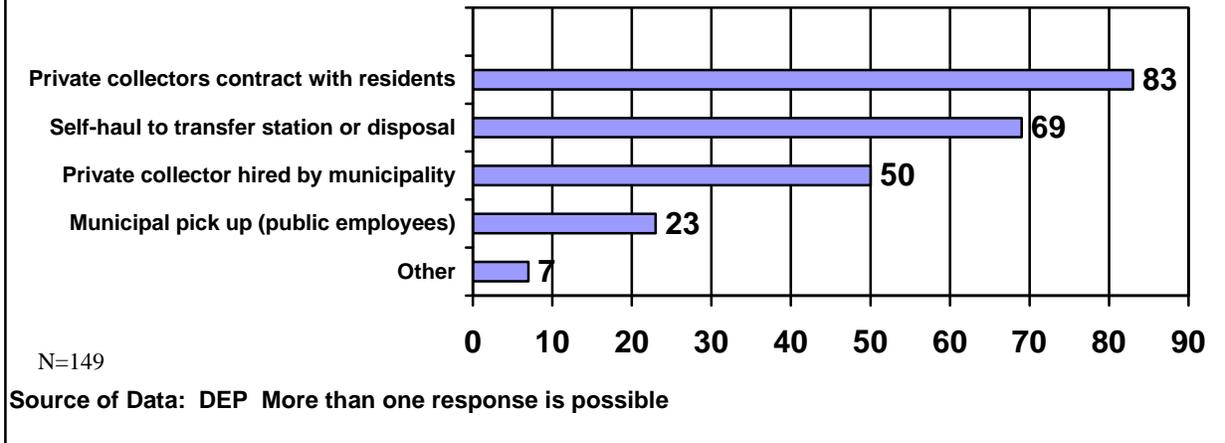
Basic collection characteristics. No state agency formally monitors or tracks the various collection arrangements that exist within municipalities on a regular basis. The following information about both residential and commercial collection services in Connecticut is based on a voluntary survey of municipalities conducted by the Department of Environmental Protection in the summer and fall of 2008. It is based on 161 responses (95 percent) from the state’s 169 municipalities, though the total number of responses to individual questions differ.

Figure III-2 shows the various types of collection services for residential customers by the number of municipalities that provide each type.²⁴ A private collection contract with residents was the most prevalent response, followed by municipalities that allow residents to self-haul to a transfer station. It can be noted that when both forms of municipal pick up (private contractor hired by municipality and municipal employees) are combined, that becomes the second most prevalent level of service.

The survey indicates that about half of Connecticut municipalities (83) have collection performed by a private hauler for at least some of their residents; at least 43 percent of municipalities (73) pick up refuse from at least some of their residents. This is consistent with the experience of CRRA, which indicated to PRI staff that about 55 percent of waste received by its projects is delivered by private haulers.

²⁴ More than one answer is possible.

Figure III-2. MSW Residential Collection, 2008



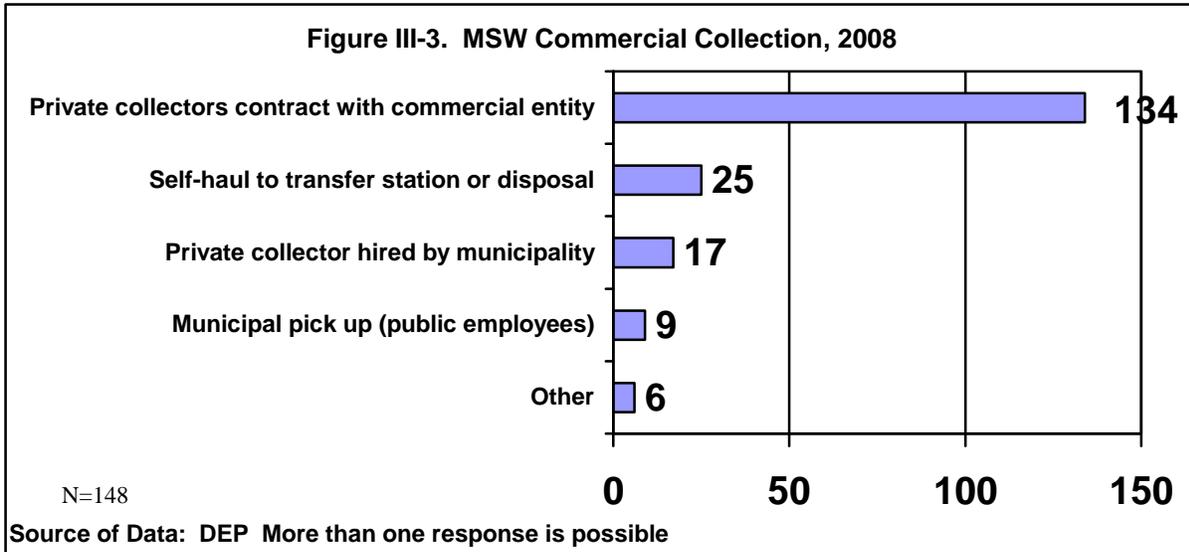
The size of the residential unit served can also vary for those municipalities that provide curbside pick up of MSW (or contract with a private collector). The maximum number of units from which they collect ranged from a single family unit to any sized residential building, though most respondents answered six units or less. Different collection methods are used by collectors – from fully automated, semi-automated, and manual pick up.²⁵ About 43 percent of municipalities indicated that MSW was manually picked up, nearly one-third indicated an automated or semi-automated system was used, and about one-quarter indicated a combination of methods were being used.

Figure III-3 illustrates the various levels of service for commercial collection of MSW. Commercial buildings include small and large businesses, municipal buildings, schools, churches, condominium complexes, and other types of institutions. A contract between a private collector and a commercial entity was the most common response.²⁶

Twenty-six municipalities noted that they participate in the collection of commercial MSW. A number of these respondents, though, noted that they collected from a limited set of “commercial” entities, such as school buildings and other municipal buildings.

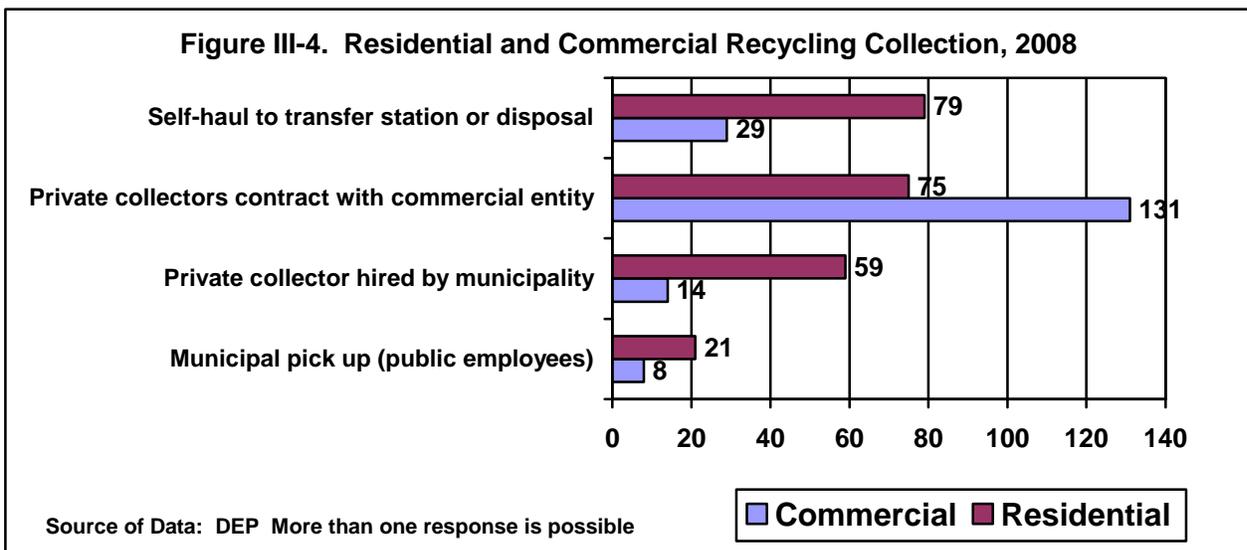
²⁵ Manual collection requires workers to physically pick up the trash receptacles and empty them into a truck. A semi-automated vehicle requires a worker to wheel the trash receptacle to a hydraulic lifting device mounted on the truck body, which empties the receptacle into the truck. An automated vehicle allows the driver to control the hydraulic arm from inside the vehicle.

²⁶ More than one response was possible.



The types of collection services for recycling are shown in Figure III-4 for both residential and commercial entities.²⁷ Self-haul and collection by a municipality (either by a private collector or public employees) were the most common levels of service for residential recycling, while contracting with a private provider was the typical response for commercial.

Eight percent of residential curbside recycling collection was performed manually, 80 percent was automated or semi-automated, and 12 percent of recyclables collection used a combination of methods.



System funding. Various funding mechanisms exist to support MSW collection services that can generally be classified into three types – property taxes, flat-fee, and variable rate. Property taxes are a traditional way of funding solid waste collection. An advantage of funding

²⁷ Multiple responses were allowed.

these services through property taxes is the ease of administration, though it can also decrease the incentive for reducing the amount of waste generated. In Connecticut, this method may also be used in special districts and boroughs. Flat-fee systems, where a resident pays a set monthly fee for collection, can be used by both a municipality and private hauler. Finally, under a variable rate system, residents are charged on a sliding scale depending on how much waste is put out for collection. This variable rate system is referred to as Pay-As-You-Throw (PAYT) or unit-based pricing.

The Department of Environmental Protection reports six towns in Connecticut have curbside PAYT. In addition, 25 towns reported in their survey responses having transfer station PAYT (including two with curbside PAYT). (Transfer stations will be discussed further below). The prevalence of the other type of funding mechanisms was not determined in the DEP study. The survey also found that the average amount paid by each of the 41 municipalities that provide or contract out curbside collection of MSW was just over \$1 million annually, while 45 municipalities that provide or contract out for curbside collection of recyclables reported each paying about \$351,000 per year on average.

Flow control. Flow control laws allow municipalities to direct their solid waste to certain designated facilities. Flow control had been widely used nationwide to guarantee that projected amounts of waste (and revenues) would be received at waste management facilities funded by bonds. Similarly, in Connecticut, the resources recovery facilities require a certain amount of solid waste to be received to be economically feasible. Waste haulers and landfill owners, most large waste management firms, and the trade association representing private waste management, though, view flow control as a barrier to their industry's ability to compete for waste management services. As a result, they generally oppose flow control.

Flow control can be exercised through a number of the collection approaches described above. For example, a municipality providing or contracting with a hauler to provide collection services may direct where that waste will be disposed. However, a municipality's ability to require by ordinance where its MSW is disposed has changed recently. The U.S. Supreme Court ruled on local flow control ordinances in two cases decided 13 years apart—one in 1994 and one in 2007. The pivotal factor distinguishing these cases was private versus public ownership of the solid waste facility.

In 1994 in C&A Carbone, Inc. v. Clarkstown 511 US 383 (1994), the Supreme Court held that a Clarkstown, New York flow control ordinance that forced trash haulers to deliver waste to a particular *private* processing facility violated the Commerce Clause.

A few years after the Carbone case was decided (which involved a private facility--although that characterization was disputed by at least one Justice), garbage haulers again went to federal court in New York challenging flow control ordinances involving public processing facilities as also violative of the Commerce Clause. In United Haulers Association, Inc., et al v. Oneida-Herkimer Solid Waste Management Authority, 550 U.S. 330 (2007), the Court determined that the flow control ordinances in the Herkimer case were valid. The Court compared this case to the Carbone case and noted that:

The only salient difference (with Carbone) is that the laws at issue here require haulers to bring waste to facilities owned and operated by a state-created public benefit corporation. We find this difference constitutionally significant. Disposing of trash has been a traditional government activity for years, and laws that favor the government in such areas—but treat every private business, whether in-state or out-of-state, exactly the same—do not discriminate against interstate commerce for purposes of the Commerce Clause.

Implications. Thus, while a municipality can contract with a collector to bring its MSW to a particular facility (public or private), a municipality cannot require private collectors, who are hired by residents, to dispose of waste at a privately-owned disposal facility. As previously discussed, the RRFs in Bristol, Bridgeport, Preston, and Wallingford are, will be, or may become privately owned. This legal decision has a number of implications.

- *Hauler as decision maker for disposal site in some cases.* In situations where a municipality does not have a contract with a publicly-owned facility or where a private hauler is not under contract with a municipality, private haulers have tremendous discretion as to where that municipality's MSW is ultimately disposed. This is especially true for commercial collection because municipalities rarely pick up any of the commercial trash generated within their borders or contract for commercial service. Among other things, this practice has the possibility of leaving municipalities open to liability concerns under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).²⁸ In addition, disposal practices exercised by haulers may run contrary to the waste management hierarchy.
- *Frustrates municipal contracting efforts.* Some municipalities have contracted with privately-owned disposal companies to provide disposal services at a certain tip fee in exchange for a guarantee that the municipality will ensure the delivery of a certain amount of MSW to that company or pay for any shortfall (i.e., put or pay). Where private collectors contract with residents directly for collection services, municipalities are impaired from requiring private collectors to bring MSW to those private facilities and from possibly meeting those minimum requirements.
- *Frustrates waste management planning efforts.* The loss of governmental control over the flow of MSW can hamper effective planning efforts. State statutes require that state and local governments plan for and manage the appropriate type and number of facilities to handle the long-term generation of waste within the state. Being able to predict the quantity of solid waste over time allows state and local governments to plan for and develop future capacity. The regulatory inability of government to control the flow of solid

²⁸ CERCLA is intended to reduce and eliminate threats to human health and the environment posed by uncontrolled hazardous waste sites. To meet this objective, CERCLA created a hazardous waste site response program and a comprehensive liability scheme that authorizes the government to hold persons who caused or contributed to the release of hazardous substances liable for the cost or performance of cleanups.

waste conflicts with the State Solid Waste Management Plan's premise of self-sufficiency. Absent public ownership of solid waste facilities, market reasons may encourage out-of-state disposal of Connecticut waste and at times in-state disposal of out-of-state waste – frustrating the premise of the state plan.

- *Hampers funding for environmentally preferred facilities.* Connecticut had relied on flow control and long-term contracts to finance the construction and operation of resources recovery facilities. Funding mechanisms to support long-term debt for the construction of solid waste facilities that rely on flow control to privately-owned solid waste facilities may be impacted by the most recent Supreme Court decision. Fundamentally, bond holder risk in the RRF projects is reduced by the guarantee of the delivery of specific levels of waste through long-term municipal contracts. Flow control and long-term contracts were used as a way to ensure that all waste generated in a municipality would end up at a designated RRF and not at a landfill or other disposal option. The municipality usually gets a predictable price over a period of time and the benefit to the facility is that it could ensure that a minimum amount of waste (and revenue) would be guaranteed.

On the other hand, solid waste haulers and others point out that there are positive aspects to the government's diminished capability to direct the flow of solid waste. For one, mandatory flow control can result in market inefficiencies. Flow control can foster the monopolistic control of solid waste by local governments that may lead to increased costs without concurrent increased benefits. When laws restrict competition, natural market forces that keep prices from unnecessarily rising disappear. Many believe that government-owned operations do not fear competition and the loss of revenue and, therefore, do not have incentives to reduce costs and improve efficiency. Residents could also be burdened with paying for excess capacity if the RRF or other solid waste facility is not utilized to the fullest extent possible. In the 1990s, for example, there was a scarcity of MSW to fuel the RRFs in Connecticut.

Also, flow control (and long-term contracts) could impact the amount of material that is recycled because there is an incentive to provide a steady stream of waste to a facility, which could be a disincentive for source reduction and diversion.²⁹ Similarly, a monopolistic environment may also inhibit innovation in the recycling and source reduction marketplace because aggressive diversion efforts may compete with the need for fuel for RRFs.³⁰ Finally, local governments can still make financial guarantees if they choose to operate or contract for solid waste collection services. Similarly, a municipality may be able to direct the MSW flow if it owns or can make arrangements with a publicly owned transfer facility.

²⁹ Studies reviewed by PRI staff that attempt to determine the impact of RRFs on recycling programs appear to be inconclusive. One reason is because the studies fail to account for differences in state recycling policies. Further, staff was unable to find research on the effects of "put-or-pay" provisions in municipal contracts on recycling rates, regardless of the amount of MSW that is obligated.

³⁰ It should be noted that many items that are recycled have limited fuel value for an RRF. This includes certain noncombustibles, such as glass and metals, as well as leaves and yard waste that have a high moisture content. On the other hand, plastics and wood have a high BTU value.

Statutory requirements. While many legal requirements apply to anyone handling solid waste in the system from generators to disposal facilities, there are relatively few statutory requirements imposed on MSW collectors to start and run a business, as compared to the operators of solid waste facilities, for example. A MSW collector:

- must register with any municipality for which the collector picks up solid waste, and identify any other municipalities in which that collector hauls solid waste;
- must mark vehicles that haul solid waste with the business name and address;
- must deliver MSW to a permitted facility;
- is prohibited from knowingly mixing recyclables with other solid waste;
- must report the name and address of any out-of-state recycling facility used by the collector and ensure by contract that the facility complies with Connecticut's reporting requirements for recyclables;
- must notify a municipality about any resident/customer believed to be discarding recyclables with solid waste; and
- must comply with various restrictions on the disposal of certain types of waste (which is a universal requirement no matter who is disposing of the waste), like grass clippings and lead acid batteries.

Enforcement and compliance. Program review staff interviewed private solid waste collectors, municipal officials, and directors of regional authorities, and reviewed the results of the governor's 2006 solid waste hauling task force report regarding municipal registration practices (discussed further below). Taken together, these sources suggest that municipal registration practices vary widely among towns. Some towns impose registration fees and may or may not require information about insurance liability and workers compensation insurance. The registration fees in the Housatonic region, for example, range from \$25 to \$500. There does not appear to be any town that requires financial and related business disclosures or subjects collectors to background checks.

DEP reports that collectors have been cited for operating illegal transfer stations and illegal disposal. One notable case involved a collector who was operating an illegal transfer station in Manchester. This collector was subject to a large fine in 2000 and has recently been cited again by DEP for similar illegal activities.

Current Issues

There are two current issues regarding MSW collection services – competition and data collection. A recent federal investigation has found anticompetitive practice in the hauling industry as detailed below. In addition, DEP has noted several concerns in collecting accurate data about disposal and recycling.

Competitiveness and “property rights system.” A recent criminal investigation and prosecution between 2003 and 2008 by the federal government revealed an extensive price fixing scheme, or “property rights system”, in the collection business in western Connecticut as well as Westchester and Putnam Counties in New York, resulting in the arrest and conviction of 33

individuals. The investigation centered on James Galante, who controlled 25 trash hauling and related companies, including a transfer station in Danbury. It is important to note that Galante did not act alone, as several other companies in Connecticut and in eastern New York also participated in the system to eliminate competition.

A “property rights system” is a fraudulent scheme to monopolize MSW collection services. It is defined in the United States Memorandum in Aid of Sentencing filed with the federal District Court in Connecticut on September 2, 2008, in regard to the above described case:

The property rights system is based on the rule that a customer or account (“a stop”) stays with a participating trash hauler forever because other participating companies will not honestly compete for that customer’s business, opting instead to refrain from soliciting that customer or, when asked to provide a bid or price quote, intentionally submitting prices above those of the current service provider.

In addition to discussing Galante’s links to organized crime families in New York, the sentencing memorandum goes on to describe various price fixing activities including incidents of bid-rigging, predatory low bidding to eliminate competition, damaging competitors’ property, attempts to work with police contacts to harass competitors’ truck drivers, arranging to have competitors’ access to transfer stations denied, and planned acts of violence where law enforcement officials had to intervene to stop.

Impact. The federal government described the criminal enterprise as a “multi-million dollar money making machine.” The Housatonic Resource Recovery Authority (HRRA), an eleven-town regional authority responsible for MSW disposal and recyclables, has estimated that losses to customers in the HRRA region, due to the illegal activity, can be conservatively estimated at \$19 million and if other customers outside the region are included, the estimated losses exceed \$32 million over a 20-year period. The Galante-owned hauling businesses controlled at least 57 percent of the market share of MSW in the HRRA region in 2006. This understates his influence because it does not include the other solid waste collection companies who participated in the property rights scheme but were not owned by Galante.

Since 2006, the control exercised by the Galante businesses, which are now run by the federal government, has declined to about 47 percent of the market share. These businesses still control over 50 percent of the hauling in four of the 11 HRRA towns . In addition, Galante owned a transfer station in Danbury, which, as noted below, handled over 80 percent of the region’s MSW. The federal government has begun an auction process for the former Galante assets. The City of Danbury is bidding on the transfer station. It appears that the sale will most likely be completed by early 2010.

Executive and legislative efforts. In the wake of these revelations, Governor Rell requested that the commissioners of the Departments of Public Health, Consumer Protection, Environmental Protection, and Public Safety, and the Office of the Chief State’s Attorney form an advisory group regarding solid waste hauling. In September 2006, the advisory group made several recommendations, including:

- requiring the licensing of solid waste haulers through DEP and background investigations through DPS;
- creating an authority that would have the responsibility to investigate fraudulent, predatory, anti-competitive, and other illegal conduct of licensed haulers;
- empowering DEP to modify, deny, transfer, suspend, and revoke licenses for waste haulers under certain conditions; and
- appointing a director to manage the daily activities of the authority.

A bill to create a solid waste commission based on the advisory group's recommendations (HB 7092) and a similar bill to license solid waste haulers (SB 1288) in 2007 did not pass. At least four bills have been introduced in the last two years that would require the licensing of haulers either by DEP or the Department of Consumer Protection as well as imposing other regulatory requirements, but none have passed.³¹

The level of competitiveness in the solid waste collection industry in Connecticut is difficult to readily ascertain because the state does not separately license or require registration of municipal solid waste collectors. This fact makes developing any information about collectors in Connecticut difficult, including the basic fact of how many there are. (The federal criminal investigation used an undercover agent to infiltrate the Galante operation to discover monopolistic practices).

Lack of solid waste disposal data. Another problem related to MSW collector activities is the inability of DEP to obtain all the necessary data from haulers about where solid waste is disposed. DEP is supposed to use this data to understand trends in the MSW market, make projections for planning purposes, and advise policy makers on various disposal issues.

State statutes require various solid waste facilities to report solid waste and recycling data to the department. DEP has found that some solid waste facilities misidentify the origin of waste received at their facilities due to inaccurate information from haulers. Some haulers are reluctant to divulge the origin or destination of waste because of alleged concerns about confidentiality. Other haulers may be contracted by a municipality to bring MSW to a specific RRF but will go somewhere else due to spot market price reductions.

Moreover, as more of Connecticut's waste gets shipped out of state, the ability of DEP to track that waste becomes even more difficult. This waste does not necessarily go through a Connecticut permitted facility and, therefore, a primary source for that information is the haulers themselves. The haulers are not required to report MSW disposal information. Although haulers are required to report the name and address of out-of-state recycling facilities that they use and the facility is supposed to abide by certain reporting requirements, DEP does not routinely receive evidence that compliance with this requirement is occurring. This is because the collector or the municipality would have to first report to DEP that this is occurring for the department to enforce the reporting requirement.

³¹ In 2008 -- SB 522, SB 137; in 2009 -- SB 918, SB 324

Currently, DEP requires waste haulers to obtain permits to haul hazardous wastes, industrial liquids, and biomedical wastes. The State Solid Waste Management Plan (SWMP) endorses the idea of MSW haulers having to register with DEP and report certain information. The department also notes that registration requirements could also facilitate hauler compliance with environmental laws.

Transfer Stations

Facilities that serve as an intermediate collection point for small scale waste haulers are called transfer stations.³² Usually, these facilities serve as an aggregation and transfer site for MSW prior to transport to an RRF and for recyclables before being processed at an intermediate processing center (discussed in Chapter IV). Transfer stations are a necessary element in the waste management system because it is too costly to transport municipal waste over long distances in typical waste collection vehicles. If needed, waste collection vehicles unload their waste into larger containers and in some cases compactors, which can be held at the stations for no more than 48 hours. Transfer stations also provide an opportunity to sort some wastes suitable for recycling and some can serve as a convenience center for public use to drop off recyclables or MSW.³³

Statutory requirements. Although no federal regulations exist that are specifically applicable to transfer stations, they are required to be permitted by DEP. The information required to permit a transfer station is fairly extensive. All facilities must be consistent with the SWMP, the Connecticut Solid and Hazardous Waste Land Disposal Siting Policy, and the Connecticut Water Quality Standards. The operators of transfer stations, like those of all solid waste facilities in Connecticut, must be certified by DEP. The actual siting of transfer stations is in response to individual town or private industry requests. There has not been any attempt to determine how all the transfer stations could be best coordinated, utilized, or constructed based on technical, environmental, and economic criteria. For example, it is unclear if transfer stations are located in the right place to maximize collection efficiency throughout the state.

By law transfer stations are required to control noise, dust, and odor emissions. The regulations also address processing limitations, specific waste storage methods, fire control, waste restrictions, and control of vectors (disease transmitting organisms). No long-term storage of waste is intended at a transfer station. Waste cannot be stored at a transfer station for longer than 48 hours after a container is filled. Transfer stations appear relatively easier to site than other waste facilities because they have fewer restrictions, perform little processing of waste, and do not pose the same environmental risk as landfills or RRFs. However, they are still likely to engender opposition because of associated truck traffic and noise, as well as perceived negative environmental impacts. In recent years, community acceptance of new transfer stations has been limited and a few municipalities have sought to exclude such facilities through zoning restrictions. DEP reports that between 2004 and 2008, 16 enforcement actions have been taken

³² The legal definition of a transfer station is found in C.G.S. Sec. 22a-207.

³³ Other facilities permitted to process or transfer recyclables include Intermediate Processing Centers and Volume Reduction Plants.

against transfer stations. This represents about one-third of all enforcement actions taken against permitted solid waste facilities.³⁴

Types of facilities. Table III-1 shows the various kinds of permits that have been issued for the 255 transfer stations in Connecticut by type of owner – either public or private. While most transfer stations are owned by public entities they are operated by private contractors. Municipalities or government authorities are the permittees of 171 transfer stations and 84 are privately owned.

Table III-1. Transfer Station Facilities				
Owner	Permit Type	Description (processing capacity)	No.	
Public	Individual Permits			
	Small	<= 75 tons/day	70	
	Medium	>75 and <= 150 tons/day	6	
	Large	>150 tons/day	19	
	<i>Total Individual Permits</i>			95
	General Permit Registrations			
	Transfer Station	<=120 tons/day	42	
	Recycling		34	
	<i>Total General Permits</i>			76
	Total Public			171
	Private	Individual Permit		
Small		<= 75 tons/day	2	
Medium		>75 and <= 150 tons/day	4	
Large		>150 tons/day	4	
<i>Total Individual Permits</i>			10	
<i>Total General Permit Registrations (recycling only)</i>			74	
Total Private			84	
Grand Total:			255*	
*For the purposes here, two separate permits owned by the City of Greenwich have been combined into one large permit. See explanation in notes to Table III-2. The designations "small", "medium", and "large" for transfer stations were created by PRI staff. Source of Data: DEP (9/30/09)				

Permitting. The publicly owned stations can be divided among those that have individual permits (95) and those that have general permits (76). According to DEP, based on the designed processing capacity (tons per day), individual permits are issued directly to an individual applicant (public or private). General permits are issued to authorize similar, but limited, activities with individual registrants being submitted by either private or municipal entities under the auspices of that general permit. A general permit establishes certain conditions for conducting an activity, and is a quicker and more cost-effective way to permit specific limited activities. Transfer stations can be permitted to handle a number of different materials including recycling materials, solid waste, bulky waste and other special wastes. DEP reports that it typically takes between six and 24 months to issue an individual permit for a transfer station and about four to six weeks to issue a general permit registration.

³⁴ Most of the solid waste enforcement actions (74 percent) are against unpermitted facilities.

As Table III-I shows, certain types of MSW and recycling transfer stations can be authorized by a general permit registration. While there is only one type of MSW transfer station general permit, there are four types of recycling facilities that can be authorized under a general permit registration. The recycling transfer stations differ based on volume of material processed and the types of materials they are allowed to process. The recycling general permits are available to both municipalities and private businesses. The general permit for municipal transfer stations is available only to municipalities.

Individual permits for transfer stations have been issued for 95 public and 10 private facilities. Individual permits are categorized by three sizes based on the designed maximum amount of tonnage that may be received per day (from less than or equal to 75 tons per day to greater than 150 tons per day). The largest number of individual permits for MSW transfer stations has been issued for small facilities for the public sector. Most of the private sector transfer stations are medium or large facilities.

Table III-2 shows the self-reported tonnage of MSW handled by medium and large transfer stations. Although most transfer facilities are publicly owned, the largest transfer station is the former Galante-owned private facility in Danbury (Transfer Systems Inc.).

Table III-2. MSW Public & Private Transfer Stations (Medium & Large)				
Transfer Station (TS)	Permittee	Town	Tonnage FY 2008	Capacity (tons/day)
Publicly-Owned Transfer Stations				
Hebron TS	Municipality	Hebron	No reports	100
Union TS	Municipality	Union	220	100
Wilton TS	Municipality	Wilton	No reports	100
Eastford TS	Municipality	Eastford	No reports	120
Barkhamsted (RRDD1) TS	Municipality	Barkhamsted / New Hartford	3,778	150
Ellington TS	CRRA	Ellington	64,130	150
Bridgeport TS	Municipality	Bridgeport	14,707	165
New Canaan TS	Municipality	New Canaan	10,036	200
Greenwich TS	Municipality	Greenwich	25,170	230/125
Milford TS	Municipality	Milford	67,779	250
Ridgefield TS	Municipality	Ridgefield	13,098	250
New London TS	Municipality	New London	No reports	300
Essex TS	CRRA	Essex	74,552	300
Stamford TS	Municipality	Stamford	62,422	400
Norwalk TS	Municipality	Norwalk	80,389	460
Watertown TS	CRRA	Watertown	118,957	550
Darien TS	Municipality	Darien	3,102	600
Fairfield TS	Municipality	Fairfield	23,217	600

Table III-2. MSW Public & Private Transfer Stations (Medium & Large)				
Transfer Station (TS)	Permittee	Town	Tonnage FY 2008	Capacity (tons/day)
Trumbull TS	Municipality	Trumbull	37,365	600
Westport TS	Municipality	Westport	19,635	600
Stratford TS	Municipality	Stratford	50,151	600
Deep River TS	Municipality	Deep River	1,386	650
Torrington TS	CRRA	Torrington	72,560	650
New Britain TS	Municipality	Berlin	2,257	860
New Haven TS	Municipality	New Haven	84,130	925
Privately-Owned Transfer Stations				
Superior Recycling, Inc.	Superior Recycling, Inc.	Bozrah	No reports	100
Wheelabrator Env. Systems, Inc.	Wheelabrator Env. Systems, Inc.	Newtown	13,839	100
Willimantic Waste Paper Co., Inc.	Willimantic Waste Paper Co. Inc.	Plainfield	No reports	100
Willimantic Waste Paper Co., Inc.	Willimantic Waste Paper Co. Inc.	Willimantic	28,154	150
Dainty Rubbish Service, Inc.	Dainty Rubbish Service, Inc.	Middletown	25,177	250
Waste Management of CT, Inc.	Waste Management of CT, Inc.	Norwalk	228	250
City Recycling, Inc.	City Recycling Inc.	Stamford	42,560	400
Transfer Systems, Inc.	Transfer Systems Inc.	Danbury	205,994	900
Notes: CRRA transferred a 230 ton per day transfer station permit to the City of Greenwich. The city maintains two permits for two facilities on two contiguous parcels of land with the daily tonnages noted in the table. For the purposes here, both permits are combined and defined as a single large facility. "No Reports" means the facilities have not reported any MSW being received or have not reported to DEP. Source of Data: DEP (9/30/09)				

An important point to consider about transfer stations is that they can serve as a collection and economic control point for the flow of MSW and recyclables. As noted above, they are generally built to save collectors money by shortening the distance between the generation source and the disposal facility. Transfer stations also provide municipalities and private owners flexibility when considering different disposal facilities and options even if those options are more distantly located. For example, the city of Stamford has a transfer station that is permitted to bail MSW with the intent of loading it onto rail cars to be shipped out of state. Stamford has not used this capability yet. Currently, there are nine rail transfer stations for construction and demolition waste that ship that material out of state. DEP has received many inquiries about the requirements for permitting MSW rail transfer stations.

Sometimes this control point aspect can be problematic. Aside from the property rights scheme described above, the Danbury transfer station, which was owned by Galante, engaged in practices in the late 1990s that were contrary to contractual arrangements made by municipalities

in the HRRRA region. The HRRRA municipalities entered into a “put or pay” contract with Wheelabrator Connecticut, Inc. to deliver a guaranteed minimum amount of MSW to Wheelabrator in exchange for a set tip fee. If the municipalities did not deliver the minimum amount, they could be liable for penalty payments to Wheelabrator. Most of the HRRRA region’s waste flowed through the Danbury transfer station.

According to HRRRA, solid waste haulers were allowed by the Danbury transfer station owner to choose whether to pay the HRRRA tip fee or to pay a tip fee that was \$10-\$15 per ton less to another company located on the same site as the Danbury station. Because the station was privately owned, private haulers could choose the cheaper tip fee. Wheelabrator sued a Galante company for breach of contract because that company (Greensphere) was contractually obligated (separate from the municipalities) to take all MSW generated in the region to a Wheelabrator disposal site. If Greensphere was not under contract with Wheelabrator, there would not have been any basis for a lawsuit. Greensphere countersued, and after five years of litigation the parties settled in 2003. The second tip fee offering ended, and the MSW was once again transported to a Wheelabrator facility.

During the five year battle, the HRRRA municipalities did not meet their put or pay obligations and the regional authority’s operations were hobbled. Eighty-four percent of the MSW in the HRRRA region still flows through that Danbury-based transfer station. Because transfer stations can provide options beyond the state’s management system, they are subject to the same implications discussed above regarding flow control.

Recycling

Recycling is probably the most positively perceived of all waste management practices. Under statute, recycling is defined as “the processing of solid waste to reclaim material therefrom.”³⁵ Recycling in Connecticut involves a multifaceted system that includes required and voluntary self-separation of certain specific materials by residents and other waste generators. These reusable materials are collected in a variety of manners including curbside pickup and at drop-off facilities like transfer stations or redemption centers.

The materials are eventually transformed when waste products are used as raw materials for another product. For example, plastic soft drink bottles can be turned into material to manufacture polar fleece clothing and various types of plastics can be made into building products, such as decking material. Home composting of yard wastes or other organic materials is another means of recycling.

This chapter provides an overview of recycling practices in Connecticut. Principally, it can be noted that:

- the recycling system is based on both mandatory and voluntary participation with incentives provided for various participants including individuals, local governments, and collectors;
- there is considerable variation in the range of items that can be recycled on a town-by-town basis and in the costs of recycling;
- paper products and yard waste are the primary materials recycled in Connecticut;
- there is a well developed infrastructure for most of the items mandated for recycling that has helped the state reach its current recycling rate; and
- there is little infrastructure for non-mandatory items that will need to be addressed, such as institutional and commercial organics, to meet future recycling goals.

Background

Two significant pieces of legislation have helped to define Connecticut’s approach to recycling – one is the “bottle bill” that has recently been expanded and the other involves mandatory recycling.

Bottle bill. Connecticut’s bottle bill was passed in 1978, becoming effective on January 1, 1980. It established that certain beverage containers would have a five cent charge or deposit on them at the time of purchase, which is returned to the consumer (or any other person who collects the container) when the empty bottle is returned to a redemption center. Each retailer

³⁵ C.G.S. Sec. 22a-207

who sells the designated beverage containers is required to participate in the deposit system and is required to act as a redemption center for the containers the retailer sells. Retailers are not required to take containers they do not stock. The bottle bill was originally created as a way to prevent litter because the bottles have a value and are often picked up by people who collect them for a refund. DEP notes that states with bottle bills are generally believed to have much higher recycling rates for containers than non-bottle bill states because of the cash value on each container. Connecticut is one of 11 states that have a container deposit system.

The original bottle bill covered beer, malt, and carbonated soft drinks. The types of beverage containers included in the bottle bill have recently been expanded. In special sessions in the fall of 2008, the legislature approved two measures that concern recycling in the state, both having to deal with the bottle deposit law. First, the unclaimed bottle deposits that, since the program's inception, had been funds that were handled and claimed by the retail outlets and operators of the redemption machines, were instead claimed for use in the Connecticut state general fund. The change in law that put the unclaimed money into the general fund happened despite DEP's suggestion in the SWMP that the unclaimed funds be used by the state for dedicated recycling purposes.

The second measure added non-carbonated beverage containers (i.e., water, flavored water, but not juice or mineral water) to the list of items on which deposits must be paid. This provision was slated to begin in April 2009, but some extensions were granted that delayed full implementation until October 2009. Disposable plastic bottles, especially for water, were not nearly as prevalent when the original deposit laws were passed as they are now. As the adjustments to the deposit laws are phased in, more data should become available on how much recycling is being done within the deposit system as well as how many items with deposits are not returned.

Mandatory recycling. The second major push into recycling began in 1986 when the state offered incentive grants to towns that required their residents to separate out their recyclable materials. At the same time, an advisory council, a trust account, and a plan to enact municipal solid waste recycling were created in order to comply with the SWMP. In 1988, the DEP commissioner designated certain items as required to be recycled and was allowed to create a secondary list of items that are "suitable for recycling." At that time, the SWMP was modified by the legislature to include a recycling rate goal of 25 percent. In 1991, mandatory recycling, both residential and non-residential, was enacted.

The legislation passed during this period demonstrated a preference toward regional handling of recyclables, as did the allocation of financial incentives. Municipalities were required to submit plans to show how they were to comply with the mandate. One option was to join one of 10 recycling regions in the state. In addition, DEP was tasked with providing monetary support for many recycling programs.

Throughout the 1990's, DEP provided nearly \$42 million worth of grants, the majority of which went towards capital expenses (e.g., bins, trucks, and facility upgrades) of regional recycling programs, such as the Southwest Connecticut Regional Recycling Operating Committee. Some money was also allocated for municipalities that were not part of a regional program, but that had set up adequate local recycling programs. Over \$5 million of the overall

grants distributed came from trust funds and were primarily used for recycling education programs and short-term (one year) recycling coordinator staffing.

The state met the initial recycling goal of 25 percent by the mid-1990s. In 1996, the legislature established a new recycling and source reduction goal of 40 percent by 2000. This goal has not been met. As noted earlier, the current rate remains at about 25 percent (not including bottle bill returns, auto scrap, and certain commercial recyclables).

These legislative efforts, along with the extensive cooperation of regional and municipal officials and fairly significant seed funding provided by the state, promoted the development of a dynamic infrastructure for the collection, processing, and marketing of recyclables on a scale that did not exist before 1991. Since the initial allocations, funding for recycling programs has essentially ended. Interviewed personnel from several municipalities and regional organizations indicated that the lack of continued financial incentives for recycling has been the largest contributor to the stagnant statewide recycling rate.

Recyclable Materials

Initially, nine items were designated as mandatory recyclables and could not be disposed of in a trash receptacle. This list was expanded in 1996 with the addition of nickel cadmium batteries. Grass clippings were banned from disposal in landfills and RRFs in 1998. The items currently required to be recycled under Connecticut law are:

- corrugated cardboard,
- glass food containers,
- metal food containers,
- leaves,
- newspaper,
- office paper (non-residential),
- scrap metal,
- batteries (lead acid and nickel cadmium), and
- waste oil.

The list of items that must be recycled is not, however, a comprehensive list of what *can* be recycled. Plastic bottles, for example, are not a required item. Local recycling requirements are often based on the recycling capabilities of the hauler, vendor, or the processing facilities that take the local recyclables.

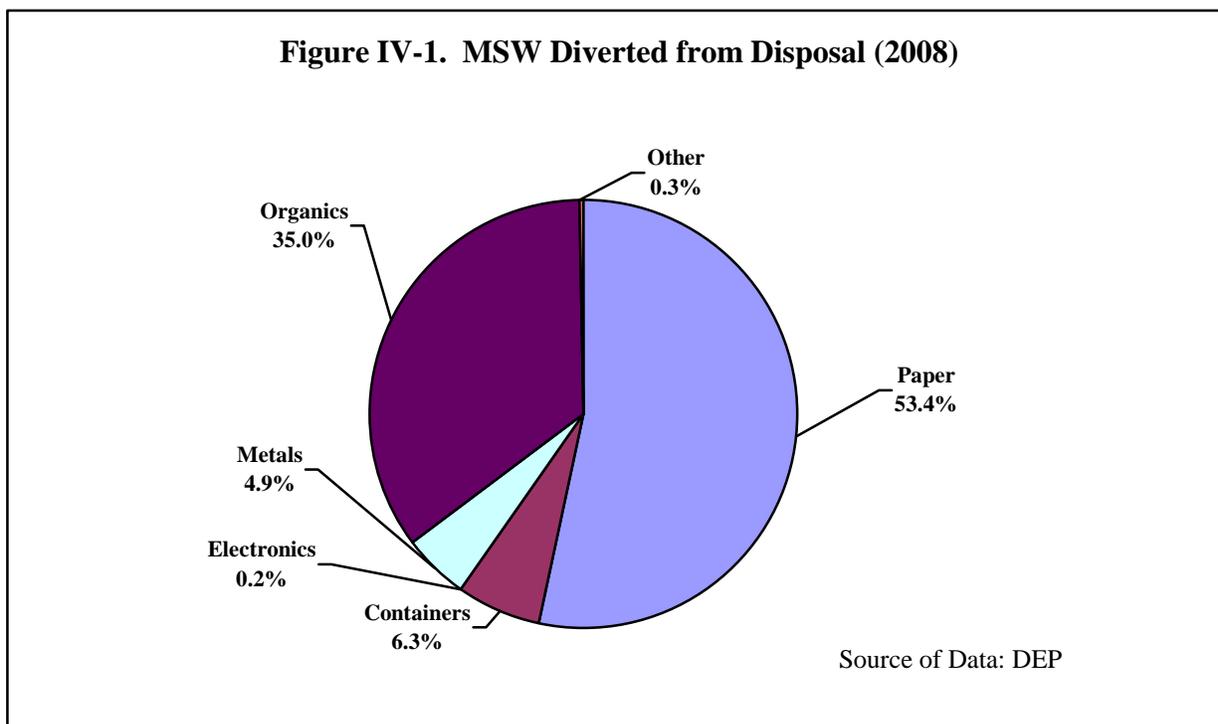
Range of recyclables. According to a recent DEP survey, over 125 Connecticut municipalities recycle plastics marked as numbers one or two,³⁶ magazines, and discarded mail through their curbside recycling programs. In the same survey, over half of the respondents

³⁶ Plastics can be identified through a voluntary resin identification coding system, which is a set of symbols placed on plastics by manufacturers to identify the polymer type. The primary purpose of the codes is to allow efficient separation of different polymer types for recycling. Plastics are coded with a recycling symbol and a number from one to seven.

indicated that their curbside recycling programs include coated paper beverage cartons, telephone directories, and boxboard. Additionally, around 25 percent of municipalities accept plastics marked with numbers one through seven through curbside recycling.

Town-to-town variations in what can and cannot be recycled may cause confusion about what belongs in the recycling bin. The inclusion of non-recyclable items leads to contamination of the recycling stream and more work for the sorting facility, which must either sort the non-recyclable items out or in some cases reject the entire load. If recyclables are rejected, those reusable materials are disposed of as trash.

Figure IV-1 shows the breakdown of MSW recycled and composted in Connecticut in FY 2008 according to unaudited reports received by DEP. The largest percentage of recycled material consists of: paper (e.g., cardboard, newspaper, magazines, and office paper), followed by: organics (e.g., leaves, grass, and brush); containers (glass, plastic, steel, and aluminum); scrap metal; other items (e.g., used oil, textiles, and antifreeze); and electronics.³⁷

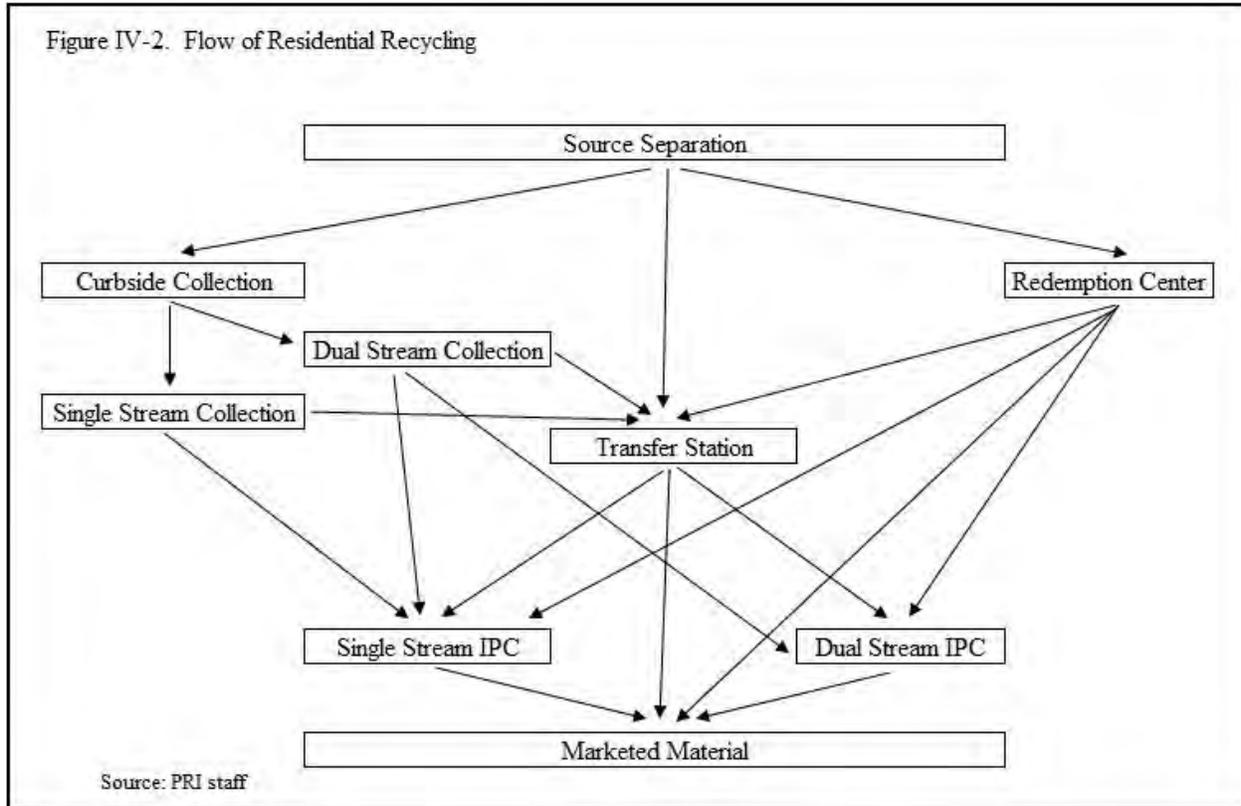


Flow of Recyclable Materials

Recycling begins when a waste generator (i.e., a resident, business, or institution) separates materials from waste so that those materials can be reused. The recyclables are then collected from the generator and eventually transported to an intermediate processing center (IPC), which is a recycling sorting facility. After undergoing a sorting process, the materials leave the IPC as marketable commodities that can be sold directly to an end-user, such as a factory or mill, or through a broker who agrees to find a buyer for the sorted materials. The

³⁷ Recycling data are provided to DEP from a variety of entities (i.e., facilities, and municipalities).

possible paths of residential recycling are shown in Figure IV-2. Each step in the recycling process is described in further detail below.



Collection. There are essentially three forms of residential collection for recyclable material – redemption centers, curbside collection, and transfer stations or convenience centers. As noted above, certain beverage containers in the state are subject to a refundable deposit fee. These items, such as glass, aluminum, and plastic beverage containers, are able to be returned to redemption centers, where the returner can recover the deposit. The deposit redemption centers serve as one type of collection, separation, and aggregation of recyclable materials within the state.

In addition, municipalities either provide or allow for curbside pickup of residential recycling. Around 21 towns have municipal employees performing the curbside collection of recycling and at least 59 have contracted with private haulers to provide curbside service for at least parts of their towns. The remaining towns use some combination of residential subscription to private haulers and/or residential drop-off of recycling at a local transfer station or convenience center.

Commercial participation. While nearly all residents have access to curbside or drop-off recycling services, DEP has noted that the situation is different for the commercial sector. Although a few municipalities provide for recycling pick-up or drop-off services for businesses, the majority of commercial recycling services is provided by the private sector. Large businesses tend to have developed recycling programs that enable them to save on costs due to

economies of scale and may, in some instances, recycle items beyond those that are mandated depending on the market for those materials. For small businesses, there is a lack of programs or hauling alternatives to achieve cost efficient collection of recyclables. This fact together with a lack of enforcement by municipalities results in limited participation by small businesses. DEP has noted that some haulers, especially those connected to IPCs, have revenue sharing arrangements with businesses, but many IPC managers and recycling officials believe that haulers do not share the revenue with generators.

Dual and single stream. The actual methods of curbside recycling differ between towns, largely based on differences in the capabilities of the hauler and the destination IPC. The two primary methods are called dual stream and single stream.

At the outset of mandatory recycling, residents were typically asked to sort their recyclables into two general categories, or dual-stream collection. The dual-stream method consists of having a recycling bin for commingled containers (e.g., glass bottles, aluminum or tin cans, and plastic bottles if accepted) and a separate bundle or bag for fibers (e.g., newsprint, cardboard, and office paper). Single stream, the use of which is increasing in Connecticut, is where all recyclable material is mixed in one container.

The type of truck used to collect recycling can vary with the method of sorting used at the destination IPC. When using dual-stream methods, haulers can choose to use a truck with separate compartments for the two streams or to use two trucks with a single compartment (or the same truck twice). If using a two compartment truck, haulers may fill one compartment before the other and thus be forced to drive to their unloading destination without a full load. Depending on the makeup of the recyclables on a particular route and day, the dual compartment truck may or may not drive less for the same amount of material than the equivalent of two trucks with single compartments.

While many MSW collection trucks are equipped with compacting equipment, the compactors do not work well for recycling collection, as the commingled containers are more easily sorted before they are crushed or broken. The extra space used by non-compacted recyclables is taken up mostly by the air within the containers, which is not efficient for the haulers to be moving around.

In the single-stream method, all acceptable materials are able to be transported in a single compartment, which eliminates the need for multiple trucks running the same route for recycling. Also, since all the materials are sorted by residents into a single recycling container, haulers have greater ability to use the generally more cost-effective automated collection for recycling.

Transport and sorting. After collection, source-separated material is then transported to an IPC. Recyclables may be transported directly to one of the IPCs, also called material recovery facilities, or be aggregated for longer hauls at a transfer station. Besides the materials recovered at redemption centers, source separated recycling is subject to further sorting at an IPC.

In an IPC, the materials are sorted to certain specifications, then shredded, crushed, or bailed in preparation for shipment to market. Materials leave the IPC as marketable

commodities and may either go directly to a factory or mill as capital resources, or to a commodities broker, who will find a facility that will reuse the reclaimed materials.

Like transfer stations, IPCs function as a collection and aggregation point for recyclable materials, which are ultimately transported to another destination to be processed further. Under Connecticut law, IPCs are considered volume reduction plants and are not licensed as transfer stations. Part of the permitted difference between an IPC and a transfer station is that a transfer station may not store any material for longer than 48 hours, while IPCs are able to store material both pre- and post-sorting in permitted conditions.

Of the seven IPCs in the state, two, in Willimantic and Berlin, use single-stream sorting and one, in Hartford, has both single- and dual-stream systems in use. The privately owned IPC in Hartford only accepts paper and cardboard, so it is able to process a portion of recyclables that are collected dual stream. The other three IPCs, in Stratford, Danbury, and Groton,³⁸ are currently only accepting dual-stream material. The three facilities that accept single-stream are all able to process dual-stream as well, while the dual-stream facilities cannot process single-stream materials.

Three of the IPCs are owned by a public entity and operated by a private vendor (Groton, Hartford, and Stratford). The remaining four are owned and operated by private entities. Table IV-1 provides more details on the IPCs.

IPC usage. In FY 2008, Connecticut recycled approximately 462,000 tons of paper or cardboard and 54,000 tons of commingled containers, for an average of over 1,400 tons per day. The 1,400 tons per day of paper and commingled containers represents the use of one-third of the state's recycling capacity for those currently mandated items, without accounting for the additional capacity of redemption centers.

³⁸ The IPC in Groton will cease operations and relinquish its permit by October 31, 2009.

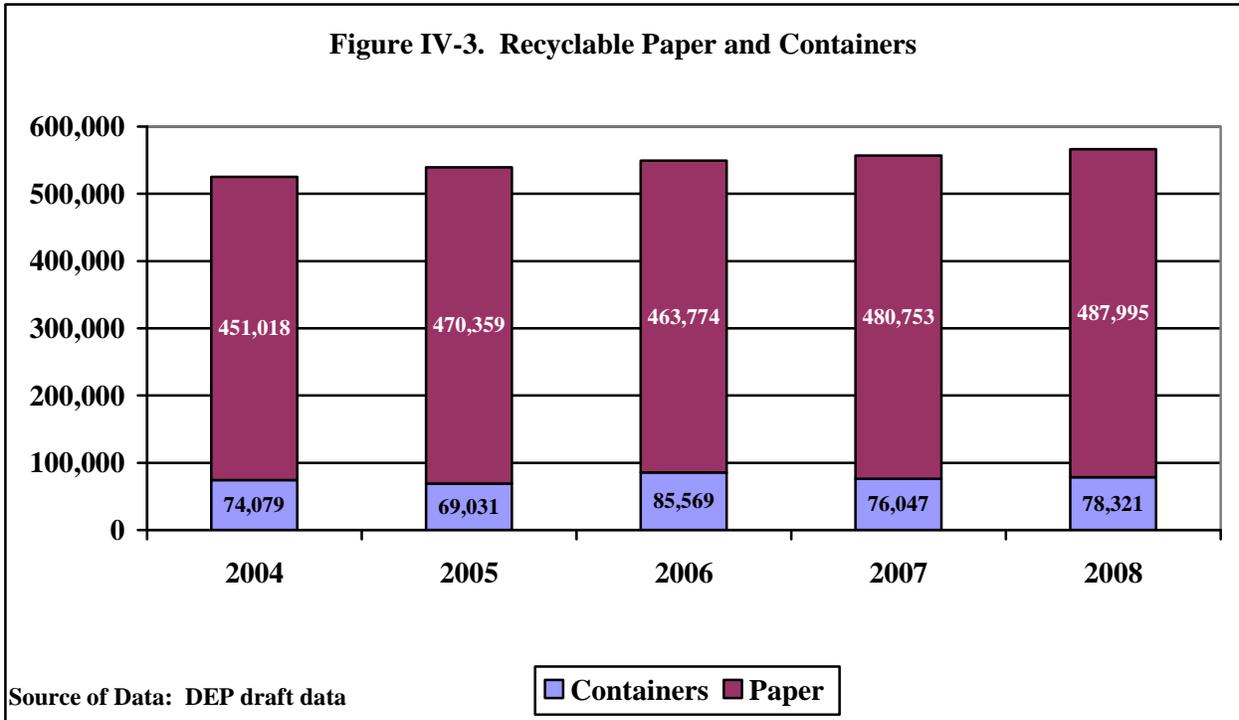
Table IV-1. Connecticut Intermediate Processing Centers			
Permittee Applicant	Ownership	Processing Lines	Permit Expiration
<i>Facility Location</i>	Permitted Capacity (Tons/Day)	<i>Materials Accepted</i>	
Murphy Road Recycling, LLC	Private	Paper Only	8/09 ³⁹
<i>Hartford</i>	1,170	<i>Paper/Cardboard</i>	
CRRA	Public	Single and Dual	2/12
<i>Hartford</i>	560	<i>Commingled Containers and Paper/Cardboard</i>	
CRRA	Public	Dual	6/12
<i>Stratford</i>	250	<i>Commingled Containers and Paper/Cardboard</i>	
Recycling Technologies, Inc.	Private	Dual	N/A
<i>Danbury</i>	200	<i>Commingled Containers and Paper/Cardboard</i>	
SCRRA	Public	Dual	5/11
<i>Groton</i>	200	<i>Commingled Containers, Paper/Cardboard, and Other</i>	
Murphy Road Recycling, LLC	Private	Single	12/13
<i>Berlin</i>	1,000	<i>Commingled Containers, Paper/Cardboard, and Other</i>	
Willimantic Waste Paper Co.	Private	Single	10/09 ⁴⁰
<i>Willimantic</i>	815	<i>Commingled Containers, Paper/Cardboard, and Other</i>	
Total Daily Capacity:	4,195		
Source of Data: DEP			

Figure IV-3 shows the total tonnage of recyclable materials that was marketed for sale from FY 2004 to FY 2008. The tonnage of paper has typically been around six times the tonnage of containers, which can be partially attributed to a combination of factors: the differences in densities between the material (paper is much more dense than containers) and the difference in percentage of the overall waste stream (paper is a larger percentage of the waste stream than plastics, metals, and glass combined).⁴¹ The total amount of recycled materials that were marketed increased consistently over the five-year period.

³⁹ Renewal application is currently under review by DEP. When an renewal application is properly submitted, the facility can continue operations under the previous permit conditions until the application is acted upon.

⁴⁰ Renewal application is currently under review by DEP. When an renewal application is properly submitted, the facility can continue operations under the previous permit conditions until the application is acted upon.

⁴¹ CT DEP Interim Waste Characterization Study Results 2009



Composting

Composting is the controlled biological decomposition of organic material, such as food waste, grass clippings and yard waste.⁴² Despite being a preferred method of disposal according to the SWMP, Connecticut lacks a significant infrastructure for composting. Most of the composting facilities within the state are permitted to accept and process yard waste, but there are few facilities capable of handling food waste.

Few towns (14, according to the DEP survey) budget for a leaf/yard waste composting facility, but over 40 towns and 20 individuals or businesses each have a general permit for a leaf and grass composting site. There is little data available on the effectiveness of leaf composting programs, though yard waste was the second highest tonnage of recycled material in FY 2008. At over 331,000 tons composted, yard waste is approximately 35 percent of the state's recycling tonnage.

Other than a single private food waste composting site in western Connecticut, there is currently no infrastructure within the state that enables large scale recycling or composting of food wastes. Like many pieces of the waste stream, a large scale food waste composting system needs both disposal and transfer facilities. According to DEP, there are over 1,300 large-scale food waste generators (i.e., universities, supermarkets, and correctional institutions) that generate approximately 99,000 to 153,000 tons of food waste annually, over 3 percent of the annual MSW generated in Connecticut. If institutional food waste from 2008 was composted, instead of disposed of at a RRF or landfill, the statewide recycling rate would go from the current approximate 24 percent to as much as 27 percent.

⁴² C.G.S. Sec. 22a-207a

The SWMP describes a few small institutional food scrap composting efforts on both the state and local level, such as the Department of Correction's decade-old program of composting food scraps in Enfield, and several local elementary school food scrap programs. There is undoubtedly some home composting of food wastes occurring within the state, but there is no information on its scope. There are currently few programs to encourage home composting of food wastes. DEP has noted, through its waste characterization study, that about 25 percent of the MSW waste stream is composed of organics, and would be a prime target for additional diversion efforts.

Costs

The monetary costs of recycling can be thought of in two ways, the actual costs incurred and the disposal costs avoided. As with non-recyclable MSW, the two main fees assessed for recycling are based on collection/transportation costs and disposal costs. While the collection and transportation costs are similar to traditional MSW costs, the disposal costs of recycling—or tip fees-- are quite different.⁴³

Incurred costs for disposal /reimbursements. Within the state, the cost of disposal for recyclables generated in municipalities with long-term disposal contracts range from paying \$39 per ton to getting reimbursed \$17.50 per ton. The large range is partially explained by variations in revenue sharing agreements based on the sale of the recycled commodities.

Regional authorities and municipalities that bundle disposal and recycling together can choose to charge higher MSW tip fees to help subsidize recycling programs and/or use revenues gained through recycling to stabilize or lower MSW tip fees. In some cases, decision makers use a combination of both to help offset the year-to-year changes in both markets.

Beyond the above issues and regional differences, there remain differences in the costs borne by municipalities and their residents. Some towns and regional authorities, such as HRRRA and TROC, have arrangements where a tip fee is assessed when the recycling is delivered and, once a minimum revenue level is reached, some percentage of the revenues from the commodity sale is returned in proportion to the tonnage of recyclables delivered. CRRA offers its members a \$0 tip fee for recyclables at both the Mid-Connecticut Project and Southwest Project. The members of the Mid-Connecticut Project were also offered the possibility of a revenue-based refund in the last two years (\$10 per ton in FY 2008 and \$5 per ton in FY 2009), but the Southwest Project members are not eligible to receive the same refunds. Some private IPC owners, such as Willimantic Waste Paper and City Carting, Inc., have been able to offer contracts that pay municipalities for each ton of recyclables delivered. Willimantic Waste, for example, has reported that it has paid an average of \$11.11 to \$18.97 per ton to 20 Connecticut municipalities for its recyclables over the last five years.

Cost avoidance. The cost avoidance of recycling instead of using traditional disposal methods makes recycling a relatively simple way to lower total disposal costs. Even municipalities that are paying relatively high recycling tip fees (around \$40 for HRRRA members) are still paying much less per ton for recyclables than they would have to pay for traditional

⁴³ A tip fee is a charge levied for a given quantity of waste received at a processing facility -- usually on a per ton basis. See Chapter V for additional discussion of tip fees

MSW disposal tip fees (around \$80 for HRRAs members). At minimum, HRRAs members save \$40 per ton by recycling. On the other extreme, Norwalk has a transportation and disposal fee of around \$75, but is currently getting paid \$17.50 for each ton of recyclables delivered, for a net savings of \$92.50 for each ton that is recycled instead of burned or landfilled.

Price of recyclable material. Once recyclable materials have been sorted and bailed, they become marketable commodities. The price of recyclable materials can range from a few dollars per ton for the least valuable items, or even negative value for some types of glass, up to hundreds of dollars per ton for some plastics and metals.

The market, and so the prices, for recyclable items are rather volatile. The prices within the recyclables market consistently grew before a dramatic downturn in the fall of 2008. Since the sharp decline, prices have begun to recover, though finding buyers in rough economic conditions appears to be more difficult than in more robust periods. For example, CRRAs reports that the average price it received for paper and cardboard at the Hartford IPC went from about \$154 per ton in August 2008 to about \$54 in November 2008. By July 2009, the average price rose to \$66 per ton. Similarly, the price for number two plastic (HDPE natural) declined from \$863 per ton in October 2008 to \$267 per ton one month later.

Recycling Rate

One of the problems facing Connecticut's recycling system is obtaining accurate data, especially data that is comparable to other states and regions. Recycling rates can vary greatly from one location to another, but in many cases it is difficult to discern whether the difference is based on actual behavioral differences or on accounting differences. The recycling rates of states vary greatly in large part because there is no reliable list of what should be counted as recycled. Most states account for the more traditional items like paper, cans, bottles, and even plastic containers. Some differences are due to state-specific decisions on how to account for yard waste.⁴⁴ The glaring differences in recycling rates may also be based on estimates of recycled or diverted waste that include such things as used or scrapped cars.

Since the early 1990s the amount of MSW generated in total and per capita has climbed steadily upward in Connecticut. The amount of waste that is recycled and marketed has also consistently grown, but the ratio of recycled to disposed waste has not changed much after an initial surge in the early 1990s. The result is that, while the recycling rate remains steady, the amount of MSW that must be disposed continues to increase.

As noted earlier, according to estimates in the 2006 SWMP, the recycling rate in 2005 with the deposits based recyclables included is about 30 percent. It is arguable that the state has been meeting the original recycling rate goal of 25 percent, but even the estimate of 30 percent falls short of the revised statutory goal of 40 percent. Further, the SWMP predicts that, in order to be able to continue to meet statewide disposal demand without exporting to other states, the statewide recycling rate would have to increase to 58 percent by 2024.

⁴⁴ State reporting of yard waste recycling varies from not being included in recycling figures to relying on estimates on the amount of yard waste that does not leave the point of generation. DEP typically counts the tonnage of yard waste accepted by composting facilities towards recycling figures, but does not include estimates of home composting.

It appears that the current recycling system was adequate to meet the original diversion goal of 25 percent, but it is possible that the system currently in place is not capable of meeting higher recycling goals. It remains to be seen how several recent developments, such as adjustments to the deposit laws and capital upgrades at IPCs, will impact the statewide recycling rate.

Both EPA and DEP recommend that a better approach to measuring the amount of waste diverted is to rely on using per capita disposal rates to assess performance, instead of recycling percentages. The per capita rate at least partially accounts for both source reduction and reuse, which is not captured by recycling percentage statistics. Also, the recycling rate can show towns with relatively low generation rates as failing certain benchmarks, while indicating that a town with a high generation rate, but average recycling rate, is adequate.

Recent Developments

The addition of single-stream capability to a few of the in-state IPCs (both private and quasi-public) is expected to dramatically increase the recycling rate for residents of the towns they serve. Hartford was one of the first municipalities to adopt single-stream collection methods through the introduction of several pilot projects. After growing by no more than 6 percent per year from FY 2005 to 2008, the amount of recycling collected in FY 2009, when the single-stream recycling began in earnest, increased by around 40 percent in Hartford. It is difficult to draw definitive conclusions from these initial results because of the short time period and the impact of the recent economic downturn. However, the initial results appear encouraging. The effects of switching to single-stream collection are likely to be remarkable as more and more towns convert from current dual stream methods.

Resources Recovery

Connecticut relies on resources recovery as a way to dispose of its municipal solid waste far more than any other state in the nation. The state's heavy reliance on RRFs for MSW disposal and a variety of ownership situations for those facilities have been questioned in recent years.

This chapter includes a description of RRF technology, a summary of Connecticut's use of RRFs, an overview of each facility in the state, an update on facility ownership information, and discussion of RRF financing. Specifically, it can be noted that:

- RRFs are waste disposal facilities that are able to reclaim energy as a byproduct of the incineration process;
- Connecticut relies on RRFs more than any other state;
- RRFs are capital-intensive facilities that rely on steady streams of waste for both fuel and revenue;
- circumstances have changed since the six current RRFs were built and some of these changes make the construction of new facilities less feasible;
- the existing RRFs differ from each other in many critical ways;
- important aspects of the waste disposal market, including RRF ownership and availability of disposal alternatives, are affected by the expiration of long-term municipal obligations;
- revenues for a RRF are tied to disposal prices and the sale of energy;
- RRFs are monitored for air and water quality issues; and
- though MSW deliveries at RRFs are supposed to be monitored for recyclable content, little is done to keep recyclables from being burned.

Resources Recovery Technology

Waste burning facilities around the world fall into a few general categories: incinerators, steam-converters, and transportable energy creators. The fuel source, or feed stock, for the plants can be a mixture of waste types including construction and demolition debris (C&D), MSW, medical waste, and in some instances, tires. The types of facilities, and their frequency of use, vary as described below.

- Incinerators burn waste to reduce volume before landfilling and typically do not recapture energy in any form. They also tend to emit any number of regulated pollutants. There are no longer any active MSW incinerators in Connecticut and the number of incinerators nationwide is decreasing.

- Steam-capturing plants burn waste and use the heat from the combustion to produce steam. The steam can be provided to steam loops as a source of heat or can be combined with an electrical turbine to produce electricity. There are over 100 steam-capturing plants of some variety in use in the United States, and many more overseas, as these types of facilities are often the cheapest way to generate electricity while disposing of waste. The RRFs in Connecticut are steam-capturing facilities that process only MSW.⁴⁵
- Transportable energy creating facilities use a high-temperature process, such as plasma-arc technology, to reduce the waste into energy-filled solids or gases that can be used to generate electricity on site or sold to specialized power plants or individual industries for their own use. The main advantage of these facilities is that the energy that is recovered from the waste can be stored and transported, while steam from the steam-based facilities must be used immediately as it is generated. Few facilities of this type exist in the United States (none in Connecticut), but are relatively common in Europe and Asia.

Mass burn. There are six active MSW resources recovery, or waste-to-energy, facilities in Connecticut and they all employ similar technologies to obtain energy from waste. With the exception of the Mid-Connecticut Project, the plants use a “mass burn” technique where all of the feed stock is burned heterogeneously and any remaining recyclable materials (ferrous metals, etc.) may be filtered out of the remaining ash residue.

Refuse derived fuel (RDF). The Mid-Connecticut Project uses refuse derived fuel (RDF) technology instead of a mass burn approach. In the RDF model, items with low burn potential and non-processible materials (e.g., grit, metal, and glass) are filtered out prior to combustion and the remaining feed stock is made more uniform through shredding. Use of the RDF model is meant to increase the homogeneity of fuels and produce a more reliable energy stream, as the components of the fuel are more closely monitored than in mass burn models. However, operation of the sorting facility and disposal of the non-processed materials, typically at landfills, may more than negate any efficiency gains made during incineration. (The non-processed material is called residue, and is not ash, which is left over at all Connecticut RRFs.)

While the plants have been updated with additional environmental control features, the basic technology of the plants has remained largely unchanged from their construction and opening. As the plants were constructed between 14 to 20 years ago, it is possible that the technology, current at the time, has become outdated. Several companies have made notable strides in the efficiency of waste-to-energy facilities in Europe and Asia and are capable of bringing those technologies to the United States if demand grows here. These technologies are currently used in the United States in experimental and small scale operations. The two main advantages of some of the new technologies are improved efficiency in the amount of energy generated per ton of waste processed and a reduction in the amount of ash that must be disposed. The ash residue left over from Connecticut’s current facilities, discussed at greater length in

⁴⁵ The Exeter Energy Plant in Sterling, Connecticut is a waste-to-energy facility that only processes tires as feed stock.

Chapter VI, has around 10 percent of the volume of the original waste stream and between 20-30 percent of the weight. New technologies promise a 99 percent or more volume reduction from the original waste stream. Some disadvantages of the new technologies are that higher initial costs are possible and that their economic feasibility has not been proven in the United States.

Resources Recovery Usage and Facilities in Connecticut

Since the early 1990s, Connecticut has relied on waste-to-energy plants as the primary mode of disposal for MSW. The RRFs in the state began operation between 1988 and 1995, while the state was making a specific effort to reduce reliance on landfills. Statistics about usage may be found on pages 6 and 7.

The six RRFs in operation in Connecticut are located in Bridgeport, Bristol, Hartford, Lisbon, Preston, and Wallingford. The RRFs vary in several operational aspects, including their capacity, the number of towns under long-term contracts, and facility operator as seen in Table V-1.

Municipal use and membership. The number of municipalities associated with a particular facility is contingent upon several things, most notably, the overall and available capacity of the facility and the amount of MSW a municipality controls.

Table V-1. Resources Recovery Facilities in Connecticut: Selected Information				
Facility	Contracted Towns	Commercial Operation Date	Approx. Capacity (tons/day)	Current Operator
Bristol Resource Recovery Facility	14	1988	650	Covanta
Bridgeport Resources Recovery Project	13	1988	2,250	Wheelabrator
Mid-Connecticut Project (Hartford)	70	1988	2,850	Covanta/ MDC
Wallingford Project	5	1989	420	Covanta
Southeast Project (Preston)	12	1992	690	Covanta
Wheelabrator Lisbon Waste-to-Energy Facility	1	1995	535	Wheelabrator
Total	115		~7,400	

Source: SWMP (2006), PRI Staff Interviews, updated as of September 2009

As of September 2009, by far the largest number of municipalities connected to any one RRF is the 70 under contract with CRRRA for the Mid-Connecticut Project. Three projects, located in Bristol, Bridgeport, and Preston, each have 12 to 14 member towns, but differ in the capacity available for non-member towns. The Wallingford Project processes trash from its five member towns, with little capacity to spare. The Lisbon facility has only one member town, Middletown, so it is able and needs to provide the majority of its capacity to towns or haulers without long-term contracts.

Eleven municipalities are associated with HRRRA, which has a long-term contact with Wheelabrator that allows Wheelabrator the flexibility to send MSW from HRRRA towns to any

Wheelabrator facility, or facilities owned by its parent company, Waste Management, Inc. Within the HRRRA contract, preference is given to facilities in Connecticut over out-of-state options. Another town, Windsor, has less than five years worth of capacity left available in its landfill. After accounting for the HRRRA towns and Windsor, there are 42 towns without long-term contracts to dispose of their trash at in-state disposal facilities. See Appendices A and B for further municipal membership and use information.

Ownership. The ownership of each facility is based on the original long-term contracts that were entered into as the facilities were built. At the expiration of the last of the initial long-term contracts in FY 2020, two facilities, Mid-Conn and Lisbon, will be publicly owned, and the remaining four will be privately owned.⁴⁶ Table V-2 explains the expected ownership scenarios for each facility as of September 2009.

Table V-2. CT Resources Recovery Facilities: Ownership and Membership
<p>■ Mid-Connecticut Project (Hartford) (Public)</p> <p><i>The facility was financed through CRRRA bonds. CRRRA owns the facility now and will remain the owner. The initial long term contracts expire in 2012. Both CRRRA and current Mid-Conn members are exploring their options for 2013 and beyond. All 70 towns involved remain under contract through 2012.</i></p>
<p>■ Bridgeport Project (Private)</p> <p><i>Wheelabrator Technologies, Inc. took ownership of the plant as of December 31, 2008. The facility was financed through CRRRA bonds and CRRRA was the official owner of the project until Wheelabrator exercised its contractual right to purchase the plant for \$1. Of the 19 towns that formerly had long-term disposal contracts, 12 have signed long-term contracts (five years plus options) through CRRRA to dispose of their MSW at the Bridgeport facility and one has signed a long-term contract directly with Wheelabrator for disposal at the facility. The remaining six towns no longer have a contractual obligation to dispose of their MSW at the Bridgeport facility.</i></p>
<p>■ Southeast (Preston) Project (Private)</p> <p><i>This project was set up under an agreement with CRRRA and SCRRRA, including CRRRA financing, so that Covanta is the equity owner of the facility when the long-term solid waste disposal agreement concludes and the revenue bonds are repaid. The initial long-term contracts expire in 2015, but there are options for extensions, which would extend the current terms through at least 2018.</i></p>
<p>■ Wallingford Project (Private)</p> <p><i>The project was set up under an agreement between CRRRA and Covanta, using CRRRA bonds, so that Covanta would be the owner when the solid waste disposal agreement concludes, unless CRRRA purchased the facility for fair market value. At the urging of the member towns, CRRRA did not exercise its purchase right. The five current member towns have signed long-term agreements (ten years beginning in July of 2010 plus two five year options) directly with Covanta to continue to bring their waste to the Wallingford facility. Though the towns did not sign agreements through CRRRA, CRRRA purchased Wallingford facility capacity from Covanta.</i></p>
<p>■ Bristol Resource Recovery Facility (Private, with option for BRRFOC purchase)</p>

⁴⁶ BRRFOC has the option to purchase the Bristol facility at fair market value at the expiration of the initial long-term contracts. If purchased by BRRFOC the facility would switch from private to public ownership.

The Bristol facility was financed using non-CRRA bonds. When the bonds are repaid in 2014, Covanta is the owner unless BRRFOC purchases the facility for fair market value (there is also an option to extend the agreement, or for a new contract for the entire disposal capacity).

■ **Lisbon (Public)**

The Lisbon facility was financed through non-CRRA bonds. The Eastern Connecticut Resource Recovery Authority (ECRRA), whose sole member is Middletown, owns the facility now and will remain the owner when the bonds are paid.

Source: 2006 SWMP App. K and PRI staff interviews. (Information current as of September 2009)

All six facilities are operated by two companies. Wheelabrator Technologies, Inc. and/or its subsidiaries operate the Bridgeport and Lisbon facilities. Covanta Energy Corporation operates the remaining four facilities (Mid-Conn, Bristol, Preston, and Wallingford).

Facility overview. Each facility is discussed in greater detail below. Appendix B provides additional summary information about each, including design capacity and the average amount of solid waste processed per year.

Bristol. The Bristol Resource Recovery Facility is overseen by the Bristol Resource Recovery Facility Operating Committee (BRRFOC). For the duration of bond repayment, BRRFOC has significant control over the budget and is able to set tip fees for its member towns. Fourteen towns are members of BRRFOC and will remain so through at least 2014 when the bonds are repaid. The Bristol facility was the first of the current six to begin operation, in May 1988. The Bristol facility is one of two that are not now and has never been formally associated with CRRA. The facility has a capacity of 650 tons per day, which makes it the fourth largest facility in the state. The facility uses mass burn technology and takes its ash residue out of state to be landfilled.

Bridgeport. The Bridgeport Resources Recovery Facility is owned and operated by Wheelabrator Technologies, Inc. The facility, the second largest in the state, has three separate processing lines with a combined capacity of 2,250 tons per day. Any single processing line at the Bridgeport facility has more capacity than the combined capacities of four of the five other RRFs in the state, as each of the three incinerator and boiler lines is capable of processing 750 tons per day. The Bridgeport facility began operation in July 1988, just two months after the Bristol facility.

The current facility was built after another RRF in Bridgeport, known as Bridgeport I, experienced several high profile failures, including a well-publicized explosion. Bridgeport I was not linked to the current facility or its owner, but the failure of the initial project created a need for additional disposal capacity in the region. The failure of Bridgeport I was undoubtedly a contributing factor in the ownership agreements that left Wheelabrator the owner and also passed to the company much of the risk of building and operating the facility.

Hartford. In October 1988, the Hartford facility became the third of the existing plants to begin operation. The facility in Hartford is the largest in the state, with a daily capacity of 2,850 tons. The Hartford facility, part of the Mid-Connecticut Project, is the lone RRF in the state to use refuse-derived fuel (RDF) technology. The RDF system was chosen, in part, because the RRF technology was retrofitted into an existing power plant. Because of the RDF system, the

facility employs two separate buildings, one for separation and waste processing and another, called the energy block, for the incineration and energy generation. The energy block is operated by Covanta and the sorting facility is operated by the Metropolitan District Commission (MDC), under contract with CRRA.

Another unique part of the Mid-Connecticut Project is that the facility itself is part of the Black Start emergency system through ISO New England. The project houses jet engine turbines and a store of fuel that, in case of a major blackout, provide the energy for other power plants as they restart. The system can also be used to help prevent brownouts during times of peak usage. Because of the designation, the facility has extra security measures tied to it.

Wallingford. The smallest of the RRFs in Connecticut, the Wallingford facility has a capacity of 420 tons per day. The facility began operation in 1989 and has since been governed by CRRA with input from the Wallingford Project Policy Board, which has representation from each of the five member towns. At different times since operation began, the Wallingford facility has been considered for both closure and expansion. Despite these considerations, the facility has stabilized in part because of the consistent waste stream from member towns. Since FY 2001, the facility has run at full capacity through mainly the waste generated by the member towns. In fact, from FY 2001 to FY 2008, the facility had to divert to another RRF or export to a landfill between 9,000 and 22,000 tons of MSW each year.

Preston. The Preston facility is part of the Southeast Project that was bonded through CRRA, but largely governed through the Southeastern Connecticut Regional Resources Recovery Authority, and operated by Covanta. The facility began operation in 1992 and has a capacity of 690 tons per day, making it the third largest facility in the state.

Lisbon. The Lisbon facility began operation in 1995, the most recent of the six active RRFs. The facility was created through a unique partnership between ECRRA, Wheelabrator, and Lisbon. Unlike four of the six facilities, the Lisbon facility, along with Bristol, has never been formally associated with CRRA. Technically, the only member town of the facility is Middletown, which is the sole member of ECRRA. Wheelabrator operates the plant and is responsible for securing minimum operating tonnages so long as Middletown brings the MSW that it controls to the facility.

There is no other facility in the state that is owned by a single municipality and, likewise, there is no other arrangement where a municipality owns a solid waste facility that is not within its own borders. As the most recently constructed and permitted, the Lisbon facility is the only facility that went through the determination of need process to obtain a permit. While the determination of need process will be discussed further in Chapter VI, it is important to note that the disposal needs of the HRRRA towns, though roughly 100 miles from the Lisbon site, were an important part of the facility's ability to demonstrate need. Also, the Lisbon facility was sited and built less than 10 miles from the RRF in Preston.

Revenues. RRFs are capital intense facilities that are largely dependent on a steady source of fuel (i.e., MSW). The facilities must have enough fuel to run consistently, as there are large efficiency decreases while a facility or unit of a facility is brought up to the appropriate temperature for incineration. In order to be economically viable, the facilities were all built in

conjunction with long-term contracts that would ensure there was enough waste to run the plants efficiently. Further, many of the initial long-term contracts included put-or-pay provisions, where municipalities had to provide a minimum amount of trash or pay for the equivalent each year.

Tipping fees. Tipping fees are typically a per ton charge on waste handling or disposal. They are based primarily on the operating and administrative expenses of waste disposal, which may include a variety of subcosts, including transport, transfer station use, actual disposal, and debt repayment. Tipping fees may or may not include a separate recycling fee, as noted earlier in Chapter IV.

Each load of MSW brought to a RRF is subject to a tipping fee. The tipping fee for each facility differs depending on agreements a town, regional authority, or hauler have with a facility owner and/or operator. According to the National Solid Wastes Management Association (2005 Tip Fee Survey), the Northeast Region (CT, ME, MA, NH, NY, RI, VT) saw average 2004 tipping fees of \$70.53 per ton in comparison to the 2004 national average of \$34.29. The Northeast by far had the highest tipping fees, as the remaining six regions ranged from \$24.06 to \$46.29. In general, tipping fees at non-landfill facilities are higher than landfill sites.

Table V-3 shows recent tip fee information for towns with long-term contracts with each of the six RRFs. Initially, long-term contracts were used to bind a municipality to a particular RRF for approximately a 20-year time period; now a long-term contract could mean as little as one year, though typically the newer contracts are for five or more years.

PROJECT	FY2006	FY2007	FY2008	FY2009	FY2010
Bridgeport ⁴⁷	\$74	\$78	\$81	\$98.50/\$63 ⁴⁸	\$63 ⁴⁹
Mid-Connecticut	\$70	\$69	\$69	\$72 ⁵⁰	\$69
Southeast	\$60	\$60	\$60	\$60	\$60
Wallingford	\$57	\$58	\$59	\$60	\$60
Bristol	\$65.50	\$65.50	\$65.50	\$65.50	\$65.50
Lisbon	\$60-\$66	\$60-\$66	\$60-\$66	\$60.25	\$60.80
Source: CRRA, ECRRRA, BRRFOC, PRI staff interviews. (Information current as of September 2009)					

The variation in what tipping fees cover makes direct comparison difficult. In some cases, a tipping fee for MSW may include a subsidy for recycling hauling and/or tipping, while in other cases, revenues from recycling are used to stabilize and/or subsidize the MSW tipping fee. Tipping fees may include transport and operation of a transfer station or it may be a bare “at

⁴⁷ From FY 2006 to FY 2009 Bridgeport members paid the listed tip fee for the tonnage they brought up to their minimum commitment. Tonnage provided in excess of minimum commitments was discounted between \$5 and \$18.50 per ton depending on the year.

⁴⁸ In the second half of FY 2009, the initial long-term contracts ended and the new terms began.

⁴⁹ Includes \$2 administrative fee for CRRA that is not paid by the lone town that contracted directly with Wheelabrator.

⁵⁰ Member towns paid \$10 less (\$62) in second half of FY 2009 due to a revenue surplus from the previous year.

the gate” disposal cost. For instance, CRRA operates four transfer stations as part of the Mid-Connecticut Project. Member towns of the Mid-Connecticut Project pay the same per ton disposal rate regardless of whether the towns use the transfer stations or haul directly to the RRF in Hartford.

In addition, public entities that set tip fees for MSW, recycling, or both (e.g., CRRA, BRRFOC, and HRRRA) all have some discretion in creating funds to stabilize year-to-year fluctuation. Some years, the tip fee may be raised to create a reserve fund, while other years, the fund may be tapped in to.

Spot market. In addition, MSW that is not controlled under long-term agreements may be subject to spot market prices. The spot market price for trash is the price that a disposal facility, be it a landfill, transfer station, or RRF, is willing to take for a load of trash on a particular day. In the spot market, tip fees can fluctuate greatly day-to-day and seasonally. As previously mentioned, RRFs need a certain amount of MSW to run efficiently, so a facility that is running low on MSW to use as fuel will lower its spot market price and, in the process, become a more attractive disposal option for haulers who have discretion in where to deliver loads of MSW. If a facility has enough MSW, it may leave the spot market price at or above the long-term contract price so as to dissuade extra tons from being delivered.

Industry personnel have indicated that the in-state spot market price can be as low as \$40 in the winter when MSW is least available. Haulers with the ability to choose between disposal sites on a daily basis can take advantage of fluctuations in the spot market price. However, those same haulers are not necessarily guaranteed a place to dispose of the MSW for which they are responsible. The risk of relying on the spot market is somewhat lessened if the hauler has access to one or more backup disposal options, such as out-of-state landfills. If done correctly, using the spot market can lead to significant savings.

Combined tip fees. One way for municipalities to take advantage of the spot market is to lock in a combination transport and disposal fee with a particular hauler and allow the hauler to either work out short-term deals (less than one year) with disposal facilities or take the collected trash to the facility with the lowest spot market price. In some instances, these combination contracts have a maximum fee outlined as well as provisions for sharing whatever savings a hauler might achieve between hauler and municipality. Committee staff interviewed several municipalities without long-term contracts with specific facilities. These municipalities reported tip fees in the \$70 to \$80 range that included at least transport and disposal, and sometimes operation of a transfer station.

HRRRA has a long-term contract, not with any one facility, but instead with Wheelabrator (through Wheelabrator of Connecticut). The contract includes a transport and disposal fee that has grown from \$74 in CY 2004 to \$80 in CY 2009. Wheelabrator is responsible for taking the waste from one of the HRRRA regional transfer stations to any Wheelabrator-run facility, though priority is given to the two facilities in Connecticut, Lisbon and Bridgeport.

As the long-term debt obligations for these facilities retire over the next several years, it might be expected that tipping fees would decrease, all things being equal. However, one part of the tipping fee that has not been previously discussed is the energy generation and sale.

Energy Sale

An identified advantage of RRFs is that they generate energy, which provides an additional revenue source for the facility. RRFs produce steam during the incineration process. The steam is then used to move a turbine that is part of a generator, creating electricity.

The facilities all produce more power than is necessary to run their plants, so the remaining energy is sold to power utility companies. Connecticut resources recovery facilities generate approximately 184 Megawatts of electricity, which is 2.7 percent of the capacity of all current electricity generating resources in Connecticut (6,700 Megawatts total).

Electricity providers purchased RRF-generated energy under contracts entered into at a time when electricity providers were compelled by statute to purchase all available RRF-generated energy at above-market rates.⁵¹ The statute provides that the rate and the mandate to buy last the length of the original contract, so long as the contract was valid for at least 20 years after the initial operation of a facility.

The RRFs thus were able to lock in long-term rates for the energy they provided for sale to the local power utilities. These rates were based on long-term projections, many of which, in retrospect, overestimated the growth of energy prices. In some cases, the locked-in rates were at or just above current market rates, but other facilities are currently selling their energy at several times the current market rate. According to the Energy Information Administration, the average wholesale price for the New England region from January to September 2009 was around \$.045 per kilowatt hour with a range from \$.025 to \$.130 per kilowatt hour. In contrast, the price received by RRFs for energy produced at the facilities ranged from \$.08 to \$.24 per kilowatt hour. Of note is that the locked-in higher rates effectively function as a subsidy for tip fees, a subsidy paid by electricity rate payers.

As most of the original energy purchasing contracts were keyed to the financing of the facilities, the energy contracts are also beginning to expire. Without further statutory direction, electric providers will most likely purchase the RRF-generated energy at the much cheaper wholesale rate rather than the locked-in higher rate. Whatever decrease there may be in revenue from energy sales will partially offset savings gained from debt retirement in the long-term tip fees.

Power companies still have some additional incentive to purchase RRF-generated energy. Under P.A. 07-242, the legislature outlined energy generation preferences with a set of renewable portfolio standards. Electricity providers must purchase a certain amount (10 percent by 2010) of a combination of Class I (e.g., solar or wind power) and Class II (trash to energy or biomass energy). Of the overall 10 percent, 7 percent must be Class I, but the remaining 3 percent can be Class I or II. Electricity providers could potentially avoid using RRF-produced energy if they are able to purchase enough Class I energy, but if the RRF energy is provided at market rates, there seems little reason to avoid it.

⁵¹ C.G.S. Sec. 16-243a and C.G.S. Sec. 16-243e

Regulation and Enforcement

As complex systems, RRFs are subject to regulation in three different areas: materials management, water quality, and air quality. All three areas are monitored by DEP, but by different sections of the agency.

Water. Water is used by RRFs in several ways. As each facility generates electricity through steam, there must be a viable source of water to be superheated, sent through a generator and cooled again before being released back into the system. As the water is kept separate from the incinerator ash and other pollutants, there are few concerns about the outgoing water being contaminated. However, the temperature of the previously superheated water must be brought down to acceptable levels before leaving the facility to prevent serious ecological harm. Waste water and water run off are also controlled at RRFs. The facility sites must be self-contained and the collected water must be sent to a water treatment plant. DEP has issued two Notices of Violation (NOV) to RRFs for water issues in the last ten years.⁵²

Air. The air around a facility is managed in several ways. First, the tip floor of a facility is held under negative pressure to keep odors from escaping. Typically the air from the tip floor is pulled into the incinerator as a fuel for the incineration process. As materials are burned, vapors are released that can contain any number of harmful elements. The gases from the incinerator are sent through a series of air quality filters that are designed to capture most, if not all, of the harmful gas.

The air emissions of the RRFs are closely monitored for harmful elements. As required by their permits, the facilities are equipped with monitoring equipment. Facility operators are required to self-report any and all emissions violations, as well as summaries of monitoring data to DEP, which addresses the violations and audits the summaries quarterly. Additionally, DEP performs regular stack tests to assess the calibration of the on-site monitoring equipment and to test for the presence of potentially harmful elements that are not continuously monitored.

DEP took seven formal actions against RRFs and issued another 13 NOVs for air compliance infractions in the last ten years.⁵³ The few violations that occur are typically the result of significant shifts in the waste that is being burned. These shifts or spikes can happen when the feed stock has changed, such as a particularly wet load on a rainy day, or improper materials, such as batteries, are burned.

Waste materials. As previously discussed, recycling of certain items in Connecticut is mandatory. As such, disposal of recyclable material at an RRF is illegal. RRF operators have the authority and responsibility to report haulers who deliver loads with “excessive” amounts of recyclable materials. The amount of recyclable material that constitutes an “excessive” amount is not defined by statute or regulation. Violations of this nature seem to be under-reported, partly due to the lack of a clear definition of what constitutes an infraction. DEP rarely conducts inspections on the amount of recyclables delivered by haulers as MSW and does not receive regular updates from the RRFs on their inspection history or results.

⁵² Both NOVs were issued to the Mid-Connecticut Project.

⁵³ Formal actions are considered less severe than a NOV. The air emissions NOVs were issued to: Wallingford (5), Hartford (4), Preston (2), Bristol (2), Bridgeport (0), and Lisbon (0).

When DEP does discover violations based on occasional tip floor inspections, fines or NOVs are levied against the hauler or generator and not the RRF. To date, DEP has yet to present an RRF with a NOV for either allowing recyclables to be delivered as MSW or for failure to inspect loads for recyclables. RRF owners and operators have little incentive to enforce recycling mandates. The facilities are always looking for MSW to use as fuel, so it may be difficult to turn away a hauler who is providing that feed stock, even if it is full of recyclables.

RRFs are required to report to DEP the tonnages received and town of origin for all the MSW delivered to the facilities. While scales at the facilities allow RRFs to determine the weight of a particular load, information about town of origin is typically obtained from the hauler. As described in Chapter III, haulers may misrepresent the town of origin for a load of MSW or take a load to the incorrect facility, all of which can contribute to inaccuracies in DEP's municipal data.

Since DEP does not regulate haulers directly, there is little state-wide information available about hauler monitoring. CRRA does collect some information on hauler violations. From FY 2007 to FY 2009, CRRA conducted over 26,000 inspections at five of the six RRFs.⁵⁴ There were approximately 1,600 violations noted, meaning that 6 percent failed inspection. Of those violations, only 99 were for recycling materials (less than 0.4 percent of inspections and 6 percent of total violations), while 320 were for various flow issues (i.e., misreporting the town of origin for a load, or going to the wrong facility). The remaining citations were a combination of safety issues and unacceptable wastes (i.e., bulky waste, hazardous waste, and household furniture).

Changing Statewide Capacity

There has been no change in the statewide RRF capacity since the most recently constructed facility began operation in 1995. Absent new landfill capacity or drastic increases in diversion rates, Connecticut needs more capacity at RRFs in order to become self-sufficient for disposal. RRF capacity can be increased in two ways: 1) create new facilities, or 2) expand existing facilities.

The creation of a new RRF in the state faces several potential challenges. In order to be permitted, any potential facility must meet or exceed a series of requirements from DEP as outlined further in Chapter VI. Of note, the geological requirements for a RRF are less rigorous than for a landfill, but there are still concerns about a potential location meeting environmental justice standards and overcoming any regional or local resistance to new waste facilities. A new facility would also have to demonstrate that there is sufficient need for additional capacity. The determination of need process is discussed in Chapter VI. While there is currently a capacity shortfall, it remains unclear whether additional capacity would be deemed necessary without the state meeting or exceeding MSW diversion goals.

Beyond the permitting process, facilities created today may face a different set of challenges than those faced by the existing facilities. The existing facilities were helped to be economically viable through the existence of flow control, long-term contracts, and favorable

⁵⁴ CRRA did not report performing inspections at the Bristol RRF.

energy sales, all of which made obtaining the necessary bonding and financial backing easier. While a new publicly-owned facility could still employ flow control to ensure some amounts of waste, it appears unlikely that many municipalities would be willing to enter into contracts with lengths of 20 years or longer. It also seems extremely unlikely that any new facility would receive long-term energy contracts that are well above market rates.

An extensive permitting process is also required in order to expand an existing facility. However, given the challenges associated with building a new facility, expansion of existing facilities seems to be a more straightforward way to increase statewide capacity. As there are already RRFs operating on site, expansions are not likely to face the same level of local opposition or siting issues of a new facility, although new DEP permits would be required. If all six of the facilities were able to increase their capacity by roughly one-third, the equivalent of adding a fourth processing line to a three line facility, statewide capacity would increase from approximately 2.2 million to 2.9 million tons of MSW a year.

It should be noted that not all of the six facilities are in a position to expand, and there are no guarantees that those with the ability to expand could increase their capacity by one-third. Further, even the estimate of an expanded yearly capacity of 2.9 million tons would barely meet the state's current disposal needs. Additional discussion of existing RRF expansion is in Chapter VIII. Both the population and the amount of MSW generated per capita have been steadily increasing over the last 10 to 20 years. If that trend continues, the state would again face an in-state disposal capacity shortfall, even if the existing RRFs were greatly expanded.

Landfills

While landfills and open burning dumps were once commonly used, changes in federal and state laws and regulations have affected the siting and use of landfills in Connecticut. Landfills, though a relatively cheap and widely used disposal method across the country, are the least preferred disposal method in Connecticut according to the statutory waste disposal hierarchy. This chapter includes several items of note about landfills including:

- the rules and regulations surrounding the minimum health and safety requirements for landfills have grown more stringent over time at both the federal and state level;
- the minimum requirements for landfills in Connecticut exceed the federally accepted minimums;
- burying MSW at landfills is the least expensive disposal option;
- the number of landfills in Connecticut has diminished, as few landfills of any type, and no MSW landfills, have been built in the previous 20 years;
- resources recovery, though a more preferred method on the hierarchy than landfills, has a landfill component; and
- some states, though not Connecticut, currently allow the beneficial reuse of ash residue.

History and Regulation

To gain a sense of why Connecticut stopped building landfills and prefers not to use them, it is important to look at the circumstances that led to their decreased use and favorability as well as what barriers exist to create additional landfills. Specific concerns over ground water protection and the consequent increase in federal and state regulation of landfills severely reduced the number of landfills in Connecticut and the nation.

Groundwater protection. One of the major reasons for moving away from the old, unlined landfills was to prevent the contamination of water, especially potable water, within the state. When the state began moving away from the old dumps many residents were reliant on well water. Regardless of the actual use of wells, it remains difficult to find parcels of land in the state that are not currently developed and do not have potential drinking water wells. In order to protect the drinking water, both federal and state laws and regulations have been enacted over the last 40 years.

Federal guidelines. The federal Environmental Protection Agency (EPA) has regulatory control over many aspects of waste disposal. The federal Resource Conservation and Recovery Act (RCRA) of 1976 amended the federal Solid Waste Disposal Act of 1965. RCRA Subtitle D set planning standards for state and regional entities, requiring that state planning for waste disposal “contain requirements that all solid waste ... shall be (A) utilized for resource recovery

or (B) disposed of in sanitary landfills” and “provide for such resource conservation or recovery and for the disposal of solid waste in sanitary landfills or any combination of practices so as may be necessary to use or dispose of such waste in a manner that is environmentally sound.”

Sanitary landfills. As part of ongoing technology improvements in waste disposal and the requirements of RCRA Subtitle D, EPA clarifies what constitutes a “sanitary landfill” and how it differs from open dumps. Federal standards for sanitary MSW landfills include:

- **Location restrictions**—ensure that landfills are built in suitable geological areas away from faults, wetlands, flood plains, or other restricted areas.
- **Composite liners requirements**—include a flexible membrane (geomembrane) overlaying two feet of compacted clay soil lining the bottom and sides of the landfill, protect groundwater and the underlying soil from leachate releases.
- **Leachate collection and removal systems**—sit on top of the composite liner and removes leachate from the landfill for treatment and disposal.
- **Operating practices**—include compacting and covering waste frequently with several inches of soil to help reduce odor; control litter, insects, and rodents; and protect public health.
- **Groundwater monitoring requirements**—requires testing groundwater wells to determine whether waste materials have escaped from the landfill.
- **Closure and postclosure care requirements**—include covering landfills and providing long-term care of closed landfills.
- **Corrective action provisions**—control and clean up landfill releases and achieves groundwater protection standards.
- **Financial assurance**—provides funding for environmental protection during and after landfill closure (i.e., closure and postclosure care).⁵⁵

State regulation. The state DEP also has regulatory control over solid waste facilities, including landfills. At minimum, Connecticut must impose the federal guidelines and requirements. In many cases, state statute and regulations are more stringent than the federal requirements. That the bar for environmental safety is raised higher by the state than is required federally appears to be largely a function of the state’s commitment to environmental responsibility and the particular circumstances that faced the state as the existing landfills were closed.

DEP permits solid waste facilities, as discussed in detail later in this chapter. Along with its permitting activities, DEP is responsible for ensuring that towns are fulfilling their obligations to provide for the safe and sanitary disposal of trash, including inspecting and, if necessary, citing violations at permitted waste facilities, including landfills.

DEP is also charged with overseeing the closure and post-closure activities of a landfill, discussed later in this chapter. DEP collects data from many closed landfills but, in general,

⁵⁵ 2008. Criteria for MSW Landfills. U.S. EPA. <http://www.epa.gov/epawaste/nonhaz/municipal/landfill.htm> (accessed August 21, 2009).

lacks the resources to thoroughly address the large amount of monitoring data that comes to the agency. DEP staff resources for landfill monitoring are prioritized to track landfills with previously established violations rather than looking for issues at landfills not previously flagged.

Lifecycle of a Landfill

Like many facilities, a landfill has an expected useful life. A landfill starts by obtaining the necessary permits. Once the permits are approved, the landfill site is prepared and eventually opened for daily operations. When the capacity of a landfill has been depleted, the landfill closes and begins a post-closure monitoring period. After a landfill is closed, it may be tapped to collect gases that build up during decomposition.

Permitting. The permitting process for a landfill is extensive and can take several years. Any entity, public or private, must invest resources in investigating potential landfill sites, acquiring the proper materials, and preparing an application for a permit. Once an application is submitted, it is reviewed by DEP, which focuses on two important aspects: the features of the proposed site and the need for additional disposal capacity within the state.

Siting. In addition to the federal regulations for sanitary landfills, DEP requires any potential landfill site to have a number of geological features, most notably, proximity to a large body of water that is not classified as a source of drinking water. The body of water creates a potential dilution point for the leachate if the liners and other preventative measures of a modern sanitary landfill fail. Trying to find bodies of water within the state that are both large enough to serve as a potential source of dilution but not of high enough quality to be used as drinking water is difficult.

A result of being a geographically small state with high environmental standards and an expressed preference to avoid using landfills is that the siting process for a new landfill is extensive. Industry personnel have taken exception to some of the fail-safe requirements as unnecessarily restrictive, but the DEP position is that the geological requirements serve as a backup should the required liners fail.

Determination of need. Beyond the physical location requirements, a written determination of need from the DEP commissioner is necessary for new or expansion permits for a landfill.⁵⁶ The first part of the determination of need process is identifying whether the combined capacity of all existing in-state facilities is sufficient to process the waste generated within the state. If a capacity shortfall is identified, the process then determines whether the proposed additional facility or expansion would leave the state with “substantial excess capacity.” If a proposed facility would result in excess capacity, the application will not be approved.

The determination of need process does not specify the time frame of need and thus does not necessarily consider long-term need and future planning. No consideration of adequate markets and/or competition in the state as a whole or within specific regions are contemplated by

⁵⁶ C.G.S. Sec. 22a-208d

the determination of need process. (Further discussion of the determination of need process is presented in Chapter X.)

Daily operation. Once a landfill has been properly permitted and constructed, the facility is ready to accept waste. Operation of a landfill is a relatively simple process, especially in comparison to operation of other disposal methods such as resources recovery. Most landfills begin as excavated pits with the necessary liners in place. Incoming loads are often unloaded in a central location within the landfill, then spread or compacted to allow the pit to be filled evenly as capacity is used. Daily operation of a landfill requires few expenses, needing little more than a scale, a way to move the trash (often a front-end loader or bulldozer), possibly a compactor, and the workforce to control the equipment.

Depending upon the capacity of the facility and the amount of waste (either MSW or ash residue) processed daily, landfills can remain open anywhere from a few years to several decades. While a landfill typically begins as a pit, they are closed when the pile of waste approaches the maximum permitted slope.

Industry personnel have estimated that the actual costs incurred before profit for a landfill may be \$5 to \$10 per ton for some landfills. As the expenses of landfills are quite low, so are the tipping fees in comparison to more capital intensive disposal methods. The SWMP indicates that tipping fees at out-of-state landfills in several states (e.g., Virginia, Ohio, and Pennsylvania) are often as low as \$20 to \$30 per ton. Ash-only landfills will be discussed later in this chapter.

Post-closure, monitoring, and land use. Ultimately, all landfills, regardless of type, are closed. In most cases, landfills are capped using some combination of synthetic material and soil, though, as discussed above, the requirements have changed with the adoption of sanitary landfill requirements. Current regulations require a landfill to be monitored for a number of water, soil, and air contaminants for at least 30 years after the landfill has been closed. A landfill is typically unavailable for land reuse immediately after its closure, but is often able to be repurposed as passive green space after certain milestones of post-closure have been met.

The responsibility for landfill monitoring typically falls on the landowner, often a municipality, unless the owner has made provisions with a separate operator. Monitoring data, including violations, are self-reported to DEP for documentation and further action as necessary. Landfills that were in use prior to the mandatory switch to sanitary landfills in the mid-1970s were not part of a permitting system, so records on the former town dumps are scarce. Current estimates are that there may be well over 300 unpermitted closed landfills, which go largely unmonitored unless a problem is discovered in nearby wells.

Landfill gas to energy. Landfills produce several gas byproducts as the materials within landfills decompose. Landfills can be fitted with wells that are able to capture the gas as it builds up. In some cases, the gas is of a high enough quality and density that it is able to be compressed and sold as fuel. In other cases, the gas is combusted on site. Depending on the facility, the combusted gas may provide power to some internal or external unit. In many instances, however, the quality of the gas does not warrant attaching expensive capital to a particular site, so the wells are used as exhaust valves to keep pressure from building up and to control the amount of gas that is allowed to escape into the atmosphere.

Landfill Usage

Landfills remain the primary source of MSW disposal nationally. In 2004, of the 390 million tons of MSW that were not recycled, 90 percent went to MSW landfills while only 10 percent were disposed of at RRFs.⁵⁷ It is estimated that there are over 1,800 active MSW landfills in the country, compared to around 100 RRFs. Connecticut's use of landfills differs greatly from the national average. In the late 1960s, Connecticut had at least 144 municipal landfills – now there is only one landfill in Connecticut that is permitted to accept MSW.⁵⁸ The remaining MSW landfill, in Windsor, has approximately 126,000 tons of MSW capacity remaining, which is estimated to be filled by 2015.⁵⁹ Table VI-1 shows the current number of active landfills permitted by the DEP.

Table VI-1. Landfill Use in Connecticut as of July, 2009	
Active Landfills by Type of Material Accepted	Number
MSW	1*
Bulky Waste (e.g., land clearing debris)	26*
Ash	1
Special Wastes	3
Source: DEP	
* Windsor landfill included in counts for both MSW and BW	

As there is little available in-state landfill capacity, most of the MSW generated within the state that exceeds the fixed capacity of the RRFs is exported, where it will likely be disposed of at a landfill. In FY 2008, approximately 261,000 tons of MSW were sent out of state. As statewide generation grows, so will the dependence on out-of-state landfills, despite the fact that both use of landfills and exporting MSW go against the stated goals of the SWMP.

Ash Residue

Beyond the state's position on the use of MSW landfills, there is a landfill component to the more preferred disposal method of waste-to-energy. Ash residue is a byproduct of the resources recovery process. The residue ash has about 10 percent of the volume and 20 to 30 percent of the weight of the original MSW. The ash itself is a combination of fly-ash, which is known to contain potentially dangerous amounts of heavy metals, and bottom ash, which is typically considered to be non-hazardous.

The bottom ash, as its name suggests, is the non-combustible or non-combusted material that remains at the bottom of an incinerator after being processed. The fly-ash, the portion that goes up the chimney of an incinerator, is sent through air quality control filters and often mixed with a treatment, such as a type of lime slurry, to help counteract some of the negative elements before being further combined with the bottom ash. The combination of bottom ash and fly ash is the material referred to as ash residue. The ash residue must be disposed of, and in Connecticut the only legal disposal method for ash is landfilling.

⁵⁷ "The State of Garbage in America." *BioCycle* 47.4 (2004): 26-40.

⁵⁸ Number of landfills cited in *Annual Plan of Operations for FY 2008 and 2009*, CRRA. January 2008.

⁵⁹ Capacity and use estimates prepared by Fuss & O'Neill for the Town of Windsor

From 1999 through 2008, there were two ash landfills in the state, in Hartford and Putnam. The closure of the Hartford landfill at the end of 2008, which had been accepting both MSW and ash in separate sections, left the Putnam ash landfill, owned by Wheelabrator Technologies Inc., as the only remaining in-state ash disposal facility for 2009 and beyond.

According to the SWMP, the Putnam facility had approximately 6.7 million tons of remaining capacity as of the end of 2004. The SWMP estimates that the Putnam facility may exhaust the rest of its remaining capacity in 2018; however that estimate is based on the assumption that all the ash from the six in-state RRFs would be disposed of at the Putnam facility. Since the SWMP was published, only two of the RRFs [Lisbon and Bridgeport - operated by Wheelabrator] have consistently brought all their ash to the facility. The Southeast RRF in Preston uses the Putnam facility to dispose of a portion of its residue ash and CRRA began bringing the ash from the Mid-Connecticut facility to Putnam in 2009.

A more recent survey of remaining space provided by Wheelabrator was calculated at the close of FY 2009. The survey indicated that the remaining space could hold an additional 7.6 million tons. At the current ash disposal rate of approximately 450,000 tons per year, the Putnam landfill could remain open, without expansion, for nearly another 17 years.

Ash Reuse

Ash residue is a substance that hardens over time and sets up with a consistency close to that of concrete. Ash residue has several potential methods of reuse, including as an ingredient for asphalt or concrete, and their many derivatives such as shingles, paver blocks, or road sub-base. According to a recent survey, Florida, Massachusetts, Pennsylvania, Maryland, New Hampshire, New York, Hawaii, and Missouri allow at least one type of beneficial use of ash residue.⁶⁰ In most cases, the eight states allow ash residue to be used as a component of asphalt, as road base, or as supplemental material for landfills (i.e., daily cover or under liner base).

Connecticut law requires a permit in order to reuse MSW ash residue, but to date, no formal application has been submitted. Since there are no ash reuse methods in place within the state, it is unclear whether methods used in other states would meet the environmental standards of DEP.

Permitting issues aside, unless a reuse method develops that proves to be more cost effective than using an ash-only landfill, it is not likely a market exists for items that contain reused ash. It should be noted, however, that there are reuse programs in place for coal ash, which has similar characteristics to MSW ash residue. DEP has indicated that the reused coal ash has effectively flooded any market there may be for MSW ash residue.

⁶⁰ “2006 Beneficial Use Survey Report” November, 2007. Association of State and Territorial Solid Waste Management Officials.

Recent Developments

In 1989, DEP published a report that indicated there were 13 sites around the state that appeared to meet minimum siting requirements for an ash landfill, including the necessary large body of water among the other requirements. In the twenty years since the study was published, at least four of the potential sites have been developed for other uses or otherwise eliminated from consideration. By statute, CRRA, by itself or through a regional resources recovery authority, may establish not more than two ash landfills on either side of the Connecticut River. For a new ash landfill to be cited in the state, it likely would have to be located at one of the nine remaining locations indicated in the DEP report.

CRRA recently investigated the possibility of siting an ash landfill at one of the potential sites in Franklin, Connecticut. CRRA pursued the landfill while stating that a publicly owned ash landfill could save municipalities money in the long-term while providing additional in-state infrastructure to support the RRFs. CRRA's geological testing showed that the Franklin site would meet the criteria set forth by DEP. However, CRRA's board of directors decided in August 2009 to suspend its pursuit indefinitely "based on its understanding of the directives received from State leaders."⁶¹ At that time, CRRA also made known its intention to pursue other low-costs options for ash disposal.

⁶¹ "CRRA Resolution Regarding Ash Landfill Initiative". CRRA. August 27, 2009.
<http://crra.org/documents/press/2009/CRRA_board_resolution_regarding_ash_landfill_8-27-2009.pdf>

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Adequacy of the Solid Waste Management System

The adequacy of the solid waste management system as a whole is examined in this study by considering system-wide activities and broad measures of outcomes compared to state policies and goals.

Any discussion of outcomes should begin with the state's articulated goal for the solid waste management system. One key legislative finding about solid waste management embedded in the Solid Waste Management Services Act (SWMSA) enacted in 1973 is that "...the people of the state of Connecticut have a right to a clean and wholesome environment."⁶²

Many factors contribute to a clean and wholesome environment. This chapter focuses on how well the solid waste management system provides safe and sanitary disposal options that contribute to a clean environment, and if those practices are consistent with state policies and goals. Specifically, changes that have occurred over time in the number of active landfills, water quality, and how well the system is managed compared to the solid waste hierarchy are reviewed. Some descriptive information from earlier chapters is presented again for easier reference, and expanded upon as necessary. Recommendations based on committee findings are set out in Chapters X and XI.

Summary of Findings:

- significant progress has been made by the state of Connecticut in reducing its dependence on permitted in-state landfills; the picture is less clear on the trend in the number of unpermitted landfills;
- the environmental impacts of reducing reliance on landfills as a disposal option have not been systematically measured;
- efforts aimed at reducing the amount of solid waste generated within the state (source reduction) are not sufficient, according to the waste hierarchy established in statute;
- although the initial legislatively mandated recycling rate goal appears to have been met in the 1990s, the recycling rate goal established by the legislature for the year 2000, a decade ago, has never been met;
- waste stream analysis shows much of the MSW that is being disposed of at resources recovery facilities contains materials that are already required to be recycled or are a type of plastic that generally has a readily available market;
- most of Connecticut's solid waste is disposed of at in-state resources recovery facilities and those facilities are at their maximum useable capacity;
- while MSW landfill capacity in Connecticut has purposely declined, the amount of waste being exported, mostly to out-of-state landfills, has increased, which conflicts with state policy; and

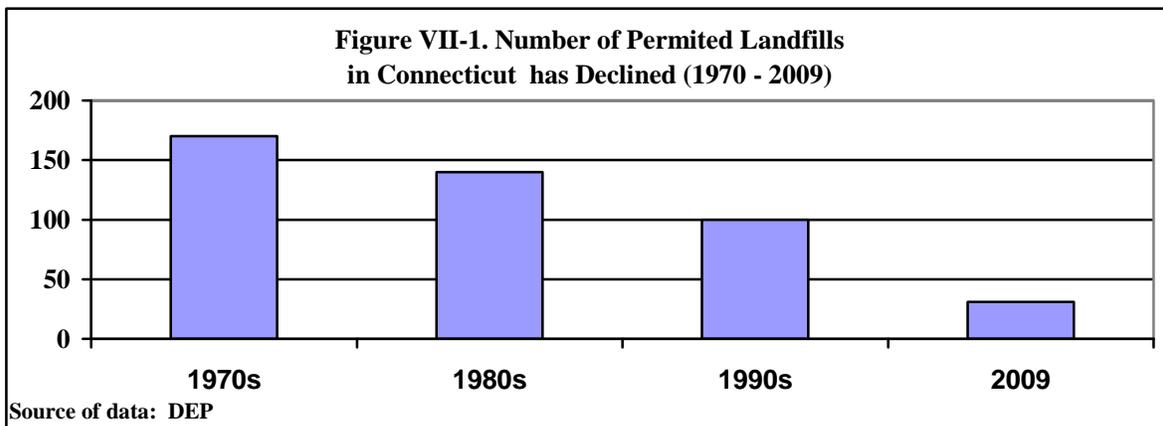
⁶² C.G.S. Sec. 22a-258

- without the use of out-of-state disposal facilities, Connecticut’s disposal system is not sufficient to process the waste generated in the state.

Number of Landfills

One of the principal reasons for developing a network of resources recovery facilities and mandating the recycling of certain items was to reduce Connecticut’s dependence on landfills for the disposal of waste. The state’s 1973 Solid Waste Management Services Act declared that “the prevailing solid waste disposal practices generally, [i.e., landfills] throughout the state, result in unnecessary environmental damage, waste valuable land and other resources, and constitute a continuing hazard to the health and welfare of the people of the state.”

Number of permitted landfills in Connecticut. Figure VII-1 shows the approximate number of permitted landfills in Connecticut for each decade from the 1970s through the 1990s, as well as the actual number in 2009. This includes MSW, ash residue, and bulky waste landfills, as well as other special waste disposal areas. The number of permitted landfills has steadily declined from about 170 in the 1970s to 31 in 2009. Clearly, significant progress has been made by the state of Connecticut in reducing its dependence on in-state landfills.



Rate of illegal dumping and unpermitted landfills. The trend in the rate of illegal dumping and the number of in-state unpermitted landfills is not readily tracked by DEP. In fact, DEP does not maintain a comprehensive list of unpermitted landfills. Department staff estimate conservatively that over 300 unpermitted waste disposal areas exist, many of which were established and used before permitting was mandatory. This number is based on the department’s involvement in solid waste closure or remediation activities. Each year, additional unpermitted sites are discovered while developing property, remediating brownfields, investigating complaints, and similar activities.

Environmental Impacts

Any disposal option has environmental impacts on air, land, and water quality. One goal of Connecticut’s shift to the use of RRFs was to protect the state’s water quality by nearly eliminating the use of in-state MSW landfills. Thus, part of the success of the state’s strategy could be broadly measured in terms of the solid waste management system’s impact on the

environment. Two key questions since the introduction of RRFs would be: 1) how has water quality changed and 2) how has air quality been impacted.

Landfills. About 15 percent of Connecticut's population relies on ground water, while 85 percent is dependent on surface water as a source of drinking water.⁶³ Either type is vulnerable to potential contamination from a variety of sources.

Neither DEP nor the Department of Public Health (DPH) have any readily available trend data on the quality of Connecticut's surface or ground water. For example, DPH, which oversees drinking water quality, collects data on water quality for specific water systems but does not generally collect data to measure trends because its focus is mainly on compliance within a specific monitoring period. What is known is that old landfills have and continue, from time to time, to contaminate wells in Connecticut.

There are a number of potential ways that landfills could impact the environment. Landfills, though, have been strictly regulated under federal and state statutes since the implementation of RCRA regulations in 1976. Landfills since that point have specific construction and operation standards that must be followed that limit the impact of contamination of surrounding land and waterways. Landfills can generate large amounts of methane and carbon dioxide. DEP could not provide estimates what the effect on air quality would have been of having landfills instead of RRFs.

Resources recovery facilities. Resources recovery facilities are regulated under state and federal law, including RCRA, the Clean Air Act, and the Clean Water Act. A RRF is required to obtain air emission and waste water discharge permits that require the permittee to monitor and report various air emissions and any discharges that could cause adverse impacts to human health and the environment. The facilities are inspected once every two years by DEP. This on-site evaluation of compliance status includes a review of required reports and records, and an assessment of control device and process operating conditions for all emission units located at the facility. Partial compliance evaluations may be conducted within the two year timeframe if follow-up inspections are deemed necessary and/ or a complaint is received regarding the facility.

The primary pollutants of concern for these facilities, on an ongoing basis, are sulfur dioxide, nitrogen oxides, carbon monoxide, particulate matter, cadmium, lead, mercury, dioxin/furan, hydrogen chloride, opacity (visual and fugitive ash emissions) and ammonia (as applicable, dependent on whether ammonia is used for nitrogen oxide control). Emissions of other pollutants may be evaluated if deemed necessary. Both federal and state statutes strictly regulate these emissions.

There are basically two forms of emissions testing. The first, continuous emissions monitoring (CEM), is performed for sulfur dioxide, nitrogen oxides, carbon monoxide, and opacity emissions. In addition, air pollution control device and process operations are continually evaluated by measuring such items as combustion temperature, particulate matter, and other process measures. Both quarterly reports and reports of any deviations from certain

⁶³ *Drinking Water in New England*, Environmental Protection Agency, October 6, 2008 (http://www.epa.gov/region01/eco/drinkwater/ne_drinkwater.html)

parameters are required under law. The second type of emissions testing requires a facility to perform annual testing for particulate matter, cadmium, lead, mercury, dioxin/furan, hydrogen chloride, ammonia, and fugitive emissions. It should be noted that DEP no longer conducts its own testing at RRFs. RRFs are reimbursed through the Solid Waste Fund account for the emission testing costs. Since the RRFs hire the test contractors and DEP no longer conducts its own testing, there is no opportunity for any “surprise” testing.

The DEP Bureau of Air Management’s point source inventory tracks emissions of the following pollutants: Volatile Organic Compounds (VOC), Nitrogen Oxides (NOx), Carbon Monoxide (CO), Particulate Matter less than 10 microns in diameter (PM10), Sulfur Oxides (SOx), and Lead (PB). According to that database, the total amount of pollutants (i.e., only those listed above, so, for example, Carbon Dioxide (CO2) is not included) emitted to the ambient air in 2008 from all RRFs in Connecticut was 4,272 tons. Program review staff obtained enforcement data from DEP regarding air violations for the RRFs in Connecticut since 1990, which is summarized in Table VII-1.

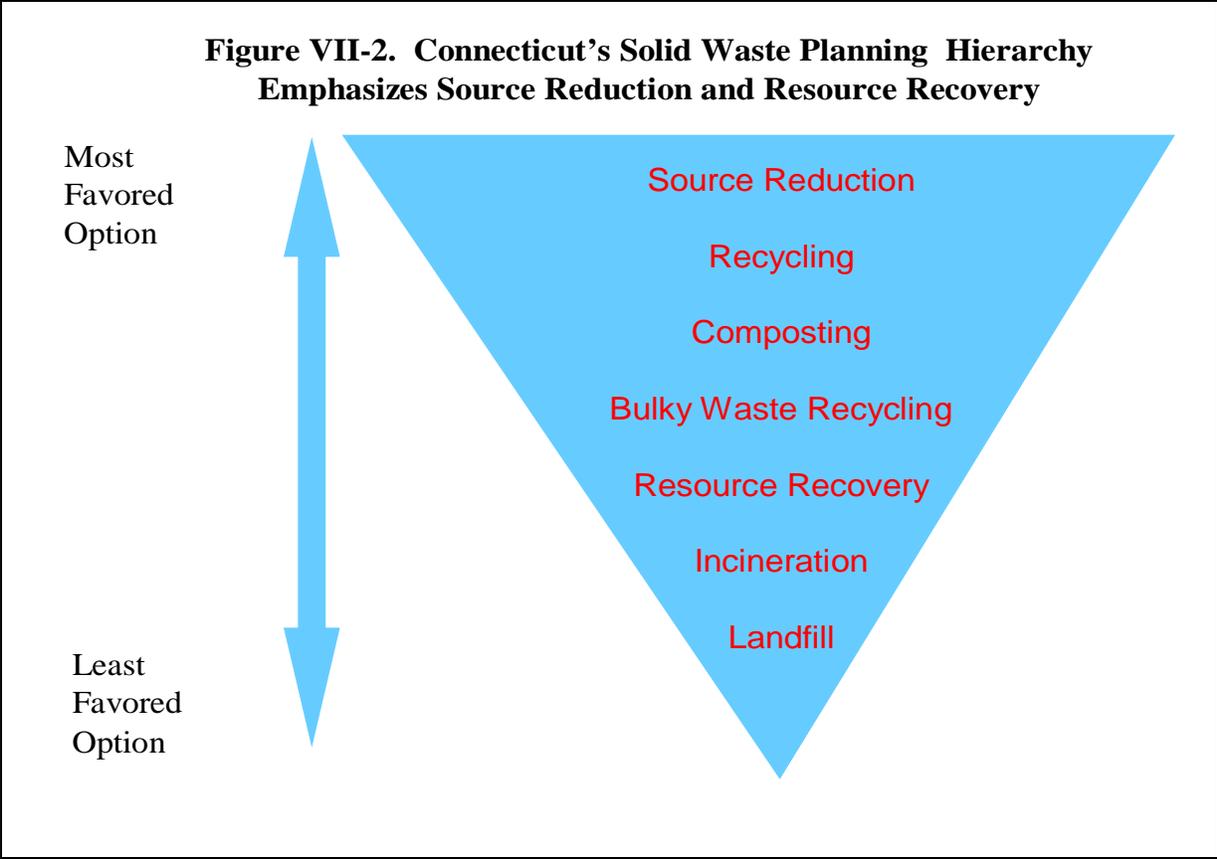
	Informal Actions	Formal Actions	Total
Mid Connecticut (Hartford)	10	7	17
Bristol	4	3	7
Bridgeport	7	2	9
Wallingford	10	5	15
Lisbon	0	0	0
Preston	0	0	0
Total	31	17	48

Source: DEP and PRI calculations

RRFs also have a land-related impact because the six plants operating in Connecticut produce about 550,000 tons per year of ash residue. Connecticut regulations require specific management and disposal requirements for ash landfills.

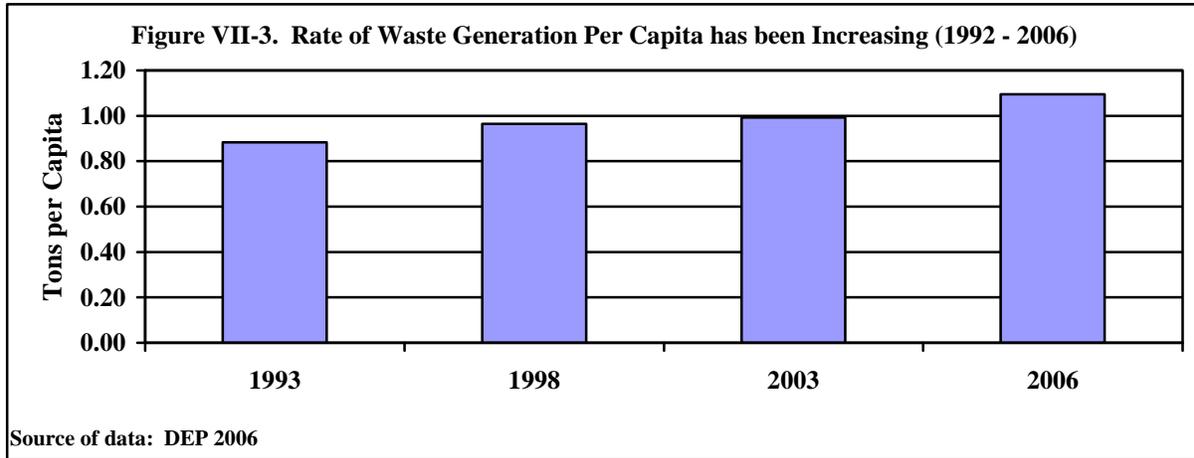
Waste Hierarchy

As noted earlier, state statutes require that DEP’s State Solid Waste Management Plan establish goals to manage waste according to a preferred hierarchy. The various approaches to solid waste management are listed in statute in a priority order as depicted in Figure VII-2. The first four activities, considered solid waste diversion strategies, are intended to avoid the problem of disposal altogether. Resources recovery facilities and landfill disposal are the last two options. (Incineration without energy recovery is no longer permitted in Connecticut). How well the state has followed these waste management methods is examined below.

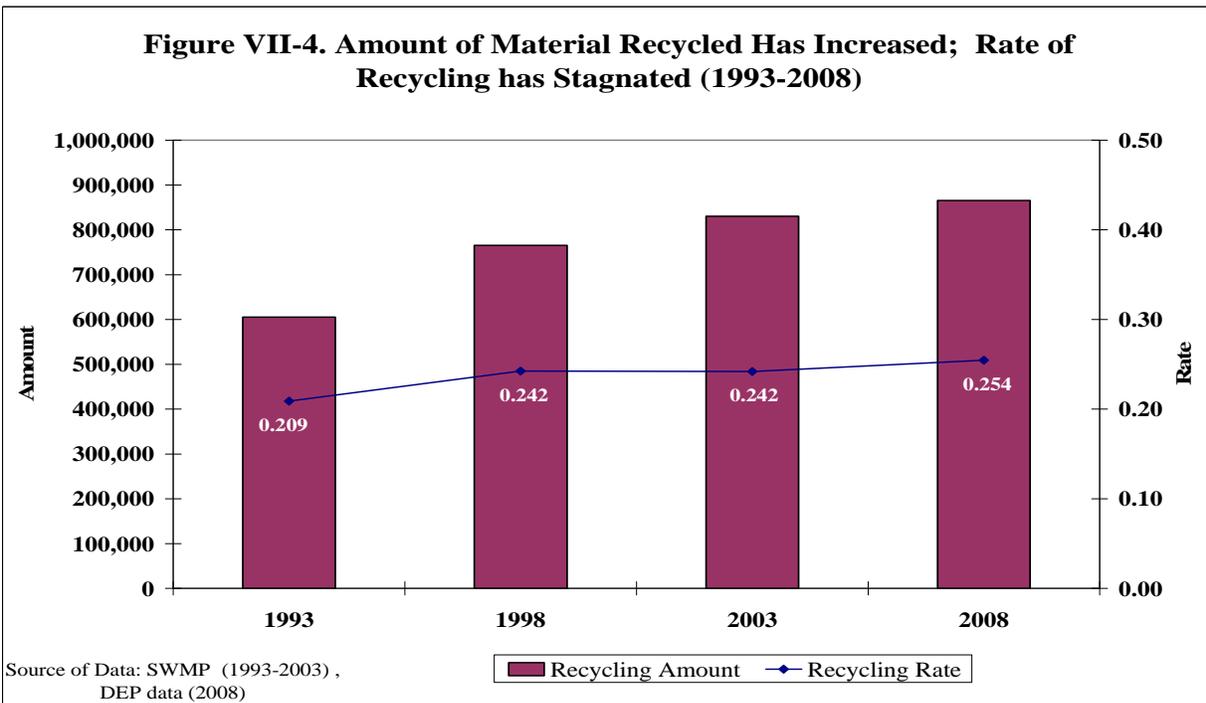


Source reduction. Source reduction refers to those activities that reduce both the *toxicity* and the *amount* of solid waste generated in Connecticut. It is the highest priority in managing solid waste and one of the more difficult waste management practices to implement because it requires both consumers and product manufacturers to change routine behaviors and procedures. Overall measures of the change in waste toxicity are difficult to find. However, there have been a number of voluntary and legislatively mandated actions to reduce the amount of toxicity of certain products. These include Public Act 02-90, which created a comprehensive program to nearly eliminate the amount of mercury in consumer and commercial products, and the recently passed electronics recycling law (PA 07-189), which requires manufacturers to finance the transportation and recycling of computers, monitors, and televisions.

A number of actions have been taken by individuals, businesses, and government that have contributed to the reduction in the amount of MSW generated. These include various industrial efforts to reduce the weight of products and packaging, pay-as-you-throw programs that require generators to pay more if they dispose more waste, and the operation of “swaps” at transfer stations to encourage the reuse of products. One way to measure how well source reduction efforts are impacting solid waste generation is to look at the amount of MSW generated per person in Connecticut. Figure VII-3 shows that the amount of MSW generated has been steadily rising since 1992. This indicates that source reduction efforts in Connecticut are not sufficient.



Rate of recycling. Recycled material in Connecticut includes items mandated through state regulation (i.e., corrugated cardboard, glass and metal food containers, leaves, newspaper, office paper, scrap metal, batteries, and waste oil) and non-mandated items (e.g., plastics, magazines, mail, coated paper beverage cartons, telephone directories, and boxboard). Composted material, which at the present time in Connecticut chiefly means leaves, is a form of recycling and included in the recycling rate.



Since the early 1990s, the amount of MSW generated in total and per capita has climbed steadily upward. The amount of waste that is recycled and marketed has also consistently grown. However, the ratio of recycled to disposed waste has not changed much after an initial surge in the early 1990s, as can be seen in Figure VII-4. The result is that, while the recycling rate remains steady, the total amount of MSW that must be disposed continues to increase.

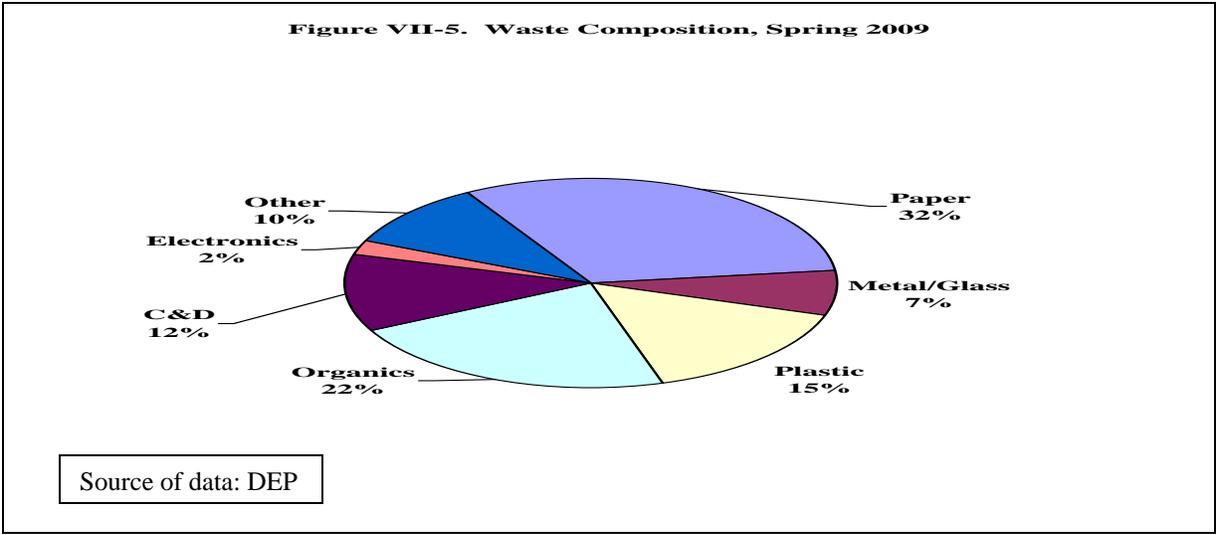
As explained before, in 1990, the legislature established a statewide recycling rate goal of 25 percent. In 1991, mandatory recycling, both residential and non-residential, was enacted. It appears the state had met the initial recycling goal of 25 percent by the early 1990s, and in 1993, the legislature established a new recycling and source reduction goal of 40 percent by 2000. As Figure VII-4 shows, this goal has not been met. The current rate remains at about 25 percent (not including bottle bill deposit returns, auto scrap, home composting, and certain commercial recyclables).

According to estimates in the 2006 SWMP, the recycling rate in 2005 with the deposits based recyclables included was about 30 percent. It is arguable that the state has been meeting the original recycling rate goal of 25 percent, but even the estimate of 30 percent falls short of the revised statutory goal of 40 percent. Further, as noted before, the SWMP predicts that, in order to be able to continue to meet statewide disposal demand without exporting to other states, the statewide recycling rate needs to increase to 58 percent by 2024.

It appears that the current recycling system was adequate to meet the original diversion goal of 25 percent, but may not be capable of meeting higher recycling goals. It remains to be seen how several recent developments, such as adjustments to the deposit laws and capital upgrades at recycling processing centers that allow for a simpler recycling process (i.e., single stream), will impact the statewide recycling rate.

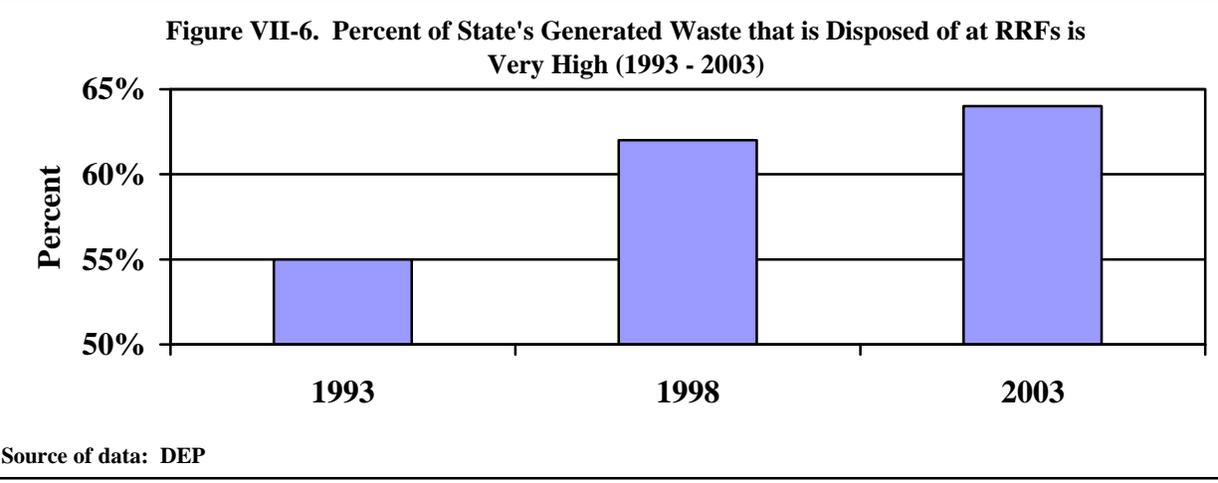
Waste characterization. One strategy in the SWMP requires that DEP conduct a solid waste characterization study for the purpose of better targeting waste disposal diversion efforts and estimating associated costs for managing the waste stream. The State-wide Solid Waste Composition and Characterization Study will estimate the actual composition of disposed municipal solid waste. The study will give DEP a snapshot of what is currently in the Connecticut MSW waste stream and will provide information to guide DEP on what material to select to enhance the recycling system and to consider for other disposal diversion activities.

The study is being carried out over the course of two seasons, with waste sampling activities occurring at five permitted solid waste facilities throughout the state. An interim report was completed and contains the preliminary results of the first round of sampling and analysis. Figure VII-5 shows the results of this first analysis.



According to the figure, about 22 percent of the MSW waste stream is composed of organics, a potential new target for additional diversion efforts. The majority of the waste stream (54 percent) is composed of paper, metal, glass and plastics. Most of the paper, metal and glass components are already required to be recycled, and most towns offer plastics recycling, though not necessarily all types of plastics. Thus, the study not only shows where there are new opportunity areas but also where current efforts may need to be redoubled.

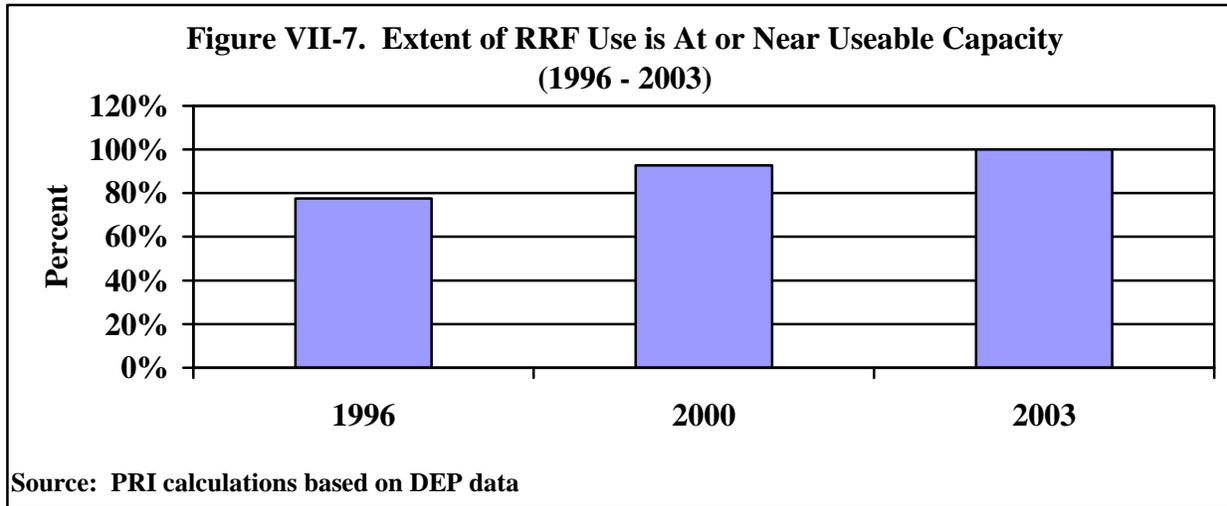
Resources recovery facilities. Resources recovery through waste-to-energy plants is the second to last waste management strategy in statute. Among the various “declared policies of the state of Connecticut” articulated in the Solid Waste Management Services Act is “that maximum resources recovery from solid waste” is an environmental goal of the state. Figure VII-6 shows that the percentage of MSW disposed of at the six RRFs has been increasing since 1993. About 64 percent of generated MSW is disposed of at an RRF in Connecticut.



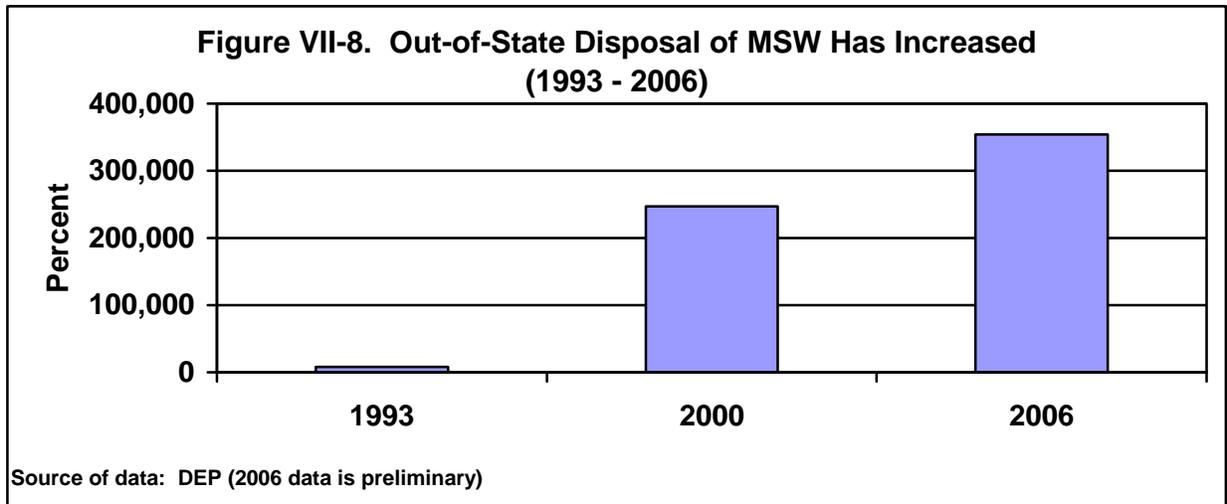
As described earlier, currently, the six RRFs in Connecticut have a permitted capacity of approximately 2.6 million tons of MSW per year. Wallingford, the smallest in Connecticut, has a

permitted capacity of 420 tons/day. The largest in Connecticut, Mid-Connecticut (Hartford), has a permitted capacity of 2,850 tons/day.

As explained in the Chapter I overview, permitted capacity is a maximum amount, not assumed to be actually useable due to maintenance and other operational aspects. A standard estimate of useable capacity is 85 percent of permitted capacity. Figure VII-7 shows the extent of RRF use compared to the useable capacity of RRFs. Connecticut's resources recovery facilities are at about their maximum useable capacity.



Landfill use. Also as described in the Chapter I overview, according to DEP, in FY 2008, 4.8 percent of MSW was landfilled in Connecticut, while 7.7 percent was disposed of outside of Connecticut (mostly in landfills). Landfill capacity for MSW in Connecticut is now virtually nonexistent, as most of the MSW landfilled in the state in FY 2008 was sent to the now-closed Hartford landfill. As reported to DEP, by 2015 the one remaining Connecticut MSW landfill (Windsor/Bloomfield) will be at capacity and/or closed, at which point all MSW must go to either Connecticut RRFs or be shipped out of state. As seen in Figure VII-8, the amount transported out of state, though, has been increasing from about 27,000 tons in FY 1994 to about 354,000 tons in FY 2006. (This does not include the landfill capacity that is needed for some of the non-processible residue produced at the RRF in Hartford). This trend of increasing use of landfills, regardless of their location, appears to conflict with the waste management hierarchy.



As noted above, a RRF requires the use of a landfill to dispose of the ash residue generated as a byproduct of the plant's operation. The plants in Connecticut generate about 550,000 tons of ash per year. Thus, the amount of material generated by Connecticut citizens that is disposed at landfills that is either MSW or the result of burning MSW totaled about one million tons in FY 2008 and is expected to grow.

Self Sufficiency as a Public Policy Goal

In-state disposal facilities cannot process all the MSW that is produced in Connecticut – the shortfall for MSW in FY 2008 was about 260,000 tons.⁶⁴ The DEP projects that by 2024 the MSW disposal shortfall will grow to about 1.5 million tons, assuming the current diversion rate remains constant. The SWMP sets as a primary state goal that the state will increase diversion rates from roughly 30 percent steadily up to 58 percent by 2024 to meet the projected growth in MSW with the current level of RRF capacity.

A key premise underlying the SWMP is the idea that the state should be self-sufficient for waste disposal. This means that Connecticut should have adequate disposal capacity for the waste generated in the state that needs disposal. The department has stated that it will use its authority as much as possible to follow this approach.⁶⁵ Acceptance of this premise has important implications for the policy choices that lawmakers would have to consider to ensure self-sufficiency. These implications involve the possible imposition of: additional system costs; new mandates on municipalities, businesses and individuals; and increased regulation. Aside from the barriers discussed further below, these implications are explored further in the policy options presented in Chapter X.

Risks of not being self-sufficient. Every state imports and/or exports waste. In fact, nine states export more than one million tons of MSW per year to other states, including New

⁶⁴ Shortfall would be larger today, by at least 135,000 tons, because of the closure of the Hartford landfill.

⁶⁵ Connecticut Department of Environmental Protection, *State Solid Waste Management Plan*, Amended December 2006. p.p. I-4

York, New Jersey, and Massachusetts.⁶⁶ Moreover, many specialty wastes (e.g., medical waste) are handled on a regional basis due to cost efficiencies. However, stakeholders cite a number of reasons why self sufficiency is a good public policy goal, including a number of potential risks the state would be exposed to without the ability to manage almost all of its own solid waste. These risks relate to not having reliable, readily available, and economical disposal options that are also compatible with Connecticut's environmental policies. Some of these cited risks are described below.

- *Loss of control.* By relying on out-of-state disposal facilities, Connecticut is subject to other states' policies and regulations that, if changed, could serve to limit access to disposal facilities in other states without much notice or subject Connecticut municipalities to a price shock. Although solid waste is considered a commodity and has certain protections from undue state regulation as interstate commerce, an individual state does not always look with favor on being an importer of solid waste. One method used to reduce imports is for a state to impose a uniform fee or tax on top of tip fees. For example, Pennsylvania has been a leading importer of solid waste in the nation but its waste imports have been declining since 2003. A principal factor has been the imposition of an additional \$4.00 per ton state fee on waste disposal, which was levied on top of the per ton disposal charge.⁶⁷
- *Transportation costs.* Typically, solid waste that is exported from Connecticut is transported in large, long-haul trucks. Price fluctuations in the cost of fuel and other expenses can lead to volatility in the cost of disposal. The development of long-haul rail options can mitigate some of the price impact but requires the development of such capacity in Connecticut. Rail can also limit where the waste can be sent because the receiving disposal area has to be served by rail or be a short distance from a rail transfer station.
- *Liability.* Although landfills are supposed to be permitted and properly monitored by government agencies, there is some risk that the facilities may not be properly operated. In addition, enforcement and permitting of facilities in other states may not be as stringent as Connecticut. Among other problems, this may leave Connecticut municipalities open to liability concerns under the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).⁶⁸ Connecticut municipalities and resources recovery authorities have been subject to CERCLA liability in the past. For example, during the construction of the Bridgeport RRF, CRRA had arranged for solid waste to be shipped to various landfills. One of those landfills in New Jersey, which received less than 100 tons of waste from Connecticut, was later determined to be a hazardous waste site. Allocation of financial responsibility is still being worked out.

⁶⁶ Congressional Research Service, *Interstate Shipment of Municipal Solid Waste: 2007 Update*, James E. McCarthy, Updated June 13, 2007 Report RL34043

⁶⁷ Ibid

⁶⁸ See footnote 26.

- *Environmental impacts.* Transporting waste out of state has environmental impacts. Both truck and rail haul options produce air emissions from diesel fuel that are a public health concern. For example, DEP has estimated that if 400,000 tons of MSW were transported to landfills in eastern Pennsylvania with an average round trip distance of about 400 miles from central Connecticut, about 200 tons of diesel engine pollutants would be added to the air per year. (Rail does have fewer emissions per mile traveled. Emission from truck transportation is about 2.8 to 5.0 times greater than rail transportation over the same distances.) By contrast, studies have shown that diesel trucks transporting MSW from New York City to Pennsylvania and Virginia emit five times more particulate matter per ton than if combusted in more local RRFs.⁶⁹ Aside from emission concerns, both rail and truck transport have other potential health and safety impacts, such as increases to traffic congestion (for trucks), litter and leakage of waste not properly contained, and leakage of hydraulic oil and fuel spills.
- *Consistency with Connecticut's own policies.* Due in large part to concerns about environmental impacts, the state of Connecticut has purposely reduced its dependence on in-state landfills in policy pronouncements, regulation, and in actual practice. Some argue that to proceed in a manner that allows Connecticut's MSW to end up in landfills in other states raises concerns about the appearance of a double standard.

Barriers to self-sufficiency. In addition to the various risks cited above by not achieving self-sufficiency, barriers to achieving self sufficiency exist:

- *Siting considerations.* It is difficult to site any type of solid waste facility in Connecticut. These facilities take a long time to develop, are usually costly to permit, and have a limited number of areas that would meet Connecticut's siting requirements.
- *Public opposition.* There is often significant local opposition to any type of proposed solid waste facility in Connecticut. One example of this opposition was the 2009 Senate Bill 3, which would explicitly ban the construction of either an ash landfill in Franklin or an organic digester in Waterbury. There are real and perceived negative impacts associated with construction and operation of solid waste facilities, from traffic concerns to runoff. There is also a public perception that combustion in RRFs and landfill operations are hazardous to public health.
- *Desire for economical solutions.* As will be discussed later, out-of-state facilities have the potential to be competitive compared to in-state options.

⁶⁹ Connecticut State Solid Waste Management Plan, DEP, 2006 p. 1-18

RRFs are costly to construct and an uncertain electric market makes this type of disposal a more speculative venture.

- *Environmental justice concerns.* Both Public Act No. 08-94 and DEP's Environmental Justice Policy require that "Environmental Justice Communities" are provided enhanced notice leading to "meaningful public participation" in the siting and permitting processes for solid waste facilities. Any changes to or expansions of Connecticut's waste management system must ensure that no segment of the population bear a disproportionate share of the risks or consequences of environmental pollution.

Further discussion on self-sufficiency is found in the next chapter, which examines the sustainability of MSW disposal in Connecticut.

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Sustainability

In this chapter, the sustainability of the municipal solid waste services industry is examined, in whole and by component. For the purposes of this report, sustainability is judged on whether the system is capable of disposing of its waste while maintaining the status quo for 20 years in regard to infrastructure, waste generation growth, and diversion rates.

A key issue regarding sustainability is the concept of self-sufficiency. Where applicable, this chapter will discuss whether the current system is sustainable with and without the premise of self-sufficiency.

Several key committee findings relate to sustainability, including that:

- existing RRF capacity is likely to continue to be available for at least the next 20 years;
- in-state RRFs do not now have the processing capability to handle the entire state's disposed MSW;
- the determination of need process for siting additional disposal capacity prevents the development of excess disposal capacity, which is at odds with the creation of a self-sufficient system;
- in-state ash disposal capacity is insufficient to handle the ash produced in state over the next 20 years;
- out-of-state landfill capacity for MSW and ash is abundantly available and will likely continue to be for at least 20 years;
- the municipal waste services system is incapable of self-sufficiency as currently constructed;
- a primary barrier to self-sufficiency is lack of in-state landfill capacity for MSW or ash; and
- the sorting facilities for the most commonly accepted recyclable materials (e.g., bottles, cans, paper) are currently operating far below capacity.

In-State Sustainability for Disposal

In-state disposal of MSW relies on two primary methods: resources recovery facilities and MSW landfills. Resources recovery facilities are the primary disposal facility for non-recycled MSW and as such are an important part of the long-term sustainability of the state's MSW services. Landfills are no longer relied on in Connecticut as a primary means of disposal. The specific issues that surround the sustainability of MSW disposal are: RRF longevity, RRF capacity, and sufficient RRF ash residue and MSW landfill capacity.

RRF longevity. The six in-state RRFs provide approximately 2.2 million tons of disposal capacity per year. Five of the six facility owners/operators indicated that their facilities

are projected to have a useful life well over the 20 year time-frame used in this sustainability discussion. The only facility that did not project over 20 years was the Mid-Connecticut plant in Hartford, which was projected in 2008 to continue operation until at least 2028. There is little reason to believe that with proper maintenance and current operating procedures that any of the RRFs will cease operations within the next twenty years. Reliance on the current facilities as a significant source of disposal seems reasonable as part of a sustainable policy going forward.

RRF capacity. Reliance over the next 20 years on current in-state RRFs for the disposal of all MSW generated in Connecticut not reasonable, and it is not occurring presently. In order to achieve self-sufficiency for disposal services, the amount of waste generated in state, minus the amount diverted through recycling, must be equal to or less than the available disposal capacity in the state.

The combined capacity of the in-state RRFs is approximately 2.2 million tons per year, significantly less than both the 3.4 million tons generated and the 2.5 million tons disposed in FY 2008 . Because of the capacity shortfall, the system is not currently capable of self-sufficiency.

RRFs as volume reduction facilities. RRFs do not eliminate the need for landfill-based disposal, as landfills are needed to dispose of the ash residue by-product of the waste-to-energy process. For the purposes of sustainability, RRFs are more accurately viewed as volume reduction facilities, not as final disposal facilities. Even if there was sufficient RRF capacity to process all MSW needing disposal in the state, the remaining ash landfill capacity currently within the state is insufficient for the 20 year timeframe.

Landfills. As explained earlier, landfills are sparsely used in Connecticut as a means of disposal; as of December 2009 one MSW landfill (in Windsor) and one ash landfill (in Putnam) have remaining capacity available. The remaining capacity in either landfill is insufficient to meet state-wide need for the next 20 years.

MSW landfill. The lone remaining landfill permitted to accept MSW has approximately 126,000 tons of remaining capacity, which is estimated to be filled by 2015. The total remaining capacity of the Windsor landfill represents less than the pre-closure annual average tonnage accepted by the Hartford landfill. If the waste tonnage from FY 2008 that was in excess of RRF capacity was sent to the Windsor landfill in an effort to achieve self-sufficiency, the landfill would be completely full within four months.

Ash landfill. The one remaining ash landfill in Putnam processes approximately 450,000 tons of ash per year and had an estimated 7.6 million tons of remaining capacity at the close of FY 09. The state has relatively little control over the operation of the plant beyond environmental regulation. The privately owned and operated landfill is able to accept ash from out of state and, in fact, occasionally accepts coal ash. The ability to process ash from out of state makes predictions of the lifetime of the remaining lifetime somewhat tenuous.

The latest estimate is approximately 17 years of remaining capacity. As some ash residue is disposed of out of state, the Putnam facility does not currently dispose of all of the ash created in state. Accepting all of the ash made in the state, the sum of which is approximately 550,000

tons per year, would bring the useful remaining lifetime of the Putnam ash landfill from 17 years to 14 years.

If RRF capacity was expanded to meet the 2008 capacity shortfall, additional ash would be created at those facilities needing disposal. The additional ash would amount to 106,000 tons, or roughly 25 percent by weight of the processed MSW. This additional tonnage would bring the Connecticut-generated ash amount up to 656,000 tons per year and would decrease the lifetime of the Putnam ash landfill to between 11 and 12 years.

Non-mono-fill. In an extreme scenario, both the MSW and ash landfills could be re-permitted to accept both materials instead of the current mono-fill requirement of the ash landfill. In this case, there would be approximately 7.7 million tons of capacity remaining for the combined disposal of ash and MSW. In this scenario, the combined tonnage of ash and MSW that would need to be landfilled would be approximately 975,000 tons per year (550,000 tons of ash, 425,000 tons of MSW), meaning that repurposing the existing two landfills would allow the state to achieve self-sufficiency for just under eight years. While this situation is highly unlikely, it suggests that the state would have some time to react should all currently feasible out-of-state options for MSW and ash disposal suddenly become unavailable.

Ash reuse. Eight states currently allow some form of beneficial reuse of ash. Connecticut currently does not allow for the reuse of ash residue. The low number of states with ash reuse policies is partially due to the low levels of reliance on waste-to-energy facilities in the nation. Beneficial use of ash is largely limited to alternate uses in building, operating, and closing MSW landfills. As the most common beneficial use of RRF ash is in MSW landfills, it seems unlikely that most of the Connecticut-generated ash could be reused in-state.

Some non-landfill uses of ash are permitted elsewhere. Pennsylvania allows RRF ash to be used in the manufacture of asphalt and as road sub-base. Florida and Massachusetts allow ash in the manufacture of asphalt. New York allows RRF ash to be used as road sub-base. New Hampshire currently allows RRF as a sub-base in asphalt paving, but in a research and development stage.

It is recognized that even in a best case scenario, beneficial use of ash will not replace the need for ash disposal landfill capacity. However, reuse of ash may lower the rate at which current ash landfill capacity is used. It is also recognized that reviewing ash reuse policy and creating a commercially viable reuse of ash are two distinct processes. However, having a formal ash reuse policy would remove some of the uncertainty and therefore some of the risk to entities that may consider pursuing ash reuse.

Options to Achieve Self-Sufficiency

The primary means to achieve self-sufficiency in MSW disposal are to: 1) increase the usable disposal capacity and 2) reduce the amount of waste needing disposal through diversion, which will be discussed later.

Disposal capacity expansion. There are three specific options for disposal capacity expansion possible in the state: 1) expanding an existing RRF, 2) creating a new RRF, and

creating a new landfill. Specific issues reduce the feasibility of each option, but first, the general obstacles to increasing in-state capacity are discussed.

Barriers to expansion. While expansion of disposal capacity would certainly impact current and future in-state disposal shortfalls, there are several notable barriers to expansion. Most of the key issues surrounding capacity expansion involve balancing the economic and operational issues of a facility with the environmental and residential issues of the surrounding community and the state. These issues include, but are not limited to, the siting/permitting process, funding, and residential and political opposition.

Siting. Siting a waste facility is a long, expensive task. Depending on the type of facility and the classification of the material to be processed, siting is limited to parcels of land that meet certain environmental benchmarks. Those interested in prospective locations must also make provisions with the host community. Special consideration must also be afforded for projects that would be located in impoverished areas because of recent environmental justice legislation. In addition to the environmental benchmarks required by DEP for siting and permitting, proposed waste facilities must also pass through the determination of need process.

Determination of need. Additional RRF capacity and landfill capacity are subject to a statutory determination of need process to obtain the proper permit, which is administered by DEP. The determination of need law provides that additional disposal capacity can only be permitted if the additional capacity does not leave the state with “substantial” excess capacity.⁷⁰ The baseline measurement of how much capacity is necessary is the amount of waste in need of disposal annually and does not consider the seasonal swings in generation.

Ideally, waste would be available at steady rates year round, but in reality waste generation has seasonal ebbs and flows. Additionally, waste cannot be stored for a long enough time to counteract the seasonal highs and lows. In the winter months, excluding late December, the amount of waste generated in Connecticut on a daily basis is lower than during the spring and summer months, when daily waste generation peaks.

By the determination of need provision, a new facility would have to have capacity equal to or less than the average yearly excess need. If a proposed facility planned to have the exact capacity needed to negate the annual average in-state capacity shortfall, the overall system would still be over-capacity in low months and under-capacity in peak months, though it is possible that the magnitude of the seasonal changes is inconsequential.

The determination of need process also does not include clear guidelines as to the time-frame of when the need will become apparent. With stagnant diversion rates and increasing generation rates, it is expected that the capacity shortfall will continue to grow. It is unclear how the expanded capacity of a new facility, which would likely take over five years to become operational, would be judged under the determination of need process. The capacity shortfall at the time the application was submitted could be the measure, or the projected shortfall at some time in the future, either when the proposed additional disposal capacity would first be available or at some other point in the proposed facility’s useful life.

⁷⁰ The amount that “substantial” refers to is not defined and therefore unclear in this context.

Feasibility of capacity expansion options. Of the three ways to expand in-state disposal capacity, expansion of existing facilities appears to be the most feasible. New facilities, whether landfills or RRFs, must undergo extensive land exploration and testing processes. New facilities must also secure both funding and waste tonnage commitments, likely by entering into long-term contracts with municipalities that, at this time, appear reluctant to enter into contracts of 20 years or longer. Existing facilities will likely face the same hurdles to expansion, but the risk and objections seem to be lessened. This is also true for overcoming local opposition. Existing facilities may face opposition to expansion because of increased waste traffic, but new facilities will face the same concerns as well as greater questions about the particular site and how it may affect the municipality, region, and its residents.

Existing facility capacity expansion. The owners/operators of the in-state RRFs indicated that each facility has the potential to expand its existing capacity; however, the amount and type of expansion varied by facility. Estimates for statewide capacity expansion ran from an additional 1,000 to over 2,000 tons per day, to a 14 to 28 percent expansion to the roughly 7,400 tons per day currently available at RRFs.

Expansion could be achieved through some combination of incorporating additional processing lines, replacing existing processing lines with higher capacity lines, or building a stand-alone facility in the proximity of the existing facility. The expansion could be greater depending on the particular technology and expansion type enacted.

The capacity gained through these expansions would be approximately enough to balance the disposal shortfall in FY 2008. However, even the expanded capacity would not be adequate if the amount of waste generated and not diverted continues to grow as projected.

Out-of-State Disposal Sustainability

The current RRFs are unable to process all of the waste needing disposal in the state; in 2008, they processed 83 percent of disposed waste. The SWMP projects that at current diversion rates, there will be a capacity shortfall of approximately 1.5 million tons by 2024. If the capacity at the plants remains unchanged, 2.2 million tons will be processed at RRFs in 2024. This means that roughly 59 percent of Connecticut's non-recycled MSW will be disposed of at an RRF. Though the percentage of disposal at RRFs would be significantly less than today's figure, 59 percent is still well above the national average, the regional average, and even the second most RRF reliant state's use.

Import and export of MSW. In order to determine the long-term feasibility of relying on out-of-state disposal options, it is important to examine the import and export trends around the nation. According to the Congressional Research Service, approximately 42.2 million tons, or 17 percent, of the 245.7 million tons of MSW generated nationally was moved between states in 2005.⁷¹ Of the 11 states that imported more than 1 million tons of MSW,⁷² all but one, Oregon, was located in the mid-west or on the east coast.

⁷¹ Congressional Research Services, *Interstate Shipment of Municipal Solid Waste: 2007 Update*

⁷² In descending order of total MSW tonnage imported: Pennsylvania, Virginia, Michigan, Indiana, Wisconsin, Illinois, Oregon, Georgia, New Jersey, Ohio, and South Carolina.

Fifteen states each exported at least 500,000 tons of waste.⁷³ Four of the top exporters, Illinois, Indiana, Ohio, and New Jersey, were also in the top ten for MSW imports. At first glance this appears odd, but nearly every state had some combination of both MSW import and export. One reason for states being both importers and exporters of waste is that the generators of waste can be located as close to out-of-state disposal facilities as they are to in-state waste disposal facilities.

Connecticut ranked as the 14th highest exporter of waste, well behind three other states in the Northeast -- New York (1st), New Jersey (2nd) and Massachusetts (6th) -- in both ranking and amount exported. The remaining Northeastern states were all well below the median tonnage of MSW exported. Twenty-four states, including Connecticut, were net exporters of waste.

The sustainability of continued, and likely increased, reliance on out-of-state landfills is based on the availability of disposal capacity. Virginia and Ohio are two of the states with relatively high levels of MSW importation and, according to the SWMP, had at least 14 and 22 years of remaining useful disposal life, respectively, without further expansion. The SWMP also indicates that there are many landfills with available capacity in the nearby states of New York⁷⁴ and Pennsylvania.⁷⁵ While it is possible that a few of the 26 states with a net import of MSW in 2005 would fill their existing capacity without establishing additional capacity, it seems unlikely that out-of-state landfill capacity would completely dry up.

The continued existence of out-of-state landfill capacity appears likely considering that every state except Connecticut and Massachusetts relies on landfills for disposal more than on waste-to-energy. Based on estimates published by BioCycle magazine in the 2006 State of Garbage survey, only 12 states use waste-to-energy to dispose of more than 10 percent of generated MSW. Reliance on landfills is dramatically higher than on waste-to-energy facilities, as every state except Connecticut and Massachusetts uses landfills to dispose of more than 35 percent of generated MSW. Based on these figures, it seems safe to assume that out-of-state landfill capacity will continue to be available for at least the next 20 years.

What is far less known is the cost of out-of-state landfill usage. Out-of-state disposal costs are primarily driven by two factors: the actual “at-the-gate” fee for disposal, and the cost to transport the material to the facility. Regarding fees, landfill costs increase as the value of land increases, and so far, the relatively low land prices in the Mid-West and West are partially responsible for the creation of several very large landfills. If the relatively close landfills in Pennsylvania, Virginia, and Ohio either close or raise their tip fees, then MSW may be transported further West or South, raising the cost of transportation. (Costs are further examined in the next chapter.)

⁷³ Washington D.C. and Ontario, Canada exported more than 500,000 tons of MSW each to U.S. states, but are left out of these state comparisons.

⁷⁴ The New York Department of Environmental Conservation’s website indicates that there are 27 active MSW landfills with approximately 226 million tons of permitted capacity remaining, enough for over 28 more years at current rates, which include imports from Connecticut.

⁷⁵ In a 2002 draft Solid Waste Management Plan, the Pennsylvania DEP indicated that there were at least 10-15 years of landfill disposal capacity remaining at the 49 permitted landfills. Since that time, there has been landfill expansion including at least 1 additional landfill being permitted.

For the purposes of examining long-term sustainability, it is important to note that transportation may be the most volatile component in assessing all long-term projections. Regardless of the method of disposal, all major waste services are dependent on waste transportation systems. The major point to be aware of is that a self-sufficient system would be less dependent on transportation primarily because the distances traveled are expected to be smaller in a closed in-state system than in a system that transports waste out of state.

Recycling

The sustainability of recycling is much harder to define than for disposal options. Under the criteria set for disposal sources, the current recycling system appears sustainable. That is, the recycling system is capable of handling the recycled material generated at current recycling rates while accounting for growth. Another way to look at recycling is disposal mitigation. For its role in the overall waste stream (i.e., diversion from disposal), the sustainability of the recycling system is far less certain.

The following discussion will look at the recycling system as an independent component and then as a piece of the larger MSW services system. In both cases, sustainability of the recycling system will be examined only on an in-state basis. As nearly all major recycling is done using in-state infrastructure, there does not seem to be a need to examine the availability of recycling capacity elsewhere.

Recycling component taken by itself is sustainable. The majority of recyclable material is a combination of paper and containers (i.e., bottles and cans), and the processing facilities for these materials (IPCs) currently operate far below capacity.

As seen in Table VIII-1, in FY 08, approximately 516,000 tons of paper and containers were processed at IPCs, or about 1,400 tons per day. The six currently operating IPCs⁷⁶ have a combined permitted daily capacity of 4,000 tons per day, meaning that current usage is around 35 percent of permitted capacity. Using the 1.6 percent inflation suggested in the SWMP and the FY 08 numbers, we estimate that there will be approximately 732,000 tons of paper and containers to be sorted in FY 30. These predictions estimate that if recycling rates remain stagnant, the IPC capacity will continue to be underused.

	Total Permitted Capacity	FY 2008 Use	FY 2030 Projection
Per Day	4,000	1,400	2,000
Per Year	1,460,000	516,000	732,000
Percentage of Capacity	-	35.0%	50.0%

⁷⁶ The IPC in Groton has ceased operation since the briefing in October 2009.

According to the interim results of the waste characterization study performed by DEP, 52.6 percent of disposed waste is paper, plastic, metal, or glass. Between 15 and 20 percent of disposed waste is paper, plastic, metal, or glass that is not currently able to be or required to be recycled. Assuming that recyclable paper and containers constitute approximately 30 percent of the current 2.86 million tons of disposed waste, nearly 860,000 tons of recyclable material are currently being burned or landfilled, an amount equal to what was actually diverted in FY 2008.

If nearly all of these recyclable materials were pulled out of the waste stream and sent to IPCs along with the material already processed there, the total tonnage of recycling would be 1.38 million tons, still under the permitted capacity of existing facilities. Additionally, removing all the currently recyclable materials would temporarily eliminate the disposal capacity shortfall that the state experienced in FY 2008; however the state would experience additional capacity shortfalls if overall waste generation increased annually as expected.

Current recycling practices are not sustainable in the overall MSW system. Viewing recycling as a separate component may over-simplify the situation. While recycling for its own sake has some merit, most recycling requirements were put in place in order to divert MSW from disposal. In Connecticut, mandatory recycling was intended to decrease the amount of waste being disposed and to date the results have been somewhat successful. The adopted waste management hierarchy puts both recycling and its subcategory composting ahead of disposal methods. The implications of the hierarchy is that more should be recycled or composted than disposed, but, as seen in Table VIII-2, this is not the case.

	Hierarchy Rank	Actual Usage Rank*	2008 Tonnage
Recycling	2	2	562,504
Composting	3	4	343,698
Resources Recovery	5	1	2,110,855
Landfill	6	3	424,798
*Actual Usage Rank does not include the other items listed in hierarchy (i.e., source reduction, bulky waste recycling, or incineration). Source: DEP			

Currently, significantly less MSW is recycled or composted than is disposed. From this basic measure, it appears that the current use of recycling systems is not in line with state policies and goals. The picture of recycling may not be complete as the recycling and composting amounts are likely understated because it does not capture reuse or home composting. Even if the unaccounted tonnage of recycling were enough to make recycling the predominant waste stream, landfill usage will likely increase in parallel to the in-state capacity shortfall.

The state and most municipalities have arguably achieved the original recycling goal of 25 percent, but have failed to approach the revised goal of 40 percent that took effect in 2000. Besides the mandate to recycle, there is also an economic incentive to recycle. In Connecticut, a ton of material that is recycled instead of disposed of can save a municipality, hauler, or resident from \$40 to \$93. That material goes unrecycled in a waste system where there is economic

incentive and statutory requirement to recycle suggests that the current system is neither efficient or sustainable.

A sustainable recycling system should limit the effects of waste generation growth. There are two main approaches to absorb the additional waste in the recycling system instead of the disposal stream. One is to remove currently recyclable materials that are not separated from the disposal stream and the other is to find ways to recycle additional types of materials. These two methods and their occurrence in Connecticut are discussed below.

Removing designated recyclable items from the waste stream. Under state law, the items that are required to be recycled are: corrugated cardboard, glass food containers, metal food containers, leaves, newspaper, office paper (non-residential), scrap metal, batteries (lead acid and nickel cadmium), and waste oil. Some of these items, such as paper and containers, are commonly collected at the curb for residents. Others, such as batteries and waste oil, have special programs for their collection. Some of each type of recyclable material still make it into the disposal stream. Given that increasing diversion can help reduce the statewide disposal capacity shortfall while saving money on disposal, efforts to further eliminate items that are required to be recycled from disposal should be integral part of a sustainable recycling system.

Finding uses and markets for new wastes. What makes a material “recyclable” is largely defined on whether there is a market for the discarded item. The markets for various waste items, along with the composition of MSW, have changed significantly since mandatory recycling was instituted. Since 1991, the state has added one item to its recycling list, nickel cadmium batteries in 1996.⁷⁷ However, in that same time frame, both use and voluntary recycling of several materials has occurred, most notably plastic bottles and various types of paper.

Plastics. Recently additional plastics, those labeled three through seven using the voluntary resin identification system, have been added as acceptable recyclable material at a number of IPCs. Industry personnel that encouraged the acceptance of these additional plastics indicated that not only did they expect additional recycling tonnage from the new materials, but that by allowing a larger range of recyclables, waste generators may have less confusion about what can be recycled, leading to further tonnage gains.

Paper and containers. As noted above, there appears to be approximately 860,000 tons of paper and containers that are disposed of instead of being recycled. This figure includes both items that are currently required to be recycled as well as many materials that are acceptable as recyclable. Removing just those items which are already able to be recycled would virtually eliminate the in-state disposal capacity shortfall experienced in FY 2008.

Composting. Composting has two main areas, yard waste (i.e., leaves, grass clippings) and food waste (i.e., plant matter, fats and greases). Both yard waste and vegetable matter are specifically mentioned in the solid waste hierarchy, however yard waste is the better developed composting area. Leaves are part of the mandatory recycling list, and grass clippings are specifically excluded from disposal at solid waste facilities other than a composting facility.⁷⁸

⁷⁷ Though not designated as recyclable, grass clippings were banned from incineration or landfill in 1998.

⁷⁸ C.G.S. Sec. 22a-208v.

Indeed, many towns provide yard waste collection services, and some have a compost site for residential drop-off of yard wastes.

The mandatory recycling statutes make mention of food containers, but there is no such mention of the food itself. There are currently no requirements that food be composted, either at home or at a designated facility. In fact, there is only one large-scale food waste composting site in the state.

Faced with a relatively well-established infrastructure including specific mention in law for yard waste composting and a negligible infrastructure for food waste composting with no legal requirement, it is expected that food waste has a greater presence in the disposal stream than yard waste. Indeed, the interim results of the DEP's waste characterization study indicate that 14.5 percent of the waste stream by weight is food waste, while leaves and grass amount to only 1.4 percent.

It is difficult to measure how much home composting is happening for either yard waste or food waste, but the relative ease of yard waste composting techniques such as "grasscycling" seems to help keep grass clippings out of the disposal system.⁷⁹ DEP estimates that over 40,000 tons of waste was home-composted or grasscycled in FY 2008.

⁷⁹ "Grasscycling" is the reduction of waste by leaving grass clippings on the lawn after mowing.

Reasonable Cost

One aspect of the scope of this study calls for a review of whether municipal solid waste management services are available at a reasonable cost in Connecticut. Basic economic theory states that reasonable costs are obtained in a competitive market environment.⁸⁰ The market economy is based on the belief that through competition a consumer's wants will be satisfied at the lowest price while using the fewest resources.

The focus here is on understanding more about the market for municipal solid waste collection and disposal at RRFs in Connecticut. Findings about costs in collection and disposal services are offered, while the next chapter of this report presents options on how the state can influence the market and ultimately costs. This chapter provides an overview of the basic economics of the collection and disposal markets, an analysis of the collection services market in Connecticut (to the extent information is available), a summary of nationwide tip fees for disposal, and estimates of the costs of out-of-state disposal. Finally, findings from two case studies conducted by PRI staff are presented, on the experience of member towns of the Bridgeport and Wallingford RRFs, which recently transitioned through ownership change, retirement of long-term debt, and the conclusion of long-term municipal contracts. The focus of these case studies, which can be found in full in Appendix D, was on the post-transition options these members towns had available to them, and at what cost.

Overall, based on the analysis provided below, it can be concluded that both collection and disposal service pricing will be affected by supply and demand for those services and both sets of markets exhibit certain barriers to market entry for new vendors. The barriers in the disposal market, though, are significant and can raise concerns about impacts on reasonable costs. In addition, with regard to *collection services* the program review committee found:

- though there is an absence of comprehensive data to analyze the MSW collection market in Connecticut, the potential exists for improper pricing of collection services due to a lack of competition; and
- illegal anti-competitive practices by haulers have been uncovered recently in Connecticut and various legislative proposals to address this issue have failed.

Further, based on the discussion and analysis provided below regarding *disposal services*, the program review committee found:

- landfills are a less expensive MSW disposal option than RRFs, but Connecticut has no appreciable MSW in-state landfill space to compete with RRF disposal;

⁸⁰ The description of economic theory in the overview is largely derived from Paul A. Samuelson and William D. Nordhaus, *Economics*, (Boston: McGraw-Hill/Irwin, 2005) and *Some Basic Concepts of Market Power for State Public Utility Commissions to Consider*, Kenneth Costello, National Regulatory Research Institute, July 2009.

- competition for in-state disposal services is limited. Competition for disposal services may be found in exploring out-of-state landfill options for certain municipalities or through the use of short-term, in-state spot market contracts, but both options carry risks;
- most of the towns that were part of the Bridgeport and Wallingford projects preferred reentering into contracts with the previous disposal facility over requesting competitive bids;
- comparing average tip fees paid by municipalities before and after CRRA affiliation with the Bridgeport and Wallingford RRFs is complex. Generally speaking, new tip fees charged by privately-owned RRFs are not significantly different from the prices charged under CRRA agreements for comparable disposal services to municipalities;
- privately owned and operated in-state RRFs have offered contract terms that are comparable to, if not less than, those offered by out-of-state disposal options and regional RRF tip fees;
- without access to the private vendors' costs of services it is unclear if the fees paid for disposal by CRRA to these same operators, while the plants were affiliated with CRRA, represented reasonable and competitive costs; and
- it is unknown what the longer-term trend in market competitiveness will be like because the Connecticut disposal market appears to rely on the nearest out-of-state disposal sites to provide competition to the only two operators of RRF disposal services in Connecticut.

Economics Overview

It is important to understand why competition in the waste management market or any market is important in assuring reasonable cost for consumers. The discussion below highlights how prices are influenced through supply and demand and how competition is supposed to operate. If the market is not competitive, questions can be raised about whether government action is needed.

Supply and demand. In perfectly competitive markets prices are set according the principle of supply and demand. Generally, an increase in demand for a service will raise the price of the service and a decrease in demand will have the opposite effect. On the other hand, an increase in the supply of a service will lower the price but a decrease in supply will raise it.

What are some of the factors that influence the price of MSW services in terms of supply and demand? The overall market for disposal services in Connecticut can be used as an example

to illuminate the theory. Certainly a business such as an RRF needs to cover its fixed costs. Because the private marketplace demands a return on its investment, the concern from a public policy standpoint is that facilities, delivering a critical and necessary public service, will charge whatever the market will bear rather than just what they must charge to cover costs and a reasonable return on investment. Generally speaking, the market for solid waste disposal can be influenced by the following:

- **The amount and availability of municipal solid waste generated (demand for disposal services).** Municipalities are responsible for finding someplace to dispose the MSW generated within their boundaries and need to buy disposal services (or have a hauler buy it for them). As noted in Chapter VII, the amount of waste being generated in Connecticut has been increasing, so demand for disposal capacity/services has been increasing.
- **The number and type of disposal options available (supply of disposal services).** Connecticut has effectively only one type of in-state disposal option – resources recovery facilities. There are currently six RRF plants in Connecticut with four owners (two public, two private) but only two operators of the six plants (all private). Landfills as a disposal option are cheaper but are difficult if not impossible to build in Connecticut. A key problem is that this scarcity of disposal options within the state puts municipalities at a disadvantage because MSW is being generated at a rate over the capacity of the RRFs. For the most part, they are purchasing disposal services in a limited capacity in-state disposal market. The exception to this is that during the price dip that is often experienced in the spot market typically during the low volume winter months, disposal fees at RRFs can be lowered significantly. However, most municipalities sign up for long-term contracts and are not able to take advantage of this seasonal dip in price. RRF ownership and barriers to market entry are described in more detail below.
- **The distance to each disposal option (transportation costs).** An element in defining the availability of viable disposal options is the distance to those alternative disposal providers. A major consideration in the overall cost of disposal is the price to get MSW to the disposal site. Generally, the closer the disposal options the less costly and more competitive it can be, depending on how close the nearest competitor is. Disposal alternatives at a further distance are subject to higher transportation costs and the volatility of fuel costs. The feasibility of out-of-state options will be discussed later in this chapter.

The principle of supply and demand also applies to collection services. The more suppliers there are the more competitive prices will be. An analysis of collection services is provided further below.

Barriers to competition. Economists define markets along a continuum from perfect competition to imperfect or monopolistic. A perfectly competitive market is one where, among

other factors,⁸¹ no firm is large enough to affect the market price; that is, prices are set by aggregate supply and demand and there are low profit margins. An imperfect market is where the sellers have some degree of influence over the price of their product; the extreme form is a monopoly where the seller has complete control over the price. Thus, in an imperfect market, a firm is said to have market power when it can set a price above competitive levels for a sustained period of time without a substantial loss of sales. Vigorous disagreements exist in the legal and economic arenas over the prevalence of market power, how to measure and detect it, and how to mitigate it.

Few, if any, markets are perfectly competitive. Concerns, though, are raised by the degree of imperfection and whether market power is being used to cause substantial harm to consumers. Historically, governments have implemented measures that have curbed the most extreme forms of imperfect competition. Governments have regulated the price and profits of certain monopolies, such as utilities, and have enacted antitrust laws to prohibit various forms of price fixing.⁸²

Ideally, a competitive price should match a company's fixed costs and a "normal" profit (i.e., marginal cost). In a perfectly competitive world, companies could only set prices above their marginal cost for a short period of time before they lose customers to lower priced competitors or until new firms enter the market. Therefore, a major source of market imperfection is a high barrier to entry. These barriers include but are not limited to large capital requirements, sunk costs, excess capacity, strategic pricing, product differentiation, government regulation, and economies of scale.⁸³ When there are a number of restrictions to entry, the number of competitors will be limited and they will have a tremendous amount of influence over pricing.⁸⁴ A natural monopoly, such as a utility distribution system (e.g., water, gas, and electric lines), is an example that is often used to illustrate this, where one company can serve the market a lower cost than is achievable with two or more companies.

Barriers to entry for waste collection. To a certain extent, the barriers to entry for the waste collection business are relatively low, compared to other elements in the solid waste system. However, as collectors seek to expand their business more barriers present themselves. There are generally no proprietary techniques involved in waste collection, financing is not that difficult, and government regulation is limited. Of course, costs will vary with the type of service, type of collection vehicle, labor rate, and the characteristics of the collection area.

Certainly starting out with a one-truck collection operation may not be that difficult. However, in order for a small operation to grow and be competitive additional significant barriers can be present. For example, ramping up of production usually has additional costs and

⁸¹ Equal access to accurate information about the market is another key element of a perfect market. Lack of accessible information is discussed further in the data management recommendations.

⁸² Also, government has a recognized role in regulating spillover effects (when economic activity imposes costs not paid for in the marketplace, such as pollution) and in the provision of public goods (commodities which can be enjoyed by everyone and from which no one can be excluded, such as public health). These roles, though present, are not explicitly covered here.

⁸³ Economies of scale refer to the increase in efficiency of production as the number of goods being produced increases. Typically, a company that achieves economies of scale lowers the average cost per unit through increased production since fixed costs are shared over an increased number of goods.

⁸⁴ A situation where an industry is dominated by a few number of suppliers is called an oligarchy

risks especially when moving to servicing a municipality with a fleet of trucks and personnel. For a new hauler looking to build commercial accounts, there are often additional barriers to entry, such as a need for route density, the practice of incumbent haulers using long-term contracts sometimes with restrictive terms (e.g., automatic renewal), and the ability of existing firms to lower prices temporarily to discourage new entrants.

Barriers to entry for disposal services. Nationally, the market for disposal has been described as the least competitive part of the solid waste industry.⁸⁵ Promulgation of new federal requirements regarding landfills in the late 1980s and early 1990s led to changes in environmental practices and business models for solid waste disposal. One result was that the number of landfills nationwide have been reduced significantly, though the capacity increased as the industry shifted toward more large scale operations. The changes have led to more concentration of landfill ownership in the overall MSW disposal market. Landfills are the predominate form of disposal in the nation, but play very little role in Connecticut.

Vertical integration of waste management services (collection, hauling and disposal) has been used as a means to ensure that large volumes of waste could be collected to supply large-scale disposal facilities.⁸⁶ The result of these trends over the last two decades is that the solid waste industry has become increasingly concentrated and dominated by a few large companies.

The two companies providing RRF disposal services in Connecticut are Covanta Holding Corporation and Wheelabrator Inc. Wheelabrator Inc. is a wholly-owned subsidiary of Waste Management Inc., which is the largest waste management company in the country. Waste Management, through its subsidiaries, provides the full range of integrated services including collection, transfer, recycling, disposal, and waste-to-energy services. Covanta operates 40 waste-to-energy plants throughout the country, including four of the six RRFs in Connecticut.

Aside from the trend in the increasing concentration of ownership, both landfills and resources recovery facilities have high barriers to entry. Some barriers to consider:

- *Government regulation.* As noted in the briefing, a number of federal, state, and local, environmental, zoning, and permit laws and regulations dictate critical aspects of storage, handling, processing, and disposal of MSW at RRFs and landfills. Obtaining a permit to construct a new disposal facility or expand an existing one is a costly and time-consuming process that typically takes many years to conclude. The Lisbon plant, for example, was the last RRF to be permitted in Connecticut and that took nearly a decade to permit and construct.
- *Capital costs.* The capital costs of building a large RRF plants have been estimated to be about \$500 million. Further, it is also difficult and costly to satisfy and overcome environmental concerns and other government requirements.

⁸⁵ *Meeting the Challenge – Ensuring Capacity for Connecticut’s Municipal Solid Waste And Recyclables in Changing Market Conditions*, Gershman, Brickner & Bratton, Inc. February 27, 2007

⁸⁶ Molly Macauley, *Waste Not, Want Not, Economic and Legal Challenges of Regulation-induced Changes in Waste Technology and Management, Resources for the Future*, Discussion Paper, June 2009

- *Public opposition.* Local public opposition often increases the time and uncertainty of successfully permitting a facility. CRRA’s recent attempt to build an ash landfill in Franklin is a prime example of public and legislative opposition defeating a proposal to develop an ash residue disposal option.

One government-imposed barrier particularly worth noting is the determination of need requirement in Connecticut that was established after five of the six RRF plants were in operation. Before a permit to build or expand an RRF, a mixed MSW landfill, or an ash landfill can be issued, DEP must find that a need exists for such a facility or expansion and such a facility or expansion will not result in “substantial” excess disposal capacity in Connecticut. This is contrary to the principals of supply and demand. Excess capacity tends to drive prices down.

Essentially, the DON requirements make it impossible for a competitor to enter the market unless there is substantial excess MSW to be disposed. However, it is likely that existing companies will try to expand before a new competitor enters.

Thus, in-state disposal services clearly appear to have high barriers to entry that could raise concerns regarding what impact they have on fair and reasonable pricing for services from existing providers.

Collection Services

Under state statute, each Connecticut municipality must “make provisions for the safe and sanitary disposal of all solid wastes generated within its boundaries.” It is not entirely clear what “make provisions for” means because, similar to other locally provided services, MSW collection practices can vary tremendously among municipalities. Solid waste collection involves the provision of a service that can be provided through the use of various systems. The most common approaches include the following:

- *Municipal collection* - a municipal department uses its own employees, fleet of vehicles, and other equipment to collect solid waste and determines its level of service;
- *Municipality contracts with private collector* - a municipality contracts for a specific level of service with a private provider to collect waste. A variation of this can be through the use of franchise agreements, where a municipality awards contracts for the right to collect solid waste within specific geographical boundaries;
- *Municipal drop off* - a municipality provides a drop off station to which residents bring their trash. The aggregated waste is then transported for disposal en masse;

- *Resident contracts with private collector (also called private subscription)* - residents directly pay and contract with private trash collectors. Some communities using this approach give residents the complete freedom to choose haulers and the level of service provided; and
- *Combination* - some municipalities may use a combination of public and private options for collection services.

As mentioned earlier, market power signifies the degree of control a single firm or a small group of firms have over the price and production decisions in an industry. One approach to understanding any market and the potential of any firm to exercise market power is to examine market concentration. This type of analysis is performed in anti-trust enforcement. However, there is not enough readily available information about the number of collection companies operating in Connecticut or about their corporate relationships to perform a formal market concentration analysis. As noted in the briefing, the level of competitiveness in the solid waste collection industry in Connecticut is difficult to readily ascertain because the state does not separately license or require registration of municipal solid waste collectors with one agency. This fact makes developing any information about collectors in Connecticut difficult, including the basic information as to how many there are.

In this study, program review staff used a simple, though not comprehensive or definitive, approach to try to obtain an indication of potential competitive issues that could lead to improper pricing of curbside collection services. Using DEP survey data, staff categorized Connecticut municipalities by different collection types. The different collection types are noted above. Two collection types that are of interest here are the ones that would be subject to the open competitive market- they are: 1) municipalities that only provide for private subscription for collection services (i.e., resident is responsible); and 2) municipalities that have a contract with a private company for collection services. *As discussed below, in both cases the program review committee finds the potential for noncompetitive pricing for curbside collection due to a lack of bids or actual collectors in 15 towns.*

Municipalities with private subscription. To understand the amount of competition within municipalities that only provide for private subscription services, program review staff used two approaches. One approach was to compare existing town-provided DEP survey data on the number of collectors per town within those municipalities. The other approach was to survey a small sample of these towns to confirm the data and determine how many collectors the towns had. Based on those two approaches, it was determined that:

- According to DEP data, there are at least eight towns that rely on private subscription services that have only one hauler identified within their town. The number could be larger because the question in the DEP survey did not ask towns to identify what type of collector was on the list, nor did all towns respond to the question or the survey. Specifically, 27 towns who had private collection did not respond and 14 towns did not identify the type of collection service they had.

- Based on the small sample survey of private subscription towns (11),⁸⁷ PRI found:
 - two towns identified only one hauler each for residential curbside service;
 - five towns identified two haulers each for residential service;
 - the remaining five towns each identified 3 to 31 haulers. Some of these haulers also service commercial customers, but in most of the towns surveyed, there are haulers who only provide commercial hauling;
 - in all of these towns, residents have the option of bringing their MSW directly to a transfer station;
 - most towns noted they had a list of haulers, while two towns did not know, and two said they did not. It is unclear how the statutory hauler registration requirement is being implemented.

Municipalities that contract with a private collector. Program review staff sent a survey to 47 municipalities that were each identified as having a contract with a private vendor to collect MSW to determine how competitive the bidding was for those services.⁸⁸ Twenty-two towns responded to the survey. Among other things, the survey asked the towns to identify the name of all the companies that submitted bids during the last bid process. In addition, the survey asked the respondents if they felt the bids for residential collection were competitive. The survey results indicated that:

- of the 20 municipalities who answered a question regarding the number of bids submitted for collection services, seven towns received only one bid. Again, this could be underestimating the prevalence of one-bid towns because 25 towns did not respond to the survey; and
- eight of 18 respondents felt that the bids received were not competitive; most cited the receipt of a single bid as the primary reason.

As noted earlier, Connecticut has had problems with collectors trying to monopolize the MSW collection business. A recent criminal investigation and prosecution between 2003 and 2008 by the federal government revealed an extensive price fixing scheme or “property rights system” in the collection business in western Connecticut as well as Westchester and Putnam Counties in New York resulting in the arrest and conviction of 33 individuals. The investigation centered on James Galante, who controlled 25 trash hauling and related companies, including a transfer station in Danbury. It is important to note that Galante did not act alone, as several other companies in Connecticut and in eastern New York also participated in the system to eliminate competition.

⁸⁷ Brooklyn, Essex, Greenwich, North Stonington, Plymouth, Prospect, Simsbury, Somers, Wallingford, Watertown, Weston, and Woodbridge

⁸⁸ The DEP survey identified 50 municipalities that contract with private collection services; however three municipalities were later identified as either having municipal collection or private subscription services only.

In the wake of these revelations, Governor Rell requested that the commissioners of the Departments of Public Health, Consumer Protection, Environmental Protection, and Public Safety and the Office of the Chief State's Attorney form an advisory group regarding solid waste hauling. A bill to create a solid waste commission based on the advisory group's recommendations (HB 7092) and a similar bill to license solid waste haulers (SB 1288) in 2007 did not pass. At least four bills have been introduced in the last two years that would require the licensing of haulers either by DEP or the Department of Consumer Protection as well as imposing other regulatory requirements, but none have passed.⁸⁹

As described above, since the arrest of Galante, the competitive situation for collection services in the Housatonic region has changed. The Galante-owned hauling businesses controlled at least 57 percent of the market share of MSW in the Housatonic region in 2006, according to the Housatonic Resources Recovery Authority.⁹⁰ This understates his influence because it does not include the other solid waste collection companies who participated in the property rights scheme but were not owned by Galante. Since 2006, the control exercised by the Galante businesses, which are now run by the federal government, has declined to about 47 percent of the market share. These businesses, though, still control over 50 percent of the hauling in four of the 11 towns in the region.

Disposal Services

The expiration of municipal contracts that have tied most of Connecticut's municipalities to a particular RRF for disposal for 20 or more years presents opportunities and risks. It is an opportunity for municipalities to change the way they have been approaching MSW disposal, to try to lower costs, and improve or change their level of services. The risks involve the unknowns for municipalities, haulers, and RRFs in changing that approach by selecting a different disposal option. A primary question, though, is whether the market for disposal in Connecticut is competitive.

To try to answer that competitiveness question, program review staff analyzed information from three different sources to put municipal costs and choices in context. First, there is an overall examination of tip fees for RRF and landfill disposal nationwide to see how the Northeast compares. Secondly, a review of the potential out-of-state market options is presented. Finally, two case studies are used to illustrate what has actually happened in towns that have or are going through a transition in ownership (as well as contractual relationships) for two RRF projects in Bridgeport and Wallingford.

There are three caveats to keep in mind regarding cost comparisons. The first has to do with what costs tip fees contain. The basis of most cost comparisons for disposal is usually expressed as a tip fee on a per ton basis. Tipping fees are typically a charge on waste handling or disposal. They are based primarily on the operating and administrative expenses of waste disposal. But they can include a range of costs and services that make comparisons difficult. For example, as will be noted in the CRRA pricing, some tip fees also include subsidy for recycling

⁸⁹ In 2008 -- SB 522, SB 137; In 2009 -- SB 918, SB 324

⁹⁰ HRRRA is an eleven-town regional authority responsible for MSW disposal and recyclables.

and other waste management activities. PRI staff tried to adjust costs as much as possible to make accurate comparisons.

Second, PRI staff do not have access to actual costs of service or the true fixed costs of disposal, or necessarily all the revenues generated by RRF plants, making a true assessment difficult. For example, CRRA receives bills for disposal services from private providers but not an indication of what the actual cost of those services are.

Finally, it should be noted that some fixed costs, such as operating a transfer station, could be included in the tip fee and affect viable cost comparisons. When costs are broken down to a per ton basis, the cost for a transfer station can vary based on the number of tons processed versus its capacity, which could tend to skew results. For example, the city of Norwalk, as discussed further below, has a transfer station that is capable of processing nearly 100,000 tons of MSW per year. The cost to run the transfer station is \$700,000. If they were processing the full amount of MSW, the cost would be about \$7.00 per ton. The city is currently processing 30,000 tons per year at a cost of about \$23.00, significantly changing the overall cost per ton.

Nationwide Tip Fees Comparisons

The comparisons provided below examine the various tip fees charged for both landfills and RRFs in different parts of the country. *In general, landfills are cheaper than RRFs as a disposal option and the Northeast region tends to be more expensive for disposal than the rest of the country, in part because of the regional scarcity of landfill capacity.*

Landfills. As shown in Table IX-1, the Northeast Region (CT, ME, MA, NH, NY, RI, VT) saw average 2004 tipping fees of \$70.53 per ton for landfills in comparison to the 2004 national average of \$34.29. The Northeast was by far the highest region, as the remaining six regions ranged from \$24.06 to \$46.29.⁹¹ Reasons for the higher costs in the Northeast may have to do with the high cost of land, relatively high population density, and a more restrictive regulatory environment. In states where there are large amounts of level land, the price of land is low and it is relatively easier to construct landfills.

⁹¹ The latest landfill tip fee survey found in the publication *State of Garbage in America*, Biocycle, December 2008, was for 2006 and the average tip fee per ton for the nation was calculated to be \$42.08, with a reported range of \$25 (Montana) to \$96 (Vermont). The survey is not comprehensive because not all states reported tip fee information.

Table IX-1. Landfill Tip Fees (\$/ton)				
Region	2004	2002	2000	1998
Northeast	70.53	69.07	69.84	66.68
Mid-Atlantic	46.29	45.26	45.84	44.11
South	30.97	30.43	30.53	30.89
Midwest	34.69	34.14	32.85	30.64
South Central	24.06	23.28	21.90	21.02
West Central	24.13	23.40	22.29	22.51
West	37.74	38.90	34.54	36.08
National	34.29	33.70	32.19	31.81
Regions: Northeast: CT, ME, MA, NH, NY, RI, VT Midwest: IL, IN, IA, MI, MN, MO, OH, WI Mid-Atlantic: DE, MD, NJ, PA, VA, WV South Central: AZ, AR, LA, NM, OK, TX South: AL, FL, GA, KY, MS, NC, SC, TN West Central: CO, KS, MT, NE, ND, SD, UT, WY West: AK, CA, HI, ID, NV, OR, WA				
Source: Edward W. Repa, <i>National Solid Wastes Management Association's 2005 Tip Fee Survey</i> , NSWMA Research Bulletin 05-3, March 2005				

Comparatively speaking, RRFs are generally more expensive for disposal than landfills. According to the National Solid Waste Management Association's latest tip fee survey, in 2004 the average RRF tip fee nationwide was about 80 percent higher than the average landfill tip fee (\$61.64 per ton versus \$34.29). Table IX-2 shows the range for 2006 RRF tip fees among nine states from a survey conducted by BioCycle magazine. The range is from \$36 per ton (Minnesota) to \$98 per ton (Washington). Connecticut's tip fees for RRFs ranged from \$57 to \$74 per ton in 2006.

Table IX-2. Resources Recovery Facilities Tip Fees 2006 (\$/ton)		
State	# RRF Plants	Average Tip Fee
Florida	11	\$53
Iowa	1	64
Massachusetts	7	71
Minnesota	9	36
New Jersey	5	80
New York	10	71
North Carolina	1	52
Washington	3	98
Wisconsin	2	59
Source: <i>State of Garbage in America</i> , BioCycle, December 2008. Note: Eighteen states that collectively have 54 RRF plants did not report any information on tip fees		

Other information, found in Appendix C compiled for Covanta and provided to the committee shows the range of RRF tip fees by region. In general, the data show the tip fees for RRFs can go as low as \$12 to \$28 per ton in the South and Midwest areas of the nation and as high as \$98.00 in the West. Covanta notes that the \$12 tip fee is an unusual situation and is offset by the incineration of higher cost special wastes, like medical waste. Similarly, Wheelabrator Inc. has provided selected RRF tip fees for their Massachusetts and New York RRFs. The tip fees range from \$64.00 to \$71.50 per ton.

Out-of-State Market

A key question in any competitiveness analysis is how large is the relevant market for MSW disposal generated in Connecticut. As noted earlier, because the current amount of waste generated in Connecticut exceeds the current disposal capacity of the state’s RRFs, out-of-state disposal may represent the only real competition.

Summary of current in-state disposal via RRFs. All six operating resources recovery facilities in Connecticut started commercial operation within a seven-year period from 1988 through 1995. Table IX-3 shows the order in which they began commercial operation along with the years their bonds have been or will be paid.

Table IX-3. Resources Recovery Facilities in Connecticut: Selected Information			
Facility	Commercial Operation Date	Year Bonds Fully Paid	Current Operator
Bristol Resource Recovery Facility	May 1988	2014	Covanta
Bridgeport Resources Recovery Project	July 1988	2008	Wheelabrator
Mid-Connecticut Project (Hartford)	October 1988	2012	Covanta/MDC
Wallingford Project	May 1989	2009 (FY)	Covanta
Southeast Project (Preston)	February 1992	2015	Covanta
Wheelabrator Lisbon Waste-to-Energy Facility	1995	2020	Wheelabrator

Source: PRI

The Bridgeport, Mid-Connecticut (Hartford), Wallingford, and Southeast (Preston) projects were financed with CRRA revenue bonds. The Bristol and Lisbon facilities were financed with municipal-connected bonds.

Each facility’s ownership is determined by complicated agreements entered into many years ago, both financial and otherwise. As described further below, two facilities have changed or are in the process of changing ownership. One facility’s ownership (Southeast Project) could transfer to private ownership in either 2015, or 2018 if certain options to extend are exercised. One other facility agreement (Bristol) allows the authority to purchase the facility for fair market value when the bonds are repaid in 2014 or to extend the agreement. The current status of each facility is summarized below:

- three facilities will be or are privately owned (Bridgeport, Southeast, and Wallingford, representing 48 percent of overall RRF capacity);
- one facility will continue to be privately owned unless the authority involved exercises its option to purchase at fair market value (Bristol, representing 9 percent of overall RRF capacity); and
- two will be owned publicly by authorities (Mid-Connecticut and Lisbon, representing 43 percent of overall RRF capacity).

Concerns have been raised about the amount of Connecticut's RRF capacity (48 percent to potentially 57 percent) in the hands of the private sector, including the specter of private operators raising prices with little consequence and of not serving Connecticut communities. This is especially of concern since there are not any other viable in-state disposal options other than RRFs.

Outlined below is a discussion of the potential out-of-state regional disposal market, identification of actual bid quotes for municipalities looking for out-of-state options, and descriptions of how municipalities in two original CRRA resources recovery projects (Bridgeport and Wallingford) have to date handled the transition to private ownership and what that reveals about competition for disposal services.

Out-of-state market cost estimates. Estimating the cost of out-of-state disposal of MSW involves three costs; the costs to construct and operate a truck-based or rail-based transfer station, the costs to transport the waste from the transfer station to the landfill, and the actual disposal or tip fee. There have been two fairly recent analyses performed on the cost to transport MSW from Connecticut to various landfills in the region. One was performed by a consultant for DEP and the other was performed by a different consultant on behalf of the South Central Regional Council of Governments (SCRCOG). These are not actual quotes from trucking or rail haul companies but estimates developed by experts.

Road haul. Table IX-4 shows the estimated costs found in the two reports to transfer and transport waste by truck to various out-of-state landfills from three different towns in Connecticut. The reports made a few different assumptions regarding transportation by truck that alter the outcomes. For example, DEP's estimated disposal tip fees tend to be higher; the SCRCOG report has assumed a better rate based on a longer-term contracts being signed by municipalities. Also, the assumed transportation cost per mile is different -- DEP's estimated about .14 cents per mile, while the SCRCOG report assumes .23 cents per mile. Finally, DEP's estimate assumes the hauler will find something to bring back ("backhaul") after the load is deposited at the landfill to subsidize the cost. For comparison purposes, the one way costs for one town and the round-trip costs for the same town based on DEP's estimate are provided. *The analysis suggests that for certain municipalities who are paying in the \$80 per ton or more range for disposal an out-of-state disposal option is viable under certain conditions.*

Table IX-4. Estimated Costs to Transfer MSW to Out-of-State Landfills				
	DEP's Estimate/Ton One Way (Danbury)	DEP's Estimate/Ton One Way (Putnam)	DEP's Estimate/Ton Round Trip (Putnam)	SCROG's Estimate /Ton Round Trip (North Haven)
Seneca Meadows (NY)	\$80	\$82	\$125	\$180
High Acres (NY)	\$82	\$85	\$131	\$278
American (OH)	\$102	\$97	\$190	\$277
Alliance (PA)	\$63	\$80	\$118	\$117
Conestoga (PA)	\$77	\$85	\$128	\$136
Middle Peninsula (VA)	\$86	\$98	\$164	\$229
All estimates include transfer, hauling and disposal costs Higher end costs were used for DEP estimates if a range was presented. Source: State of Connecticut DEP, <i>State Solid Waste Management Plan</i> , December 2006 and South Central Regional Council of Governments, <i>Future of Regional Solid Waste Disposal...</i> , RS Lynch and Company, January 30, 2009. PRI calculation based on DEP data for the DEP round-trip estimate				

The competitiveness of out-of-state disposal options by long-haul trucking is not clear cut based on the development and analysis of estimates by experts. Based on current in-state RRF disposal rates, both with and without estimated transfer station costs, running between \$60 to about \$85 per ton, the table shows that long-haul out-of-state disposal of waste could be competitive if municipalities only had to pay one-way costs. The most cost competitive disposal options are landfills in Pennsylvania with costs ranging from \$63 to \$80 depending on where the load originates. It should be noted that truck transportation is also very sensitive to volatility in fuel costs.⁹²

Rail haul. Another potential lower cost option is to export MSW from Connecticut by rail to out-of-state landfills. Rail transport requires special loading and unloading facilities. Rail transport can be achieved through the use of intermodal containers, direct-loaded into bulk rail cars, or baled (i.e., MSW is wrapped into cubes). Rail car transport becomes more cost effective the greater the distance versus over the road trucking.

There are several benefits cited in regard to rail transportation over trucking.⁹³ These include:

- reduction of traffic congestion by keeping trucks off the highways;
- rail transportation produces almost five times less air pollution than

⁹² Of course, not included in the cost estimates are the additional environmental impacts of truck transportation. As noted earlier, diesel trucks transporting MSW emit five times more particulate matter per ton than if disposed of in local RRFs.

⁹³ *City of New Haven Solid Waste System*, Malcolm Pirnie, Inc. January 2008

- transportation by trucking;
- rail hauling is also safer, from an accident point of view, than truck hauling; and
- a single railcar can carry up to 110-130 tons of waste while a single long-haul truck can only transport about 22 tons.

In the State Solid Waste Management Plan, DEP, with the help of a consultant, developed an estimated range of costs to ship waste by rail from Connecticut to landfills in New York, Virginia, South Carolina, Ohio, and Western Pennsylvania. These estimates are presented in Table IX-5.

Landfill	Transfer	Rail Haul	Tip Fee	Total
Virginia	\$7.00	\$48.00	\$25.00	\$80.00
South Carolina	7.00	57.00	25.00	89.00
Ohio	7.00	51.00	30.00	88.00
Western Pennsylvania	7.00	49.00	30.00	86.00
New York, Rochester Area	7.00	39.00	30.00	76.00

Higher end costs were used for DEP estimates if a range was presented.
 Source: State of Connecticut DEP, *State Solid Waste Management Plan*, December 2006

Again, if the current in-state RRF disposal rates, both with and without estimated transfer station costs, are between \$60 to about \$85 per ton, rail haul could be a competitive option (especially to western New York and Virginia) for some municipalities paying tip fees on the higher end of the current range. DEP notes that actual quotes from rail companies or shippers could be lower because of the large volumes of shipments that municipalities generate and therefore could be in a better bargaining position to negotiate better rates. They have estimated the rates could be 10 to 20 percent lower for large volumes of waste.

Recent actual experience. There have been a couple of examples of actual haul-by-rail quotes received by different municipalities in the state. In 2007, the city of Stamford issued a request for proposals for MSW management services. The city received proposals from five different vendors. The proposals included both in-state and out-of-state disposal options that ranged from \$69 per ton to \$96 per ton. The city selected Transload America to handle its MSW disposal needs. Transload is shredding, baling, and loading solid waste on a flat-bed carrier, and rail-hauling it to a landfill in Ohio. The cost for the three-year rail haul and disposal contract is \$69.00 per ton in 2008, \$76.00 per ton in 2009 and \$79.80 in 2010. The contract has two one-year options to renew. These costs do not include complete transfer station expenditures. In

addition, the city operates a transfer station operation and charges \$88.00 per ton for commercially generated municipal solid waste and bulky wastes.

The SCRCOG report mentioned earlier contains references to two quotes received from Transload America. Transload recently submitted a proposal to the New Haven to operate its transfer station, bale the MSW, and transfer and transport the baled MSW to an out-of-state facility for about \$82 per ton. In 2008, New Haven had been paying about \$91 per ton for hauling and disposal at the Lisbon RRF.⁹⁴ Transload also estimated that it could provide another SCRCOG community with a transfer station with the same services as New Haven for about \$92 per ton.

Findings for Two Case Studies: RRF Disposal Competitiveness.

As this study began and while it was underway, two RRFs, Bridgeport and Wallingford transitioned through ownership change, retirement of long-term debt obligations, and the conclusion of long-term municipal contracts. As a result, the member towns formerly bound by the long-term municipal contracts had the opportunity to re-evaluate how they wanted to handle their municipal solid waste. PRI staff examined the experiences of these member towns to see what post-transition options these members towns had available to them, and at what cost. The full case studies are in Appendix D.

Certainly there are a number of factors that influence disposal contract decisions, of which reasonable cost is only one. Accounting for differences in preferences other than cost is beyond the limited scope of this study. Based on the case studies of the Bridgeport and Wallingford RRF contract expiration and negotiations, a few key points were found:

- new tip fees charged by privately-owned RRFs are not significantly different from the prices charged under CRRA agreements for comparable disposal services to municipalities;
- many towns preferred reentering into contracts with the previously utilized disposal facilities over requesting competitive bids;
- privately owned and operated in-state RRFs have offered contract terms that are comparable to those offered for out-of-state disposal options and to regional RRF tip fees;
- without access to the private vendor's costs of services, it is unclear if the fees paid for disposal by CRRA to these same operators, while the plants were affiliated with CRRA, represented reasonable and competitive costs; and
- it is unknown what the longer-term trend in market competitiveness will be like because the Connecticut disposal market appears to rely on the nearest out-of-state disposal sites to provide competition to the only two providers of RRF disposal services in Connecticut.

⁹⁴ Ibid

Policy Options and Recommendations

This chapter contains policy options and recommendations to address the findings in the previous three chapters. The findings and recommendations regarding system adequacy and sustainability are discussed first followed by those related to reasonable cost. The committee has also provided a number of policy options to address the findings that generally require significant additional resources or changes to state policy and practices for the committee's consideration.

Adequacy and Sustainability

Through the examination of whether the state's waste system was adequate and sustainable, there were several important findings including that:

- efforts aimed at reducing the amount of solid waste generated within the state (source reduction) are not sufficient, as the amount of waste generated and disposed per capita has continued to steadily increase;
- although the initial legislatively mandated recycling rate goal appears to have been met in the 1990s, the recycling rate goal established by the legislature for the year 2000, a decade ago, has never been met;
- Connecticut's recycling rate is below the national average and is the second lowest rate in the Northeast region;
- waste stream analysis shows much of the MSW that is being disposed of at resources recovery facilities contain materials that are already required to be recycled or are a type of plastic, that largely has a readily available market;
- diverting waste from disposal includes economic incentives, partially due to revenue received from most diverted materials;
- the sorting facilities for the most commonly accepted recyclable materials (e.g., bottles, cans, paper) are currently operating far below capacity; and
- infrastructure for additional diversion methods (i.e., composting) remains mostly undeveloped.

To address committee findings regarding system adequacy and sustainability, the state should focus significant efforts on diverting waste from disposal. The program review committee offers recommendations to improve waste diversion that include: the creation of a mechanism to periodically review the mandated recyclables list; the development of incentive programs with dedicated funding; and a study of Connecticut's composting infrastructure.

Periodically update which materials are mandated recyclables. As noted in the briefing, the list of materials that must be recycled has only been adjusted once since mandatory recycling began in 1991. Since then, many elements of the waste stream have changed, most notably the increased presence and use of plastic beverage containers. Each municipality has decided which, if any, additional items must be recycled in the absence of statewide additions to the mandatory

recycling list. Variations in what items can be or must be recycled between towns have led to general confusion for residents, which may negatively impact the diversion of materials.

In order to be responsive to advances in the recycling market, the program review committee recommends C.G.S. Sec. 22a-241b be amended to include provisions for the commissioner of DEP to review the regulations designating items that are required to be recycled at least every ten years beginning January 1, 2011. Should it be determined there is a demonstrated market for the reuse of additional material(s), the commissioner shall adopt by regulation the material to be added to the designated recyclable list.⁹⁵

Adjusting the list of mandatory recyclables will help reduce, though not eliminate, confusion over variation in material classification between municipalities. It is possible that adjusting the mandatory recycling list will increase statewide diversion by increasing recycling in towns that have not adjusted their recycling lists independent of the state list. As part of the process of adding additional materials, it is expected that education and advertising will help increase recycling beyond just removing the additional materials.

Review municipal recycling incentive and enforcement programs. DEP has the authority to enforce recycling at the municipal level if it is determined that “a municipality is making insufficient progress in implementing a recycling program.”⁹⁶ Further, waste generators, collectors, and facility operators all have some amount of responsibility to ensure that recyclable materials are separated from disposed materials. Enforcement of recycling mandates at either the municipal or generator level have been lax or non-existent due partially to an apparent general aversion to enforcement activities by state agencies towards municipalities or residents.

Nevertheless, municipalities and waste generators are the key to reducing waste disposal. The authority to help achieve state goals for diversion through enforcement already exists, but the state and many municipalities fail to meet the statewide recycling goals.

There are a number of ways to enhance recycling compliance and achieve recycling goals that include:

- further enforcement of existing recycling statutes;
- creating incentive programs for municipal recycling leaders; and
- creating a cap and trade program for per capita waste disposal between municipalities.

All strategies have a mix of advantages and disadvantages, the most prominent of which involve either increased costs to municipalities or funding problems at the state level. The strategies listed above are discussed further in Appendix E. Regardless of the specific strategy or combination of, DEP should work with other states and high-performing municipalities to develop a series of best practices for minimizing disposal and maximizing diversion of waste.

⁹⁵ In this context, a “demonstrated market” for a recyclable material means that one or more sorting facilities have the capability and capacity to accept the material or that several municipalities have ordinances or programs that successfully require or promote the separation of the material in question.

⁹⁶ C.G.S. Sec. 22a-220

Because increased diversion can positively impact most aspects of the waste disposal system, **the program review committee recommends that DEP: 1) review the state's diversion and recycling policies and strategies and 2) develop specific flexible incentive programs after consultation with various stakeholders to assist the state and its municipalities in achieving the state solid waste management plan's recycling and diversion goals. These incentive programs can include incentives for implementation of pay as you throw programs, development of single stream recycling, and development of incentives for improved commercial recycling.**

The programs shall be developed by January 1, 2011, and submitted for review to the committee having cognizance over environmental matters. The incentive programs shall begin on December 31, 2011, and end on December 31, 2016, and contain specific program goals and measures. The department shall provide updates to the committee having cognizance over environmental matters on the impact of the incentive programs and recommend any other strategies to improve recycling and diversion on an annual basis beginning on December 1, 2012 until the programs are terminated.

Funding for incentive or other recycling programs is likely to be at a premium. The program review committee has identified a few potential revenue sources that could be used for waste diversion programs. These sources, along with their potential pros and cons, are listed in Table X-1.

A \$.50 per ton increase in the solid waste assessment fee would raise approximately \$1.1 million per year and a total of \$5.5 million for the five-year period to be dedicated to the incentive programs.⁹⁷ The incentive programs are intended to provide a short-term boost to assist municipalities in transforming their current disposal practices to focus more on diversion and recycling.

It is expected that a temporary increase of diversion funding will result in long-term cost savings. Assuming a cost avoidance of \$40 for each ton of waste that is recycled instead of disposed, only 27,500 additional tons of disposed waste, less than one percent, would have to be diverted from RRFs to recycling facilities to realize a net savings in any one year of the program. If the diversion programs are successful and diversion continues at or above the increased levels, municipalities will be able to realize long-term cost avoidance.

⁹⁷ \$1.1 million yearly estimate based on 2.2 million tons of waste processed at in-state RRFs being charged an additional \$.50 per ton.

Table X-1 Revenue Options	
<i>Revenue Option</i>	<i>Description</i>
Increase solid waste assessment fee	<ul style="list-style-type: none"> The solid waste assessment fee (“dioxin tax”), which is charged for every ton of waste received at RRFs, would be temporarily increased
<i>Pro</i>	<i>Con</i>
<ul style="list-style-type: none"> Would work as an excise tax, would not be charged on diverted waste Increase of currently assessed fee is relatively easy to implement May stimulate cost savings through increased diversion 	<ul style="list-style-type: none"> Tax would be passed through to generators (i.e., residents, businesses) Increases incentive to escape fee by disposing out of state, as it is not charged on waste that is not sent to RRFs (i.e., landfill or sent out of state)
<i>Revenue Option</i>	<i>Description</i>
Institute a statewide disposal fee and eliminate dioxin tax	<ul style="list-style-type: none"> All solid waste would be charged a per ton fee for disposal, regardless of disposal facility (transfer station, RRF, landfill)
<i>Pro</i>	<i>Con</i>
<ul style="list-style-type: none"> Expand the fee base to include waste that is disposed out of state Would decrease incentive to dispose of waste out of state 	<ul style="list-style-type: none"> Tax would be passed through to generators (i.e., residents, businesses) Administrative burden due to inclusion of additional facilities May create incentive to under-report waste taken directly out of state Removes funding from environmental testing of RRFs
<i>Revenue Option</i>	<i>Description</i>
Recapture bottle deposit money	<ul style="list-style-type: none"> Unclaimed deposit money would be put in a dedicated fund for waste diversion programs
<i>Pro</i>	<i>Con</i>
<ul style="list-style-type: none"> Money from recyclables would be used most directly for additional recycling programs Funding source would allow further development of diversion incentive programs 	<ul style="list-style-type: none"> Would remove money recently claimed into the general fund Can expect opposition from recyclers, bottlers, and grocers/retailers Sale would be one time revenue gain
<i>Revenue Option</i>	<i>Description</i>
Sell Mid-Conn Plant	<ul style="list-style-type: none"> CRRA would sell its RRF asset
<i>Pro</i>	<i>Con</i>
<ul style="list-style-type: none"> CRRA could use the money from sale of the plant to provide other statewide services, such as diversion and recycling Statewide agency would not be dependent 	<ul style="list-style-type: none"> Lose public control of large state asset (unless alternative public buyer was found and preferred) Base funds were ultimately provided by

Table X-1 Revenue Options	
<p>on opt-in membership to fund state-wide programs</p> <ul style="list-style-type: none"> • Allows CRRA to focus on other responsibilities such as developing new technologies/best practices in disposal and diversion instead of being another service provider 	<ul style="list-style-type: none"> • One time revenue gain • Expect CRRA opposition to forced sale of largest agency asset

Study the viability of food waste composting systems. The interim results of the DEP waste characterization study as well as other research on food waste generators in the state indicate that food waste is a large portion of the disposed waste within the state. There are several ways to help reduce the amount of food waste that is disposed, ranging from home composting to large-scale composting facilities for institutional food waste generators.

Connecticut currently has very little infrastructure or formal programs to promote food waste composting of any type. **To help determine the viability and feasibility of food waste composting in Connecticut, the program review committee recommends that DEP examine the potential costs and benefits to the state, municipalities, and waste generators of the various methods of removing food waste from the waste stream, identify any incentives or guidance the state could provide to develop the necessary composting infrastructure, and report the results to the committee having cognizance over environmental matters by June 1, 2011.**

The study should examine the infrastructure changes needed to create a statewide or regional food composting system for institutional sources (i.e., schools, correctional facilities, groceries) and/or residential generators. A secondary goal of the study would be to determine what impact increased focus on home composting may have on waste disposal rates.

Reasonable Cost

Collection services. Based on the analysis in the previous chapter, the findings regarding the cost of collection services in Connecticut include the following:

- there is a lack of comprehensive data to analyze and fully understand how competitive the MSW collection market is in Connecticut;
- illegal, anti-competitive practices by haulers have been uncovered by law enforcement recently in Connecticut; and
- the potential exists for improper pricing of collection services due to a lack of competition. Based on surveys of municipalities, it was found that in at least 15 municipalities there was either a single bidder for collection services or there only one collector operating in an open market.

Highlighted in Table X-2 are various alternatives to address these findings along with a description of some of the advantages and disadvantages of each approach. These options run the gamut from enhancing existing reporting requirements to the regulation of collector rates.

Table X-2. Collection Services Recommendation Options

Option	Pros	Cons
<p>Enhance Municipal Registration Requirements; Report Results to DEP</p>	<ul style="list-style-type: none"> • Further define what registration means in statute by specifying reporting requirements that would include identification of: principal partners and any related hauling enterprises; type of collection (residential, commercial, construction and demolition, other) • Provide tool to understand: the overall collection market; interrelationships between collection companies; extent of competition and market concentration • Greater consistency in reporting requirements • Not as burdensome as full licensing 	<ul style="list-style-type: none"> • Some increase in time and cost to haulers to provide information • Mandate on local governments; significant opposition from some municipalities could be expected • Additional reporting requirements from haulers could cause significant opposition from industry • Possible additional costs for DEP to administer and report
<p>Licensing of Haulers by State Agency</p>	<ul style="list-style-type: none"> • Provides tool to understand: the overall collection market; interrelationships between collection companies; extent of competition and market concentration • Could explicitly outlaw operators or employees with criminal backgrounds; could require background checks to be performed • Intended to reduce reliance on sporadic and cumbersome law enforcement efforts to assure no anti-competitive practices • Statewide reporting requirement would ensure greater consistency • Could improve tracking of MSW disposal and recycling • Provides state additional authority to leverage environmental compliance • Eliminates municipal registration requirements; reduces costs 	<ul style="list-style-type: none"> • Increase cost to haulers • Increase in state regulatory personnel to oversee system • Haulers object to revealing collection information • Break with a traditionally local function • Major change in state function; significant opposition from industry • Similar proposals have been defeated several times in the legislature • Loss of revenue to some towns
<p>Mandate Franchising of Collection for Municipalities that Rely on Private Subscription Services</p>	<ul style="list-style-type: none"> • This option would require each municipality that currently relies on private subscription to designate services area(s) and assign a collector to those areas through a competitive bid process. • Allows each resident to take advantage of volume contracting resulting in the lowering of everyone's price for collection 	<ul style="list-style-type: none"> • Would require municipality to develop actual structure of the franchise districts in their area • Would require some municipalities to develop a contracting procedure but could still require hauler to collect from customer • Could put some haulers out of business if municipal bids are not

Table X-2. Collection Services Recommendation Options		
Option	Pros	Cons
	<ul style="list-style-type: none"> • Franchising allows for uniform and efficient waste collection • Reduces the number and frequency of collection vehicles traveling on town roads • Reduces diesel fuel and greenhouse gas emissions • Could include commercial collection and possibly increase recycling and improve reporting amount of MSW disposed • Could improve residential recycling collection and improve the accuracy of the amount of MSW disposed • Provides a consistent revenue stream for haulers • Eliminates need for hauler sales force to acquire or maintain a customer base • Services could be offered on a Pay-As-You-Throw system; increasing economic efficiency 	<ul style="list-style-type: none"> • carefully constructed; may require special set-aside districts for small haulers • Limits residents to use of designated hauler; no ability to choose • Significant opposition from industry
Regulate Rates of Collectors	<ul style="list-style-type: none"> • Control rates using cost-based pricing and provide an allowance for profits similar to utility rate regulation • Stabilize pricing for municipalities • Provide state with knowledge of the overall collection market; interrelationships between collection companies; extent of competition and market concentration • Department of Public Utility Control has experience in setting utility rates 	<ul style="list-style-type: none"> • Few places do this, though New York City reports success through regulation of commercial collectors, while the State of New Jersey has de-regulated this area. • Major change in state function; significant opposition from industry
Regulate Rates if Municipalities that Rely on Private Subscription Have Not Franchised	<ul style="list-style-type: none"> • Option would require only municipalities that rely on private subscription services for collection • Would encourage but not requires these municipalities to franchise • Similar pros as regulation of rates and franchising noted above 	<ul style="list-style-type: none"> • Additional cost to customers in towns that did not franchise to pay for rate regulation • Similar cons as regulation of rates and franchising noted above • This model is used in the state of Washington

MSW Collection Services Information Should be Enhanced. The first key issue is to gather information to know more about the MSW collection market for the purposes of determining if there are any competitive deficiencies and for deterring certain anti-competitive practices. Connecticut statutes currently only require that any collector of solid waste generated within a municipality shall register with that municipality and identify any other municipality in

which that collector hauls solid waste. As noted earlier and in the briefing document, municipal registration practices vary widely among towns. Several data elements are missing that would assist in indentifying anti-competitive practices, such as the identification of principal partners and managers who have financial decision making authority, identification of subsidiaries, the type of collection and waste collected, and any criminal convictions of applicants and principals.

Requiring a single, centralized point of licensing by a state agency, such as DEP, would be perhaps the most efficient method of obtaining this information. In addition, by requiring a license, the department would also have another tool to ensure compliance with environmental laws by collectors. A central licensing agency is also similar the recommendations of a governor's task force on solid waste hauling in 2006 that called for state-level solid waste hauling authority. Given that this type of proposal, though, has not passed the legislature, it is doubtful the legislature would want to pursue this type of elaborate approach. **The program review committee, therefore, recommends that the current municipal registration requirements for collectors be enhanced to include, but not be limited to, the following:**

- **name and address of applicant/owner, principal partners, and of any manager or other person who has policy or financial decision-making authority in the business;**
- **identification of any and all subsidiaries;**
- **names of other towns and states in which collector is doing business;**
- **type of collection performed (residential, commercial, other);**
- **type of waste collected (solid waste, recyclables, construction and demolition, yard waste, other);**
- **location of current and expected disposal areas of all solid waste; and**
- **any other information required by municipalities to ensure the health and safety of its citizens.**

Each municipality shall provide an updated list of registered collectors and the required information to DEP on at least an annual basis in a format and timeframe prescribed by the commissioner of the Department of Environmental Protection. DEP shall collate the data and provide on-line public access to the information collected. Municipalities not providing the data in a timely manner shall not be eligible for any recycling incentive grants from DEP.

Other MSW collection services policy options. The second key issue has to do with the potential of noncompetitive pricing of collection services due to a lack of competition. The program review committee has provided a range of options in Table X-2 along with the pros and cons of each, that can assist in promoting competition or regulating the actual price of collection services. These options include:

- rate regulation of collectors;
- mandate franchising of collection services for towns with private subscription services; and

- provide rate regulation of collection services to those towns with private subscription services that do not franchise.

The franchising of collection services could also be accomplished on a regional basis. Contiguous municipalities could realize significant savings by banding together to franchise collection services and achieve greater efficiencies. Municipalities that have difficulty in attracting multiple bidders especially may experience a new level of market power through this mechanism. Care needs to be exercised to ensure that there are a mix of districts within the franchise area to allow smaller haulers the ability to compete.

Disposal services. The committee has made a number of findings regarding the disposal market in Connecticut in the previous chapter. Generally speaking, competition in the disposal market currently relies either on out-of-state disposal options for certain municipalities or the in-state spot market -- both of which carry risks as discussed below.

What this may mean for the long-term trend in pricing is unclear. There are some characteristics in the structure of the disposal market that may raise some concerns. These include:

- four of the six RRF plants are or will be privately owned, but there remains only two private operators of all six plants (Wheelabrator and Covanta);
- private-sector facility owners can choose to contract for and process out-of-state solid waste, further diminishing capacity dedicated to Connecticut municipalities – though very little of this appears to be happening now;
- CRRA may be providing some in-state cost competition, but it relies on contractors to perform all of its operations. Some of those contractors are providing competing services;
- landfills generally provide lower cost disposal options; however there is only one ash landfill in Connecticut and virtually no MSW landfill capacity;
- there are tremendous barriers to entry to the disposal market, even more so in Connecticut compared to other states;
- increasing market concentration of disposal services both within and outside the state could further reduce the state’s municipalities’ bargaining position; and
- depending how wide geographically the market for disposal is defined, the Connecticut disposal market arguably has elements of a natural monopoly or a duopoly.

Based on these structural factors, many have noted that there are long-term risks to the state in transferring significant control of waste management to the private sector, including noncompetitive pricing and a reduced amount of MSW disposal capacity available to Connecticut municipalities. Table X-3 presents an array of options that are intended to influence the long-term cost competitiveness of MSW disposal services (both RRF and ash), improve disposal capacity, and provide more information about the cost of those disposal services.

Table X-3 State Policy Options to Influence Disposal Costs

Option	Description	Pros	Cons
RRF Disposal			
Regulate Disposal Rates at RRFs	<ul style="list-style-type: none"> • Per ton disposal rates at in-state RRFs would be set by regulator • Control rates using cost-based pricing and provide an allowance for profits similar to utility rate regulation 	<ul style="list-style-type: none"> • Less expensive than outright purchase of facilities • Stabilize pricing for municipalities • Provide state with knowledge of financial viability of plants • Department of Public Utility Control has experience in setting utility rates 	<ul style="list-style-type: none"> • Additional regulatory responsibility of the state • Added expense for plant owners and ultimately rate payers • Added expense for municipalities to intervene in rate cases • Few states regulate; unclear how rates would be impacted • Major change in state policy; significant opposition from industry • Unclear whether all facilities provide same rate, or variable between facilities • If regulated rate is higher, municipalities may choose to go out-of-state (may need to mandate municipal use)
Require Financial Reporting to DPUC	<ul style="list-style-type: none"> • RRFs would be required to submit financial documents to DPUC as proof of future solvency • Similar to insurance and banking requirements 	<ul style="list-style-type: none"> • Provides cost information to determine competitiveness of pricing • Less expensive than full regulation • Provide state with knowledge of financial viability of plants 	<ul style="list-style-type: none"> • Cost to industry to provide information and state to develop and oversee; ultimately paid by customers • Significant industry opposition would be expected
Build More In-State RRF Capacity by Public Entity by Expansion or New Facility	<ul style="list-style-type: none"> • A public entity (state, regional, or local) would fund capacity expansion, either at an existing facility or by building a new facility 	<ul style="list-style-type: none"> • Encourage the development of additional in-state RRF capacity; ideally at cost-based pricing • Additional renewable energy supply would be created • May give additional choices and leverage to municipalities in negotiation with any disposal vendor 	<ul style="list-style-type: none"> • Significant costs to the state or regional authority to develop and build or expand facility – estimates at \$500 million for new plant • May be incurring cost that private marketplace may decide to do on its own • Public opposition to either expansion or new facility can be expected • Additional environmental impacts, especially air

Table X-3 State Policy Options to Influence Disposal Costs

Option	Description	Pros	Cons
		<ul style="list-style-type: none"> All the benefits and avoidance of issues previously described regarding in-state capacity in Chapter VII 	<p>impacts, would be incurred, though its unclear whether the avoided transportation emissions and MSW landfill emissions would balance the increased burn emissions</p> <ul style="list-style-type: none"> Likely to need long-term contracts to secure funding
Disallow Favored Nation Status in Contracts	<ul style="list-style-type: none"> Most Favored Nation clauses would be disallowed in future contracts. Most Favored Nation clauses in RRF contracts require that the RRF owner (the seller) give a purchaser of disposal services as favorable a price as any other subsequent purchasers of disposal services. 	<ul style="list-style-type: none"> Eliminate the current floor pricing incentives by private companies; now the first one to contract sets price for everyone else Allow contractees more leverage in contract negotiations Increase flexibility in market pricing for disposal services 	<ul style="list-style-type: none"> Unclear legal status Without MFN status, there may be a greater discrepancy in costs of disposal for same service among towns May only apply to public entities entering into contracts
Expand MSW Landfill Capacity	<ul style="list-style-type: none"> Public entity would build a new MSW landfill within the state 	<ul style="list-style-type: none"> New landfills for MSW would be sited in the state using the technical specifications outlined in RCRA subtitle D Optionally, landfill could be for mixed use, allowing for both MSW disposal and beneficial use of ash Landfill space is necessary step if seeking self-sufficiency 	<ul style="list-style-type: none"> Capacity/land use would have to be very large to realize significant statewide effects Once acceptable sites are used, landfilling will no longer be an option in the state Significant pressure from residents and environmental groups High development costs (i.e., permit and land acquisition) may largely negate decreased operational costs Contrary to state waste management hierarchy

Table X-3 State Policy Options to Influence Disposal Costs

Option	Description	Pros	Cons
		<ul style="list-style-type: none"> • Landfill operations are relatively inexpensive and cost of disposal should reflect this • Possible that disposal capacity provided at lower disposal rates will help lower RRF disposal rate 	
Public Purchase of RRF Plants	<ul style="list-style-type: none"> • Public entities (i.e., CRRA, regional authority, municipalities) would purchase the privately owned facilities using public financing mechanisms 	<ul style="list-style-type: none"> • Public control over pricing and operation • Operations would be cost based • Limit issues from lack of competitive market • Little need for economic regulation 	<ul style="list-style-type: none"> • Significant costs to state and ultimately customers from “repurchase” of the plant • Unless publicly operated, operations costs (and operators) may be similar to private ownership • Assumes public employees can provide service at less cost than private sector • Greater risks associated with ownership than use, possible there’s less stability • Purchase of plants that are aging
State Finance of Large Scale Rail Transfer Station	<ul style="list-style-type: none"> • State would finance public entities to develop a centralized rail based transfer station to ship waste out of state • Could also develop a series of smaller regionalized transfer stations 	<ul style="list-style-type: none"> • Rail-based transportation would increase the market for out-of-state disposal options • Increase competition within the state • Potentially easier to site than RRF or landfill • May be able to use some federal funds to further develop railways 	<ul style="list-style-type: none"> • Must have rail-based landfill disposal options to be worthwhile • Initial development may be costly • Could undermine the economic feasibility of in-state RRFs • Promotion of landfill use goes against disposal hierarchy
Purchase Out-of-State Disposal Capacity or Landfill by Regional Resource	<ul style="list-style-type: none"> • Purchase of landfill capacity to a greater extent than 5-10 year deals that are already in place 	<ul style="list-style-type: none"> • Assures disposal capacity at lower cost • Likely to be less costly than siting in Connecticut • Minimal environmental 	<ul style="list-style-type: none"> • Intricate undertaking that could take years and outcome not certain to try to pursue a landfill purchase • Requires upfront costs with an outcome that is uncertain • Long-term liability of owning

Table X-3 State Policy Options to Influence Disposal Costs			
Option	Description	Pros	Cons
Recovery Authority	<ul style="list-style-type: none"> Secure long-term usable disposal capacity for municipal use 	<ul style="list-style-type: none"> impacts to Connecticut 	<ul style="list-style-type: none"> a landfill Transport costs would still be incurred Would probably require legislative authorization Conflicts with Connecticut's hierarchy of waste disposal
Ash Landfill			
Development Of Site By the State/CRRA	<ul style="list-style-type: none"> State or CRRA would develop an ash landfill in the state for the disposal of state generated ash 	<ul style="list-style-type: none"> Increased in-state capacity would help put state on path towards self-sufficiency Costs to dispose ash would be passed through to generators without profit markup More options for ash disposal may help drive down the market price 	<ul style="list-style-type: none"> Significant siting opposition Cost savings may accrue to the plant owners instead of waste generators Would require a long-term commitment Unclear how project development would be funded and who would reap the benefits
Purchase Only of Property by the State	<ul style="list-style-type: none"> Purchasing of potential landfill sites Sites would be held until certain trigger conditions are met and landfill space becomes necessary 	<ul style="list-style-type: none"> Number of suitable sites in state is limited, purchasing one or more would protect those areas from alternative uses Sites can be part of a long-term plan to minimize risk of being locked out of out-of-state disposal Property can be used as public green space until needed 	<ul style="list-style-type: none"> Purchase would require immediate funding without immediate benefit Prevents development of sites which may otherwise have economic benefit Significant siting opposition
Purchase of Out-of-State Capacity	<ul style="list-style-type: none"> State or CRRA would purchase sufficient capacity at out-of-state sites for long-term use for ash disposal 	<ul style="list-style-type: none"> Avoids in-state siting issues Large enough purchase is likely to lower price from market value Minimal environmental impact to Connecticut 	<ul style="list-style-type: none"> Agreements with entities in other states may not be as safe as in-state guarantees Ignores concept of in-state self-sufficiency Purchasing capacity may be more expensive than owning site Transportations costs may make use of the capacity a burden

Concerns have also been raised about self-sufficiency or the need to develop reliable and dependable in-state disposal capacity. The major premise of the 2006 SWMP was that the state should be self-sufficient in waste disposal services. The risks associated with a reliance out-of-state disposal have been described in Chapter VII and include a loss of control over disposal, volatile transportation costs, potential liability issues, and increased negative environmental impacts. While there are significant risks in depending on out-of-state options, becoming self-sufficient also has significant barriers, including:

- a considerable investment in disposal capacity expansion unless recycling goals are met. A self-sufficient system would most likely have to include use of existing RRFs and expanded capacity at RRFs through existing facility expansion or development of new expensive facilities;
- at a minimum, development of landfills are necessary to become completely self-sufficient, which are difficult to site in Connecticut;
- the additional capacity required to become self-sufficient may ultimately be as or more costly than capacity than is available out of state; and
- due to limited land availability, a self-sufficient system will eventually cease to be unless there is a technological breakthrough that does not require the use of an ash landfill or landfills for other noncombustible material.

In-state disposal options would not necessarily create a competitive market for waste in the absence of out-of-state alternatives, so it is possible that a self-sufficient system would have to be regulated, unless actions are taken to secure additional publicly-owned capacity. Some options provided in Table X-3 could allow the state to pursue increased self-sufficiency as well as possibly increasing competition. These options include building of new publicly-owned RRF capacity, either through a new plant or the encouragement/incentive of expansion of existing plants, and the development of additional publicly-owned landfill capacity.

The options also have an impact on other state goals such as consistency with state policies as expressed in the waste hierarchy. Table F-1 in Appendix F shows the impact on various state goals as well as competition and gives a general indication of the cost of those options.

The options are offered with no specific recommendation. Because of the scale of these recommendations, more direction from the legislature and study of the proposals would be warranted before the recommendations could be made and implemented. The program review committee recommends, at a minimum, revising state policies to encourage competition and to position the state to act should the need arise to become self-sufficient in the future. This includes:

- the elimination of the determination of need process for RRFs and ash landfills;
- research on the beneficial reuse of ash; and
- consideration of a state purchase of land for future use as a landfill.

Determination of need process could be eliminated. The determination of need process acts as a barrier to competition, virtually insulates the current RRF operators from local

competitors, and without price regulation may be inadvertently driving up disposal prices. As noted earlier, before a permit to build or expand an RRF, a mixed MSW landfill, or an ash landfill can be issued, DEP must find that a need exists for such a facility or expansion and such a facility or expansion will not result in substantial excess disposal capacity in Connecticut. This is contrary to the principals of supply and demand. Excess capacity tends to drive prices down. In addition, DON by inhibiting new entrants into the marketplace may also be hindering the adoption of new disposal technologies.

Essentially, the DON requirements make it impossible for a competitor to enter the market unless there is substantial excess MSW to be disposed. However, it is likely that existing companies will try to expand before a new competitor enters.

Even with the elimination of DON, significant barriers still exist for the expansion or siting of new facilities. Other environmental and siting protections would still remain. New facilities would still have to meet all current environmental, health, and siting requirements. In addition, new facilities would still have to find financing to ensure financial viability; effectively the financial marketplace would act similar to DON. The downside is that with the introduction or expansion of new plants, a current plant may not be financially viable and it could increase the amount of out-of-state waste processed in Connecticut.

Potential beneficial use of ash residue should be researched. There has been much controversy lately regarding the need for an ash landfill in Connecticut. CRRA recently investigated the possibility of siting an additional ash landfill in Franklin, Connecticut. CRRA pursued the landfill while stating that a publicly owned ash landfill could save municipalities money in the long-term while providing additional in-state infrastructure to support the RRFs. CRRA's geological testing showed that the Franklin site would meet the criteria set forth by DEP. However, CRRA's board of directors decided in August of 2009 to suspend their pursuit indefinitely "based on its understanding of the directives received from State leaders."⁹⁸ At that time, CRRA also made known its intention to pursue other low-costs options for ash disposal.

Ash residue is a byproduct of the resources recovery process. The residue ash has about 10 percent of the volume and 20 to 30 percent of the weight of the original MSW. The ash itself is a combination of fly-ash, which is known to contain potentially dangerous amounts of heavy metals, and bottom ash, which is typically considered to be non-hazardous. The combination of bottom ash and fly ash is the material referred to as ash residue. The ash residue must be disposed of, and in Connecticut the only legal disposal method for ash is landfilling.

From 1999 through 2008, there were two ash landfills within the state. The closure of the Hartford landfill at the end of 2008, which had been accepting both MSW and ash in separate sections, leaves the Putnam ash landfill, owned by Wheelabrator Technologies Inc., as the only remaining in-state ash disposal facility for 2009 and beyond.

Ash residue is a substance that hardens over time and sets up with a consistency close to that of concrete. Ash residue has several potential methods of reuse, including as an ingredient for asphalt or concrete, and their many derivatives such as shingles, paver blocks, or road sub-

⁹⁸ "CRRA Resolution Regarding Ash Landfill Initiative". CRRA. August 27, 2009.
<http://crra.org/documents/press/2009/CRRA_board_resolution_regarding_ash_landfill_8-27-2009.pdf>

base. According to a recent survey,⁹⁹ Florida, Massachusetts, Pennsylvania, Maryland, New Hampshire, New York, Hawaii, and Missouri allow at least one type of beneficial use of ash residue. In most cases, the eight states allow ash residue to be used as a component of asphalt, as road base, or as supplemental material for landfills (i.e., daily cover or under liner base).

Since there are no ash reuse methods in place within the state, it is unclear whether methods used in other states would meet the environmental standards of DEP. Connecticut law requires a permit in order to reuse MSW ash residue, but to date, no formal application has been submitted.

Legal and permitting issues aside, unless a reuse method develops that proves to be more cost effective than using an ash-only landfill, it is unclear whether there would be a market for items that contain reused ash. It should be noted, however, that there are reuse programs in place for coal ash, which has similar characteristics to MSW ash residue. DEP has indicated that the reused coal ash has effectively flooded any market there may be for MSW ash residue. **Because the question of beneficial reuse of ash residue has not been fully explored, the program review committee recommends that the PRI co-chairs request that legislative leadership consider requesting the Connecticut Academy of Science and Engineering (CASE) to evaluate the potential beneficial use of ash residue. Specifically, a CASE evaluation should:**

- 1. Determine how many states allow the beneficial reuse of ash residue and for what purposes;**
- 2. Compare how much residue is actually reused in those states that permit ash residue reuse and for what purposes;**
- 3. Evaluate the potential for the beneficial reuse of ash residue in Connecticut;**
- 4. Examine barriers to the beneficial reuse of ash residue in Connecticut, including barriers to possible adoption by Connecticut state agencies of ash residue as a roadbed material or component in asphalt used in various state-funded infrastructure projects; and**
- 5. Propose cost-effective solutions for the reuse or disposal of ash residue.**

The state should consider the purchase of parcels of land to ensure the future availability of landfill space. The most prominent risks caused by the lack of in-state landfill capacity to both cost and sustainability are the possibility of significant and sudden changes beyond the state's control. Based on state policies and practices, it appears that waste stakeholders are currently comfortable with the risks associated with the lack of in-state landfill capacity. In addition, it is unlikely that out-of-state disposal capacity will cease to be available in the near future

However, there are many variables involved in the current situation that may change the waste disposal landscape sometime in the future. Most notably, the program review committee finds that:

⁹⁹ "2006 Beneficial Use Survey Report" November, 2007. Association of State and Territorial Solid Waste Management Officials.

- it is possible that out-of-state disposal costs will increase, due partially to changes in other states' policy, though the increase could be mitigated by cost and availability of disposal in other states or regions;
- transportation costs may be the most volatile and unpredictable component of waste disposal;
- out-of-state disposal is more heavily dependent on transportation than in-state disposal;
- Connecticut has limited potential land available for waste disposal;
- additional landfill capacity for ash residue or MSW may reduce the cost of disposal; and
- land that is suitable for disposal in Connecticut may become more scarce if the land is used for disposal or the land is otherwise developed.

While the lack of landfill capacity is currently something of a liability, having the potential for developing landfill capacity is a potential asset. The landfill capacity capability of the state is fixed at a relatively small amount due to the size of the state and the environmental restrictions. Developing some of the potential landfill capability would likely lead to a decrease in disposal costs, both directly for those using the disposal facility and indirectly as the prices of the disposal market are likely to be driven lower. The cost savings will happen whenever the landfill's disposal capacity is available for use.

If the potential landfill disposal sites in Connecticut are few and fixed, as stated above, the state runs the risk of running out of potential in-state landfill disposal sites. If the landfill disposal sites are used to mitigate costs and move the state toward self-sufficiency now, they would not be available to protect the state from future risks. Given that the current levels of risks and costs for out-of-state disposal appear to acceptable to some municipalities, it may be worth protecting the potential disposal sites so that they may be developed at some point in the future when the combination of transportation costs, other states' waste disposal policies, and lack of in-state disposal capacity have made out-of-state disposal options unpalatable.

One way to mitigate such risk would be to acquire potential disposal sites now but prevent development of the site as a disposal area unless certain criteria are met. As part of the purchase and hold strategy, the potential sites should be properly permitted using current environmental regulations to help prevent the site from being unusable due to changes in regulations when the site may be needed. An acquired and held site would serve several key functions that include:

- mitigating some of the risks of continued reliance on out-of-state disposal options;
- potentially creating a ceiling for disposal prices (if alternative disposal price is included as a condition to build);
- giving the state an emergency disposal option in the case of a major state-wide disaster; and
- preventing the loss of potential disposal capacity due to non-waste related development of the site.

The acquire and hold scenario is not without potential problems. Among other considerations, a potential site may prove costly to acquire, maintain, or permit. Additionally, the held site cannot be used for other purposes that may serve as economic drivers for the municipality or region in the area. Also, if the use criteria create a cost ceiling, it may reassure other disposal facilities that competition will not increase except under the specified criteria. As with all potential disposal facilities, even a site that is not to be used except under certain conditions is still likely to face local opposition.

As the mitigation of risks and costs that occur because of the acquisition of land may or may not outweigh the risks associated with the acquire and hold scenario, **the program review committee recommends that DEP study the economic feasibility of a state purchase and hold of potential disposal sites.**

The study itself should include a discussion and recommendations regarding:

- **the entities that are most appropriate to acquire and maintain the sites;**
- **the costs of acquiring, maintaining, and permitting the sites without use;**
and
- **the conditions necessary that would call for the development and use of the disposal site, including;**
 - **the presence of uncompetitive disposal practices or other unreasonably high disposal costs: and**
 - **the minimum and maximum time frame the land should be held before either use or sale.**

The study shall be completed by July 1, 2011, and the results shall be reported to the committees of cognizance over environmental matters.

Other Recommendations

During the course of this review, the program review committee noted a number of areas where some system improvements could be made that were not encompassed in the adequacy, sustainability, and reasonable cost framework. This includes improvements to the collection and dissemination of solid waste system data, a mandated timeframe for revisions to the State Solid Waste Management Plan, a re-examination of CRRA's role and purpose, and a review of landfill monitoring practices by DEP.

MSW Services Data Management Practices Need Improvement

One role of DEP in the solid waste management system is to administer and enforce those policies instituted by the state to ensure that waste disposal practices contribute to a clean and wholesome environment. Adequate data collection and analysis are crucial components of both planning and enforcement strategies. Information systems should be designed such that the minimum amount of time is spent capturing the data so that the maximum amount of time can be spent analyzing and reacting to the data. The program review committee finds that:

- DEP collects the statutorily specified information from solid waste disposal facilities (i.e., RRFs, transfer stations) regarding the delivered tonnage of MSW and town of origin, but does not regularly collect additional information as allowed by statute;
- information submitted from disposal sites to DEP about MSW tonnage is done so via hard-copy, despite the fact that solid waste facilities generally aggregate data electronically;
- DEP personnel eventually enter the submitted information into an electronic database;
- the current reporting requirements include a number of redundancies. For example, municipalities and solid waste disposal facilities are both required to report tonnages to DEP, but municipalities typically have no way to independently assess the amount and destination of their MSW. DEP has recently instituted changes to help eliminate the redundancies;
- the accuracy of the data provided to DEP is largely dependent on collectors, though DEP has little formal recourse to ensure that data provided by haulers is accurate;
- the usefulness of current data is limited in several ways, including lack of accessibility, timeliness of publishing, and accuracy of reporting; and
- due partially to the limitations of the data and the data reporting system, few enforcement actions have been taken toward entities that fail to report or provide inaccurate data.

The inadequacies of the current data management system likely mask several underlying problems in the waste management system itself. Access to a clear, timely description of the current system can help inform interested parties (e.g., public officials, industry personnel) to make comparisons of their own performance to others. Information about current system performance can also assist DEP in fulfilling its environmental planning and enforcement role, and support decision-makers at all levels.

Electronic data submission. The RRFs and many transfer stations already aggregate waste tonnage data electronically. Submitting the data to DEP using paper creates unnecessary waste and introduces greater potential for error as DEP staff must recreate the data electronically.

For this reason, **the program review committee recommends that DEP allow and encourage electronic submission of waste tonnage data by solid waste facilities, with a goal of eliminating paper-based submission by FY 2012.**

DEP should take the following steps to allow electronic submission of data:

- **notify solid waste facilities of the option to submit data electronically for the remainder of FY 2010 and of the goal to switch by FY 2012;**
- **notify solid waste facilities of the range of electronic formats that are acceptable;**
- **require that electronically submitted data be organized using basic labels for the information to be submitted;**
- **develop an electronic verification system to replace the current need for signed hard copies; and**
- **reassign staff responsibilities from manual entry of paper-based data to temporarily assisting solid waste facility operators in complying with electronic data submission.**

Waste tonnage data detail level. DEP receives statutorily required waste data that includes the amount of MSW tonnage, municipality (or facility) of origin, and identification of the solid waste facility reporting the tonnage. Current statute allows DEP to require that solid waste facilities include “such information the commissioner deems necessary.”¹⁰⁰ There are often inconsistencies within the data submitted to DEP, such as a spike in the waste delivered from one municipality or a sharp decline in the waste delivered from another municipality to a certain facility. At current levels of detail, it is somewhat difficult to make accurate claims about the validity of the data. **The program review committee recommends that C.G.S. Sec. 22a-208e be amended to include a requirement that solid waste facilities shall report to DEP the collector or transporter of all loads of waste received, except those loads weighing less than one ton.**

While most solid waste planning can be achieved using more aggregated levels of data, reporting the hauler along with the tonnage will, among other things, allow the state to direct further questions about discrepancies to the collector who provided the information. Including the hauler of origin can also help verify municipal registration lists. Additionally, program

¹⁰⁰ C.G.S. Sec. 22a-208e

review staff contacted every in-state RRF and each indicated that hauler information is already collected and would not be difficult to include in data reports. The committee recognizes that exemptions from this requirement may need to be made for direct residential use of transfer stations or municipal convenience centers.

Data publishing schedule. Due partially to the time constraints associated with non-electronic submission of data, solid waste tonnage data is neither timely nor easily accessible by stakeholders (i.e., solid waste facility personnel, haulers, or municipal personnel). Increased access to waste tonnage data may help solid waste facilities and municipal officials better track the flow of waste within the state, including allowing analysis that may reduce the instances of improper attribution of waste to municipalities.

The program review committee recommends DEP adopt the following data publishing policy:

- **Submitted waste tonnage data should be aggregated and made publicly available online in its unaudited form within one month of the deadline for data submission.**
- **Verified data should be made publicly available online on an annual basis.**

State Solid Waste Management Plan Needs Revision Schedule

The State Solid Waste Management Plan is a statutorily required document for outlining the state's environmental goals with regards to handling of solid waste.¹⁰¹ Municipalities are required to make provisions for solid waste disposal with regards to the solid waste management plan and one of the primary charges for CRRA is enacting the plan. Waste management systems change as new problems emerge and trends change, so planning for waste services should be similarly responsive. The current plan was updated in 2006, 15 years after the previous plan. The current statute does not specify a timeframe for revising the SWMP and the program review committee finds that too much time has elapsed between plan revisions.

Therefore, the program review committee recommends that C.G.S. Sec. 22a-228 be amended to require the commissioner of DEP to prepare a solid waste management plan revision at least once every 10 years with the next revision to be adopted on or before July 1, 2016. Additionally, the statute should be amended to require that by July 1, 2011 and within five years of submission of a plan, DEP prepare and publish an adjustment to the most recently published plan that includes a comparison of the state's performance to the projections in the plan, revised projections for the remaining duration of the plan, and the status of accomplishment of goals outlined in the plan.

¹⁰¹ C.G.S. Sec. 22a-228

The Role and Purpose of CRRA Should be Evaluated

A review of the legislative history shows that one of the main reasons CRRA was created was to provide a vehicle to encourage a regional approach to transform the way in which solid waste was managed in Connecticut, through voluntary decisions on the part of towns to utilize the services of CRRA, among their other options.

The creation of CRRA was based on the belief that resources recovery projects and related services could be developed more quickly and with greater flexibility by an independent, quasi-public organization authorized to issue special revenue bonds, than through a state agency structure. The authority developed and at one time oversaw an integrated system that included four of the six resources recovery facilities in Connecticut, two regional recycling centers, five landfills (all of which are in post-closure), and several transfer stations. The four original CRRA-connected RRFs handled more than 80 percent of the municipal solid waste disposed of in Connecticut. Comparing CRRA's purposes, accomplishment, and the current state solid waste management plan it can be noted that:

- **Some of the major CRRA purposes have been accomplished.** Some of the major goals of CRRA, such as the creation of a network of resources recovery facilities and development of recycling facilities in Connecticut to transform the way in which solid waste is handled, have largely been accomplished. Connecticut used to rely primarily on landfills as a means of waste disposal. As documented in the briefing report, the state now disposes of nearly 64 percent of its solid waste in RRFs and about 25 to 30 percent of its waste is recycled.
- **Significant changes in ownership of and affiliation with RRFs have occurred.** CRRA will only own or be affiliated with one RRF by 2015, when the Preston RRF bonds will be paid, though it maintained a role with the Bridgeport project by negotiating capacity at the RRF for 12 municipalities and has purchased some disposal capacity at the Wallingford plant. In some sense, CRRA is a competitor with municipalities in securing disposal services, which may not have been envisioned in the original purposes of CRRA. In addition, the long-term municipal contracts that bind 70 communities to CRRA-owned Mid-Connecticut plant will expire in 2012, and some of the 70 municipalities may choose to dispose of their waste elsewhere.
- **The State Solid Waste Management Plan has a new vision and aggressive goals.** DEP issued an amended State Solid Waste Management Plan in 2006 with a new vision and goals. The previous plan was issued 15 years before. CRRA has a key statutory responsibility in implementing major portions of the SWMP, whose primary goal is to increase the diversion rate to 58 percent (from 25-30 percent) by 2024. CRRA has increased its recycling efforts over the years. But in order to meet the new goal, CRRA's role may need to be changed or expanded, if appropriate, to further develop the waste diversion infrastructure.

- **There is a tension between municipal control and state goals.** While CRRA is intended to play a major role in implementing the solid waste management plan, state statutes give each municipality maximum flexibility in determining how it wants to manage its own solid waste. Because joining CRRA is voluntary, a fundamental question arises as to whether CRRA is really equipped to act broadly on a statewide basis to achieve state goals. While the responsibility to act on a statewide basis is envisioned in statute, the necessary authority to do so is not. The remaining member towns of CRRA's Mid-Conn facility may also question the fairness of having to fund and have liability for solid waste initiatives with potential statewide benefits and use. If CRRA is not properly equipped to achieve state goals, a question remains as to how those goals should be accomplished.
- **CRRA impact on disposal price is worth a closer examination.** It is unclear what impact CRRA is having on disposal prices and if the organizational model under which the authority operates truly reduces costs. CRRA does perform an oversight and contracting function, which should be acting as a check on costs, but the authority does not actually operate any RRF, transfer station, or recycling facility. By statute it is limited in the number of employees it can hire and it must use private industry or contractors to implement nearly all of its activities. Each of those industries presumably has a profit component, which is added to CRRA administrative costs.

Given the changes in ownership of Connecticut's resources recovery facilities and the aggressive waste diversion goals adopted by DEP, the program review committee recommends that a task force be created to examine if any changes or refinements need to be made to the statutory role and purpose of CRRA. The task force shall examine: 1) how changes in RFF ownership and affiliation have affected CRRA operations and its influence over waste management compared to its statutory responsibilities; 2) if CRRA is the best mechanism to be the primary contributor to the accomplishment of the goals of SWMP; 3) if so, what type of changes, if any, should be made to CRRA's structure and funding to better address the goals of SWMP; 4) how other waste management authorities contribute to state waste management goals and if any statutory changes are necessary to ensure greater support and promotion of state goals by these entities; and 5) the impact of CRRA's structure and ownership of key solid waste facilities on disposal prices.

The task force shall consist of 14 members and be appointed by the governor (1 appointee) and the six legislative leaders (2 appointees each) from among various stakeholders from local, regional, and state government entities, industry experts, and environmental organizations. The DEP commissioner or designee shall be an ex officio, non-voting member. The task force shall report its results to the committee of cognizance over environmental matters by June 1, 2011.

Department of Environmental Protection Landfill Monitoring

DEP is required to collect data from many closed landfills but reports that it lacks the staffing to thoroughly address the large amount of monitoring data that comes to the agency. DEP staff resources for landfill monitoring are prioritized to track landfills with previously established violations rather than combing through looking for issues on facilities that have not been previously flagged. While a thorough review of DEP landfill monitoring policy was not within the scope of this study, it is recognized that this is a critical component of ensuring appropriate protection of the environment. **Therefore, the program review committee recommends that DEP review its current landfill monitoring practices. DEP should evaluate if the monitoring is performed adequately to protect the public health and environment, and if the monitoring requirements should be reduced, performed in a different manner by the department, or performed by an independent third party that provides results to DEP. The department should estimate any costs of any changes and report its results to the committee of cognizance over environmental matters by January 1, 2011.**

APPENDICES

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APPENDIX A

Member Municipalities by Long-term Resources Recovery Facility Contracts

Mid-Conn Project (70)				HRRA (11)	Bristol (14)
Avon	East Windsor	Middlebury	Suffield	Bethel	Berlin
Barkhamsted	Ellington	Middlefield	Thomaston	Bridgewater	Branford
Beacon Falls	Enfield	Naugatuck	Tolland	Brookfield	Bristol
Bethlehem	Essex	New Hartford	Torrington	Danbury	Burlington
Bloomfield	Farmington	Newington	Vernon	Kent	Hartland
Bolton	Glastonbury	Norfolk	Waterbury	New Fairfield	New Britain
Canaan	Goshen	North Branford	Watertown	New Milford	Plainville
Canton	Granby	North Canaan	West Hartford	Newtown	Plymouth
Chester	Guilford	Old Lyme	Westbrook	Redding	Prospect
Clinton	Haddam	Old Saybrook	Wethersfield	Ridgefield	Seymour
Colebrook	Hartford	Oxford	Winchester	Sherman	Southington
Cornwall	Harwinton	Portland	Windsor Locks		Warren
Coventry	Hebron	Rocky Hill	Woodbury	Wallingford Project (5)	Washington
Cromwell	Killingworth	Roxbury		Cheshire	Wolcott
Deep River	Litchfield	Salisbury		Hamden	
Durham	Lyme	Sharon		Meriden	Lisbon Project (1)
East Granby	Madison	Simsbury		North Haven	
East Hampton	Manchester	South Windsor		Wallingford	Middletown
East Hartford	Marlborough	Southbury			
Non-Member Municipalities (43)					
Bridgeport Project (13)	Southeast Project (12)	Non-Member Municipalities (43)			
Bethany	East Lyme	Andover	East Haddam	New Haven	Thompson
Bridgeport	Griswold	Ansonia	Eastford	Norwalk	Union
East Haven	Groton	Ashford	Franklin	Plainfield	Voluntown
Easton	Ledyard	Bozrah	Greenwich	Pomfret	West Haven
Fairfield	Montville	Brooklyn	Hampton	Putnam	Weston
Milford	New London	Canterbury	Killingly	Salem	Willington
Monroe	North Stonington	Chaplin	Lebanon	Scotland	Windham
Orange	Norwich	Colchester	Lisbon	Somers	Windsor
Shelton	Preston	Columbia	Mansfield	Stafford	Wilton
Stratford	Sprague	Darien	Morris	Stamford	Woodstock
Trumbull	Stonington	Derby	New Canaan	Sterling	
Westport	Waterford				
Woodbridge					
As of September 2009.					

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APPENDIX B

Resources Recovery Facility Summary Information

Selected Information	Bridgeport RRF	Wallingford RRF	Southeast RRF	Mid-CT RRF	Bristol RRF	Lisbon RRF
Maximum Permitted Design Capacity (tons/year) (1)	821,250	153,300	251,485	888,888	237,250	195,640 (2)
Average Amount (tons)of MSW Burned/Year (3)	722,692	143,158	250,484	715,011	196,113	181,987
Generation Capacity (Megawatts) (4)	67	11	18	68.5	16.3	15
Year Bonds Will be Paid off	2008	2009	2015	2012	2014	2020
Operator	Wheelabrator	Covanta	Covanta	Covanta/M DC	Covanta	Wheelabrator
2007 Owner	CRRA	CRRA	Covanta	CRRA	Covanta	ECRRA
Contract End Owner (5)	Wheelabrator	Covanta	Covanta	CRRA	Covanta	ECRRA
Ash Disposal Site	Putnam	Peabody/ Springfield (MA)	Putnam	Putnam	Peabody (MA)	Putnam
<p>1) This represents the maximum (theoretical) amount of waste the facility is permitted to process per day multiplied by the number of days a year the facility operates.</p> <p>2) As appropriate, 13,140 tons/year are dedicated only for processed demolition wood (based on the Lisbon RRF permit to operate)</p> <p>3) The Average Amount of Waste burned per year is based on the five year period of FY 2000-FY 2004.</p> <p>4) Information obtained from facility operators (Wheelabrator Inc, Covanta Energy). Numbers are approximate at permitted capacity.</p> <p>5) This category refers to what entity is expected to own the facility after the financing bonds are repaid. The items do not reflect potential purchase of the facilities through contractual options or otherwise, except the Bridgeport plant which already exercised its ownership option.</p> <p>SOURCE: Based on SWMP (2006). Updated as of September 2009.</p>						

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APPENDIX C

Sample Resources Recovery Facility Tip Fees

Table C-1. Range of Waste-to-Energy Tip Fees Nationwide	
Regions	Tip Fee Ranges
Mid Atlantic	\$65.25-\$72.22
Mid West	\$28.00-\$88.80
New England	\$56.00-\$76.05
South	\$12.00-\$85.00
West	\$51.91-\$98.00
Source: Covanta Holding Corp. 2009	

Table C-2. Selected Waste-to-Energy Tip Fees Provided by Wheelabrator	
Municipality/WTE facility	Tip Fee
<i>Massachusetts:</i>	
Millbury	\$70.00
North Andover	\$64.00
Saugus	\$71.00
<i>New York:</i>	
Westchester County	\$71.50
Source: Wheelabrator Inc. 2009	

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Two Case Studies: Municipal Disposal Options Post-RRF 20-Year Contracts

Case Study #1 Bridgeport Project

The Bridgeport RRF project was the first to experience a change in ownership and the end of the original long-term municipal contracts. After a previous unsuccessful attempt to establish a waste-to-energy plant in Bridgeport in the early -1980s, the current plant went into commercial operation in July 1988. By the end of the project, it served 18 towns through long-term disposal contracts. The project consists of two now closed landfills, eight transfer stations, and a 2,250-ton per day mass burn incinerator that converts solid waste into electricity, which is capable of producing 67 megawatts of power.

Wheelabrator Technologies, Inc., the facility operator, took ownership of the plant as of January 1, 2009. The facility was in part financed through CRRA bonds. CRRA held the title to the facility and leased it to a vendor under a long-term, sales-type arrangement until Wheelabrator exercised its contractual right to purchase the plant for one dollar. The transfer stations were originally owned by CRRA, though the land under the transfer stations was owned by the towns and leased to CRRA for one dollar per year. The ownership of the transfer stations reverted back to the towns in which they are located on January 1, 2009. The closed landfills remain the responsibility of CRRA.

Of the 18 towns that formerly had long-term disposal contracts, 12 again signed long-term contracts (although only five years, plus options to renew, compared to the original 20-year contracts) with CRRA to dispose of their MSW at the Bridgeport facility.¹⁰² One town has signed a long-term contract directly with Wheelabrator for disposal at the facility.¹⁰³ The remaining five towns issued a request for proposals to find another vendor and no longer have a contractual obligation to dispose of their MSW at the Bridgeport facility, though much of their waste is still disposed there.¹⁰⁴

Below is a description of the previous pricing structure and the different arrangements that occurred after Wheelabrator took ownership of the Bridgeport plant. Complicating the description and comparison are at least two factors 1) the 18 member towns split into different groups; and 2) certain services that were provided under the CRRA contract tip fee were not continued in the new contracts.

Previous tip fees. The basic tip fee is the price paid for MSW disposal. As noted earlier the fee can include a range of expenses and other services that can make comparisons difficult. Bridgeport project towns had a complicated tip fee pricing structure. For at least the last decade, the Bridgeport project towns were charged the highest or close to the highest tip fees in the state.

¹⁰² Bethany, Bridgeport, Easton, Fairfield, Milford, Monroe, Orange, Shelton, Stratford, Trumbull, Westport, and Woodbridge

¹⁰³ East Haven

¹⁰⁴ Darien, Greenwich, Norwalk, Weston, Wilton, and New Canaan, New Canaan was not part of the CRRA Bridgeport project but its disposal contract ended at about the same time as did Norwalk's.

Table D-1 contains the tip fees charged to the Bridgeport project towns from 2005 through the first 6 months of 2009. (The project changed ownership mid-fiscal year in 2009.)

Table D-1. Bridgeport Project Towns Tip Fees Charged by CRRA, FY 2005-2009					
	2005	2006	2007	2008	2009 (first 6 mos)
Tip Fees per Ton	\$64.50/ \$8.00	\$66.00/ \$8.00	\$70.00/ \$8.00	\$76.00/ \$5.00	\$80.00/ \$18.50
Source: CRRA					

The total tip fee for those years had been composed of two elements: a “market component” and a “minimum commitment component.” Using 2009 as an example, each town was assessed a fixed charged by CRRA of \$18.50 per ton for its minimum tonnage commitment (regardless of the number of tons actually delivered), and \$80.00 per ton of MSW actually delivered to the Bridgeport RRF. So, each town would pay \$98.50 up to its minimum commitment, and \$80.00 per ton for each ton in excess of its minimum.

If a town disposed less than its minimum commitment, it would pay \$98.50 per ton for the amount of tons it disposed and would still have to pay \$18.50 per ton for any tonnage not delivered up to the minimum required. As will be shown below, the average actual amount collected from a town could be higher than the tip fee charged if a town is disposing less than its minimum commitment, as it is still being charged the minimum commitment component. Thus, the actual amount charged per ton would rise.

“The Bridgeport 12.” In mid-2007, the majority of the original Bridgeport project towns asked CRRA to negotiate on their behalf a new agreement with Wheelabrator. Ultimately, the participating towns agreed to pay \$63.00 per ton for disposal at the Bridgeport RRF. This tip fee is paid to CRRA and is composed of \$61.00 per ton disposal fee plus a \$2.00 per ton administrative fee. The new contracts, however, do not include the cost of transporting trash from the town or regional transfer stations to the Bridgeport plant or the costs for operating the transfer stations, which were either subsidized or covered completely in the previous CRRA tip fee. The agreement also calls for a minimum amount of trash from all 12 communities of 265,000 tons. East Haven negotiated directly with Wheelabrator and entered into a five-year agreement at \$62.50 per ton, with an annual adjustment based on the consumer price index.

“The Norwalk six.” In anticipation of the expiration of its long-term contract with CRRA for waste disposal at the Bridgeport RRF project, the City of Norwalk issued a request for proposals (RFP) in September 2007 for the operation of its transfer station and disposal services in an attempt to acquire these services at a lower cost and improve the level of service.

Other towns eventually joined in Norwalk’s effort in return for covering a portion of the procurement costs. Six towns joined in (the original five plus New Canaan).¹⁰⁵ Each town only needed a commitment from the town’s mayor or town selectmen as required by local ordinance. According to Norwalk, the towns were guided by the belief that they could create competition where it had not existed.

¹⁰⁵ East Haven and Stamford initially participated in the Norwalk effort. East Haven decided to negotiate directly with Wheelabrator and Stamford developed its own RFP and selected a different vendor than did the Norwalk six.

The RFP asked the bidders to respond to three discrete scenarios that involved different levels of responsibility for the transfer station operations. The city received three bids from City Carting, IESI NY Corporation, and Enviro Express/Wheelabrator Bridgeport, L.P. CRRA did not participate in the bidding. Only one vendor was determined to be responsive and City Carting was selected.

After the selection of the vendor, each town was responsible for contracting separately with the winning bidder. For calendar year 2009, the municipalities are being charged \$74.88 per ton for the transport and disposal of MSW. Under the contract, the tipping fee increases by four percent each year. Ultimately, the six towns entered into separate 5-year agreements with City Carting and there is a provision for three 5-year renewals. City Carting offered the same flat rate for disposal to all the towns involved, regardless of each town's relative distance to possible disposal locations. It is likely that due to the shared bidding process the six municipalities share what is in essence a blended rate because the tipping fee is the same for Greenwich as it is for Norwalk and Weston, though costs incurred by City Carting likely vary between towns. There is no minimum tonnage commitment.

Originally, the proposal was for City Carting to install a MSW baler at the Norwalk transfer station and MSW from the area would be transported by truck to a landfill in Pennsylvania. Since the inception of the contract, however, City Carting has been delivering the MSW from all the towns to the Bridgeport RRF on a spot market basis. Therefore, a baler has not been installed and the waste has stayed in state.

Tip fee comparison. How do the tip fees compare before and after CRRA ownership of the Bridgeport facility? The answer is not straightforward due to differences in the services towns received while being a part of CRRA and after Wheelabrator took ownership of the Bridgeport RRF. Provided in Table D-2 is a description of the basic expenditure categories that are part of the operation of an RRF based on CRRA's budget reports and statements. The various descriptions are intended to aid in any cost comparison discussions below.

Table D-2. Description of RRF Expenditure Categories	
Item	Description
General Administration	Includes costs related to various administrative charges including legal, auditing, consulting, office supplies, and the allocation of CRRA salaries and overhead
Debt Service/ Administration	Cost for the repayment of principal and interest on CRRA's portion of the bonds to finance the project and other financial and bank fees related to borrowing
Resource Recovery Facility	Various costs related to the operation of the RRF plant including the solid waste assessment tax ("Dioxin Tax"), payment in lieu of taxes, insurance premiums, and certain maintenance costs
Disposal	Also called the Contract Operating Charges – this is a fee charged by the operator for disposal of MSW in the RRF facility
Ash disposal	Cost for the hauling and disposal of ash, the byproduct of RRFs
Waste Transport	Costs for the export or diversion of waste brought to or intended to be delivered to the RRF plant but processed elsewhere because the intended facility could not process due to capacity or other processing issues. Subsidies for certain towns who transport waste for a long distance (in Bridgeport project).
Recycling	Costs related to the support of various recycling activities in the area, including advertising, education, and electronics recycling
Landfills	Costs related to the maintenance of closed landfills
Transfer Station Operations and Maintenance	Costs related to the operation and maintenance of transfer stations
Transportation from Transfer Station to RRF	Transportation costs for hauling MSW from transfer stations to the RRF
Transfer Station	Capital construction costs related to the improvement of transfer stations
Source: PRI descriptions based on CRRA budget documents	

Final years with CRRA. Table D-3 shows how the expenses compared to the tip fees for the Bridgeport project towns before ownership was transferred to Wheelabrator. The table shows two ways of calculating the tip fees over two time periods.

Table D-3. Bridgeport Project Expenditures and Tip Fees, FY 2007 and FY 2009				
Expenditure	Actual Total Cost per Ton FY 2007	Average Cost Member Town per Ton FY 2007	Adopted* Total Cost per Ton FY 2009 (6 mos.)	Adopted Average Cost Member Town per Ton FY 2009 (6 mos.)
CRRA General Administration	\$ 4.48	\$ 4.13	\$ 9.61	\$ 9.54
Debt Service/ Administration	3.35	3.09	2.92	2.90
Resource Recovery Facility	5.82	5.37	6.11	6.06
Disposal (Wheelabrator)	58.38	53.84	59.04	58.58
Transfer Station Operations	Included in Disposal	Included in Disposal	Included in Disposal	Included in Disposal
Transport from Transfer Station to RRF	Included in Disposal	Included in Disposal	Included in Disposal	Included in Disposal
Ash Disposal	6.38	5.89	14.23	14.12
Recycling	0.94	0.88	0	0
Landfills	4.56	4.20	7.23	7.17
Other (Transfer Station Capital, Waste Transport Subsidy)	1.97	1.81	2.72	2.70
Total	\$ 85.89	\$ 79.21	\$ 101.86	\$ 101.08
* Budgeted amounts				
Source: CRRA, Fiscal Year 2009 Operating and Capital Budget and PRI calculations				

Both fiscal years 2007 and the first six months of 2009 are shown because of concerns about which time period can be considered the fairest comparison. CRRA maintains that due to the project closing in the middle of FY 2009 additional expenses were incurred in the final year and one-half (FY 08 and 6 months of FY 09) such as legal and administrative costs, which are not representative of the project's true operation costs over time. CRRA believes FY 2007 to be more appropriate and represents a "normal" year¹⁰⁶. Not all member towns, though, were convinced costs would have gone down if CRRA maintained ownership and insist that FY 09 costs are representative. Fiscal year 2007 also represents actual costs, while FY 2009 figures are based on adopted budgeted amounts. Program review staff chose to show both time periods.

Also both *total cost* per ton and the *average member town cost* per ton for fiscal year are presented in the table. The total cost tip fee represents what the fee would have been if all of CRRA's costs of the project were borne by the tip fee only and did not include other types of revenue.¹⁰⁷ The difference between the total cost and per member town costs shows the impact

¹⁰⁶ As noted later, the Bridgeport Project ran a \$3 million deficit for FY 2007.

¹⁰⁷ The Bridgeport Project had both costs and revenues beyond CRRA's direct control. The facility operator, Wheelabrator, maintained separate costs and revenues. What is described in Table III-8 as "total costs" do not

(or total subsidy) of other revenue sources. The Bridgeport project, though, did have other income including interest income, and fee and permit revenue, among others. So, the member town tip fee shows how much, on average, the member towns actually paid per ton after adjusting for other revenues. (Tables D-4 through D-7 shows the detailed revenues and expenses for the Bridgeport project and how PRI applied various costs to develop the tip fee estimate.) Some general observations about the tip fees are made below.

- The total tip fee for FY 2007 would have been \$85.89, but due to other revenues the average member town cost was actually \$79.21 per ton. This is more than the \$70.00 plus \$8.00 pricing structure noted earlier. This indicates that the member towns on average did not meet their minimum commitments and effectively paid a penalty. It should also be noted that the Bridgeport project ran a nearly \$3 million deficit in FY 2007, which was financed in the subsequent year. If that deficit were included in FY 2007 and funded entirely by the member town tip fee, the effective additional cost would have been \$7.29 per ton.
- The adopted total cost tip fee for FY 09 is not notably different than the adopted member cost tip fee (\$101.86 versus \$101.08). Again, both tip fees are higher than what the tip fee pricing structure for FY 09 (\$80.00 plus \$18.50) calls for, indicating member towns on average were not expected to meet their minimum tonnages.
- The costs for administration, ash disposal, and reserves for landfill expenses in FY 09 do increase significantly compared to FY 07. As Appendix D shows a number of limited use revenues (i.e., use of unrestricted reserves, use of bond proceeds, and, use of board designated reserves) were also used to stabilize the tip fee in the last several years.
- Unlike the other projects, all the revenues from the generation of electricity in Bridgeport completely accrued to the operator - Wheelabrator. In exchange, Wheelabrator assumed a significant portion of the debt for the project. Presumably, all of Wheelabrator's debt costs, operation and maintenance costs (i.e., RRF and project related transfer stations) and electric generation revenues were considered in determining the disposal fee of about \$58.00 – \$59.00 per ton.
- Those expecting a large reduction in the tip fee due to the retiring of project debt paid by CRRA would be disappointed. CRRA's portion of debt service from FYs 2007 through 2009 is relatively low –only amounting to about \$3.00 per ton of the tip fee. Wheelabrator reports that it will be paying its share of the debt service until 2014. PRI staff have estimated that Wheelabrator's current debt costs about \$21.00 per ton.¹⁰⁸

include costs born by the facility operator, nor do the subsidized costs reflect the effect of electricity sale revenue on the disposal costs charged by the operator.

¹⁰⁸ Estimated debt payment provided by Wheelabrator of about \$16,000,000 annually. Per ton amount is based on 2007 tonnage of 758,000. This per ton fee would be much higher if the fee was based on only the 265,000 tons of waste secured through CRRA.

<i>CRRA Project Amount</i>	FY 2007 Actual		FY 2008 Estimated		FY 2009 Estimated	
	Amount (Tons)	%	Amount (Tons)	%	Amount (Tons)	%
Member Towns	407,331	64%	414,000	64%	211,100	65%
Contracted Amount	231,988	36%	233,000	36%	112,000	35%
Diversions	416	0%	-	0%	-	0%
Total CRRA Project MSW	639,735		647,000		323,100	

Contracted amount identifies the amount of tonnage processed through contracts arranged by CRRA
Diversions are the amount of tonnage sent to another disposal site due to capacity or operational concerns
Source: CRRA, Fiscal Year 2009 Operating and Capital Budget

Revenue Source	Actual FY 07	Adjusted (Net Ash Disposal and Recycling Revenues and Expenses)*	%	Actual Rate per Ton (Revenue/Tonnage)
Service Charge Solid Waste – Member Towns	\$32,266,714	\$32,266,714	62%	\$79.21
Service Charge Solid Waste – Contracts	15,171,622	15,171,622	29%	\$65.40
Ash Disposal Reimbursement Fees	4,485,119		0%	
Recycling Sales	2,442,295		0%	
Recycling Sales - settlement	23,097		0%	
Rental Income	1,184,709	1,184,709	2%	
Permit Fees	21,750	21,750	0%	
Miscellaneous Income	5,389	5,389	0%	
Interest Income	321,200	321,200	1%	
Use of Undesignated/Unrestricted Reserves	2,998,000	2,998,000	6%	
Use of Bond Proceeds (DSRF)	-	-	0%	
Use of Board Designated Reserves	11,645	11,645	0%	
Total Revenues	\$58,931,540	\$51,981,029	100%	

* See explanation in note in next table.

Source: CRRA, Fiscal Year 2009 Operating and Capital Budget and PRI calculations

Table D-6. Bridgeport Project Actual Expenses and Tip Fee for Member Towns, FY 2007					
Expenditure	Actual FY 07	Adjusted (Net of Ash and Recycling)*	Total Member Share (62% of Total Expenses)	% of Total	Member Town Tip Fee Per Ton**
General Administration	\$ 2,865,279	\$ 2,865,279	\$ 1,778,594	5.2%	\$ 4.13
Debt Service/ Administration	2,142,569	2,142,569	1,329,979	3.9%	3.09
Resource Recovery Facility (w/o COC)	3,721,693	3,721,693	2,310,204	6.8%	5.37
Contract Operating Charges (Disposal)	37,349,628	37,349,628	23,184,415	68.0%	53.84
Ash Disposal	8,568,960	4,083,841	2,535,004	7.4%	5.89
Waste Transport	563,368	563,368	349,705	1.0%	0.81
Regional Recycling	2,858,625	393,233	244,096	0.7%	0.57
Recycling Education	215,000	215,000	133,459	0.4%	0.31
Landfill Shelton	2,838,043	2,838,043	1,761,687	5.2%	4.09
Landfill Waterbury	79,479	79,479	49,336	0.1%	0.11
Transfer Stations	696,701	696,701	432,470	1.3%	1.00
Total	\$ 61,899,345	\$ 54,948,834	\$ 34,108,950	100.0%	\$ 79.21
Balance	-2,967,805	-2,967,805	-1,834,249		
Wheelabrator invoice (7/1/07) shows amount paid for disposal \$38,231,883 or \$59.76 per ton – if refinance savings are included cost declines to \$58.62 per ton.					
* Both Ash Disposal and Recycling functions have a revenue and expenditure component. The result shown here is the net expense.					
** Total does not include financing of deficit as noted in Balance. Deficit is financed in succeeding year. If deficit was paid in current year entirely by member town tip fee, the cost would be \$7.29 per ton.					
Source: CRRRA, Fiscal Year 2009 Operating and Capital Budget and PRI calculations					

Table D-7. Bridgeport Project Actual Cost Per Ton, FY 2007*			
Expenditure	Actual FY 07	Adjusted for Ash and Recycling	Actual Cost Per Ton based on Project Total Tons (639,735)
General Administration	\$ 2,865,279	\$ 2,865,279	\$4.48
Debt Service/ Administration	2,142,569	2,142,569	3.35
Resource Recovery Facility (w/o COC)	3,721,693	3,721,693	5.82
Contract Operating Charges (Disposal)	37,349,628	37,349,628	58.38
Ash disposal	8,568,960	4,083,841	6.38
Waste Transport	563,368	563,368	0.88
Regional Recycling	2,858,625	393,233	0.61
Recycling Education	215,000	215,000	0.34
Landfill Shelton	2,838,043	2,838,043	4.44
Landfill Waterbury	79,479	79,479	0.12
Transfer Stations	696,701	696,701	1.09
	\$61,899,345	\$ 54,948,834	\$ 85.89
* See notes in above table regarding adjustments and balance			
Source: CRRRA, Fiscal Year 2009 Operating and Capital Budget and PRI calculations			

New contracts. Table D-8 compares tip fee pricing and costs under the new CRRA disposal contracts for the Bridgeport RRF and for the city of Norwalk for the final six months of FY 2009. Separate pricing is shown for towns with transfer stations.

Table D-8. Bridgeport Project, New FY 2009 CRRA Contracts and Norwalk			
Expenditure	New CRRA Contract w/out Transfer Station, FY 2009	New CRRA Contract w/ Transfer Station, FY 2009	Norwalk, FY 2009
CRRA General Administration	\$ 2.00	\$ 2.00	n/a
Debt Service/ Administration	n/a	n/a	n/a
Resource Recovery Facility	Included in Disposal	Included in Disposal	n/a
Disposal	61.00	61.00	74.88
Transfer Station Operations	n/a	7.00**	23.33
Transport from Transfer Station to RRF	n/a	14.00**	Included in Disposal
Ash Disposal	Included in Disposal	Included in Disposal	n/a
Regional Recycling	Municipal Expense	Municipal Expense	Municipal Expense*
Landfills	n/a	n/a	n/a
Other (Transfer Station Capital, Waste Transport Subsidy)	n/a	Municipal Expense	Municipal Expense
Total	\$ 63.00	\$ 84.00	\$ 98.21
<p>* Norwalk's new recycling contract with a different vendor contains a provision for rebate of \$17.50 per ton for recycled material</p> <p>** New Contract estimate based on current and previous contracts, CRRA estimates the weighted average cost of transportation to be \$14.00/ton and estimates the cost of transfer station O&M to be \$7.00/ton.</p> <p>Norwalk transfer station operations portion of tip fee based on \$700,000 costs and 30,000 tons MSW</p> <p>Source: CRRA, City of Norwalk, and PRI calculations</p>			

Under the old contracts with CRRA, the Bridgeport project towns' tip fee included a recycling subsidy and the costs for landfill closure. These costs were spread among all members of the project. The costs of transfer station operation, transfer of waste from transfer stations to the RRF, and the operation and maintenance of the RRF itself were included in the disposal fee charged by Wheelabrator. The make-up of the disposal fee was determined in the original operating/ownership agreement and it is likely that both ownership options and electricity revenue for the operator resulted in significantly lower disposal charges than would have occurred in their absence.

Under the new contracts, each town is responsible for their own transfer station costs and landfill closure costs are no longer collected. The recycling subsidy was included in CRRA's FY 07 costs but was not in FY 09. The prices under the new contract with a transfer station column

include estimates for the average costs of transfer station operation and transportation. Each individual town's situation will be different. It can be noted that:

- The average cost for *those towns without a transfer station* dropped from FYs 2007 (\$79.21) and 2009 (\$101.08) to \$63.00 under the new CRRA contract with Wheelabrator. This is true even when subtracting out the landfill, recycling, and other costs from the old CRRA contract amounts for FY 2007 (\$72.32) and in FY 09 (\$91.21). This assumes that the municipal expense of replacing whatever services CRRA was providing through the recycling subsidy did not exceed the difference between the prices.
- The average cost for towns *with transfer stations* under the new CRRA contract with Wheelabrator includes an estimate for transfer station operations and transportation to the RRF and totals \$84.00 per ton.¹⁰⁹ The new contract costs for these towns appears higher than the FY 2007 costs (\$79.21) but lower than the FY 2009 costs (101.08), even when adjusting for the landfill and other costs in FY 09 (\$91.21).
- The city of Norwalk's new contract cost (\$98.21) appears to be higher than the average CRRA FY 2007 cost (\$73.32) and FY 2009 cost (\$91.21) after adjusting for the recycling subsidy, landfill, and other costs. Norwalk reports its actual tip fee costs charged by CRRA in 2009 were \$116.00 per ton. If that fee were adjusted by the landfill and other costs, the comparable CRRA tip fee would be about \$106.00 per ton and higher than the new contract. To be truly comparable, other unknown costs would have to be included to Norwalk's new contract costs over the life of the contract including the cost to develop the RFP and any additional administrative costs involved in administering the contract with City Carting that would be different than contracting with CRRA.
- The city of Norwalk has pointed out that the level and types of service offered by the new contractor is qualitatively different than what CRRA was providing, reducing the comparability of the figures. For example, differences include improved cleanliness, the addition of electronics recycling, expansion of plastics recycling, and the addition of managed disposal of oil and batteries. The town also changed recycling contracts from CRRA to City Carting. Under CRRA, the town was not charged for recycling. Under the town's new vendor the range of recyclable material has been expanded and the town is now paid \$17.50 per ton of recyclables.

Wheelabrator cost comparison. Staff also tried to compare Wheelabrator charges after the change of ownership in January 2009 to CRRA costs in FY 2007 and FY 2009. The goal was to provide a comparison between like services to the extent possible. Because the electricity

¹⁰⁹ These estimates by CRRA appear reasonable. The town of Milford is reported to be paying \$23 per ton for transfer station operations and transportation, while the town of Westport is reported to be paying about \$22 per ton for those services.

revenues accrued to Wheelabrator and were unknown to PRI staff, and staff did not have access to Wheelabrator's actual cost of services, a valid comparison could not be completed.

Case Study #2 Wallingford Project

The Wallingford RRF project will be the second plant to experience a change in ownership. As discussed in more detail below, the towns involved in the project have signed agreements with Covanta, the current operator and soon-to-be owner of the plant, for the disposal of their MSW when the current agreements expire in June 2010. What follows below is a brief description of the negotiations, key aspects of the proposals, elements in the process that made it difficult for CRRA to compete, and the outcome of the negotiations.

Contract. The Wallingford RRF facility began operation in May 1989 to serve Cheshire, Hamden, Meriden, North Haven, and Wallingford. The facility consists of a now closed landfill and a 420-ton per day mass burn incinerator that converts solid waste into electricity, which is capable of producing 11 megawatts of power. There are no transfer stations. Covanta Projects L.P. of Wallingford operates the facility.

The towns entered into a disposal contract with CRRA, which provided the financing for the project and oversees the facility until June 2010. Covanta has a service agreement with CRRA that is set to expire on June 30, 2010. Unlike the Bridgeport project, CRRA under this agreement had the right to purchase the plant at fair market value, though CRRA had to declare its intent to purchase the facility (by December 31, 2008) before the actual value of the plant was established. If the parties could not agree on a purchase price, it would go through an arbitration process. If CRRA decided not to purchase the plant, Covanta could purchase the plant for one dollar. This process, established 20 years ago, was problematic for CRRA because committing to purchasing the plant without knowing the price introduced a level of risk that was unacceptable to the potential long-term disposal customers.

Negotiations. The towns began negotiations with both Covanta and CRRA in the late summer and through the fall of 2008. Various proposals were floated at different times, even purchase of the plant by CRRA without the member towns' support. This eventually prompted Wallingford Mayor William Dickinson Jr. to go before the CRRA board to urge the authority to abandon its efforts to buy the plant. Table D-9 highlights a few of the key differences between the disposal services proposals offered by CRRA and Covanta based on an analysis developed by municipal officials in the Town of Wallingford.¹¹⁰

CRRA's proposal was hampered by three shifting variables: the cost of ash disposal; the uncertain cost of energy; and the purchase price of the facility. CRRA's only ash landfill was in the closure process and the siting of a new CRRA landfill was not assured (and later dropped by CRRA). The Wallingford plant enjoyed the highest purchase price for energy contracts in

¹¹⁰ PRI staff obtained information about these final offers from interviews and documents from municipal officials. This information is based on written comparisons used by town officials to explain the proposals before a vote on them by the Wallingford Town Council. CRRA disputes that the proposal attributed to it in the table was its final proposal, and offered to let PRI staff review what it said was its last proposal. However, CRRA considered the information proprietary, meaning PRI staff would not be able to publicly discuss the proposal in this report. PRI staff determined instead to rely on the statements and documents provided by the Town of Wallingford that municipal officials stated were the last proposals from each proposer.

Connecticut, but expired in FY 2009. By FY 2010, market pricing for the facility’s electricity was in effect and electric revenues declined 71 percent from FY 2008.

Table D-9. Wallingford Project Towns Proposals: Key Provisions		
	CRRA	Covanta
Tip fee for disposal	Yearly tip fee based on net costs of operation. Reportedly, the tip fee was estimated to be between \$63.98-\$110.77 for the first year. Any natural and unavoidable catastrophes (force majeure) or changes in law would add to the disposal fee	\$65.00 first year Increases based on CPI with a minimum of 1.75% and a maximum of 3.5% with a reset provision every 5 years based on the local market Any natural and unavoidable catastrophes (force majeure) or changes in law would add to the disposal fee
Contract duration	20-year term	10-year term with an option for two 5-year contract renewals at same terms as initial term
Purchase option	None. CRRA to own.	Option for municipal purchase in year 20
Minimum commitment	Towns must pay their share of any shortfall between revenues and expenses of the facility based on average annual tonnage.	Less than current commitment of 125,000 tons
Electric rate revenue sharing	Applied to project expenses	If electric market rate exceeds benchmark rate, towns receive pro rata share of 20% of difference between market and benchmark rate. If electricity revenues fall below benchmark, Covanta bears full loss.
Source: Town of Wallingford. See footnote 103 in this chapter regarding CRRA’s objections to this summary.		

The biggest uncertainty behind the proposals was the purchase price of the plant. The reported appraisals of the plant’s market value ranged from \$23 million to \$100 million. (Other reports have stated that CRRA put the price at \$10 million to \$14 million.)¹¹¹ Consequently, CRRA was unable to commit to a firm tip fee. Reported estimates for CRRA’s proposed tip fees were in the range of about \$64.00 to \$111.00 per ton in the first year, though the real number would be determined by the net cost of operations.¹¹²

The five towns in choosing the Covanta proposal clearly favored certainty and a stable tip fee over the possibility of CRRA ownership and an open-ended price structure. In contrast to

¹¹¹ Minutes, Cheshire Town Council Solid Waste Committee Joint Town Council Meeting, November 24, 2008

¹¹² A pro forma base case was developed by CRRA in August 2008 and was provided to the Wallingford project towns that assumed a purchase price for the plant of \$23.5 million and indicated a tip fee of \$67.45 per ton in Year 1 to \$77.97 in Year 5. Other scenarios were developed based on various assumptions including changes in electric revenue, recycling rates, operator of the facility, and the cap on CRRA personnel, that resulted in the \$64.00 to \$111.00 range.

CRRA’s proposal, Covanta offered a first year (July 1, 2010) tip fee of \$65.00 per ton (the tip fee in 2008 was \$60.00 per ton). Increases to the fee would be based on the Consumer Price Index and no lower than 1.75 percent a year and no higher than 3.5 percent a year. Covanta’s proposal did not require a 20-year commitment, contained a revenue sharing component, had a lower minimum tonnage requirement than CRRA, and an option to buy the plant at the end of 20 years. In addition, the town of Wallingford would receive \$11.00 per ton as a host benefit fee, which was higher than the proposal offered by CRRA. Table D-10 shows the trend in the tip fees for the Wallingford project towns, including Covanta’s charge for 2011.

Table D-10. Wallingford Project Towns Tip Fee, FY 2007-2011					
	2007	2008	2009	2010	2011
Tip Fees per Ton	58.00	\$59.00	\$60.00	\$60.00	\$65.00
Source: CRRA and Town of Wallingford					

Aside from the purchase option in the Wallingford project contract, there are other significant differences from the Bridgeport situation that underscores the various arrangements that exist that make comparisons among RRFs difficult. Unlike the Bridgeport project, as noted above, the revenue for electricity at the Wallingford RFF was collected by CRRA and it made a big difference in pricing. Electricity sold by the RRF projects was generally not at market rates. Electricity providers purchased RRF-generated energy under contracts entered into at a time when the providers were compelled, by statute, to purchase all available RRF-generated electricity at the same rate that the energy was sold to municipalities. The Wallingford project’s electric revenues amounted to nearly 50 percent of total project revenues. But the electric rate “subsidy” ended in FY 2009 for the Wallingford project and the revenue declined by 71 percent. Tables D-11 through D-13 show the detail on both the revenues and expenditures for the Wallingford project.

Table D-11. Wallingford Project Revenues and Tip Fees, FY 08 and FY 10				
Revenues	FY 08 ACTUAL	Actual Rate per ton	FY 10 ADOPTED	Adopted Rate per ton
Service Charge Solid Waste – Members	\$ 8,648,771	\$ 58.98	\$ 9,180,000	\$ 60.00
Service Charge Solid Waste – Spot	177,155	\$ 56.11	180,000	\$ 60.00
Electricity	11,189,152		3,336,000	
Permit Fees	18,550		20,000	
Fines/Penalties	20,800		-	
Interest Income	1,169,395		300,000	
Use of Tip Fee Stabilization Fund	-		1,747,000	
Use of Future Use Reserve	-		820,000	
Use of Bond Proceeds (DSRF)	2,015,000		-	
Total Revenues	\$ 23,238,823		\$ 15,583,000	
Source: CRRA, Fiscal Year 2010 Operating and Capital Budget and PRI calculations				

Expenditure	FY 08 ACTUAL	FY 10 ADOPTED
General Administration	\$ 939,612	\$ 1,109,000
Local Administration-Project	51,048	54,000
Project Closure Reserve	-	820,000
Debt Service / Administration	4,532,795	-
Resource Recovery Facility	1,839,487	1,936,000
Disposal	7,605,833	7,623,000
Future Planning Reserve Contribution	3,543,996	-
Ash Disposal	3,140,132	2,772,000
Waste Transport-Diversion & Exports	751,336	839,000
Regional Recycling	120,906	139,000
Landfill – Wallingford	136,346	291,000
Total Expenditures	\$ 22,661,491	\$ 15,583,000

Source: CRRA, Fiscal Year 2010 Operating and Capital Budget

Expenditure	Actual Total Cost per Ton FY 2008	Average Cost Member Town per Ton FY 2008	Adopted Total Cost per Ton FY 2010	Adopted Average Cost Member Town per Ton FY 2010
General Administration	\$ 6.27	\$ 2.31	\$ 7.11	\$ 4.27
Local Administration-Project	0.34	0.13	0.35	0.21
Project Closure Reserve	-	-	5.26	3.16
Debt Service / Administration	30.26	11.13	-	-
Resource Recovery Facility	12.28	7.85	12.41	7.45
Disposal	50.77	18.67	48.87	29.35
Future Planning Reserve Contribution	23.66	8.70	-	-
Ash Disposal	20.96	7.71	17.77	10.67
Waste Transport-Diversion & Exports	5.02	1.84	5.38	3.23
Regional Recycling	0.81	0.30	0.89	0.54
Landfill - Wallingford	0.91	0.33	1.87	1.12
Total	\$ 151.27	\$ 59	\$ 99.89	\$ 60

Source: CRRA, Fiscal Year 2010 Operating and Capital Budget and PRI calculations

In addition, debt service for the Wallingford project was a large portion of total expenditures in the final years, though not the last one, while under CRRA affiliation. In FY 2008, it amounted to about 20 percent of expenses.

There were a couple of other interesting aspects of the transition process that are worth mentioning. For one, the Wallingford project towns had built up a reserve account over time that grew to about \$52 million by June 2008 and was held by CRRA.¹¹³ One purpose of this reserve was to use it for possible purchase of the plant. The reserve fund no doubt provided some leverage in negotiations because it demonstrated some financial ability to actually make the purchase. It also represented an opportunity for the towns to assert some control over their own disposal needs. On the other hand, it also involves more risk in having a greater role in being responsible for determining how to manage a waste-to-energy plant. Ultimately, the towns decided not to pursue ownership and to have CRRA distribute the money to them on a pro rata basis.

Also, the Wallingford project towns throughout the negotiations remained united. These five towns represent the overwhelming majority of the tonnage already being delivered to the plant. By working and staying together, the towns had some negotiating advantage because of the sizable amount of MSW they generate compared to the amount the plant needed. Waste-to-energy plants need fuel seven days a week, 24 hours per day to be cost-efficient.

Finally, in exchange for not pursuing the purchase of the plant, CRRA entered into a spot market agreement with Covanta.¹¹⁴ The agreement is for one year with seven one year renewal options and permits CRRA to use up to 25,000 tons of capacity at the Wallingford plant for \$55.00 per ton with price escalators in subsequent years. CRRA has, in effect, become a broker of capacity at the Wallingford plant. The Wallingford towns also have a right to the capacity of the plant to process their MSW. On the one hand, it appears that CRRA negotiated a better deal than the towns as the member communities are paying \$65 per ton to CRRA's \$55 per ton. On the other hand, under the old agreement, CRRA paid \$51.00 per ton for disposal of the minimum commitment of 125,000 tons to Covanta and \$11 per ton for any tonnage delivered in excess of the minimum.¹¹⁵ The towns have not had any recent problems in meeting their minimum commitment. Assuming the towns will probably use at least up to their previous minimum disposal amount, Covanta has realized a net gain for the tonnage above the minimum compared to what CRRA was paying.

Covanta cost comparison. Program review staff attempted to perform a check on the reasonability of the bid the Wallingford towns received from Covanta at \$65 per ton. Without access to Covanta's actual costs of doing business, staff made a broad brush estimate based on previous revenue and costs established by CRRA for the project.

¹¹³ Minutes, Cheshire Town Council Meeting, November 24, 2008

¹¹⁴ Covanta had also initiated a civil action against CRRA seeking a restraining order and other injunctive relief for various CRRA actions, as well as an arbitration proceeding. Both actions were dropped as a result of this agreement.

¹¹⁵ Also worth noting is that the CRRA capacity is a spot market contract, not a long-term minimum tonnage commitment. It is likely that CRRA's contractual ability to purchase the plant impacted the price offered in the spot market agreement.

Staff examined the revenues and expenses for the Wallingford project in FY 2010 (as shown in Tables D-11 through D-13) and selected a few major expenses and the major revenue source (electricity) to compare as shown in Table D-14.¹¹⁶ (Tables D-11 and D-12 also show FY 2008 actual revenues and expenses and FY 2010 adopted amounts as points of comparison.) The expense side incorporated those activities that have to be performed or paid. This includes operations and maintenance the facility, ash disposal, taxes (or host community fees) and some other miscellaneous fees like the dioxin tax, transportation for diverted material, and insurance.

Table D-14. Wallingford Project Major Estimated Expenditure and Revenues		
	FY 10 Estimate	Per Ton Cost
Disposal	\$7,623,000	\$48.87
Ash Disposal	\$2,772,000	\$17.77
Payment in Lieu of Taxes	\$1,489,000	\$9.54
Other Miscellaneous*	\$1,286,000	\$8.24
<i>Total Estimated Expenditure</i>	<i>\$13,170,000.00</i>	<i>\$84.42</i>
Electric Revenue	(\$3,336,000)	(\$21.38)
<i>Net Total</i>	<i>\$9,834,000</i>	<i>\$63.04</i>
* Waste transport and balance of Resource Recovery Facility (Building Operation, Dioxin Tax, Insurance)		
Source: PRI calculations based on CRRA data		

The point was to examine just the basic costs without getting into other soft cost areas such as legal and administrative salaries or overhead. Those expenses were not included below but as a point of reference those expenses for CRRA in FY 2010 amounted to over \$7.00 per ton. Other revenues such as permit and fine revenue were not included, but they tend to be relatively small amounts. It should also be noted that the FY 2008 through 2010 CRRA budgets had a number of short-term revenue sources such as the use of various reserve funds and bond proceeds. The tip fee was based on these budgeted amounts but the numbers were not audited and could change as the fiscal year draws to a close.

As the table shows, the total costs were about \$63 per ton after subtracting out revenues derived from the sale of electricity. If it can be accepted that the cost CRRA was paying for those selected services was not excessive, then the bid of \$65 per ton by Covanta does not appear excessive.

RRF disposal competitiveness. There are a number of factors that influence disposal contract decisions, of which reasonable cost is only one. Accounting for differences in preferences other than cost is beyond the limited scope of this study. Based on the case studies of the Bridgeport and Wallingford RRF contract expiration and negotiations, a few key points were found:

- new tip fees charged by privately-owned RRFs are not significantly different from the prices charged under CRRA agreements for comparable disposal services to municipalities;
- many towns preferred reentering into contracts with the previously utilized

¹¹⁶ Fiscal Year 2010 is a fair comparison year because the expenditure categories used for comparison do not include extra collections for reserves.

- disposal facilities over requesting competitive bids;
- privately owned and operated in-state RRFs have offered contract terms that are comparable to those offered for out-of-state disposal options and to regional RRF tip fees;
 - without access to the private vendor's costs of services, it is unclear if the fees paid for disposal by CRRA to these same operators, while the plants were affiliated with CRRA, represented reasonable and competitive costs; and
 - it is unknown what the longer-term trend in market competitiveness will be like because the Connecticut disposal market appears to rely on the nearest out-of-state disposal sites to provide competition to the only two providers of RRF disposal services in Connecticut.

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General State Strategies to Increase Diversion

Table E-1. Strategies to Increase Diversion	
<i>Strategy</i>	<i>Description</i>
Further enforcement of existing recycling statutes	<ul style="list-style-type: none"> • DEP would inspect various aspects of the solid waste disposal system to determine whether the requirements of mandatory recycling were being fulfilled • DEP would require that individual towns meet the 40 percent recycling goal
<i>Pros</i>	<i>Cons</i>
<ul style="list-style-type: none"> • Further reduce the presence of recyclable items in the waste stream • Create a revenue source through fines • Increase economic incentive to recycle • Target underperforming municipalities or regions 	<ul style="list-style-type: none"> • Unpopular process for both the fines and the inspection of trash • Not clear what entity would be responsible for payment of fines • Greater enforcement requires higher level of staffing • Current data reporting is inadequate to ensure accurate list of underperforming towns • Recycling rate goal may reward towns with high generation rates and punish towns with low generation rates • Increase incentive to misreport waste and recycling figures

<i>Strategy</i>	<i>Description</i>
<p>Develop incentive program with a dedicated source of funding for recycling and source reduction</p>	<ul style="list-style-type: none"> • Create system that focuses on providing greater economic incentives for municipalities with high diversion or low disposal rates • DEP should reward municipalities with high recycling rates or low disposal per capita rates in order to give further economic incentive to under performing municipalities
<i>Pros</i>	<i>Cons</i>
<ul style="list-style-type: none"> • Economic incentives could be used to offset costs of recycling and/or capital investment in diversion system • Level for incentive based on median rates for Connecticut municipalities • Outcome based incentive gives towns flexibility to achieve goals • DEP already has enforcement authority 	<ul style="list-style-type: none"> • Needs a funding source • Levels may be unrealistic goals without population density adjustment, which would make the system more complicated • Top performers may use incentive for non-recycling purposes • System depends on accurate, timely reporting system which may be manipulated with self reporting

<i>Strategy</i>	<i>Description</i>
<p>Develop a cap and trade system for disposal</p>	<ul style="list-style-type: none"> • DEP first sets a cap for MSW disposal per capita • Municipalities issued credits based on current per capita rates • If a municipality comes in below its cap or above its floor, it has extra credits which it may trade with other municipalities • Municipalities which come in below caps can sell their extra credits, while reducing their MSW disposal • Municipalities which cannot get their disposal rate low enough are given the opportunity to purchase excess credits from other towns or be penalized
<i>Pros</i>	<i>Cons</i>
<ul style="list-style-type: none"> • By creating a cap, it makes it clear the state wants to reduce its overall MSW disposal rate rather than just fining municipalities for not meeting goals • Avoids moral hazard of rewarding municipalities who have done less than other municipalities to increase recycling or reduce generation • Municipalities that need to buy additional credits can assign the costs to residents/businesses as they see fit 	<ul style="list-style-type: none"> • Setting initial rate is potentially difficult • Setting at current rates may punish those that already excel and reward those that have not yet reduced • Adjustment necessary for residential and commercial density • May encourage non-reporting of direct haul out of state • relies on accurate hauler reporting, like the current data system

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APPENDIX F

Policy Options Relationship to State Goals, Competition, and Costs

Table F-1. Policy Options					
Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
Adequacy and Sustainable					
<p><u><i>Diversion</i></u></p> <ul style="list-style-type: none"> • Inadequate source reduction and recycling efforts • The sorting facilities for the most commonly accepted recyclable materials (e.g., bottles, cans, paper) are currently operating far below capacity 	<ul style="list-style-type: none"> • Increase diversion <ul style="list-style-type: none"> ○ DEP incentive program with dedicated funding ○ Composting study ○ Cap and trade ○ Allow commissioner to mandate more items ○ Enforce current regulations 	Yes	Yes	Yes	Low-Med
<p><u><i>MSW Disposal</i></u></p> <ul style="list-style-type: none"> • Connecticut's disposal system is not sufficient to process all the waste generated within the state • Existing RRF capacity is likely to continue but in-state RRFs 	<ul style="list-style-type: none"> • Increase diversion <ul style="list-style-type: none"> ○ See above • Increase in-state publicly-owned RRF disposal capability to prevent out-of-state landfill use 	Yes	Yes	Yes	Med
		Yes	Yes	Possible	Hi

Table F-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p>do not have the processing capability to handle the entire state's disposed MSW</p> <ul style="list-style-type: none"> • Resource recovery is at maximum capacity • Waste being exported has increased • The determination of need process for siting additional disposal capacity prevents the development of excess in-state disposal capacity. • Out-of-state landfill capacity for MSW and ash is abundantly available and will likely continue to be for the foreseeable 	<ul style="list-style-type: none"> • Eliminate DON to increase in-state disposal options • Develop in-state landfill capacity • Develop connection to out-of-state landfill to improve sustainability 	<p>Yes</p> <p>Yes</p> <p>No</p>	<p>Yes/No</p> <p>No</p> <p>No</p>	<p>Yes</p> <p>Yes</p> <p>Yes</p>	<p>Low/Savings</p> <p>Med</p> <p>Med</p>

Table F-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
future					
<p><u>Ash Disposal</u></p> <ul style="list-style-type: none"> • In-state ash disposal capacity is insufficient to handle the ash produced in-state for 20 years • Out-of-state landfill capacity for MSW and ash is abundantly available and will likely continue to be for the foreseeable future 	<ul style="list-style-type: none"> • Develop in-state ash landfill • Develop better connection to out-of-state ash landfill to improve sustainability • Purchase by public entity and preserve property for possible future use as ash landfill • Research possible permitting, beneficial use of, and market for ash residue 	<p>Yes</p> <p>No</p> <p>Yes</p> <p>Yes</p>	<p>Yes/No</p> <p>Yes/No</p> <p>Yes/No</p> <p>Yes</p>	<p>Yes</p> <p>Yes</p> <p>Possible</p> <p>Possible</p>	<p>Med</p> <p>Med</p> <p>Med</p> <p>Low</p>
Reasonable Cost					
<p><u>MSW Landfill Disposal</u></p> <ul style="list-style-type: none"> • Landfills are a less expensive MSW disposal option than RRFs, but Connecticut has 	<ul style="list-style-type: none"> • Build in-state MSW landfill capacity • Develop better 	<p>Yes</p> <p>No</p>	<p>No</p> <p>No</p>	<p>Yes</p> <p>Yes</p>	<p>Med</p> <p>Med</p>

Table F-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p>no appreciable in-state landfill space to compete with RRF disposal.</p> <ul style="list-style-type: none"> Certain municipalities have found and other municipalities with high-end tip fees may find that disposal in out-of-state landfills is a less expensive alternative to in-state RRFs. Competition for disposal services, may be found in exploiting out-of-state landfill options for certain municipalities or through the use of short-term, in-state spot market contracts. 	<p>connection to out-of-state landfill through public entity</p> <ul style="list-style-type: none"> Purchase of out-of-state landfill capacity by public entity 	No	No	Yes	Med
<p><i>RRF disposal</i></p> <ul style="list-style-type: none"> Limited in-state competition 	<ul style="list-style-type: none"> Eliminate DON 	Possible	Yes	Yes	Low/Savings

Table F-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p>for RRF services. Competition for disposal services may be found in exploiting out-of-state landfill options for certain municipalities or through the use of short-term, in-state spot market contracts but both options carry risks</p> <ul style="list-style-type: none"> • Unknown long-term trend in market competitiveness because market appears to rely on nearest out-of-state competitor and only two providers of disposal services - no true public option. • Without access to the private vendor's costs of services, it is unclear if the fees paid for disposal by CRRA to these same operators, 	<ul style="list-style-type: none"> • Regulate Rates 	No	-	Yes	Low
	<ul style="list-style-type: none"> • Require Financial Reporting to DPUC but No Rate Setting 	No	-	Possible	Low
	<ul style="list-style-type: none"> • Build more in-state RRF capacity by expansion or new facility by public entity 	Yes	Yes	Yes	Hi
	<ul style="list-style-type: none"> • Disallow Favored Nation Status in Contracts 	No	-	Yes	Low
	<ul style="list-style-type: none"> • Public Purchase of RRF Plants 	Possible	Yes	Possible	Hi

Table F-1. Policy Options

Findings Area	Policy Options	Tends to Increase Self-Sufficiency	Consistent with Hierarchy	Tends to Increase Competition or Lower Costs	Cost to Implement Hi, Med, Low*
<p>while the plants were affiliated with CRRA, represented reasonable and competitive costs.</p> <ul style="list-style-type: none"> • It is unknown what the longer-term trend in market competitiveness will be like because the Connecticut disposal market appears to rely on the nearest out-of-state disposal sites to provide competition to the only two providers of RRF disposal services in Connecticut. 					
<p>*Note: Estimated implementation cost ranges: Low = Less than \$10 million; Medium = Between \$10 million to \$100 million; Hi = Over \$100 million</p>					

Agency Responses



STATE OF CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION



March 26, 2010

The Honorable John Kissel, Co-Chair
The Honorable Mary M. Mushinsky, Co-Chair
Legislative Program Review and Investigations Committee
State Capitol, Room 506
Hartford CT 06106

RE: Legislative Program Review and Investigations Committee's final report on *Municipal Solid Waste Management Services in Connecticut*.

Dear Senator Kissel and Representative Mushinsky:

Thank you for the opportunity to comment on the findings and recommendations of the committee's final report on *Municipal Solid Waste Management Services in Connecticut*. We appreciate the level of effort the committee has expended on the topic and believe the review has provided productive findings.

The report has very efficiently summarized the existing state of the adequacy and sustainability of the state's solid waste management infrastructure and captured the complexities of our waste management system. The findings and discussions thereof provide a useful background and understanding to the issues and assessment of the systems' adequacies and deficiencies. The "options" tables and discussions associated with the findings provide valuable insights into opportunities and key issues.

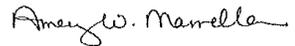
Although we recognize the value in all of the recommendations, we must acknowledge that the Department of Environmental Protection (DEP) is limited in its resources for implementing many of them and, in fact, would be hard pressed to carry out some of the recommendations. For example, while we support and concur with the recommendations regarding electronic data submission, financial, logistical and technological constraints exist that affect our ability to accommodate such improvements in DEP's information management systems. As another example, we would need additional resources to carry out the recommendation that the DEP study the economic feasibility of a state purchase and hold of potential disposal sites.

We would like to thank the committee and the committee staff for their collaborative approach to gathering information from the agency and others. The committee staff members, Scott Simoneau and Eric Michael Gray, demonstrated exemplary work in distilling a diverse array of information and issues and integrating that information in a meaningful way.

The Honorable John Kissel, Co-Chair
The Honorable Mary M. Mushinsky, Co-Chair
March 26, 2010
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We feel that state policy makers will greatly benefit from the report's findings as Connecticut continues to plan and make decisions about what greater efforts and approaches will be necessary to meet the challenges set out in the State's Solid Waste Management Plan. Thank you.

Yours truly,



Amey W. Marrella
Commissioner

Copy: Carrie Vibert, Director, Legislative Program Review and Investigations Committee