The 2010 ERC Directory of Waste-to-Energy Plants

The 2010 ERC Directory of Waste-to-Energy Plants provides current information about the waste-to-energy sector in the United States. Since this Directory was last published in 2007, waste-to-energy capacity has increased for the first time in many years and additional capacity is under development. In the past three years, three facilities have completed construction on expansion units, and more expansions are both planned and under construction. Several communities are also in the process of developing greenfield waste-to-energy facilities. The development of new capacity reflects the desire of local governments to exercise control of solid waste decisions, rather than be at the mercy of economic fluctuations of distant landfills. In addition, energy generation in densely populated areas could greatly benefit communities that struggle with transmission congestion.

In 2010, 86 plants operate in 24 states and have capacity to process more than 97,000 tons of municipal solid waste per day. According to the latest BioCycle estimates, 26 million tons of trash were processed by waste-to-energy facilities in 2008. While this amount is less than the 28 million tons processed in 2006, it reflects reduced waste generation during difficult economic times rather than decreased waste-to-energy capacity. In fact, policymakers are looking at the development of waste-to-energy and other renewable resources as a source of green jobs during these difficult economic times. Policies have been put in place that are intended to spur this technology that will create a significant number of construction jobs for two to three years and an average of 58 full-time jobs per facility for the next forty to fifty years. ERC is working to ensure that additional policies are implemented that will provide waste-to-energy with opportunities to grow.

The nation’s waste-to-energy facilities have the capacity to generate the energy equivalent of 2,790 megawatt hours of electricity. This figure includes an electric generating capacity of 2,572 megawatts and an equivalent of 218 megawatts based on steam exports estimated at approximately 2.8 million pounds per hour. 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.

The Energy Recovery Council (ERC) was formed in 1991 and encourages the use of waste-to-energy 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, ERC’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 September 30, 2010, over 1,040 mayors have signed the agreement.

In the European Union, waste-to-energy facilities are not required to have a permit or credits for emissions of CO$_2$, because of their greenhouse gas mitigation potential. In a 2008 briefing, the European Environment Agency attributes reductions in waste management greenhouse gas emissions to waste-to-energy.

Under the Kyoto Protocol, by displacing fossil fuel-fired electricity generation and eliminating methane production from landfills, waste-to-energy plants can generate tradable credits (Certified Emission Reductions [CERs]) through approved Clean Development Mechanism protocols. These CERs are accepted as a compliance tool in the European Union Emissions Trading Scheme.

In the United States, Lee County (FL) has been certified by the Voluntary Carbon Standard to generate carbon offsets which can be sold to those entities wishing to acquire carbon credits. The 636 ton-per-day expansion of Lee County's waste-to-energy plant is the first waste-to-energy capacity in the nation to sell its own carbon credits on the voluntary market.

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

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.

- 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. 25 states, the District of Columbia, and Puerto Rico have defined waste-to-energy as renewable energy in various state statutes and regulations, including renewable portfolio standards.
- 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 renewable 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.

- 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 to Landfilling*

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.

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**The Waste-to-Energy Research and Technology Council (www.wtert.org)**

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

**Sustainable waste management**

The mission of the Earth Engineering Center (EEC) is to analyze existing and novel technologies for the recovery of materials and energy from “waste” materials, carry out additional research as required, and disseminate this information by means of the EEC publications, web pages, and meetings. The guiding principle is that “wastes” are resources and must be managed on the basis of science and best available technology and not on ideology or economics that exclude environmental costs. One of the EEC activities is a survey of waste generation and disposition in the U.S., carried out in collaboration with BioCycle journal. The *State of Garbage in America* (SOG) is based on data provided by the waste management departments of the fifty states. By now, the results of the SOG Survey are used by U.S. EPA for estimating the Greenhouse gas (GHG) effects of MSW management.

In recognition of the fact that there was not enough academic research on the subject of sustainable waste management, especially energy recovery from wastes, in 2003 EEC co-founded, with Energy Recovery Council (than called IWSA), the Waste-to-Energy Research and Technology Council. WTERT brings together scientists, engineers, and managers concerned with advancing sustainable waste management in the U.S. and worldwide. During the first decade of this century, WTERT has sponsored nearly thirty academic research theses and published about one hundred papers on all means of waste management, including waste reduction, recycling, aerobic and anaerobic composting, waste-to-energy by combustion and by gasification, and landfill gas recovery from modern sanitary landfills (see www.wtert.org, Publications). By now WTERT has sister organizations in Brazil, Canada, China, France, Germany, Greece, Japan, and the U.K.

**Public Information on Sustainable Waste Management**

During each year, WTERT and its sister organizations (e.g., look up www.wtert.eu and www.wtert.gr) receive many requests for information on WTE and on waste management practice, in general. The principal means of communication between WTERT and the general public is its web page (www.wtert.org). It continues to be the premier source of up-to-date technical information on domestic and international waste-to-energy and sustainable waste management.
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

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>1990 Emissions (ipy)</th>
<th>2005 Emissions (ipy)</th>
<th>Percent Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDD/CDF, TEQ basis*</td>
<td>4400</td>
<td>15</td>
<td>99+ %</td>
</tr>
<tr>
<td>Mercury</td>
<td>57</td>
<td>2.3</td>
<td>96 %</td>
</tr>
<tr>
<td>Cadmium</td>
<td>9.6</td>
<td>0.4</td>
<td>96 %</td>
</tr>
<tr>
<td>Lead</td>
<td>170</td>
<td>5.5</td>
<td>97 %</td>
</tr>
<tr>
<td>Particulate Matter</td>
<td>18,600</td>
<td>780</td>
<td>96 %</td>
</tr>
<tr>
<td>HCl</td>
<td>57,400</td>
<td>3,200</td>
<td>94 %</td>
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<tr>
<td>SO₂</td>
<td>38,300</td>
<td>4,600</td>
<td>88 %</td>
</tr>
<tr>
<td>NOₓ</td>
<td>64,900</td>
<td>49,500</td>
<td>24 %</td>
</tr>
</tbody>
</table>

(*) 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
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 51 waste-to-energy facilities with the designation of STAR status under the Voluntary Protection Program (VPP). VPP STAR status is the highest honor given to worksites with comprehensive, successful safety and health management systems. STAR sites are committed to effective employee protection beyond the requirements of federal standards and participants develop and implement systems to effectively identify, evaluate, prevent, and control occupational hazards to prevent injuries and illnesses. The keys to health and safety success under VPP are the employee engagement and ongoing involvement in on-site health and safety program development combined with long-term commitment and support from management. VPP-level recipients routinely incur injury and illness rates that are at or below the state average for their specific industry.

Impressively, 51 of the 86 waste-to-energy facilities have earned VPP STAR status. Less than 0.02 percent of all worksites in the United States are enrolled in VPP, yet more than 59 percent of U.S. waste-to-energy facilities are have achieved STAR status. This illustrates the commitment of this sector is superior attention to health and safety.

SAFETY: DO IT FOR LIFE

Created under an ERC-OSHA Alliance Agreement, ERC and its members have designated the month of June as “Hauler Safety Month”. Throughout the month of June each year, ERC 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. ERC 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.
A Compatibility Study: Recycling and Waste-to-Energy Work in Concert
By Eileen Bretlter Berenyi, Ph.D.
Government Advisory Associates, Inc.

Executive Summary (for the full report, please visit www.energyrecoverycouncil.org):

Critics of waste-to-energy have argued the presence of a waste combustion facility in an area inhibits recycling and is an obstacle to communities’ efforts to implement active recycling programs. As this study will show, this contention has no basis in fact. In an examination of recycling rates of more than 500 communities in twenty-two states, which rely on waste-to-energy for their waste disposal, it is demonstrated that these communities recycle at a rate higher than the national average. Many of these areas have recycling rates at least three to five percentage points above the national average and in some cases are leading the country in recycling. The study concludes that recycling and waste-to-energy are compatible waste management strategies, which are part of an integrated waste management approach in many communities across the United States.

Key Findings:

- The study covers 82 waste-to-energy facilities in 22 states. Recycling data was obtained from 567 local governments, including 495 cities, towns and villages and 72 counties, authorities or districts. In addition, statewide data was obtained for each of the 22 states.

- Communities nationwide using waste-to-energy have an aggregate recycling rate at least 5 percentage points above the national average.

- Communities using waste-to-energy for disposal are recycling at about 33.3%, which is higher than the national rate, no matter how the national rate is calculated as shown to the right.

- The unadjusted U.S. EPA computed national recycling rate is computed using a waste stream model and includes certain commercial/industrial components and yard waste. These materials are often excluded in individual state and local recycling tonnages. Therefore the figure to the right also includes an adjusted EPA rate, which excludes these tonnages, adjusting the rate downwards.

- Almost all communities using waste-to-energy provide their residents an opportunity to recycle and most have curbside collection of recyclables. In fact, some of these communities are leaders in the adoption of innovative recycling programs, such as single stream collection and food waste collection and composting. The coincident nature of recycling programs and waste-to-energy in each community is evidence that these two waste management strategies are compatible.
Waste-to-Energy is an Important Factor in Sustainability

This publication provides information on waste-to-energy plants in the United States, but it is important to acknowledge the role of waste-to-energy in the waste management practices of countries around the world. Waste-to-energy has proven itself successful in nations that have high population densities, limited available landfill space, and intense energy demands.

For instance, 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. Countries within the EU, such as Germany, have an outright ban on landfilling of biodegradable waste. As such, nation’s that rely on waste-to-energy also tend to have exceptional recycling rates, while minimizing landfilling. The figure below highlights the waste management practices of European countries. Not surprisingly, the countries that landfill the most also recycle the least and do not utilize waste-to-energy. This is another illustration (as described in more detail on page 9) of how waste-to-energy and recycling are compatible.
### ERC Membership

#### Waste-to-Energy Providers

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covanta Energy Company</td>
<td>40 Lane Road, Fairfield, NJ 07004</td>
<td>(973) 882-9000</td>
<td><a href="http://www.covantaenergy.com">www.covantaenergy.com</a></td>
</tr>
<tr>
<td>Wheelabrator Technologies Inc.</td>
<td>4 Liberty Lane West, Hampton, NH 03842</td>
<td>(800) 682-0026</td>
<td><a href="http://www.wheelabratortechologies.com">www.wheelabratortechologies.com</a></td>
</tr>
<tr>
<td>Babcock &amp; Wilcox</td>
<td>20 South Van Buren Avenue, Barberton, OH 44203-0351</td>
<td>(330) 753-4511</td>
<td><a href="http://www.babcock.com">www.babcock.com</a></td>
</tr>
</tbody>
</table>

#### ERC 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
ecomaine
- Fairfax County, VA
- Islip (NY) Resource Recovery Agency
- 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
- Pope-Douglas (MN) Solid Waste Management
- Solid Waste Authority of Palm Beach County (FL)
- Spokane (WA) Regional Solid Waste System
- Union County (NJ) Utilities Authority
- Wasatch (UT) Integrated Waste Management District
- York County (PA) Solid Waste Authority

#### ERC Associate Members

- Babcock Power, Inc.
- Dvirka & Bartilucci Consulting Engineers
- Energy Answers International
- Gershman, Brickman, and Bratton, Inc.
- Green Conversion Systems, LLC
- Jansen Combustion & Boiler Technologies, Inc.
- Martin GmbH
- Minnesota Resource Recovery Association
- Resource Recovery Technologies, Inc.
- Resource Recycling, LLC
- Rich and Henderson, P.C.
- Zar-Tech
**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.

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Co-sponsored by the Energy Recovery Council (ERC), 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 18 years and has showcased the latest research, technology, innovations, and policies affecting the municipalities and companies involved in the waste-to-energy industry. The 19th NAWTEC will take place May 16-18, 2011 in Lancaster, PA.

For more information, please visit http://www.nawtec.org.
<table>
<thead>
<tr>
<th>State</th>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity</th>
<th>Energy Capacity</th>
<th>Project Startup</th>
<th>Technology</th>
<th>CEMS</th>
<th>APC System</th>
<th>Owner</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALABAMA</td>
<td>Huntsville Solid Waste-to-Energy Facility</td>
<td>Huntsville, AL</td>
<td>2 units @ 345 tpd = 690 tpd</td>
<td>178,620 Lbs/HR steam export</td>
<td>1990</td>
<td>MBWW</td>
<td>CO; NOx; Temp; Opacity; SO2</td>
<td>SDA; FF; SNCR; CI</td>
<td>City of Huntsville Solid Waste Disposal Authority</td>
<td>Covanta Huntsville, Inc.</td>
</tr>
<tr>
<td>ALABAMA</td>
<td>Eielson Air Force Base</td>
<td>North Pole, AK</td>
<td>5 units @ 2 tpd = 10 tpd</td>
<td>STM: 2,775 Lbs/HR ELE: 0.2 MW (RDF Attributed-Peak)</td>
<td>1995</td>
<td>RDF (co-fired in Coal Boiler)</td>
<td>Opacity</td>
<td>FF</td>
<td>Eileson Airforce Base</td>
<td></td>
</tr>
<tr>
<td>CALIFORNIA (3 facilities; combined capacity of 2,540 TPD and 69.5 MW)</td>
<td>Commerce Refuse-to-Energy Facility</td>
<td>Commerce, CA</td>
<td>1 unit @ 360 tpd = 360 tpd</td>
<td>ELE: 10 MW</td>
<td>1987</td>
<td>MBWW</td>
<td>CO; NOx; O2; Temp; Opacity; SO2</td>
<td>SDA; FF; SNCR, CYC; FSI</td>
<td>Commerce Refuse-to-Energy Authority</td>
<td>Sanitation Districts of Los Angeles County</td>
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<tr>
<td>CALIFORNIA (3 facilities; combined capacity of 2,540 TPD and 69.5 MW)</td>
<td>Southeast Resource Recovery Facility (SERRF)</td>
<td>Long Beach, CA</td>
<td>3 units @ 460 tpd = 1,380 tpd</td>
<td>ELE: 37.5 MW</td>
<td>1988</td>
<td>MBWW</td>
<td>CO; CO2; NOx; O2; Opacity; Temp; Moisture; SO2</td>
<td>SDA; FF; SNCR</td>
<td>City of Long Beach</td>
<td>Covanta Energy Renewable Energy Corp.</td>
</tr>
<tr>
<td>CALIFORNIA (3 facilities; combined capacity of 2,540 TPD and 69.5 MW)</td>
<td>Stanislaus County Resource Recovery Facility</td>
<td>Crow’s Landing, CA</td>
<td>2 units @ 400 tpd = 800 tpd</td>
<td>22 MW</td>
<td>1989</td>
<td>MBWW</td>
<td>CO; O2; NOx; Temp; Opacity; SO2</td>
<td>SDA; FF; SNCR; CI</td>
<td>Covanta Stanislaus, Inc.</td>
<td>Covanta Stanislaus, Inc.</td>
</tr>
</tbody>
</table>

“Discarded MSW is a viable energy source for electricity generation in a carbon-constrained world. […] Waste-to-energy appears to be a better option than landfill gas-to-energy. If the goal is greenhouse gas reduction, then WTE should be considered as an option under U.S. renewable energy policies.”

—“Is It Better to Burn or Bury Waste for Clean Electricity Generation?,” (Environ. Sci. Technol. 2009, 43, 1711–1717), Kaplan (EPA), DeCarolis (NC State Univ), Thorneloe (EPA)
<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity</th>
<th>Energy Capacity</th>
<th>Project Startup</th>
<th>Technology</th>
<th>CEMS</th>
<th>APC System</th>
<th>Owner</th>
<th>Operator</th>
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</thead>
<tbody>
<tr>
<td>Bristol Resource Recovery Facility</td>
<td>Bristol, CT</td>
<td>2 units @ 325 tpd = 650 tpd</td>
<td>16 MW</td>
<td>1988</td>
<td>MBWW</td>
<td>CO; O₂; Link; NOx; Opacity; SO₂; Temp</td>
<td>SDA; FF; SNCR; CI</td>
<td>Covanta Bristol, Inc.</td>
<td>Covanta Bristol, Inc.</td>
</tr>
<tr>
<td>Mid-Connecticut Resource Recovery Facility</td>
<td>Hartford, CT</td>
<td>3 units @ 676 tpd = 2,028 tpd</td>
<td>68 MW</td>
<td>1987</td>
<td>RDF—SSWW</td>
<td>CO; CO₂; NOx; O₂; Opacity; SO₂</td>
<td>SDA; FF; SNCR</td>
<td>Connecticut Resource Recovery Authority</td>
<td>Covanta Mid-Conn, Inc.</td>
</tr>
<tr>
<td>Riley Energy Systems of Lisbon Connecticut Corp.</td>
<td>Lisbon, CT</td>
<td>2 units @ 250 tpd = 500 tpd</td>
<td>15 MW</td>
<td>1995</td>
<td>MBWW</td>
<td>CO; NOx; O₂; Opacity; Temp; Moisture; CO₂; SO₂</td>
<td>SDA; FF; SNCR; CI</td>
<td>Eastern Connecticut Resource Recovery Authority</td>
<td>Riley Energy Systems of Lisbon Corp</td>
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<tr>
<td>Southeastern Connecticut Resource Recovery Facility</td>
<td>Preston, CT</td>
<td>2 units @ 344.5 tpd = 689 tpd</td>
<td>17 MW</td>
<td>1991</td>
<td>MBWW</td>
<td>CO; NOx; O₂; Opacity; Temp; CO₂; SO₂</td>
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<td>Wallingford Resource Recovery Facility</td>
<td>Wallingford, CT</td>
<td>3 units @ 140 tpd = 420 tpd</td>
<td>11 MW</td>
<td>1989</td>
<td>MBRW</td>
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<td>Wheelabrator Bridgeport Company, L.P.</td>
<td>Bridgeport, CT</td>
<td>3 units @ 750 tpd = 2,250 tpd</td>
<td>67 MW</td>
<td>1988</td>
<td>MBWW</td>
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<td>FLORIDA</td>
<td>(11 facilities; combined capacity of 18,756 TPD and 453.4 MW)</td>
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<td>O₂; CO; NOx; SO₂; Opacity; Temp</td>
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<td>Owner:</td>
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<td>Miami, FL</td>
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<td>Trash Capacity:</td>
<td>3 units @ 600 tpd = 1,800 tpd</td>
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<td>Energy Capacity:</td>
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<td>1987 (units 1&amp;2); 2009 (unit 3)</td>
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<tr>
<td>Operator:</td>
<td>Covanta Hillsborough, Inc.</td>
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<td><strong>Lake County Resource Recovery Facility</strong></td>
<td>Okahumpka, FL</td>
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<td>Trash Capacity:</td>
<td>2 units @ 264 tpd = 528 tpd</td>
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<tr>
<td>Energy Capacity:</td>
<td>ELE: 14.5 MW</td>
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<tr>
<td>CEMS:</td>
<td>CO; CO₂; NOx; Opacity; SO₂; O₂</td>
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<tr>
<td>APC System:</td>
<td>SDA; FF; SNCR; CI</td>
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<tr>
<td>Owner:</td>
<td>Covanta Lake, Inc.</td>
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<tr>
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<td><strong>Lee County Resource Recovery Facility</strong></td>
<td>Fort Myers, FL</td>
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<tr>
<td>Trash Capacity:</td>
<td>2 units @ 600 tpd</td>
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<td></td>
<td>1 unit @ 636 tpd</td>
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<td>1,836 tpd total</td>
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<td>Energy Capacity:</td>
<td>ELE: 59 MW</td>
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<td>Project Startup:</td>
<td>1994 (units 1&amp;2); 2007 (unit 3)</td>
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<tr>
<td>Technology:</td>
<td>MBWW</td>
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<tr>
<td>CEMS:</td>
<td>CO; CO₂; NOx; O₂; Opacity; Temp; Moisture; SO₂</td>
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<tr>
<td>APC System:</td>
<td>SDA; FF; SNCR; CI; FGR</td>
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<tr>
<td>Operator:</td>
<td>Covanta Lee, Inc.</td>
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<tr>
<td><strong>McKoy Bay Refuse-to-Energy Facility</strong></td>
<td>Tampa, FL</td>
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<td>Trash Capacity:</td>
<td>4 units @ 250 tpd = 1,000 tpd</td>
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<tr>
<td>Energy Capacity:</td>
<td>ELE: 22.2 MW</td>
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<td>1985</td>
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<tr>
<td>Technology:</td>
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<td>CEMS:</td>
<td>CO; Opacity; SO₂; NOx; Temp; Moisture; O₂</td>
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<tr>
<td>Owner:</td>
<td>City of Tampa</td>
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<tr>
<td>Operator:</td>
<td>Wheelabrator McKay Bay Inc.</td>
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</tbody>
</table>
**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; SO2; Opacity; CO2  
- **APC System:** SDA; ESP  
- **Owner:** Palm Waste Authority of Palm Beach County  
- **Operator:** Palm Beach Resource Recovery Corporation  
(Bacock & Wilcox)

**Pasco County Resource Recovery Facility**  
Spring Hill, FL

- **Trash Capacity:** 3 units @ 350 tpd = 1,050 tpd  
- **Energy Capacity:** ELE: 31.2 MW  
- **Project Startup:** 1991  
- **Technology:** MBWW  
- **CEMS:** CO; NOx; O2; Opacity; Temp; SO2; CO2  
- **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 @ 1,050 tpd = 3,150 tpd  
- **Energy Capacity:** ELE: 75 MW  
- **Project Startup:** 1983 (units 1&2); 1986 (unit 3)  
- **Technology:** MBWW  
- **CEMS:** CO; NOx; O2; Opacity; SO2  
- **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: 67 MW  
- **Project Startup:** 1991  
- **Technology:** MBWW  
- **CEMS:** CO; NOx; O2; Opacity; Temp; SO2; CO2  
- **APC System:** SDA; FF; SNCR  
- **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; O2; Opacity; Temp; SO2; CO2  
- **APC System:** SDA; FF; SNCR  
- **Owner:** Wheelabrator Technologies Inc.  
- **Operator:** Wheelabrator Technologies Inc.

“Squeezing energy out of garbage puts trash to good use. That’s not just green. It’s smart. And it’s the best plan the county has in the works for dealing with its growing trash pile.”

—Editorial from the South Florida Sun-Sentinel on Palm Beach County’s proposed new waste-to-energy facility. (2/27/10)
**Hawaii**

**Honolulu Resource Recovery Venture (HPOWER)**
Honolulu, HI

- **Trash Capacity:** 2 units @ 925.5 tpd = 1,851 tpd
- **Energy Capacity:** ELE: 58.6 MW
- **Project Startup:** 1990
- **Technology:** RDF-SSWW
- **CEMS:** CO; NOx; Opacity; Temp; SO2; O2
- **APC System:** SDA; ESP
- **Owner:** City & County of Honolulu
- **Operator:** Covanta Honolulu Resource Recovery Venture (HPOWER)

**Indianapolis Resource Recovery Facility**
Indianapolis, IN

- **Trash Capacity:** 3 units @ 725 tpd = 2,175 tpd
- **Energy Capacity:** STM: 587,400 Lbs/Hr
- **Project Startup:** 1988
- **Technology:** MBWW
- **CEMS:** CO; NOx; Opacity; SO2; Temp; O2
- **APC System:** SDA; FF; SNCR; CI
- **Owner:** Marion County
- **Operator:** Covanta Indianapolis, Inc.

**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:** CO2; NOx; O2; Opacity; SO2
- **APC System:** ESP
- **Owner:** City of Ames
- **Operator:** Ames Municipal Electric System

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

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Direct CO2&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Life Cycle CO2E&lt;sup&gt;2&lt;/sup&gt;</th>
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<tbody>
<tr>
<td>Coal</td>
<td>2,138</td>
<td>2,196</td>
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<tr>
<td>Oil</td>
<td>1,496</td>
<td>1,501</td>
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<td>Natural Gas</td>
<td>1,176</td>
<td>1,276</td>
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<tr>
<td>Waste-To-Energy&lt;sup&gt;3&lt;/sup&gt;</td>
<td>1,294</td>
<td>-3,636</td>
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</tbody>
</table>

<sup>1</sup> Based on 2007 EPA eGRID data except WTE which is a nationwide average using 34% anthropogenic CO2.

<sup>2</sup> Life Cycle CO2E for fossil fuels limited to indirect methane emissions using EPA GHG inventory and EIA power generation data. Life Cycle value would be larger if indirect CO2 was included.

<sup>3</sup> Life Cycle CO2E for WTE based on nominal nationwide avoidance ratio of 1 ton CO2E per ton of MSW using the Municipal Solid Waste Decision Support Tool, which includes avoided methane and avoided CO2.
### MAINE (4 facilities; combined capacity of 2,800 TPD and 65.3 MW)

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity</th>
<th>Energy Capacity</th>
<th>Project Startup</th>
<th>Technology</th>
<th>CEMS</th>
<th>APC System</th>
<th>Owner</th>
<th>Operator</th>
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<tbody>
<tr>
<td>Maine Energy Recovery Company</td>
<td>Biddeford, ME</td>
<td>2 units @ 300 tpd = 600 tpd</td>
<td>ELE: 22 MW</td>
<td>1987</td>
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<td>CO; Link; NOx; O₂; Opacity; SO₂; Temperature</td>
<td>SDA; FF</td>
<td>Casella Waste Systems</td>
<td>KTI Operations</td>
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<td>Mid-Maine Waste Action Corporation</td>
<td>Auburn, ME</td>
<td>2 units @ 100 tpd = 200 tpd</td>
<td>ELE: 3.6 MW</td>
<td>1992</td>
<td>RWW</td>
<td>CO; CO₂; NOx; Opacity; SO₂; Temperature</td>
<td>SDA; FF; CI</td>
<td>Mid-Maine Waste Action Corp.</td>
<td>Mid-Maine Waste Action Corp.</td>
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<td>Penobscot Energy Recovery Corp.</td>
<td>Orrington, ME</td>
<td>2 units @ 750 tpd = 1,500 tpd</td>
<td>ELE: 25 MW</td>
<td>1988</td>
<td>RDF</td>
<td>CO; CO₂; O₂; NOx; Opacity; SO₂</td>
<td>SDA; FF</td>
<td>USA Energy Group LLC; PERC Holdings LLC; Communities</td>
<td>ESOCO Orrington LLC</td>
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<td>Greater Portland Resource Recovery Facility</td>
<td>Portland, ME</td>
<td>2 units @ 250 tpd = 500 tpd</td>
<td>ELE: 14.7 MW</td>
<td>1988</td>
<td>MBWW</td>
<td>NOx; SO₂; CO; Opacity; Link; Temp; O₂</td>
<td>SDA; SNCR; CI; CYC; ESP</td>
<td>ecomaine</td>
<td>ecomaine</td>
</tr>
</tbody>
</table>

---

### 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)

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity</th>
<th>Energy Capacity</th>
<th>Project Startup</th>
<th>Technology</th>
<th>CEMS</th>
<th>APC System</th>
<th>Owner</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harford Waste-to-Energy Facility</td>
<td>Joppa, MD</td>
<td>4 units @ 90 tpd = 360 tpd</td>
<td>STM: 100,000 Lbs/Hr</td>
<td>1988</td>
<td>MCU</td>
<td>SO₂; CO; CO₂; Temp; Opacity; NOx; O₂</td>
<td>SDA; FF; CI; DS</td>
<td>Northeast Maryland Waste Disposal Authority</td>
<td>Energy Recovery Operations, Inc.</td>
</tr>
<tr>
<td>Montgomery County Resource Recovery Facility</td>
<td>Dickerson, MD</td>
<td>3 units @ 600 tpd = 1,800 tpd</td>
<td>ELE: 63 MW</td>
<td>1995</td>
<td>MBWW</td>
<td>CO; CO₂; HCl; Link, NOx; O₂; Opacity; Temp; Moisture; SO₂</td>
<td>FSI; SDA; FF; SNCR; CI</td>
<td>Northeast Maryland Waste Disposal Authority</td>
<td>Covanta Montgomery, Inc.</td>
</tr>
<tr>
<td>Baltimore Refuse Energy Systems Company (BRESCO)</td>
<td>Baltimore, MD</td>
<td>3 units @ 750 tpd = 2,250 tpd</td>
<td>ELE: 60 MW</td>
<td>1985</td>
<td>MBWW</td>
<td>CO; NOx; O₂; Opacity; Temp; Moisture; CO₂; SO₂</td>
<td>SDA; ESP; SNCR; CI</td>
<td>John Hancock Life Insurance Company</td>
<td>Wheelabrator Baltimore, L.P.</td>
</tr>
</tbody>
</table>

“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.”


### MASSACHUSETTS

(7 facilities; combined capacity of 9,450 TPD, 265.9 MW, 164,000 lbs/hr)

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity</th>
<th>Energy Capacity</th>
<th>Project Startup</th>
<th>Technology</th>
<th>CEMS</th>
<th>APC System</th>
<th>Owner</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haverhill Resource Recovery Facility</td>
<td>Haverhill, MA</td>
<td>2 units @ 825 tpd = 1,650 tpd</td>
<td>ELE: 46.9 MW</td>
<td>1989</td>
<td>MBWW</td>
<td>CO; NOx; Opacity; Temp; SO₂; O₂</td>
<td>SDA; FF; SNCR; CI</td>
<td>City of Haverhill</td>
<td>Covanta Haverhill, Inc.</td>
</tr>
<tr>
<td>Pioneer Valley Resource Recovery Facility</td>
<td>Agawam, MA</td>
<td>3x136=408 (design); 3x120=360 (permit)</td>
<td>STM: 96,000 Lbs/Hr</td>
<td>1988</td>
<td>MBRW</td>
<td>CO; NOx; Opacity; SO₂</td>
<td>FGR; DSI; FF; CI, CYC</td>
<td>Covanta Springfield, LLC</td>
<td>Covanta Springfield, LLC</td>
</tr>
</tbody>
</table>
### Pittsfield Resource Recovery Facility
Pittsfield, MA

- **Trash Capacity:** 3x120=360 (design); 3x80=240 (actual practice)
- **Energy Capacity:** STM: 68,000 Lbs/Hr; ELE: 0.8 MW
- **Project Startup:** 1981
- **Technology:** MBRW
- **CEMS:** CO; NOx; O2; Opacity; SO2
- **APC System:** FGR; ESP; CI; Packed Tower Scrubber
- **Owner:** Covanta Pittsfield, LLC
- **Operator:** Covanta Pittsfield, LLC

### SEMASS Resource Recovery Facility
West Wareham, MA

- **Trash Capacity:** 3 units @ 900 tpd = 2,700 tpd
- **Energy Capacity:** ELE: 84.8 MW
- **Project Startup:** 1989
- **Technology:** RDF-SSWW
- **CEMS:** CO; NOx; Temp; Opacity; SO2; O2; CO2
- **APC System:** SDA; ESP; COHPAC (Units 1&2); SDA; FF; SNCR (Unit 3)
- **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; O2; Opacity; SO2
- **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; O2; C02; Temp; Opacity; SO2
- **APC System:** SDA; FF; SNCR; CI
- **Owner:** Wheelabrator North Andover Inc.
- **Operator:** Wheelabrator North Andover Inc.

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"[Waste-to-energy] can add in-state capacity so that we can end the practice of burying our waste in someone else’s backyard. They can help advance recycling by diverting recyclable wastes from their facilities to recycling centers. And because every ton of trash that we turn into energy is the equivalent of using one less barrel of oil or one-quarter ton less coal, generating energy from waste can contribute to addressing the global challenge of climate change."

Greater Detroit Resource Recovery Facility
Detroit, MI

Trash Capacity: 3 units @ 1,100 tpd = 3,300 tpd
Energy Capacity: STM: 725,600 Lbs/Hr; ELE: 68 MW
Project Startup: 1991
Technology: RDF-SSWW
CEMS: CO; NOx; Temp; Opacity; SO2; Link; O2
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; CO2; NOx; O2; Opacity; SO2; Temperature
APC System: SDA; FF; CI
Owner: Jackson County
Operator: U.S. Filter, Inc.

“Waste-to-energy provides double benefits: it diminishes waste reserves and produces clean energy while offsetting greenhouse gas emissions. As our nation’s energy needs grown and we continue to discern how best to meet them, we think it is important to take an inclusive view of the ways in which already-existing technologies can be used to reduce our dependence on fossil fuels.”

—15 United States Senators (in a letter dated March 4, 2009)

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; O2; NOx; Temp; Opacity; SO2; Link
APC System: SDA; FF; SNCR; CI
Owner: Kent County
Operator: Covanta Kent, Inc.

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; O2; SO2; 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: 39.6 MW
Project Startup: 1989
Technology: MBWW
CEMS: CO; CO2; NOx; Temp; Opacity; SO2
APC System: SDA; FF; CI
Owner: Hennepin County

MINNESOTA 9 facilities; combined capacity of 4,418 TPD, 132.4 MW, and 114,000 lbs/hr)
<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity</th>
<th>Energy Capacity</th>
<th>Project Startup</th>
<th>Technology</th>
<th>CEMS</th>
<th>APC System</th>
<th>Owner</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olmsted Waste-to-Energy Facility</td>
<td>Rochester, MN</td>
<td>2 units @ 100 tpd</td>
<td>1 unit @ 200 tpd = 400 tpd total</td>
<td>1987 (units 1&amp;2); 2010 (unit 3)</td>
<td>MBWW</td>
<td>CO; CO₂; SO₂; O₂; NOx; Opacity</td>
<td>SDA; FF; CI</td>
<td>Olmsted County</td>
<td>Olmsted County</td>
</tr>
<tr>
<td>Perham Resource Recovery Facility</td>
<td>Perham, MN</td>
<td>2 units @ 58 tpd = 116 tpd</td>
<td>STM: 37,000 Lbs/Hr</td>
<td>1986; 2002 (upgrade)</td>
<td>MCU</td>
<td>SO₂; CO; O₂; Opacity; Temp</td>
<td>SDA; DS1; FF; CI</td>
<td>City of Perham</td>
<td>City of Perham</td>
</tr>
<tr>
<td>Polk County Solid Waste Resource Recovery Plant</td>
<td>Fosston, MN</td>
<td>2 units @ 40 tpd = 80 tpd</td>
<td>STM: 25,000 Lbs/Hr</td>
<td>1988</td>
<td>MCU</td>
<td>CO; SO₂; O₂</td>
<td>CI; DS1; ESP</td>
<td>Polk County</td>
<td>Polk County</td>
</tr>
<tr>
<td>Pope/Douglas Solid Waste Management</td>
<td>Alexandria, MN</td>
<td>2 units @ 40 tpd = 80 tpd</td>
<td>STM: 36,000 Lbs/Hr</td>
<td>1987</td>
<td>MCU</td>
<td>CO; NOx; SO₂; CO₂; O₂; Opacity</td>
<td>DS1; FF; CI</td>
<td>Pope/Douglas Solid Waste Management Board</td>
<td>Pope/Douglas Solid Waste Management Board</td>
</tr>
<tr>
<td>Red Wing Resource Recovery Facility</td>
<td>Red Wing, MN</td>
<td>2 units @ 45 tpd = 90 tpd</td>
<td>STM: 16,000 Lbs/Hr</td>
<td>1983</td>
<td>MCU</td>
<td>CO; SO₂; O₂; Opacity</td>
<td>GSA; ESP</td>
<td>City of Red Wing</td>
<td>City of Red Wing</td>
</tr>
<tr>
<td>Xcel Energy - Red Wing Steam Plant</td>
<td>Red Wing, MN</td>
<td>2 units @ 360 tpd = 720 tpd</td>
<td>ELE: 21 MW</td>
<td>1988</td>
<td>RDF-SSWW</td>
<td>SO₂; O₂; NOx; CO</td>
<td>CI; ESP; GSA</td>
<td>Xcel Energy</td>
<td>Xcel Energy</td>
</tr>
</tbody>
</table>
### MINNESOTA (continued)

**Xcel Energy-Wilmarth Plant**  
Mankato, MN

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trash Capacity</td>
<td>2 units @ 360 tpd = 720 tpd</td>
</tr>
<tr>
<td>Energy Capacity</td>
<td>ELE: 22 MW</td>
</tr>
<tr>
<td>Project Startup</td>
<td>1987</td>
</tr>
<tr>
<td>Technology</td>
<td>RDF-SSWW</td>
</tr>
<tr>
<td>CEMS</td>
<td>CO; NOx; O₂; Opacity; SO₂</td>
</tr>
<tr>
<td>APC System</td>
<td>SDA; FF</td>
</tr>
<tr>
<td>Owner</td>
<td>Xcel Energy</td>
</tr>
<tr>
<td>Operator</td>
<td>Xcel Energy</td>
</tr>
</tbody>
</table>

“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 700 TPD and 18.5 MW)

**Wheelabrator Claremont Co, L.P.**  
Claremont, NH

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trash Capacity</td>
<td>2 units @ 100 tpd = 200 tpd</td>
</tr>
<tr>
<td>Energy Capacity</td>
<td>ELE: 4.5 MW</td>
</tr>
<tr>
<td>Project Startup</td>
<td>1987</td>
</tr>
<tr>
<td>Technology</td>
<td>MBWW</td>
</tr>
<tr>
<td>CEMS</td>
<td>CO; O₂; Opacity; Temp; SO₂</td>
</tr>
<tr>
<td>APC System</td>
<td>SDA; FF; CI</td>
</tr>
<tr>
<td>Owner</td>
<td>Wheelabrator Claremont Co, L.P.</td>
</tr>
<tr>
<td>Operator</td>
<td>Wheelabrator Claremont Co, L.P.</td>
</tr>
</tbody>
</table>

**Wheelabrator Concord Company, L.P.**  
Penacook, NH

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trash Capacity</td>
<td>2 units @ 250 tpd = 500 tpd</td>
</tr>
<tr>
<td>Energy Capacity</td>
<td>ELE: 14 MW</td>
</tr>
<tr>
<td>Project Startup</td>
<td>1989</td>
</tr>
<tr>
<td>Technology</td>
<td>MBWW</td>
</tr>
<tr>
<td>CEMS</td>
<td>CO; NOx; O₂; Opacity; Temp; SO₂</td>
</tr>
<tr>
<td>APC System</td>
<td>SDA; FF; SNCR; CI</td>
</tr>
<tr>
<td>Owner</td>
<td>Wheelabrator Concord, L.P.</td>
</tr>
<tr>
<td>Operator</td>
<td>Wheelabrator Concord, L.P.</td>
</tr>
</tbody>
</table>

### NEW JERSEY (5 facilities; combined capacity of 6,372 TPD and 176.5 MW)

**Camden Resource Recovery Facility**  
Camden, NJ

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trash Capacity</td>
<td>3 units @ 350 tpd = 1,050 tpd</td>
</tr>
<tr>
<td>Energy Capacity</td>
<td>ELE: 34 MW</td>
</tr>
<tr>
<td>Project Startup</td>
<td>1991</td>
</tr>
<tr>
<td>Technology</td>
<td>MBWW</td>
</tr>
<tr>
<td>CEMS</td>
<td>Opacity; NOx; HCl; SO₂; non-methane hydrocarbons</td>
</tr>
<tr>
<td>APC System</td>
<td>SDA; ESP; CI</td>
</tr>
<tr>
<td>Owner</td>
<td>Camden County Energy Recovery Associates</td>
</tr>
<tr>
<td>Operator</td>
<td>Camden County Energy Recovery Corp</td>
</tr>
</tbody>
</table>

**Essex County Resource Recovery Facility**  
Newark, NJ

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trash Capacity</td>
<td>3 units @ 933 tpd = 2,800 tpd</td>
</tr>
<tr>
<td>Energy Capacity</td>
<td>ELE: 70 MW</td>
</tr>
<tr>
<td>Project Startup</td>
<td>1990</td>
</tr>
<tr>
<td>Technology</td>
<td>MBWW</td>
</tr>
<tr>
<td>CEMS</td>
<td>CO; NOx, O₂; Opacity; SO₂; Moisture</td>
</tr>
<tr>
<td>APC System</td>
<td>SDA; ESP; SNCR; CI; CYC</td>
</tr>
<tr>
<td>Owner</td>
<td>Covanta Energy Corporation</td>
</tr>
<tr>
<td>Operator</td>
<td>Covanta Energy Corporation</td>
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</tbody>
</table>
### New Jersey (continued)

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity:</th>
<th>Energy Capacity:</th>
<th>Project Startup:</th>
<th>Technology:</th>
<th>CEMS:</th>
<th>APC System:</th>
<th>Owner:</th>
<th>Operator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union County Resource Recovery Facility</td>
<td>Rahway, NJ</td>
<td>3 units @ 500 tpd = 1,500 tpd</td>
<td>ELE: 45 MW</td>
<td>1994</td>
<td>MBWW</td>
<td>CO; NOx; Opacity; SO₂; Link; O₂; NH₃; HCl; Temp</td>
<td>SDA; FF; SNCR; CI</td>
<td>Union County Utility Authority</td>
<td>Covanta Union, Inc.</td>
</tr>
<tr>
<td>Warren Energy Resource Company</td>
<td>Oxford Township, NJ</td>
<td>2 units @ 224 tpd = 448 tpd</td>
<td>ELE: 13.5 MW</td>
<td>1988</td>
<td>MBWW</td>
<td>CO; NOx; Opacity; SO₂, Link; O₂; Temp</td>
<td>SDA; FF; SNCR; CI</td>
<td>Covanta Warren Energy Resource Co, L.P.</td>
<td>Covanta Warren Energy Resource Co, L.P.</td>
</tr>
<tr>
<td>Wheelabrator Gloucester Company, L.P.</td>
<td>Westville, NJ</td>
<td>2 units @ 287 tpd = 574 tpd</td>
<td>ELE: 14 MW</td>
<td>1990</td>
<td>MBWW</td>
<td>CO; O₂; SO₂; Opacity; Temp; NOx</td>
<td>SDA; FF; SNCR; CI</td>
<td>Wheelabrator Gloucester Inc.</td>
<td>Wheelabrator Gloucester Inc.</td>
</tr>
</tbody>
</table>

### New York (10 facilities; combined capacity of 12,319 TPD, 332.45 MW, and 460,000 lbs/hr)

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity:</th>
<th>Energy Capacity:</th>
<th>Project Startup:</th>
<th>Technology:</th>
<th>CEMS:</th>
<th>APC System:</th>
<th>Owner:</th>
<th>Operator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Babylon Resource Recovery Facility</td>
<td>Babylon, NY</td>
<td>2 units @ 375 tpd = 750 tpd</td>
<td>ELE: 17 MW</td>
<td>1989</td>
<td>MBWW</td>
<td>CO; CO₂; NOx; Opacity; Temp; Moisture; O₂; SO₂</td>
<td>SDA; FF; CI; CYC</td>
<td>Covanta Babylon, Inc.</td>
<td>Covanta Babylon, Inc.</td>
</tr>
<tr>
<td>Dutchess County Resource Recovery Facility</td>
<td>Poughkeepsie, NY</td>
<td>2 units @ 225 tpd = 450 tpd</td>
<td>STM: 50,000 Lbs/Hr</td>
<td>1988</td>
<td>RWW</td>
<td>CO; NOx; SO₂; Temperature; Opacity; O₂; CO₂</td>
<td>SDA; FF; CI</td>
<td>Dutchess County Resource Recovery Agency</td>
<td>Covanta Hudson Valley Renewable Energy LLC</td>
</tr>
</tbody>
</table>

Waste-to-energy is "probably one of the greatest stories never told. We take regular household garbage and use it as a fuel, burning it in a boiler to create electricity."

—Sunil Garg, Executive Director, Union County (NJ) Utilities Authority
<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Location</th>
<th>Trash Capacity</th>
<th>Energy Capacity</th>
<th>Project Startup</th>
<th>Technology</th>
<th>CEMS</th>
<th>APC System</th>
<th>Owner</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hempstead Resource Recovery Facility</td>
<td>Westbury, NY</td>
<td>2 units @ 890.3 tpd = 2,671 tpd</td>
<td>ELE: 75 MW</td>
<td>1989</td>
<td>MBWW</td>
<td>CO; CO₂; NOx; Opacity; Temp; SO₂</td>
<td>SDA; FF; SNCR; CYC</td>
<td>Town of Hempstead Co.</td>
<td>Covanta Hempstead Co.</td>
</tr>
<tr>
<td>Huntington Resource Recovery Facility</td>
<td>East Northport, NY</td>
<td>3 units @ 250 tpd = 750 tpd</td>
<td>ELE: 25 MW</td>
<td>1991</td>
<td>MBWW</td>
<td>CO; O₂; NOx; Temp; Opacity; SO₂; NH₃</td>
<td>SDA; FF; SNCR; CI</td>
<td>Covanta Huntington, Inc.</td>
<td>Covanta Huntington, Inc.</td>
</tr>
<tr>
<td>MacArthur Waste-to-Energy Facility</td>
<td>Ronkonkoma, NY</td>
<td>2 units @ 243 tpd = 486 tpd</td>
<td>ELE: 12 MW</td>
<td>1989</td>
<td>RWW</td>
<td>CO; NOx; O₂; Opacity; SO₂; Temp; Moisture</td>
<td>SDA; FF</td>
<td>Islip Resource Recovery Agency</td>
<td>Covanta MacArthur Renewable Energy, Inc.</td>
</tr>
<tr>
<td>Niagara Falls Resource Recovery Facility</td>
<td>Niagara Falls, NY</td>
<td>2 units @ 1,125 tpd = 2,250 tpd</td>
<td>STM: 350,000 Lbs/Hr</td>
<td>1996</td>
<td>MBWW</td>
<td>CO; NOx; O₂; Opacity; Temp; CO₂; SO₂</td>
<td>SDA; FF; SNCR; CI; ESP</td>
<td>Covanta Energy Corporation</td>
<td>Covanta Energy Corporation</td>
</tr>
<tr>
<td>Onondaga County Resource Recovery Facility</td>
<td>Jamesville, NY</td>
<td>3 units @ 330 tpd = 990 tpd</td>
<td>ELE: 39.2MW</td>
<td>1995</td>
<td>MBWW</td>
<td>CO; CO₂; NOx; O₂; Opacity; SO₂; NH₃</td>
<td>SDA; FF; SNCR; CI</td>
<td>Onondaga County Resource Recovery Agency</td>
<td>Covanta Onondaga, L.P.</td>
</tr>
<tr>
<td>Oswego County Energy Recovery Facility</td>
<td>Fulton, NY</td>
<td>4 units @ 50 tpd = 200 tpd</td>
<td>STM: 60,000 Lbs/Hr</td>
<td>1985</td>
<td>MCU</td>
<td>Steam flow; CO; O₂; SO₂; Opacity; Temp; Moisture</td>
<td>SDA; FF; CI; FGR</td>
<td>Oswego County</td>
<td>Oswego County</td>
</tr>
</tbody>
</table>

**NEW YORK (continued)**
NEW YORK (continued)

Wheelabrator Hudson Falls Inc.
Hudson Falls, NY

Trash Capacity: 2 units @ 236 tpd = 472 tpd
Energy Capacity: ELE: 14.4 MW
Project Startup: 1991
Technology: MBWW
CEMS: CO; NOx; O₂; Opacity; O₂; Temp; SO₂
APC System: SDA; ESP; CI; CYC
Owner: Warren & Washington Counties Industrial Development Agency
Operator: Wheelabrator Hudson Falls Inc.

Wheelabrator Westchester Company, L.P.
Peeskill, NY

Trash Capacity: 3 units @ 750 tpd = 2,250 tpd
Energy Capacity: ELE: 63 MW
Project Startup: 1984
Technology: MBWW
CEMS: Opacity; CO; O₂; SO₂; Temp; 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; CO₂; NOx; O₂; Opacity; SO₂
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: 13.1 MW
Project Startup: 1986
Technology: MBWW
CEMS: O₂; CO; SO₂; Temp; Opacity; NOx
APC System: SDA; FF; SNCR; CI; CYC; DSI
Owner: Covanta Marion, Inc.
Operator: Covanta Marion, Inc.

As of September 30, 2010, the U.S. waste-to-energy industry has 51 facilities that have earned STAR status under the OSHA Voluntary Protection Program. While less than 0.02% of all worksites are enrolled in VPP, more than 59% of all U.S. waste-to-energy facilities are enrolled in VPP.

MSW Management in the U.S.

## OKLAHOMA

### Warren B. Hall Resource Recovery Facility
**Tulsa, OK**

- **Trash Capacity:** 3 units @ 375 tpd = 1,125 tpd
- **Energy Capacity:** ELE: 16.8 MW; or STM: 240,000 Lbs/Hr
- **Project Startup:** 1986 (2 units); 1987 (1 unit)
- **Technology:** MBWW
- **CEMS:** CO; CO$_2$; NOx; O$_2$; Temp; Opacity; SO$_2$
- **APC System:** CI; CYC; FF; SNCR; SDA
- **Owner:** Covanta WBH, LLC
- **Operator:** Covanta WBH, LLC

The Walter B. Hall Resource Recovery Facility began commercial operation in October 1986 with two units. A third unit was added in October 1987 to meet growing demands of the residents and businesses in the Tulsa area. The facility generates up to 240,000 pounds per hour of steam, which can be used to power a turbine generator to produce 16.8 megawatts of clean, renewable energy that is sold to Public Service Company of Oklahoma. However, on a more regular basis, the steam is sold to the adjacent Sunoco refinery, so it does not have to use fossil fuels to generate their own steam.

## PENNSYLVANIA

(6 facilities; combined capacity of 9,408 TPD and 276.5 MW)

### Delaware Valley Resource Recovery Facility
**Chester, PA**

- **Trash Capacity:** 6 units @ 558 tpd = 3,348 tpd
- **Energy Capacity:** ELE: 90 MW
- **Project Startup:** 1992
- **Technology:** RWW
- **CEMS:** CO; HCl; Link; NOx; O$_2$; CO$_2$; Opacity; Temp; Moisture; 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 @ 266 tpd = 800 tpd
- **Energy Capacity:** ELE: 24.2 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 Harrisburg, Inc.

### 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; Temp; Moisture
- **APC System:** SDA; FF; SNCR; CI; FSI
- **Owner:** Lancaster County Solid Waste Management Authority
- **Operator:** Covanta Lancaster, 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
### PENNSYLVANIA (continued)

**Covanta Plymouth Renewable Energy**  
Conshohocken, PA

- **Trash Capacity:** 2 units @ 608 tpd = 1,216 tpd  
- **Energy Capacity:** ELE: 41 MW  
- **Project Startup:** 1989  
- **Technology:** MBWW  
- **CEMS:** CO; HCl; NOx; O\(_2\); Opacity; Temp; Moisture; SO\(_2\)  
- **APC System:** SDA; FF; SNCR; CI  
- **Owner:** Covanta Plymouth Renewable Energy  
- **Operator:** Covanta Plymouth Renewable Energy

**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:** Covanta York Renewable Energy, LLC

### UTAH

**Wasatch Integrated Waste Management District**  
Layton, UT

- **Trash Capacity:** 2 units @ 210 tpd = 420 tpd  
- **Energy Capacity:** STM: 105,000 Lbs/Hr  
  - ELE: 1.6 MW  
- **Project Startup:** 1986  
- **Technology:** MBRW  
- **CEMS:** CO; NOx; O\(_2\); Temp; CO\(_2\); Opacity; SO\(_2\)  
- **APC System:** GSA; ESP  
- **Owner:** Wasatch Integrated Waste Management District  
- **Operator:** Wasatch Integrated Waste Management District

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"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)
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; O₂; Temp; Opacity; SO₂
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; O₂; 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; CO₂; O₂; Opacity; SO₂; 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: 126 MW
Project Startup: 1990
Technology: MBWW
CEMS: CO; O₂; NOx; Temp; Opacity; SO₂; Link
APC System: SDA; FF; SNCR; CI
Owner: Covanta Fairfax, Inc
Operator: Covanta Fairfax,

Wheelabrator Portsmouth, Inc.
Portsmouth, VA

Trash Capacity: 4 units @ 500 tpd = 2,000 tpd
Energy Capacity: STM: 25,000 Lbs/Hr
ELE: 60 MW
Project Startup: 1988
Technology: RDF-SSWW
CEMS: CO; HCl; NOx; O₂; Opacity; Temp; SO₂
APC System: SDA; FF
Owner: Wheelabrator Portsmouth, Inc.
Operator: Wheelabrator Portsmouth, Inc.

Full-time Employees at Waste-to-Energy Facilities
(based on survey of 63 facilities)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total FTE's</th>
<th>Mean</th>
<th>25th Percentile</th>
<th>Median</th>
<th>75th Percentile</th>
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</thead>
<tbody>
<tr>
<td>2006</td>
<td>58.4</td>
<td>37.0</td>
<td>46.0</td>
<td>66.0</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>57.6</td>
<td>37.0</td>
<td>46.0</td>
<td>63.0</td>
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</tr>
<tr>
<td>2008</td>
<td>57.9</td>
<td>37.5</td>
<td>46.0</td>
<td>65.5</td>
<td></td>
</tr>
</tbody>
</table>

## WISCONSIN

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

<table>
<thead>
<tr>
<th>Facility</th>
<th>Location</th>
<th>Trash Capacity</th>
<th>Energy Capacity</th>
<th>Project Startup</th>
<th>Technology</th>
<th>CEMS</th>
<th>APC System</th>
<th>Owner</th>
<th>Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barron County Waste-to-Energy &amp; Recycling Facility</td>
<td>Almena, WI</td>
<td>2 units @ 50 tpd = 100 tpd</td>
<td>STM: 19,000 Lbs/Hr ELE: 0.265 MW</td>
<td>1986</td>
<td>MBWW</td>
<td>CO₂; NOx; O₂; Opacity; SO₂</td>
<td>SDA; FF; SNCR; CI</td>
<td>Barron County</td>
<td>ZAC, Inc.</td>
</tr>
<tr>
<td>Xcel Energy French Island Generating Plant</td>
<td>LaCrosse, WI</td>
<td>2 units @ 200 tpd = 400 tpd</td>
<td>ELE: 32 MW</td>
<td>1987</td>
<td>RDF-SSWW</td>
<td>SO₂; NOx; Opacity; CO</td>
<td>DSI; FF; SNCR</td>
<td>Xcel Energy</td>
<td>Xcel Energy</td>
</tr>
</tbody>
</table>

## Green Investing

*Towards a Clean Energy Infrastructure*

In this report released in Davos, Switzerland in January 2009, the World Economic Forum highlighted eight renewable energy technologies which look particularly promising.

1. Onshore Wind
2. Offshore Wind
4. Solar Thermal Electricity Generation
5. **Municipal Solid Waste-to-Energy (MSW)**
6. Sugar Based Ethanol
7. Cellulosic and Next Generation Biofuels
8. Geothermal

“Green energy is a growing field. It is exciting to have a state-of-the-art, renewable power plant created right here in Curtis Bay. It will create 180 ‘green collar’ jobs and is expected to pump millions of dollars into the local economy through salaries and spin-off businesses. This is great news in this struggling economy.”

—Congressman C.A. “Dutch” Ruppersberger, Maryland, regarding the development of an Energy Answers International waste-to-energy facility in Baltimore, MD.
The Energy Recovery Council 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.energycouncil.org or call ERC at (202) 467-6240.