

Chapter 9

ENERGY RECOVERY

This chapter describes how energy recovery from municipal solid waste (MSW) will be considered in the Plan. As noted in Chapter 1, Clark County's energy recovery for wood waste and other types of source-separated waste was a higher priority in solid waste management compared to Washington state, placing it below recycling and composting but above treatment and disposal. Incineration of the municipal waste stream is placed below treatment and disposal.

Energy recovery from the collection and utilization of landfill gas at landfills is discussed in *Chapter 10 Landfill Disposal*. Use of motor oil as an alternative fuel source is addressed in *Chapter 11 Moderate Risk Waste*. Energy recovery from the conversion of organics/food waste is described in *Chapter 13 Organic Wastes*. Energy recovery from the incineration of special wastes is described in *Chapter 14 Special Wastes*.

Assessment of Conditions

By using renewable energy sources culled from the waste stream, the County may be able to lower its costs, generate revenues for other programs, and reduce the volume of waste being landfilled. Wood waste burned as hog fuel and motor oil burned as bunker fuel are not included when calculating Clark County's recycling rate, but are included when calculating the recovery rate.

Currently, the County and cities do not have any operating Energy Recovery/Incineration (ER/I) facilities. Previous Plan updates have included a detailed evaluation of the potential for development and operation of an Energy Recovery (ER/I) facility in Clark County, but have not recommended it as a viable disposal option.

Source-separated wood waste recovery has increased significantly since the Plan was developed. Much of this recovered material is currently sold as hog fuel while lesser quantities are periodically marketed to particleboard and liner board manufacturers. Though market demand and prices for this commodity vary over time, no source-separated wood waste is currently being landfilled. The wood-waste recovery market in Clark County is very competitive; in-county and regional operators from the Portland area actively compete for material. In Clark County, Columbia Resource Company (CRC) sorts wood waste from incoming MSW in addition to collecting source-separated materials from larger generators. Other private wood-waste recycling operators, such as H&H Wood Recyclers, Inc., McFarlane's Bark, and Triangle Resources, also accept and process source-separated wood waste, land clearing debris and similar materials.

Over the last few years the County has evaluated the feasibility of biomass plants for forest byproducts in both urban and rural sites. Both projects faced siting difficulties and were not able to move forward. These projects focused on the utilization of forestry waste so they did not directly tie in with management of the municipal solid waste stream that is the focus of this plan. However, having facilities such as these either in or near our region would potentially offer an end use and energy recovery opportunity for urban wood or similar hog fuel products produced from solid waste generated in Clark County.



Source: National Renewable Energy Laboratory

Throughout Washington State — Past And Present

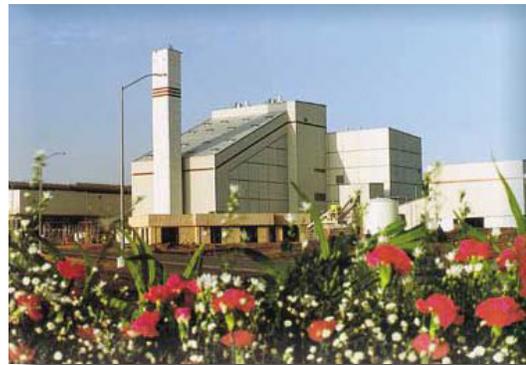
In the 1990's, the City of Tacoma operated the only refuse-derived fuel (RDF) facility in Washington. RDF is burnable MSW that has been shredded or pelletized into a uniform size and shape before it is burned. Separation of burnable and non-burnable MSW is done at the facility where RDF is made. At the Tacoma facility, processed RDF from the facility was burned at the City's power station, along with coal and wood, and the residual ash was landfilled. In 2000, the Washington Department of Ecology reclassified the plant as an "incinerator", requiring higher burning temperatures. For a time, segregated asphalt roofing materials from Clark County were transported to the Tacoma Steam Plant for energy recovery.

In 2001, Tacoma Public Works shut down the plant until permitting issues could be resolved. In 2004, State rules changed with regard to an emission standard. With this change, the City of Tacoma evaluated whether the steam plant could be refurbished into a state-of-the-art waste-to-energy plant. In December 2005, the Tacoma City Council voted to not proceed with the project. The incineration facility was returned to Tacoma Public Utilities who dismantled the plant. The City of Tacoma owns its own landfill which it uses for its waste disposal.

Several small MSW incinerators within Washington State have closed in the past years: The 178-tpd Skagit facility was closed in 1996 due to equipment failures and high operating costs. A smaller incinerator in Friday Harbor (San Juan County) was closed in 1995 because its environmental compliance costs exceeded its budget. A 100 ton-per-day facility in Ferndale (Whatcom County) was closed in December 1998 due to its inability to compete economically against other county waste export operations.

There is currently one operating MMSW energy recovery incinerator in Washington State: an 800 ton-per-day facility in Spokane. The facility is owned by the City of Spokane, managed by the Spokane Regional Solid Waste System and operated by [Wheelabrator Spokane, Inc.](#) This facility opened in 1991 with partial funding through a State-matching grant. The Spokane facility uses energy recovery equipment to generate electricity, which is then used for in-plant operations or sold to utility companies.

All incinerators in Washington State are subject to the "Special Incinerator Ash Standards" adopted by the Washington Department of Ecology in 1991 and update in 200 (WAC 173-306). These standards require ash be tested to determine whether it must be handled as a solid waste or as a "special waste." Currently, Spokane transports their ash to a dedicated ash cell at Allied Waste Services Regional landfill in Roosevelt, Washington. This type of facility typically produces ash equivalent to 30% by weight and 10% by volume of the incoming waste.



Source: [Wheelabrator Spokane, Inc.](#)
spokanewastetoenergy.com

Energy Recovery Nationwide, Local Experience

During the 1980s and early 1990s, many communities turned to Energy Recovery/ Incineration (ER/I) facilities (both mass burning and RDF plants) as a way to extend the life of local landfills or minimize the size of replacement-ash landfills. Typically, communities used revenue bonds to finance capital costs; capital and operating costs were then funded through tipping fees and offset by energy sales. Because tipping fees at ER/I facilities were usually higher than neighboring landfills, communities adopted flow-control ordinances to ensure that the facilities received enough waste to remain economically viable. In addition to the Spokane incinerator, similar mass burn facilities continue to operate in Salem, Oregon and Burnaby, British Columbia.

The 1994 U.S. Supreme Court *Carbone* decision on flow control jeopardizes the ability of local governments to direct waste to ER/I facilities. The inability to control the flow of MSW, concerns over the disposal of hazardous ash and the emergence of lower-cost regional landfills have essentially stopped the construction of new ER/I facilities and severely hindered existing operations. In 2007, a Supreme Court reviewed *United Haulers* where the Court evaluated flow control ordinances enacted by the Counties of Oneida and Herkimer in New York State. On April 30, 2007, the U.S. Supreme Court ruled in *United Haulers Association Inc. v. Oneida-Herkimer Solid Waste Management Authority* that local governments are permitted to engage in flow control to government-owned disposal facilities in specific circumstances. The Court concluded that flow control laws that favor government-owned disposal facilities do not discriminate against interstate commerce, and are reviewed under a more lenient balancing test. The Court conferred a benefit on a public facility rather than a private one. These distinctions noted that government is vested with responsibility to protect the health, safety and welfare of its citizens and that laws favoring local government should therefore be evaluated for Commerce Clause deficiencies differently than laws favoring private industry. However, in October 2012, a federal district court in Texas issued a permanent injunction enjoining the City of Dallas from enforcing its flow control law. The court concluded Dallas' flow control law violated the Contracts Clause of the U.S. Constitution. This decision underscores that despite the Supreme Court's 2007 decision in the *United Haulers* case, there are constitutional limits to local governments' authority over solid waste management.

Through a long-term disposal contract and inter-local agreements Clark County's mixed municipal solid waste stream is contracted to be directed toward the transfer system and landfill facilities operated by Columbia Resource Company. This commitment which runs to 2021 (with one possible extension - 2026) has helped to reduce costs by spreading out the cost of the infrastructure. Directing this volume to an energy recovery facility, if one were to be proposed or developed within or near our region, would necessitate review of the economic feasibility and contractual obligations. As the contract term begins to expire over the next 10 to 20 years, consideration and analysis on the potential for an energy from waste project(s) would be appropriate.

Types of Energy Recovery

Municipal Waste Incineration

Energy Recovery / Incineration (ER/I) facilities may use either mass burning systems or prepared fuel systems. Mass burning systems involve feeding mixed municipal solid waste (MMSW) into a furnace or boiler without mechanically separating or preparing the waste in any way. These facilities can be either large field-erected furnace-boiler systems or smaller modular furnace-boiler systems.

In prepared fuel systems, MMSW is mechanically separated and processed to make refuse-derived fuel, either as a supplemental fuel for an existing furnace-boiler or to be used alone in a dedicated furnace-boiler.



Source: CP Manufacturing

Energy recovery is rarely associated with small incinerators; incinerators burning less than 250 tons per day do not produce cost-effective steam. Medium and large MMSW incinerators, however, can install larger boilers, which will generate steam more cost-effectively. This steam can then be used to generate electricity, power industrial processes, or provide heat.

Biomass Incineration

Biomass incineration involves the incineration of dry organic matter such as animal litter (for example, horse stall material and chicken litter), yard waste, discarded wood products (such as pallets or urban wood), and forest debris collected during forest thinning. The organic matter is reduced in size to burn more quickly, consistently and efficiently. The heat generated is used to create steam which is then used to generate electricity. The County has an abundant supply of organic materials that could potentially serve as fuel for a biomass incineration plant.

Biogas Production

Some of the less dry, less woody types of organic matter which are not as suitable for biomass incineration can be used to create biogas. There are a number of ways to generate biogas: anaerobic digestion, pyrolysis, and gasification. Once produced, the gas can be burned as a fuel for any purpose. Anaerobic digestion should be considered as a possibility for food waste handling.

Recommendations

1. **Continue the established energy recovery program for wood waste**, monitoring the volume being diverted from landfill disposal. (9-1)
2. **Stay informed about developments in the energy recovery field** and look into opportunities that meet regional needs. (9-4)

End of Chapter 9