The 2007 IWSA Directory of Waste-to-Energy Plants

By Ted Michaels

The 2007 IWSA Directory of Waste-to-Energy Plants provides current information about the waste-to-energy industry in the United States. Since this Directory was last published in 2004, the environment in which waste-to-energy plants exist has begun to change. Many communities are placing premiums on energy sources that reduce greenhouse gas emissions and the nation's dependency on foreign oil and fossil fuels. In addition, there is a continued need to manage a growing waste stream. Despite efforts to increase recycling, the average amount of waste generated per person continues to grow. As a result, communities are once again looking to waste-to-energy technology to safely manage solid waste and to produce clean, renewable, and climate friendly power.

As the country continues to focus on energy solutions that will reduce greenhouse gas emissions, waste-to-energy is poised to play an important role. The first new capacity in a decade is being added in Florida as the Lee County and Hillsborough County facilities expand their existing facilities by fifty percent each. Other existing facilities are actively considering expansions. Several communities have out requests for proposals to construct new greenfield facilities. While this Directory provides a snapshot of the industry in 2007, it seems clear that the industry is about to undergo exciting changes.

In 2007, 87 plants operate in 25 states and process 28.7 million tons of trash according to the latest estimates published in *Biocycle*. Electric generating capacity is estimated at 2,720 megawatts. The fact that waste-to-energy provides baseload power and that most plants operate in excess of 90 percent of the time translates to a significant number of renewable kilowatt-hours produced by waste-to-energy. As a result, waste-to-energy facilities generate approximately 17 million kilowatt-hours annually, which is roughly 20 percent of the nation's non-hydroelectric renewable energy.

As the waste-to-energy industry continues to evolve to meet the demands and challenges of the communities it serves and as the nation's public policies are shaped, IWSA will ensure that waste-to-energy is a valued and recognized solution to the nation's energy and waste management challenges.

The Integrated Waste Services Association (IWSA) was formed in 1991 to promote integrated solutions to municipal solid waste management challenges. IWSA encourages the use of waste-to-energy technology as an integral component of a comprehensive, integrated solid waste management program. In addition to providing essential trash disposal services cities and towns across the country, today's waste-to-energy plants generate clean, renewable energy. Through the combustion of everyday household trash in facilities with state-of-the-art environmental controls, IWSA's members provide viable alternatives to communities that would otherwise have no alternative but to buy power from conventional power plants and dispose of their trash in landfills.

Waste-to-Energy Reduces Greenhouse Gas Emissions

Waste-to-energy plants are tremendously valuable contributors in the fight against global warming. According to the U.S. EPA, nearly one ton of CO_2 equivalent emissions are avoided for every ton of municipal solid waste handled by a waste-to-energy plant due to the following:

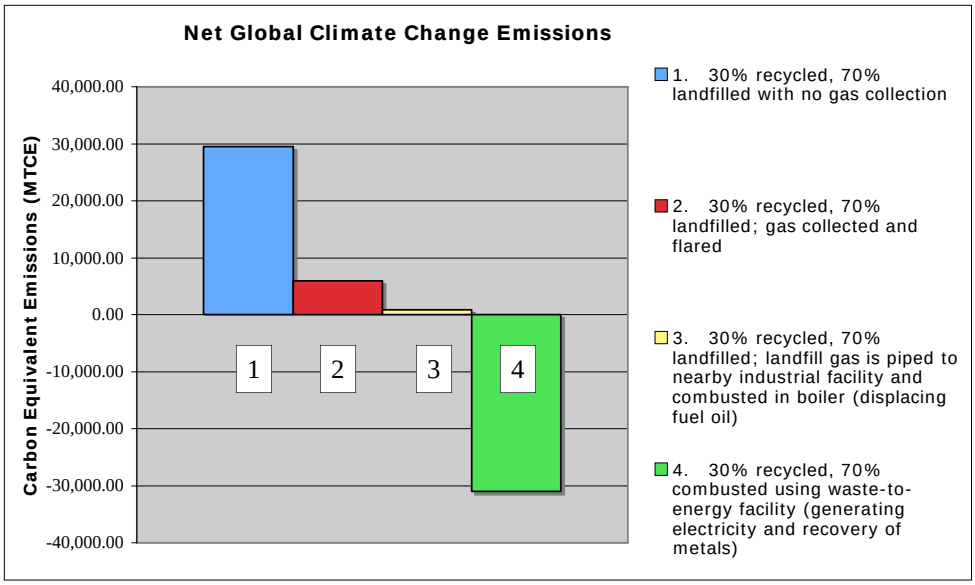
- **Avoided methane emissions from landfills.** When a ton of solid waste is delivered to a waste-to-energy facility, the methane that would have been generated if it were sent to a landfill is avoided. While some of this methane could be collected and used to generate electricity, some would not be captured and would be emitted to the atmosphere.

- **Avoided CO_2 emissions from fossil fuel combustion.** When a megawatt of electricity is generated by a waste-to-energy facility, an increase in carbon dioxide emissions that would have been generated by a fossil-fuel fired power plant is avoided.

- **Avoided CO_2 emissions from metals production.** Waste-to-energy plants recover more than 700,000 tons of ferrous metals for recycling annually. Recycling metals saves energy and avoids CO_2 emissions that would have been emitted if virgin materials were mined and new metals were manufactured, such as steel.

The United States Conference of Mayors adopted a resolution in 2005 endorsing the U.S. Mayors Climate Protection Agreement, which identifies waste-to-energy as a clean, alternative energy source which can help reduce greenhouse gas emissions. As of June 30, 2007, over 500 mayors have signed the agreement.

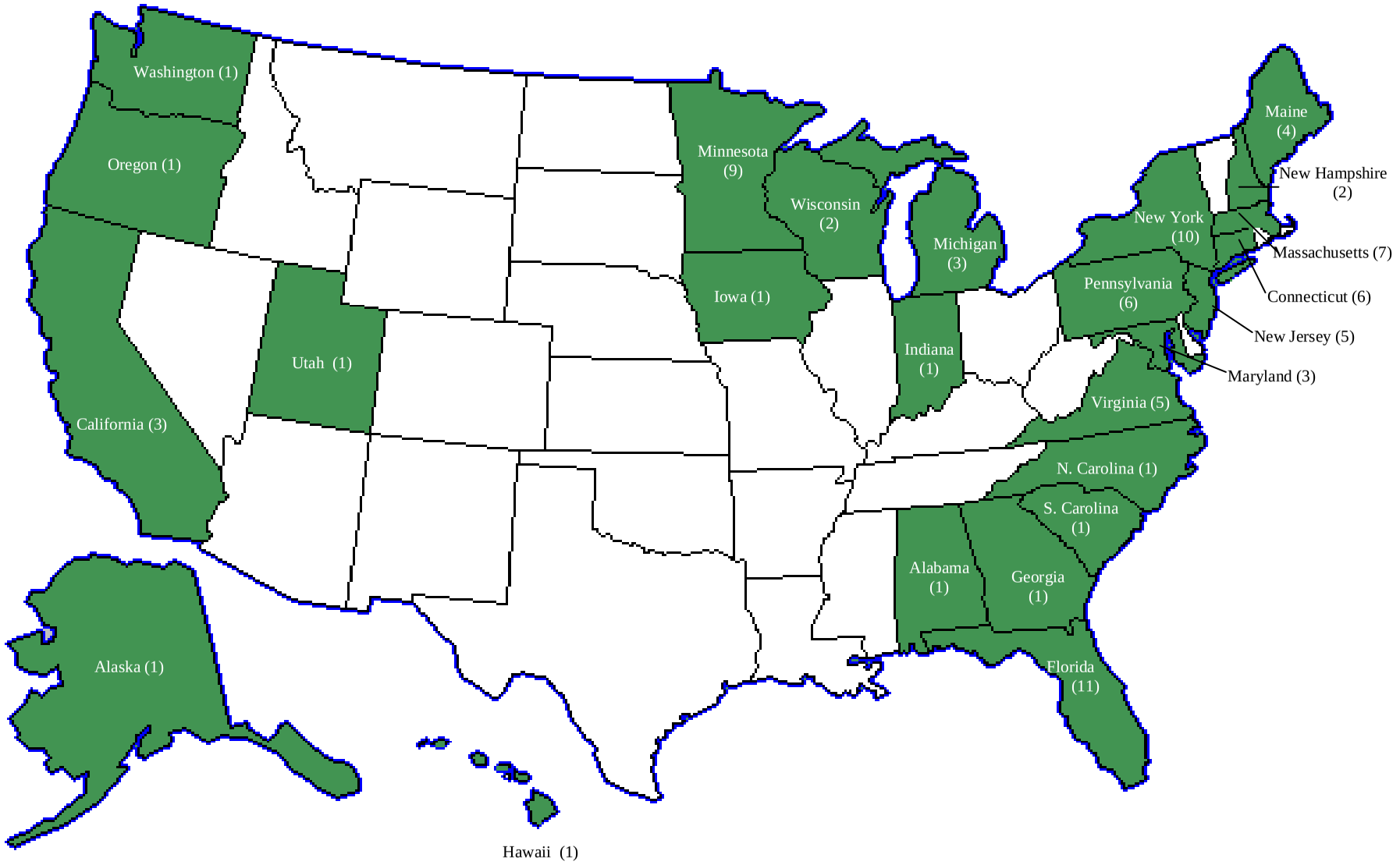
Recently, the Global Roundtable on Climate Change, an initiative sponsored by The Earth Institute at Columbia University, issued a statement on climate change indicating that decarbonization of the economy can be achieved through "the use of non-fossil-fuel-based sources…such as "wind, geothermal, hydro, tidal, wave, nuclear, waste-to-energy, and/or biomass. Efforts to reduce global emissions of methane from landfills should be expanded, including increased use of waste-to-energy facilities where appropriate and cost-effective."



Data Source: Thorneloe SA, Weitz K, Jambeck J. Application of the U.S. Decision Support Tool for Materials and Waste Management. WM Journal 2006 August.

The European Union Emission Trading Scheme explicitly excludes municipal waste combustion from the cap and trade program due to the ability of waste-to-energy to reduce greenhouse gas emissions and divert waste from landfills.

Operating WTE Plants in the U.S. — By State



States with operating plants (number of plants in state)

Source: Ted Michaels, Integrated Waste Services Association, June 2007.

Waste-to-Energy is a Renewable Resource

Waste-to-energy meets the two basic criteria for establishing what a renewable energy resource is—its fuel source (trash) is *sustainable* and *indigenous*. Waste-to-energy facilities recover valuable energy from trash after efforts to "reduce, reuse, and recycle" have been implemented by households and local governments.

Waste-to-energy facilities generate clean renewable energy and deserve the same treatment as any other renewable energy resource.

Federal Statutes and Policies Defining Waste-to-Energy as Renewable (as of 6/30/07)
Energy Policy Act of 2005
Federal Power Act
Public Utility Regulatory Policy Act (PURPA) of 1978
Biomass Research and Development Act of 2000
Pacific Northwest Power Planning and Conservation Act
Internal Revenue Code (Section 45)
Executive Orders 13123 and 13423
Federal Energy Regulatory Commissions Regulations (18 CFR.Ch. I, 4/96 Edition, Sec. 292.204)

- **Trash Would Otherwise go to a Landfill.** Waste-to-energy facilities use no fuel sources other than the waste that would otherwise be sent to landfills.

- **State Renewable Statutes Already Include Waste-to-Energy.** 23 states and the District of Columbia states have defined waste-to-energy as renewable energy in various state statutes and regulations.

- **Communities with Waste-to-Energy Have Higher Recycling Rates.** Several studies have demonstrated that communities served by waste-to-energy have recycling rates that are nearly twenty percent higher than the national average.

- **Waste-to-Energy Emissions Comply with EPA's Most Stringent Standards**. All waste-to-energy facilities comply with EPA's Maximum Achievable Control Technology (MACT) standards. After analyzing the inventory of waste-to-energy emissions, EPA concluded that waste-to-energy facilities produce electricity "with less environmental impact than almost any other source of electricity."

- **Waste-to-Energy Has a Long History as Renewable**. Waste-to-energy has been recognized as a renewable energy source by the federal government for nearly thirty years under a variety of statutes, regulations, and policies. Many state have recognized as renewable under state statutes as well. The renewable status has enabled waste-to-energy plants to sell credits in renewable energy trading markets, as well as to the federal government through competitive bidding processes.

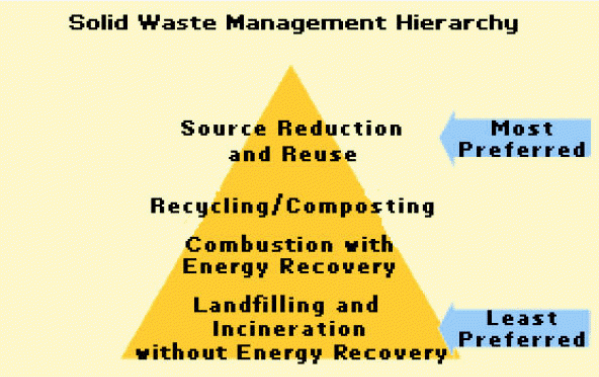
States Defining Waste-to-Energy as Renewable in State Law (as of 6/30/07)		
Alaska	Indiana	New Hampshire
Arkansas	Maine	New Jersey
California	Maryland	New York
Connecticut	Massachusetts	Oregon
District of Columbia	Michigan	Pennsylvania
Florida	Minnesota	Virginia
Hawaii	Montana	Washington
Iowa	Nevada	Wisconsin

- **Renewable Designations Benefit Many Local Governments and Residents.** The sale of renewable energy credits creates revenue for local governments that own waste-to-energy facilities, helping to reduce a community's cost of processing waste. The U.S. Conference of Mayors has adopted several resolutions supporting the inclusion of waste-to-energy as a renewable resource.

EPA's Solid Waste Hierarchy

Waste-to-Energy is Preferable

Waste-to-energy has earned distinction through the U.S. Environmental Protection Agency's solid waste management hierarchy, which recognizes combustion with energy recovery (as they refer to waste-to-energy) as preferable to landfilling. EPA's hierarchy reflects what EPA has stated previously—that the nation's waste-to-energy plants produce electricity with "less environmental impact than almost any other source of electricity." EPA's hierarchy is also consistent with actions taken by the European Union, which established a legally binding requirement to reduce landfilling of biodegradable waste.



Source: U.S. Environmental Protection Agency

WTERT Takes Leadership Role in Promoting Waste-to-Energy

By Prof. Nickolas J. Themelis, Director of Earth Engineering Center of Columbia University

Energy and materials recovery from solid wastes

For the last ten years, Columbia University has been engaged in research of all available methods for the recovery of energy and materials from municipal solid wastes (MSW), in the U.S. and abroad. The results are described in nearly thirty technical papers and graduate theses (www.columbia.edu/cu/wtert, Publications).

The Columbia studies also showed that there was very little R&D in the U.S. on the thermal treatment of MSW (commonly called waste-to-energy, or WTE) and, also, not sufficient information available to the public on the energy and other environmental benefits of WTE. This led to the formation, in 2003, of the WTERT. (Waste-To-Energy Research and Technology) Council. This organization is a unit of Columbia's Earth Engineering Center (EEC) and is headquartered in New York City. The mission of WTERT is:

> *WTERT brings together engineers, scientists, and managers from universities, industry, and government to identify the best available technologies for the recovery of energy and materials from solid wastes worldwide, advancing the public understanding of sustainable waste management, and directing academic research on these subjects for the benefit of society and the environment.*

Public Information on Sustainable Waste Management

During each year WTERT receives many requests for information on WTE and on "best waste management practice". The principal means of communication between WTERT and the general public is the WTERT web page (www.columbia.edu/cu/wtert). It continues to be the premier source of up-to-date technical information on domestic and international waste-to-energy and integrated waste management technology.

WTERT

Waste-To-Energy Research and Technology Council

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

AUG 1 0 2007

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Emissions from Large and Small MWC Units at MACT Compliance

FROM: Walt Stevenson
OAQPS/SPPD/ESG (D243-01)

TO: Large MWC Docket (EPA-HQ-OAR-2005-0117)

This memorandum presents information on the overall emissions reductions achieved by large and small municipal waste combustion (MWC) units following retrofit of Maximum Achievable Control Technology (MACT). This memorandum is a companion to the memorandum titled "Emissions from Large MWC Units at MACT Compliance (note a). Consistent with Clean Air Act (CAA) section 129, large and small MWC units completed MACT retrofits by December 2000 and December 2005, respectively. The performance of the MACT retrofits has been outstanding. Emission reductions achieved for all CAA section 129 pollutants are shown below. Of particular interest are dioxin/furan and mercury emissions. Since 1990 (pre-MACT conditions), dioxin/furan emissions from large and small MWCs have been reduced by more than 99 percent, and mercury emissions have been reduced by more than 96 percent. Dioxin/furan emissions have been reduced to 15 grams per year* and mercury emissions reduced to 2.3 tons/year.

Emissions From Large and Small MWC Units

Pollutant	*1990 Emissions (tpy)*	*2005 Emissions (tpy)*	*Percent Reduction*
CDD/CDF, TEQ basis*	4400	15	99+ %
Mercury	57	2.3	96 %
Cadmium	9.6	0.4	96 %
Lead	170	5.5	97 %
Particulate Matter	18,600	780	96 %
HCl	57,400	3,200	94 %
SO_2	38,300	4,600	88 %
NO_x	64,900	49,500	24 %

(*) dioxin/furan emissions are in units of grams per year toxic equivalent quantity (TEQ), using 1989 NATO toxicity factors; all other pollutant emissions are in units of tons per year.

The MACT performance data presented above is from the initial MACT compliance tests from all large and small MWC units. The inventory of large MWC units at MACT compliance identifies 167 large MWC units located at 66 MWC plants (note b). The inventory of small MWC units at MACT compliance identifies 60 small MWC units located at 22 MWC plants (note c). The baseline 1990 emissions data are from the large and small MWC emissions trend memo (note d and e). In combination, the above information defines the 1990 and 2005 emissions for large and small MWC units.

notes

(a) see docket A-90-45, item VIII-B-11.
(b) see docket A-90-45, item VIII-B-6
(c) see docket OAR-2004-0312, "National Inventory of Small Municipal Waste Combustor (MWC) Units at MACT Compliance (Year 2005)", dated November 1, 2006.
(d) see docket A-90-45, item VIII-B-7
(e) see docket OAR-2004-0312, "National Emissions Trends for Small Municipal Waste Combustion Units [year 1990 – 2005]", dated June 12, 2002.

Workplace Health & Safety — A Waste-to-Energy Priority

The Occupational Safety & Health Administration (OSHA) sets standards for America's workers to ensure employees are safe and their health is protected. Waste-to-energy facilities, like all other workplaces, must meet these tough standards. The waste-to-energy industry takes tremendous pride in its health and safety programs and often goes beyond what is required by law. Great importance is placed on developing and implementing successful programs that protect the people working in our plants.

OSHA has recognized the stellar accomplishments of more than 40 waste-to-energy plants through the Voluntary Protection Program (VPP) and three facilities through the Safety and Health Achievement Recognition Program (SHARP). Both programs are designed to recognize and promote effective safety and health management. Facilities must undergo a rigorous process that assures only the best programs qualify. VPP participants are a select group of facilities that have designed and implemented outstanding health and safety programs that go well beyond OSHA standards. SHARP is a similar program for smaller facilities. Of the more than seven million American workplaces, only about 1,400 sites have been awarded VPP status.

IWSA and OSHA celebrated their Alliance Agreement with a signing ceremony on October 13, 2005. Signing the Alliance was, in the front row from L-R, Steve Passage, President, Veolia ES Waste-to-Energy, Inc.; Drennan Lowell, President, Wheelabrator Technologies Inc.; OSHA's Acting Assistant Secretary Jonathan L. Snare; Anthony Orlando, President and Chief Executive Officer, Covanta Energy Company and Ted Michaels, President, IWSA.

In addition to the site-specific achievements of the industry, IWSA joined the OSHA Alliance Program on October 13, 2005. This cooperative program enables organizations committed to safety and health to work with OSHA to further prevent injuries, illnesses and fatalities in the workplace. OSHA and Alliance Program participants work together to reach out to, educate, and lead the nation's employers and their employees in advancing workplace safety and health. Through the IWSA-OSHA Alliance, IWSA has instituted a Hauler Safety Campaign that focuses on the health and safety of waste haulers that deliver waste to waste-to-energy plants (see box below).

VPP Voluntary Protection Programs An OSHA Cooperative Program

alliance An OSHA Cooperative Program

SHARP Safety & Health Achievement Recognition Program

SAFETY: DO IT FOR LIFE

Though the IWSA-OSHA Alliance Agreement, the Integrated Waste Services Association (IWSA) and its members have identified the month of June as "Hauler Safety Month". Throughout the month of June, IWSA members host a "Hauler Safety Day" at their facilities to educate public and private waste haulers, municipal and private owners and operators, and facility employees about best health & safety practices to ensure a safe and healthy workplace. IWSA member companies have coordinated the event by developing and utilizing a unified campaign with posters, stickers and "12 Rule" cards to get the message out regarding health and safety on waste-to-energy tipping floors. Our goal is to ensure that everyone who conducts business at or visits a waste-to-energy facility will return home safe and sound at the end of each and every day.

Understanding Why Recycling and Waste-To-Energy are Compatible in the U.S.

By Jonathan V. L. Kiser, President, Kiser Consulting, Harrisonburg, Virginia

The compatibility of waste-to-energy (WTE) and materials recycling has been an issue of interest for well over a decade in the United States (U.S.). Since 1992, the author has conducted empirical research among WTE communities across the U.S. and the results have consistently shown WTE and recycling are compatible and have, on average, maintained a higher recycling rate than the national EPA average as illustrated in Table A.

During late 2005, Kiser Consulting conducted a more in-depth look at the compatibility issue in 19 communities. Among the topics explored with WTE plant operators, community recycling coordinators, and other municipal solid waste (MSW) management officials were why WTE communities have higher recycling rates and why the two management options are compatible.

Table A - WTE Community Average Recycling Rate vs. National Average

Year	WTE Recycling Rate	National Recycling (4)
2004	**34% (1)**	**31%**
2002	**33% (2)**	**30%**
1992	**21% (3)**	**17%**

(1) Source: J. V. L. Kiser, based on feedback from 94 WTE communities.
(2) Source: J. V. L. Kiser, based on feedback from 98 WTE communities.
(3) Source: J. V. L. Kiser, based on feedback from 66 WTE communities.
(4) Source: U.S. EPA, based on most recent data available during the study year

WTE plant operators shed further light on this trend by responding to the question why they believed WTE communities have had higher average recycling rates. Responses included: waste-to-energy plant officials promote recycling during facility tours and conduct community outreach efforts that may not be occurring in other locations (Biddeford, ME); the municipal recycling program, when combined with on-site materials recovery at the waste-to-energy plant, exceeds the national average (Long Beach, CA); waste-to-energy plants prefer not to accept recyclables like glass, metals, and white goods, since they can cause operation and maintenance problems at the facility (Harford, MD); WTE communities have more opportunities to recycle since they handle the MSW stream more (Dutchess Co., NY); WTE communities tend to be more knowledgeable and forward thinking about recycling and MSW management in general (Hartford, CT, Honolulu, HI, Layton, UT); and the Materials Recovery Facility in front of the WTE plant gives credit back to participating counties which have more than doubled their recycling rates (Polk County, MN).

Each of the 19 WTE communities surveyed are linked to off-site recycling programs. Such programs typically include a combination of curbside collection, drop off centers, MRFs, and/or yard waste management. In addition to the typical metals, glass, plastic, and paper from household and/or commercial sources, the communities reported other recycling programs are in place, handling other materials for recycling. These ranged from batteries, used oil, and e-waste, to household hazardous waste, public and school outreach programs, and tires management, to scrap metals, food waste, and artificial reef construction projects. Each community surveyed had a combination of these kinds of recycling programs.

For the complete research results relating to this compatibility study, contact Jonathan V.L. Kiser, at: jvlkiser@aol.com.

Waste-to-Energy is an International Solution

While this publication focuses on waste-to-energy plants in the United States, it is important to understand that waste-to-energy has roots worldwide in nations that have high population densities, limited available landfill space, and intense energy demands.

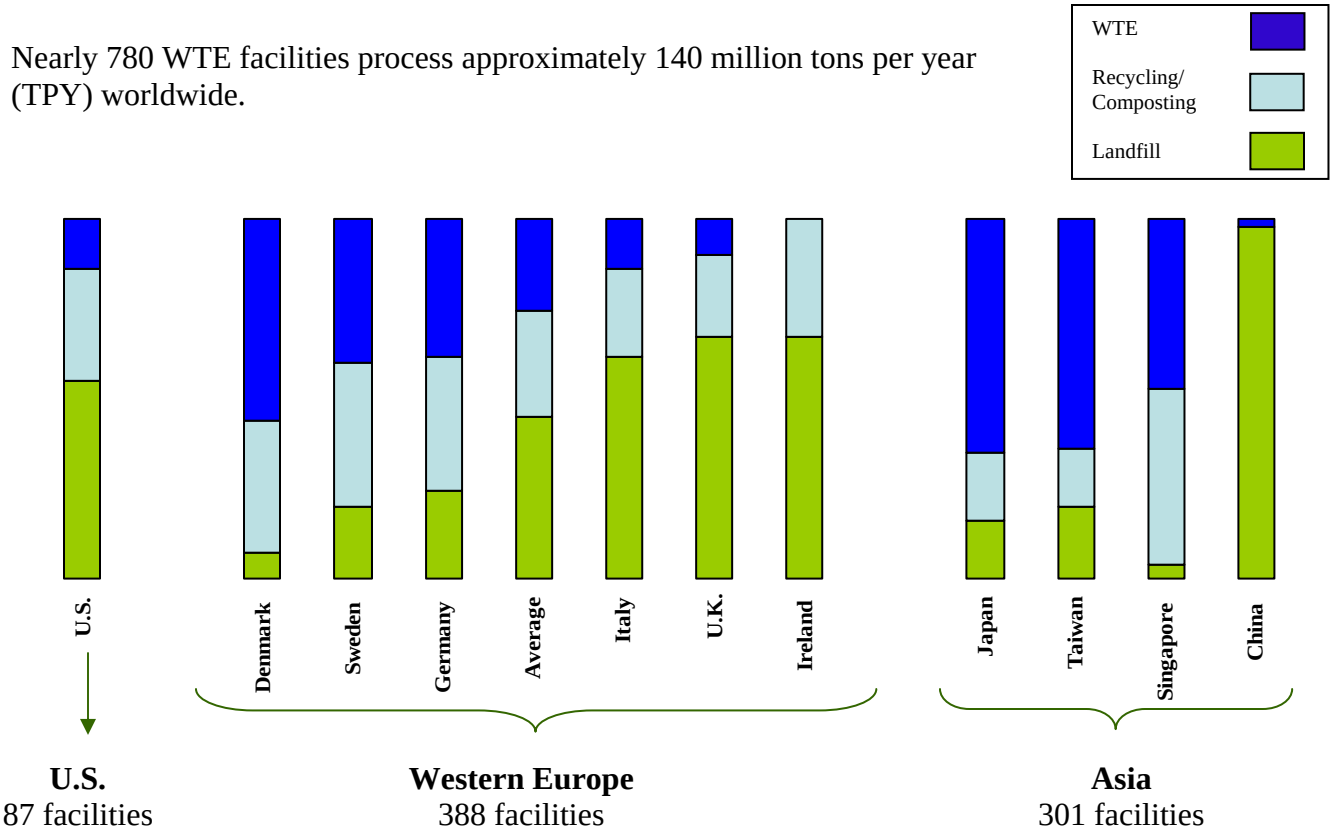
Nations in Western Europe and Asia have utilized waste-to-energy as an environmentally friendly method of waste disposal and energy production that will assist in the reduction of greenhouse gas emissions. The European Union (EU) requires all members to reduce landfilling of biodegradable municipal solid waste by 65 percent by 2020, which has placed higher emphasis on waste-to-energy and recycling.

Asia has also turned to waste-to-energy to relieve its waste management burdens. Japan suffers from decreasing open space and increasing volume of trash due to an expanding population and limited landmass. The country has therefore become one of the most prolific users of waste-to-energy, processing 70% of its municipal waste at waste-to-energy facilities. Singapore handles all combustible waste at waste-to-energy plants, generating up to 2% of the countries energy. In addition, China's Ministry of Construction plans to handle 30% of more than 280 million annual tons of garbage with waste-to-energy technology by the year 2030, thereby helping to satisfy the country's growing demand for energy.

As with IWSA in the United States, waste-to-energy groups are active internationally. The Confederation of European Waste-to-Energy Plants (CEWEP) pursues policies in support of waste-to-energy in Europe and their activities can be found online at www.cewep.eu. The International Solid Waste Association is a global organization and more information can be found at www.iswa.org.

Figure 1. Global Waste-to-Energy Capacity

Nearly 780 WTE facilities process approximately 140 million tons per year (TPY) worldwide.



IWSA Membership

Waste-to-Energy Providers

Covanta Energy Company
40 Lane Road
Fairfield, NJ 07004
(973) 882-9000
www.covantaenergy.com

Wheelabrator Technologies Inc.
4 Liberty Lane West
Hampton, NH 03842
(800) 682-0026
www.wheelabratortechnologies.com

Veolia ES Waste-to-Energy, Inc.
One Pennsylvania Plaza
Suite 4400
New York, NY 10119
(212) 947-5828
www.veoliaes-wte.com

Energy Answers Corporation
79 North Pearl Street
Albany, NY 12207-2289
(518) 434-1227
www.energyanswers.com

IWSA Municipal Members

City of Alexandria/Arlington County (VA)
Bristol (CT) Resource Recovery Facility Operating Committee
Broward County, FL
Camden County (NJ) Pollution Control Financing Authority
City of Long Beach, CA
City of Red Wing, MN
City of Tampa, FL
Connecticut Resource Recovery Authority
Dade-Miami County, FL
Delaware Solid Waste Authority
Dutchess County (NY) Resource Recovery Agency
ecomaine
Fairfax County, VA
Greater Detroit Resource Recovery Authority
Lake County, FL
Lancaster County (PA) Solid Waste Management Authority
Montgomery County (PA) Waste Systems Authority
Northeast Maryland Waste Disposal Authority
Onondaga County (NY) Resource Recovery Agency
Olmsted, MN
Pinellas County (FL)
Polk County (MN) Solid Waste Resource Recovery Plant
Spokane (WA) Regional Solid Waste System
Wasatch (UT) Integrated Waste Management District
York County (PA) Solid Waste Authority

IWSA Associate Members

Babcock Power, Inc.
Dvirka & Bartilucci Consulting Engineers
EMCO Chemical Distributors, Inc.
HDR, Inc.
Jansen Combustion & Boiler Technologies, Inc.
Joule' Industrial Contracting
Malcolm Pirnie
Martin GmbH
Minnesota Resource Recovery Association
NAMCO
Resource Recycling, LLC
Rich and Henderson, P.C.
Riker, Danzig, Scherer, Hyland & Perretti, LLP
Specialized Environmental Technologies
Turbine Generator Maintenance
Zar-Tech

Waste-to-Energy Directory: Key Terms

Trash Capacity: The trash capacity is the rated capacity for each unit housed at a facility. The number of units at a facility is provided, followed by the capacity for each unit (i.e. 2x250 represents a facility with two units, each designed to process 250 tons per day, reflective of a 500 ton-per-day facility). The total daily design capacity is also provided.

Energy Capacity: Expressed in gross megawatts (MW) capacity for electric generating facilities (ELE) or pounds of steam per hour for steam generating facilities (STM). Some facilities produce both steam for export and electricity for either internal use or for sale on the electric grid.

Continuous Emissions Monitors (CEMS): All facilities employ continuous emissions monitors (CEMS) and the directory identifies emissions at each plant which are monitored continuously. References to *Link* in the CEMS column means that the facility is connected to the state regulatory agency by way of computer for emissions-monitoring purposes.

Technology: An abbreviated summary of the furnace technology employed at a facility is provided. The following technologies are listed in their abbreviated form:

MBWW: Mass Burn, Water Wall furnace
MBRW: Mass Burn, Refractory Wall furnace
MCU: Modular Combustion Unit
RWW: Rotary Water Wall combustor
RRW: Rotary bed combustion chamber, Refractory Wall
RDF: Refuse-Derived Fuel facility that burns the RDF previously processed from trash
SSWW: Spreader Stoker, Water Wall furnace

Project Startup: Actual year of commercial startup is listed.

APC System: This entry reflects the Air Pollution Control System in use at the facility:

CI: Activated Carbon Injection
CYC: Cyclone Separator
DSI: Duct Sorbent (dry) Injection (downstream of furnace)
ESP: Electrostatic Precipitator
FF: Fabric Filter
FGR: Flue Gas Recirculation
FSI: Furnace Sorbent (dry) Injection
GSA: Gas Suspension Absorber
SDA: Spray Dryer Absorber, or Scrubber
SNCR: Select Non-Catalytic Reduction for NOx Control (e.g. aqueous ammonia)

Owner: The current owner of the facility is listed in this column.

Operator: The current operator of the facility is listed in this column.

The North American Waste-to-Energy Conference (NAWTEC)

Co-sponsored by the Integrated Waste Services Association (IWSA), the American Society of Mechanical Engineers (ASME), the Solid Waste Association of North America (SWANA), and in partnership with the Waste-to-Energy Research and Technology Council (WTERT) at Columbia University, the North American Waste-to-Energy Conference (NAWTEC) is widely recognized as the leading industry technical conference and trade show focusing on municipal waste-to-energy.

NAWTEC has taken place annually for the past 15 years and has showcased the latest research, technology, innovations, and policies affecting the municipalities and companies involved in the waste-to-energy industry. The 16th NAWTEC will take place May 19-21, 2008 in Philadelphia, PA.

For more information, please visit http://www.nawtec.org.

ALABAMA

Huntsville Solid Waste-to-Energy Facility
Huntsville, AL

Trash Capacity: 2 units @ 345 tpd = 690 tpd
Energy Capacity: 178,620 Lbs/Hr steam export
Project Startup: 1990
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity, SO_2
APC System: SDA; FF; SNCR; CI
Owner: City of Huntsville Solid Waste Disposal Authority
Operator: Covanta Huntsville, Inc.

ALASKA

Eielson Air Force Base
North Pole, AK

Trash Capacity: 5 units @ 2 tpd = 10 tpd
Energy Capacity: STM: 2,775 Lbs/Hr
ELE: 0.2 MW
(RDF Attributed-Peak)
Project Startup: 1995
Technology: RDF (co-fired in Coal Boiler)
CEMS: Opacity
APC System: FF
Owner: Eileson Airforce Base
Operator: Eileson Airforce Base

CALIFORNIA (3 facilities; combined capacity of 2,530 TPD and 69.5 MW)

Commerce Refuse-to-Energy Facility
Commerce, CA

Trash Capacity: 1 units @ 350 tpd = 350 tpd
Energy Capacity: ELE: 10 MW
Project Startup: 1987
Technology: MBWW
CEMS: CO; NOx; O_2; SO_2
APC System: SDA; FF; SNCR
Owner: Commerce Refuse-to-Energy Authority
Operator: Sanitation Districts of Los Angeles County

Southeast Resource Recovery Facility (SERRF)
Long Beach, CA

Trash Capacity: 3 units @ 460 tpd = 1,380 tpd
Energy Capacity: ELE: 37.5 MW
Project Startup: 1988
Technology: MBWW
CEMS: CO; CO_2; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR
Owner: City of Long Beach
Operator: Montenay Pacific Power Corp.

Stanislaus County Resource Recovery Facility
Crow's Landing, CA

Trash Capacity: 2 units @ 400 tpd = 800 tpd
Energy Capacity: 22 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; CO_2; Link; NOx; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Covanta Stanislaus, Inc.
Operator: Covanta Stanislaus, Inc.

Each year, the nation's waste-to-energy facilities recover more than 700,000 tons of ferrous metal from the combustion ash, which is sold for recycling. That is enough metal to manufacture more than a half-million new cars.

CONNECTICUT (6 facilities; combined capacity of 6,509 TPD and 194 MW)

Bristol Resource Recovery Facility
Bristol, CT

Trash Capacity: 2 units @ 325 tpd = 650 tpd
Energy Capacity: 16 MW
Project Startup: 1988
Technology: MBWW
CEMS: CO; CO_2; Link; NOx; Opacity; SO_2; VOC
APC System: SDA; FF; SNCR; CI
Owner: Covanta Bristol, Inc.
Operator: Covanta Bristol, Inc.

Mid-Connecticut Resource Recovery Facility
Hartford, CT

Trash Capacity: 3 units @ 666 tpd = 2,000 tpd
Energy Capacity: 68 MW
Project Startup: 1987
Technology: RDF—SSWW
CEMS: CO; CO_2; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR
Owner: Connecticut Resource Recovery Authority
Operator: Covanta Mid-Conn, Inc.

Riley Energy Systems of Lisbon Connecticut Corp.
Lisbon, CT

Trash Capacity: 2 units @ 250 tpd = 500 tpd
Energy Capacity: 15 MW
Project Startup: 1995
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Eastern Connecticut Resource Recovery Authority
Operator: Riley Energy Systems of Lisbon Corp (Wheelabrator)

Southeastern Connecticut Resource Recovery Facility
Preston, CT

Trash Capacity: 2 units @ 344.5 tpd = 689 tpd
Energy Capacity: 17 MW
Project Startup: 1991
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; CI
Owner: Covanta Company of Southeastern Connecticut
Operator: Covanta Company of Southeastern CT

Wallingford Resource Recovery Facility
Wallingford, CT

Trash Capacity: 3 units @ 140 tpd = 420 tpd
Energy Capacity: 11 MW
Project Startup: 1989
Technology: MBRW
CEMS: CO; CO_2; NOx; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Connecticut Resource Recovery Authority
Operator: Covanta Projects of Wallingford, L.P.

Wheelabrator Bridgeport Company, L.P.
Bridgeport, CT

Trash Capacity: 3 units @ 750 tpd = 2,250 tpd
Energy Capacity: 67 MW
Project Startup: 1988
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Wheelabrator Technologies Inc.
Operator: Wheelabrator Technologies Inc.

FLORIDA (11 facilities; combined capacity of 18,414 TPD and 514 MW)

Bay County Resource Recovery Center
Panama City, FL

Trash Capacity: 2 units @ 250 tpd = 500 tpd
Energy Capacity: ELE: 10 MW
Project Startup: 1987
Technology: RWW
CEMS: O_2; CO; NOx; SO_2; Opacity
APC System: SDA; FF; CI
Owner: Bay County
Operator: Montenay Bay LLC

Miami-Dade County Resource Recovery Facility
Miami, FL

Trash Capacity: 4 units @ 750 tpd = 3,000 tpd
Energy Capacity: ELE: 77 MW
Project Startup: 1979
Technology: RDF—SSWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Miami-Dade County
Operator: Montenay Power Corp.
Fact: *An additional 1,200 tpd is exported as biomass fuel.*

Hillsborough County Resource Recovery Facility
Tampa, FL

Trash Capacity: 2 units @ 600 tpd = 1,200 tpd
Energy Capacity: ELE: 29 MW
Project Startup: 1987
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; O_2
APC System: SDA; FF; SNCR; CI
Owner: Hillsborough County
Operator: Covanta Hillsborough, Inc.
Fact: *Hillsborough County initiated a 600 TPD expansion in 2007.*

Lake County Resource Recovery Facility
Okahumpka, FL

Trash Capacity: 2 units @ 264 tpd = 528 tpd
Energy Capacity: ELE: 14.5 MW
Project Startup: 1991
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; O_2
APC System: SDA; FF; SNCR; CI
Owner: Covanta Lake, Inc.
Operator: Covanta Lake, Inc.

Lee County Resource Recovery Facility
Fort Myers, FL

Trash Capacity: 2 units @ 600 tpd
1 unit @ 636 tpd
1,836 tpd total
Energy Capacity: ELE: 58 MW
Project Startup: 1994 (units 1&2); 2007 (unit 3)
Technology: MBWW
CEMS: CO; CO_2; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Lee County
Operator: Covanta Lee, Inc.

McKay Bay Refuse-to-Energy Facility
Tampa, FL

Trash Capacity: 4 units @ 250 tpd = 1,000 tpd
Energy Capacity: ELE: 22.5 MW
Project Startup: 1985
Technology: MBWW
CEMS: CO; Opacity; SO_2; NOx; Temp
APC System: SDA; FF; SNCR; CI
Owner: City of Tampa
Operator: Wheelabrator McKay Bay Inc.

FLORIDA (continued)

North County Resource Recovery Facility
West Palm Beach, FL

Trash Capacity: 2 units @ 900 tpd = 1,800 tpd
Energy Capacity: ELE: 62 MW
Project Startup: 1989
Technology: RDF-SSWW
CEMS: NOx; CO; SO_2; Opacity; CO_2
APC System: SDA; ESP
Owner: Solid Waste Authority of Palm Beach County
Operator: Palm Beach Resource Recovery Corporation

Pasco County Resource Recovery Facility
Spring Hill, FL

Trash Capacity: 3 units @ 350 tpd = 1,050 tpd
Energy Capacity: ELE: 30 MW
Project Startup: 1991
Technology: MBWW
CEMS: CO; CO_2; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Pasco County
Operator: Covanta Pasco, Inc.

Pinellas County Resource Recovery Facility
St. Petersburg, FL

Trash Capacity: 3 units @ 1,000 tpd = 3,000 tpd
Energy Capacity: ELE: 77 MW
Project Startup: 1983
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Pinellas County
Operator: Veolia ES Waste-to-Energy, Inc.

Wheelabrator North Broward, Inc.
Pompano Beach, FL

Trash Capacity: 3 units @ 750 tpd = 2,250 tpd
Energy Capacity: ELE: 68 MW
Project Startup: 1991
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Wheelabrator Technologies Inc.
Operator: Wheelabrator Technologies Inc.

Wheelabrator South Broward, Inc.
Ft. Lauderdale, FL

Trash Capacity: 3 units @ 750 tpd = 2,250 tpd
Energy Capacity: ELE: 66 MW
Project Startup: 1991
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Wheelabrator Technologies Inc.
Operator: Wheelabrator Technologies Inc.

Waste-to-energy plants are a "clean, reliable, renewable source of energy" that 'produce 2,800 megawatts of electricity with less environmental impact than almost any other source of electricity." Communities "greatly benefit from the dependable, sustainable [solid waste disposal] capacity of municipal waste-to-energy plants."

—USEPA letter from Assistant Administrators Marianne Horinko, Office of Solid Waste and Emergency Response, and Jeffery Holmstead, Office of Air and Radiation to IWSA, 2/14/03

GEORGIA

Montenay Savannah Operations, Inc.
Savannah, GA

Trash Capacity: 2 units @ 250 tpd = 500 tpd
Energy Capacity: ELE: 5 MW
STM: 130,000 Lbs/Hr
Project Startup: 1987
Technology: MBWW
CEMS: CO; HCl; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Montenay Savannah Limited Partnership
Operator: Montenay Savannah Operations, Inc.

HAWAII

Honolulu Resource Recovery Venture (HPOWER)
Honolulu, HI

Trash Capacity: 2 units @ 925.5 tpd = 1,851 tpd
Energy Capacity: ELE: 57 MW
Project Startup: 1990
Technology: RDF-SSWW
CEMS: CO; NOx; Opacity; SO_2; O_2
APC System: SDA; ESP
Owner: City & County of Honolulu
Operator: Covanta Honolulu Resource Recovery Venture (HPOWER)

INDIANA

Indianapolis Resource Recovery Facility
Indianapolis, IN

Trash Capacity: 3 units @ 787.3 tpd = 2,362 tpd
Energy Capacity: STM: 558,000 Lbs/Hr
Project Startup: 1988
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; Link; O_2
APC System: SDA; FF; SNCR; CI
Owner: Marion County
Operator: Covanta Indianapolis, Inc.

IOWA

Ames Municipal Electric Utility
Ames, IA

Trash Capacity: 1 units @ 175 tpd = 175 tpd
Energy Capacity: ELE: 10 MW
(RDF Attributed)
Project Startup: 1975
Technology: RDF-Pulverized Coal WW
CEMS: CO_2; NOx; O_2; Opacity; SO_2
APC System: ESP
Owner: City of Ames
Operator: Ames Municipal Electric System

Air Emissions of Waste-To-Energy and Fossil Fuel Power Plants
(Pounds per Megawatt Hour)

Facility Type	Carbon Dioxide	Sulfur Dioxide	Nitrogen Oxides
Coal	2,249	13	6
Oil	1,672	12	4
Natural Gas	1,135	0.1	1.7
Waste-To-Energy	837	0.8	5.4

Source: "Comparison of Air Emissions from Waste-to-Energy Facilities to Fossil Fuel Power Plants." 2005, SWANA Applied Research Foundation, by Jeremy O'Brien.

MAINE (4 facilities; combined capacity of 2,850 TPD and 65.6 MW)

Maine Energy Recovery Company
Biddeford, ME

Trash Capacity: 2 units @ 300 tpd = 600 tpd
Energy Capacity: ELE: 22 MW
Project Startup: 1987
Technology: RDF-SSWW
CEMS: CO; Link; NOx; O_2; Opacity; SO_2; Temperature
APC System: SDA; FF
Owner: Casella Waste Systems
Operator: KTI Operations

Mid-Maine Waste Action Corporation
Auburn, ME

Trash Capacity: 2 units @ 100 tpd = 200 tpd
Energy Capacity: ELE: 3.6 MW
Project Startup: 1992
Technology: RWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; Temperature
APC System: SDA; FF; CI
Owner: Mid-Maine Waste Action Corp.
Operator: Mid-Maine Waste Action Corp.

Penobscot Energy Recovery Corp.
Orrington, ME

Trash Capacity: 2 units @ 750 tpd = 1,500 tpd
Energy Capacity: ELE: 25 MW
Project Startup: 1988
Technology: RDF
CEMS: CO; CO_2; O_2; NOx; Opacity; SO_2
APC System: SDA; FF
Owner: USA Energy Group LLC; PERC Holdings LLC; Communities
Operator: ESOCO Orrington LLC

Greater Portland Resource Recovery Facility
Portland, ME

Trash Capacity: 2 units @ 275 tpd = 550 tpd
Energy Capacity: ELE: 15 MW
Project Startup: 1988
Technology: MBWW
CEMS: NOx; SO_2; CO; Opacity; Link
APC System: SDA; SNCR; SNCR; CI
Owner: ecomaine
Operator: ecomaine

Waste-to-Energy & Steam Exports

Waste-to-energy produces more than just electricity. Many facilities also generate steam that is exported directly to customers located in close proximity to the plant, eliminating the need for those customers to burn fossil fuels to meet their demand for steam.

Many businesses are served by downtown steam loops to which waste-to-energy facilities in Baltimore, Indianapolis, Detroit, and Grand Rapids provide steam. Waste-to-energy facilities in Minnesota serve a local industries, including those as diverse as 3M, Tuffy's Dogfood, Bongard's Cheese, and the S.B. Foot Tannery. The Pittsfield Resource Recovery Facility in Massachusetts exports its steam to a Crane & Company paper mill where currency paper stock for the U.S. Treasury and several other nations is manufactured.

Several waste-to-energy facilities have partnered with the federal government to provide steam. The Huntsville (AL) facility serves the Army's Redstone Arsenal; the Harford (MD) facility serves the Aberdeen Proving Grounds; the Davis (UT) facility serves Hill Air Force Base; the Hampton (VA) facility serves NASA.

MARYLAND (3 facilities; combined capacity of 4,410 TPD, 123 MW, 100,000 lbs/hr)

Harford Waste-to-Energy Facility
Joppa, MD

Trash Capacity: 4 units @ 90 tpd = 360 tpd
Energy Capacity: STM: 100,000 Lbs/Hr
Project Startup: 1988
Technology: MCU
CEMS: SO_2; CO; CO_2; Opacity; NOx; O_2
APC System: SDA; FF; CI
Owner: Northeast Maryland Waste Disposal Authority
Operator: Energy Recovery Operations, Inc.

Baltimore Refuse Energy Systems Company (BRESCO)
Baltimore, MD

Trash Capacity: 3 units @ 750 tpd = 2,250 tpd
Energy Capacity: ELE: 60 MW
Project Startup: 1985
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; ESP; SNCR; CI
Owner: John Hancock Life Insurance Company
Operator: Wheelabrator Baltimore, L.P.

Montgomery County Resource Recovery Facility
Dickerson, MD

Trash Capacity: 3 units @ 600 tpd = 1,800 tpd
Energy Capacity: ELE: 63 MW
Project Startup: 1995
Technology: MBWW
CEMS: CO; CO_2; HCl; Link, NOx; O_2; Opacity; SO_2
APC System: FSI; SDA; FF; SNCR; CI
Owner: Northeast Maryland Waste Disposal Authority
Operator: Covanta Montgomery, Inc.

"EPA strongly supports the use of waste-to-energy facilities. With fewer and fewer new landfills being opened and capacity controls being imposed on many existing landfills, our communities greatly benefit from the dependable, sustainable capacity of municipal waste-to-energy plants."

—USEPA letter from Acting Assistant Administrator William Wehrum, Office of Air and Radiation to Rep. Joe Barton, 9/29/06

MASSACHUSETTS (7 facilities; combined capacity of 9,450 TPD, 259.7 MW, 162,000 lbs/hr)

Haverhill Resource Recovery Facility
Haverhill, MA

Trash Capacity: 2 units @ 825 tpd = 1,650 tpd
Energy Capacity: ELE: 48 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; NOx; Opacity; SO_2; O_2
APC System: SDA; FF; SNCR; CI
Owner: City of Haverhill
Operator: Covanta Haverhill, Inc.

Pioneer Valley Resource Recovery Facility
Agawam, MA

Trash Capacity: 3x136=408 (design); 3x120=360 (permit)
Energy Capacity: STM: 96,000 Lbs/Hr
ELE: 9.4 MW
Project Startup: 1988
Technology: MBRW
CEMS: CO; NOx; Opacity; SO_2
APC System: FGR; DSI; FF; CI, CYC
Owner: eco/Springfield L.L.C.
Operator: eco/Springfield L.L.C.

MASSACHUSETTS (continued)

Pittsfield Resource Recovery Facility
Pittsfield, MA

Trash Capacity: 3x120=360 (design); 3x80=240 (actual practice)
Energy Capacity: STM: 66,000 Lbs/Hr; ELE: 0.8 MW
Project Startup: 1981
Technology: MBRW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: FGR; ESP; CI; CYC; Packed Tower Scrubber
Owner: eco/Pittsfield, L.L.C.
Operator: eco/Pittsfield, L.L.C.

SEMASS Resource Recovery Facility
West Wareham, MA

Trash Capacity: 3 units @ 900 tpd = 2,700 tpd
Energy Capacity: ELE: 78 MW
Project Startup: 1989
Technology: RDF-SSWW
CEMS: CO; NOx; Opacity; SO_2; O_2
APC System: SDA; ESP; SNCR; CI
Owner: Covanta SEMASS, L.P.
Operator: Covanta SEMASS, L.P.

Wheelabrator Millbury Inc.
Millbury, MA

Trash Capacity: 2 units @ 750 tpd = 1,500 tpd
Energy Capacity: ELE: 46 MW
Project Startup: 1987
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: CIT
Operator: Wheelabrator Millbury Inc.

Wheelabrator North Andover Inc.
North Andover, MA

Trash Capacity: 2 units @ 750 tpd = 1,500 tpd
Energy Capacity: ELE: 40 MW
Project Startup: 1985
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Wheelabrator North Andover Inc.
Operator: Wheelabrator North Andover Inc.

Wheelabrator Saugus, J.V.
Saugus, MA

Trash Capacity: 2 units @ 750 tpd = 1,500 tpd
Energy Capacity: ELE: 37.5 MW
Project Startup: 1975
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Wheelabrator Saugus, J.V.
Operator: Wheelabrator Saugus, J.V.

"Generation of energy from municipal solid waste disposed in a waste-to-energy facility not only offers significant environmental and renewable benefits, but also provides greater energy diversity and increased energy security for our nation."

—The United States Conference of Mayors, Adopted Resolution on Comprehensive Solid Waste Disposal Management (2005)

MICHIGAN (3 facilities; combined capacity of 3,657 TPD, 89.7 MW, 149,200 lbs/hr)

Greater Detroit Resource Recovery Facility
Detroit, MI

Trash Capacity: 3 units @ 944 tpd = 2,832 tpd
Energy Capacity: STM: 100,000 Lbs/Hr; ELE: 68 MW
Project Startup: 1991
Technology: RDF-SSWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; Link; O_2
APC System: SDA; FF
Owner: City of Detroit, MI (GDRRA)
Operator: Covanta Energy Corporation

Jackson County Resource Recovery Facility
Jackson, MI

Trash Capacity: 2 units @ 100 tpd = 200 tpd
Energy Capacity: STM: 49,200 Lbs/Hr
ELE: 3.7 MW
Project Startup: 1987
Technology: MBWW
CEMS: CO; CO_2; NOx; O_2; Opacity; SO_2; Temperature
APC System: SDA; FF; CI
Owner: Jackson County
Operator: U.S. Filter, Inc.

Kent County Waste-to-Energy Facility
Grand Rapids, MI

Trash Capacity: 2 units @ 312.5 tpd = 625 tpd
Energy Capacity: ELE: 18 MW
Project Startup: 1990
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; Link
APC System: SDA; FF; SNCR; CI
Owner: Kent County
Operator: Covanta Kent, Inc.

"In my judgment, waste-to energy is undoubtedly a renewable source of energy. Our cities and towns will continue to produce solid waste that must be disposed of in some manner. Waste-to-energy is a viable means of dealing with the problem of disposal."

—U.S. Senator Bob Graham (in a speech on the Senate floor, April 24, 2002)

MINNESOTA 9 facilities; combined capacity of 4,218 TPD, 123.7 MW, and 114,000 lbs/hr)

Great River Energy - Elk River Station
Elk River, MN

Trash Capacity: 2 units @ 250 tpd; 1 unit @ 500 tpd =1,000 tpd
Energy Capacity: ELE: 35 MW
Project Startup: 1989
Technology: RDF-SSWW
CEMS: CO; NOx; O_2; SO_2; Opacity
APC System: SDA; FF
Owner: Great River Energy (Rural Electric Gen/Trans Coop)
Operator: Great River Energy

Hennepin Energy Resource Co.
Minneapolis, MN

Trash Capacity: 2 units @ 606 tpd = 1,212 tpd
Energy Capacity: ELE: 38.7 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Hennepin County
Operator: Covanta Hennepin Energy Resource, Inc.

MINNESOTA (continued)

Olmsted Waste-to-Energy Facility
Rochester, MN

Trash Capacity: 2 units @ 100 tpd = 200 tpd
Energy Capacity: ELE: 4 MW
Project Startup: 1987
Technology: MBWW
CEMS: CO; CO_2; SO_2; O_2; Opacity
APC System: SDA; FF; CI
Owner: Olmsted County
Operator: Olmsted County

Perham Resource Recovery Facility
Perham, MN

Trash Capacity: 2 units @ 58 tpd = 116 tpd
Energy Capacity: STM: 37,000 Lbs/Hr
ELE: 2.5 MW
Project Startup: 1986; 2002 (upgrade)
Technology: MCU
CEMS: SO_2; CO; O_2; Opacity
APC System: SDA; DSI; FF; CI
Owner: City of Perham
Operator: City of Perham

Polk County Solid Waste Resource Recovery Plant
Fosston, MN

Trash Capacity: 2 units @ 40 tpd = 80 tpd
Energy Capacity: STM: 25,000 Lbs/Hr
Project Startup: 1988
Technology: MCU
CEMS: CO; SO_2; O_2
APC System: CI; DSI; ESP
Owner: Polk County
Operator: Polk County

Pope/Douglas Solid Waste Management
Alexandria, MN

Trash Capacity: 2 units @ 40 tpd = 80 tpd
Energy Capacity: STM: 36,000 Lbs/Hr
ELE: 0.5 MW
Project Startup: 1987
Technology: MCU
CEMS: CO; NOx; SO_2; CO_2; O_2; Opacity
APC System: DSI; FF; CI
Owner: Pope/Douglas Solid Waste Management Board
Operator: Pope/Douglas Solid Waste Management Board

Red Wing Resource Recovery Facility
Red Wing, MN

Trash Capacity: 2 units @ 45 tpd = 90 tpd
Energy Capacity: STM: 16,000 Lbs/Hr
Project Startup: 1983
Technology: MCU
CEMS: CO; SO_2; O_2; Opacity
APC System: GSA; ESP
Owner: City of Red Wing
Operator: City of Red Wing

Xcel Energy - Red Wing Steam Plant
Red Wing, MN

Trash Capacity: 2 units @ 360 tpd = 720 tpd
Energy Capacity: ELE: 21 MW
Project Startup: 1988
Technology: RDF-SSWW
CEMS: SO_2; O_2; NOx; CO
APC System: DSI; FF
Owner: Xcel Energy
Operator: Xcel Energy

MINNESOTA (continued)

Xcel Energy-Wilmarth Plant
Mankato, MN

Trash Capacity: 2 units @ 360 tpd = 720 tpd
Energy Capacity: ELE: 22 MW
Project Startup: 1987
Technology: RDF-SSWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF
Owner: Xcel Energy
Operator: Xcel Energy

"Waste-to-energy is turning a problem into an energy solution."

—Rick Brandes, Chief, Waste Minimization Branch, Office of Solid Waste and Emergency Response, US Environmental Protection Agency as reported in *The Examiner*, 7/16/07

NEW HAMPSHIRE (2 facilities; combined capacity of 775 TPD and 18.5 MW)

Wheelabrator Claremont Co, L.P.
Claremont, NH

Trash Capacity: 2 units @ 100 tpd = 200 tpd
Energy Capacity: ELE: 4.5 MW
Project Startup: 1987
Technology: MBWW
CEMS: CO; O_2; Opacity; SO_2
APC System: SDA; FF; CI
Owner: Wheelabrator Claremont Co, L.P.
Operator: Wheelabrator Claremont Co, L.P.

Wheelabrator Concord Company, L.P.
Penacock, NH

Trash Capacity: 2 units @ 288 tpd = 575 tpd
Energy Capacity: ELE: 14 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Wheelabrator Concord, L.P.
Operator: Wheelabrator Concord, L.P.

NEW JERSEY (5 facilities; combined capacity of 6,265 TPD and 173 MW)

Camden Resource Recovery Facility
Camden, NJ

Trash Capacity: 3 units @ 350 tpd = 1,050 tpd
Energy Capacity: ELE: 34 MW
Project Startup: 1991
Technology: MBWW
CEMS: Opacity; NOx; HCl; SO_2; non-methane hydrocarbons
APC System: SDA; ESP; CI
Owner: Camden County Energy Recovery Associates
Operator: Camden County Energy Recovery Corporation

Essex County Resource Recovery Facility
Newark, NJ

Trash Capacity: 3 units @ 933 tpd = 2,800 tpd
Energy Capacity: ELE: 70 MW
Project Startup: 1990
Technology: MBWW
CEMS: CO; NOx, O_2; Opacity, SO_2
APC System: SDA; ESP; SNCR; CI
Owner: Covanta Energy Corporation
Operator: Covanta Energy Corporation

NEW JERSEY (continued)

Union County Resource Recovery Facility
Rahway, NJ

Trash Capacity: 3 units @ 480 tpd = 1,440 tpd
Energy Capacity: ELE: 42 MW
Project Startup: 1994
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; Link; O_2; NH_3; HCl; Temp
APC System: SDA; FF; SNCR; CI
Owner: Union County Utility Authority
Operator: Covanta Union, Inc.

Warren Energy Resource Company
Oxford Township, NJ

Trash Capacity: 2 units @ 200 tpd = 400 tpd
Energy Capacity: ELE: 13 MW
Project Startup: 1988
Technology: MBWW
CEMS: CO; NOx; Opacity; SO_2; Link; O_2; Temp
APC System: SDA; FF; SNCR; CI
Owner: Covanta Warren Energy Resource Co, L.P.
Operator: Covanta Warren Energy Resource Co, L.P.

Wheelabrator Gloucester Company, L.P.
Westville, NJ

Trash Capacity: 2 units @ 287 tpd = 575 tpd
Energy Capacity: ELE: 14 MW
Project Startup: 1990
Technology: MBWW
CEMS: CO; O_2; SO_2; Opacity; NOx
APC System: SDA; FF; SNCR; CI
Owner: Wheelabrator Gloucester Inc.
Operator: Wheelabrator Gloucester Inc.

As of August 31, 2007, the U.S. waste-to-energy industry has 43 facilities that have earned STAR status under the OSHA Voluntary Protection Program. Three additional facilities are recognized under OSHA's Safety & Health Achievement Recognition Program. While less than 0.02% of all worksites are enrolled in VPP, more than 49% of all U.S. waste-to-energy facilities are enrolled in VPP.

NEW YORK (10 facilities; combined capacity of 11,187 TPD, 307.5 MW, and 460,000 lbs/hr)

Babylon Resource Recovery Facility
Babylon, NY

Trash Capacity: 2 units @ 375 tpd = 750 tpd
Energy Capacity: ELE: 17 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Covanta Babylon, Inc.
Operator: Covanta Babylon, Inc.

Dutchess County Resource Recovery Facility
Poughkeepsie, NY

Trash Capacity: 2 units @ 225 tpd = 450 tpd
Energy Capacity: STM: 50,000 Lbs/Hr
ELE: 10.5 MW
Project Startup: 1988
Technology: RWW
CEMS: CO; NOx; SO_2; Temperature; Opacity, CO_2
APC System: SDA; FF; CI
Owner: Dutchess County Resource Recovery Agency
Operator: Montenay Dutchess LLC

NEW YORK (continued)

Hempstead Resource Recovery Facility
Westbury, NY

Trash Capacity: 2 units @ 890.3 tpd = 2,671 tpd
Energy Capacity: ELE: 75 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Town of Hempstead
Operator: Covanta Hempstead Co.

Huntington Resource Recovery Facility
East Northport, NY

Trash Capacity: 3 units @ 250 tpd = 750 tpd
Energy Capacity: ELE: 25 MW
Project Startup: 1991
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; NH_3
APC System: SDA; FF; SNCR; CI
Owner: Covanta Huntington, Inc.
Operator: Covanta Huntington, Inc.

MacArthur Waste-to-Energy Facility
Ronkonkoma, NY

Trash Capacity: 2 units @ 243 tpd = 486 tpd
Energy Capacity: ELE: 12 MW
Project Startup: 1989
Technology: RWW
CEMS: CO; CO_2; HCl; NOx; O_2; Opacity; SO_2
APC System: SDA; FF
Owner: Islip Resource Recovery Agency
Operator: Montenay Islip, Inc.

Niagara Falls Resource Recovery Facility
Niagra Falls, NY

Trash Capacity: 2 units @ 1,100 tpd = 2,200 tpd
Energy Capacity: STM: 350,000 Lbs/Hr
ELE: 50MW
Project Startup: 1996
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Covanta Energy Corporation
Operator: Covanta Energy Corporation

Onondaga County Resource Recovery Facility
Jamesville, NY

Trash Capacity: 3 units @ 330 tpd = 990 tpd
Energy Capacity: ELE: 39.5 MW
Project Startup: 1995
Technology: MBWW
CEMS: CO; CO_2; NOx; O_2; Opacity; SO_2; NH_3
APC System: SDA; FF; SNCR; CI
Owner: Onondaga County Resource Recovery Agency
Operator: Covanta Onondaga, L.P.

Oswego County Energy Recovery Facility
Fulton, NY

Trash Capacity: 4 units @ 50 tpd = 200 tpd
Energy Capacity: STM: 60,000 Lbs/Hr
ELE: 4 MW
Project Startup: 1985
Technology: MCU
CEMS: Steam flow; CO; O_2; SO_2; Opacity
APC System: SDA; FF: CI
Owner: Oswego County
Operator: Oswego County

NEW YORK (continued)

Wheelabrator Hudson Falls Inc.
Hudson Falls, NY

Trash Capacity:	2 units @ 220 tpd = 440 tpd
Energy Capacity:	ELE: 14.5 MW
Project Startup:	1991
Technology:	MBWW
CEMS:	CO; NOx; O_2; Opacity; SO_2
APC System:	SDA; ESP; CI
Owner:	Warren & Washington Counties Industrial Development Agency
Operator:	Wheelabrator Hudson Falls Inc.

Wheelabrator Westchester Company, L.P.
Peekskill, NY

Trash Capacity:	3 units @ 750 tpd = 2,250 tpd
Energy Capacity:	ELE: 60 MW
Project Startup:	1984
Technology:	MBWW
CEMS:	Opacity; CO; CO_2; SO_2; NOx
APC System:	SDA; FF; SNCR; CI
Owner:	Wheelabrator Technologies, Inc.
Operator:	Wheelabrator Technologies, Inc.

NORTH CAROLINA

New Hanover County—Wastec
Wilmington, NC

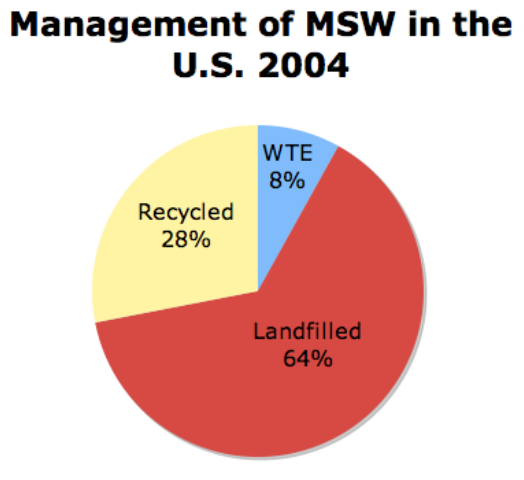
Trash Capacity:	2 units @ 100 tpd 1 unit @ 300 tpd 500 tpd total
Energy Capacity:	ELE: 10.5 MW
Project Startup:	1984 (units 1&2); 1991 (unit 3)
Technology:	MBWW
CEMS:	CO; CO_2; NOx; O_2; Opacity; SO_2
APC System:	SDA; FF; CI
Owner:	New Hanover County
Operator:	New Hanover County

OREGON

Marion County Solid Waste-to-Energy Facility
Brooks, OR

Trash Capacity:	2 units @ 275 tpd = 550 tpd
Energy Capacity:	ELE: 13 MW
Project Startup:	1986
Technology:	MBWW
CEMS:	O_2; CO; SO_2; Opacity; NOx
APC System:	SDA; FF; SNCR; CI
Owner:	Covanta Marion, Inc.
Operator:	Covanta Marion, Inc.

*Last year, this source of energy generated enough electricity to light all of the homes in Maine, New Hampshire, Vermont, Rhode Island, and most of Massachusetts. That is enough electricity to displace over **1.2 billion** gallons of crude oil, which could fill **15 supertankers**.*



PENNSYLVANIA (6 facilities; combined capacity of 8,733 TPD and 268.5 MW)

Delaware Valley Resource Recovery Facility
Chester, PA

Trash Capacity: 6 units @ 448 tpd = 2,688 tpd
Energy Capacity: ELE: 78 MW
Project Startup: 1992
Technology: RWW
CEMS: CO; HCl; Link; NOx; O_2; Opacity; SO_2
APC System: SDA; FF
Owner: Covanta Delaware Valley, L.P.
Operator: Covanta Delaware Valley, L.P.

Harrisburg Resource Recovery Facility
Harrisburg, PA

Trash Capacity: 3 units @ 267 tpd = 801 tpd
Energy Capacity: ELE: 24.5 MW
Project Startup: 2006 (retrofit completed)
Technology: MBWW
CEMS: CO; O_2; SO_2
APC System: SDA; FF; SNCR; CI
Owner: City of Harrisburg
Operator: Covanta Energy Corporation

Lancaster County Resource Recovery Facility
Bainbridge, PA

Trash Capacity: 3 units @ 400 tpd = 1,200 tpd
Energy Capacity: ELE: 36 MW
Project Startup: 1991
Technology: MBWW
CEMS: CO; CO_2; NOx; Opacity; SO_2; Link; O_2; HCl
APC System: SDA; FF; SNCR; CI
Owner: Lancaster County Solid Waste Management Authority
Operator: Covanta Lancaster, Inc.

Montenay Energy Resources of Montgomery County, Inc.
Conshohocken, PA

Trash Capacity: 2 units @ 600 tpd = 1,200 tpd
Energy Capacity: ELE: 36 MW
Project Startup: 1992
Technology: MBWW
CEMS: CO; HCl; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Montenay Montgomery L.P.
Operator: Montenay Energy Resources of Montgomery County, Inc.

Wheelabrator Falls Inc.
Morrisville, PA

Trash Capacity: 2 units @ 750 tpd = 1,500 tpd
Energy Capacity: ELE: 53 MW
Project Startup: 1994
Technology: MBWW
CEMS: CO; HCl; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Wheelabrator Falls, Inc.
Operator: Wheelabrator Falls, Inc.

York Resource Recovery Center
York, PA

Trash Capacity: 3 units @ 448 tpd = 1,344 tpd
Energy Capacity: ELE: 41 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; CO_2; HCl; Link; NOx; O_2; Opacity; SO_2; Temp
APC System: SDA; FF; CI
Owner: York County Solid Waste Authority
Operator: Montenay York Resource Energy Systems

SOUTH CAROLINA

Montenay Charleston Resource Recovery Inc.
Charleston, SC

Trash Capacity: 2 units @ 300 tpd = 600 tpd
Energy Capacity: ELE: 13 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; CO_2; NOx; O_2; Opacity; SO_2
APC System: SDA; ESP; CI
Owner: AT&T
Operator: Montenay Charleston RRI

UTAH

Wasatch Integrated Waste Management District
Layton, UT

Trash Capacity: 2 units @ 200 tpd = 400 tpd
Energy Capacity: STM: 104,000 Lbs/Hr
ELE: 1.4 MW
Project Startup: 1986
Technology: MBRW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: GSA; ESP
Owner: Wasatch Integrated Waste Management District
Operator: Wasatch Integrated Waste Management District

VIRGINIA (5 facilities; combined capacity of 6,415 TPD, 155.5 MW, and 134,000 lbs/hr)

Alexandria/Arlington Resource Recovery Facility
Alexandria, VA

Trash Capacity: 3 units @ 325 tpd = 975 tpd
Energy Capacity: ELE: 24 MW
Project Startup: 1988
Technology: MBWW
CEMS: CO; NOx; O_2; Opacity; SO_2
APC System: SDA; FF; SNCR; CI
Owner: Covanta Arlington/Alexandria, Inc.
Operator: Covanta Arlington/Alexandria, Inc.

Hampton-NASA Steam Plant
Hampton, VA

Trash Capacity: 2 units @ 120 tpd = 240 tpd
Energy Capacity: STM: 66,000 Lbs/Hr
Project Startup: 1980
Technology: MBWW
CEMS: CO; O_2; Opacity
APC System: DSI; FF
Owner: NASA and City of Hampton
Operator: City of Hampton

Harrisonburg Resource Recovery Facility
Harrisonburg, VA

Trash Capacity: 2 units @ 100 tpd = 200 tpd
Energy Capacity: STM: 43,000 Lbs/Hr
ELE: 2.5 MW
Project Startup: 1982
Technology: MBRW
CEMS: CO; CO_2; O_2; Opacity; SO_2; Temperature
APC System: DSI; FF; CI
Owner: City of Harrisonburg
Operator: City of Harrisonburg

I-95 Energy-Resource Recovery Facility (Fairfax)
Lorton, VA

Trash Capacity: 4 units @ 750 tpd = 3,000 tpd
Energy Capacity: ELE: 79 MW
Project Startup: 1990
Technology: MBWW
CEMS: CO; O_2; NOx; Opacity; SO_2; Link
APC System: SDA; FF; SNCR; CI
Owner: Covanta Fairfax, Inc.
Operator: Covanta Fairfax, Inc.

VIRGINIA (continued)

Southeastern Public Service Authority of Virginia

Portsmouth, VA

Trash Capacity:	4 units @ 500 tpd = 2,000 tpd
Energy Capacity:	STM: 25,000 Lbs/Hr ELE: 50 MW
Project Startup:	1988
Technology:	RDF-SSWW
CEMS:	CO; CO_2; HCl; NOx; O_2; Opacity; SO_2
APC System:	SDA; FF
Owner:	Southeastern Public Service Authority (SPSA)
Operator:	SPSA

WASHINGTON

Spokane Regional Solid Waste Disposal Facility

Spokane, WA

Trash Capacity:	2 units @ 400 tpd = 800 tpd
Energy Capacity:	ELE: 26 MW
Project Startup:	1991
Technology:	MBWW
CEMS:	CO_2; NOx; O_2; Opacity; SO_2
APC System:	SDA; FF; SNCR; CI
Owner:	City of Spokane
Operator:	Wheelabrator Spokane, Inc.

WISCONSIN (2 facilities; combined capacity of 500 TPD, 32.3 MW, and 19,000 lbs/hr)

Barron County Waste-to-Energy & Recycling Facility

Almena, WI

Trash Capacity:	2 units @ 50 tpd = 100 tpd
Energy Capacity:	STM: 19,000 Lbs/Hr ELE: 0.265 MW
Project Startup:	1986
Technology:	MCU
CEMS:	Opacity; Temperature
APC System:	SDA; ESP; CI; FF
Owner:	Barron County
Operator:	ZAC, Inc.

Xcel Energy French Island Generating Plant

LaCrosse, WI

Trash Capacity:	2 units @ 200 tpd = 400 tpd
Energy Capacity:	ELE: 32 MW
Project Startup:	1987
Technology:	RDF-SSWW
CEMS:	SO_2; NOx; Opacity; CO
APC System:	DSI; FF; SNCR
Owner:	Xcel Energy
Operator:	Xcel Energy

NOTES

NOTES

October 26, 2007

The Integrated Waste Services Association is a national trade group located in Washington, D.C. For more information about waste-to-energy and integrated waste management, please visit http://www.wte.org or call IWSA at (202) 467-6240.