Now celebrating its 25th Anniversary, the Energy Recovery Council is the trade association representing companies, organizations, and local governments engaged in recovering energy and materials from waste.
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<td>Xcel Energy French Island Generating Station (LaCrosse)</td>
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ERC MEMBERSHIP

Membership is available for WTE owners and operators, local governments, and companies that provide goods and services to WTE owners and operators. Visit www.energyrecoverycouncil.org for more info.

Waste-to-Energy Owners/Operators

Covanta
445 South Street
Morristown, NJ 07960
(862) 345-5000
www.covanta.com

Wheelabrator Technologies Inc.
100 Arboretum Drive
Suite 310
Portsmouth, NH 03801
(603) 929-3000
www.wtienergy.com

The Babcock & Wilcox Company
13024 Ballantyne Corporate Place
Suite 700
Charlotte, NC 28277
(704) 625-4900
www.babcock.com

ERC Municipal Members

- City and County of Honolulu, HI
- City of Alexandria/Arlington County (VA)
- City of Ames (IA) Resource Recovery System
- City of Long Beach, CA
- City of Tampa, FL
- Connecticut Materials Innovation and Recycling Authority
- County Sanitation Districts of Los Angeles County, CA
- Dade-Miami County, FL
- Delaware Solid Waste Authority
- ecomaine
- Fairfax County, VA
- Hennepin County (MN) Dept. of Environmental Services
- Kent County (MI) Department of Public Works
- Lancaster County (PA) Solid Waste Management Authority
- Lee County (FL) Solid Waste Division
- Northeast Maryland Waste Disposal Authority
- Olmsted County (MN)
- Onondaga County (NY) Resource Recovery Agency
- Pinellas County (FL) Utilities
- Pollution Control Financing Authority of Camden County (NJ)
- Pope-Douglas (MN) Solid Waste Management
- Prairie Lakes Municipal Solid Waste Authority (MN)
- Solid Waste Authority of Palm Beach County (FL)
- Solid Waste Disposal Authority of Huntsville (AL)
- Southeastern CT Regional Resources Recovery Authority
- Town of Wallingford (CT)
- Wasatch (UT) Integrated Waste Management District
- York County (PA) Solid Waste Authority

ERC Associate Members

- Caterpillar/Solar Turbines
- DustMASTER EnviroSystems
- Dvirka & Bartilucci Consulting Engineers
- Energy Answers International
- Gersham, Brickner, and Bratton, Inc.
- Great River Energy
- Green Conversion Systems, LLC
- Hawkins Delafield & Wood LLC
- HDR, Inc.
- Helfrich Brothers Boiler Works, Inc.
- Hitachi Zosen Inova USA
- INASHCO North America Inc.
- Jansen Combustion & Boiler Technologies, Inc.
- Konecranes Canada, Inc.
- Lab USA
- Lechler Inc.
- Martin GmbH
- Minnesota Resource Recovery Association
- New England Mechanical Overlay
- PERC Holdings LLC
- Plattco Corporation
- Powerhouse Technology, Inc.
- Ramboll
- RRC Power & Energy, LLC
- RRT Design & Construction
- Southern Recycling
- Valmet Inc.
- Zampell Refractories, Inc.
WASTE-TO-ENERGY CAPACITY

Total Capacity U.S Facilities (by energy)

Daily Throughput
95,023 Tons/day

Gross Electric Capacity
2,547 MW

Equivalent CHP Capacity
2,747 MW

No. of Operating Facilities in the U.S.

Operating Facilities 77
States with WTE 22

Ownership
Private 41
Public 36

Operation
Private 65
Public 12

No. of Facilities (by technology)

Mass Burn 60
Refuse Derived Fuel (RDF) 13
Modular 4

No. of Facilities (by offtake)

Electricity Generation 59
Steam Export 3
Combined Heat & Power 15
WTE facilities continue to be extremely stable and reliable.

![WTE Production Chart](chart.png)

**Total Production by U.S WTE Facilities**

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<th>Year</th>
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<th>MSW Throughput</th>
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<td>14,871</td>
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<td>2005</td>
<td>14,878</td>
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<td>15,080</td>
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WTE facilities continue to operate reliably and steadily, which is a testament to the success of the technology. While some units eventually close, and some new units have been added, waste-to-energy facilities have a proven track record of operational availability, reliability. Challenging market conditions in the energy and waste markets have served as an impediment to constructing more facilities and recovering energy from more of the 250 million tons of post-recycled waste that is sent to landfills each year.
77 WASTE-TO-ENERGY PLANTS IN 22 STATES

STATES DEFINING WTE AS RENEWABLE

States with WTE Plants (number of plants in state)

States with WTE in other renewable law
Includes District of Columbia

States with WTE in RPS
Includes Puerto Rico and N. Mariana Islands
Numerous international governments, NGOs, and researchers recognize the climate benefits of WTE, including the U.S. EPA, the Intergovernmental Panel on Climate Change ("IPCC"), the World Economic Forum, the European Union, CalRecycle, and the Center for American Progress, and other researchers.

WTE facilities generate carbon offsets credits under both the Clean Development Mechanism (CDM) of the Kyoto Protocol and voluntary carbon offset markets. Under CDM, more than 40 WTE projects have been registered, with a combined annual GHG reduction of 5 million metric tons of CO2e per year. To date, three WTE expansions have been validated as carbon offset projects in North America. The Lee and Hillsborough County facilities, operated on behalf of municipal owners in Florida, have been selling carbon credits into the voluntary market for several years.

WTE reduces greenhouse gas emissions in three ways:

- It generates energy that otherwise would likely be generated by fossil-fueled facilities;
- It diverts solid waste from landfills where it would have emitted methane for generations; and
- It recovers metals for recycling, thereby saving the GHGs and energy associated with the production of products and materials from virgin inputs.

On average, the U.S. EPA has determined that WTE facilities reduce GHG emissions by one ton of CO2 equivalents (CO2e) for every ton of MSW diverted from landfill and processed.

EPA Clean Power Plan

WTE facilities may generate tradable emission rate credits (ERCs) under a rate-based state plan to reduce GHG emissions from the power sector.

Is it Better to Bury or Burn?

"WTE 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."

Intergovernmental Panel on Climate Change (IPCC)

WTE is identified as a "key mitigation measure" in IPCC, "Climate Change 2007: Synthesis Report".

World Economic Forum

WTE was recognized as a key emerging large-scale clean energy sector in a low-carbon economy along with onshore and offshore wind, solar, cellulosic ethanol and geothermal power.

Center for American Progress

"In order to reduce greenhouse-gas emissions, garbage must be diverted from landfills and sent to EFW facilities after significant recycling and composting efforts are accomplished."

Third Way

"A mass-based [Clean Power Plan] approach allows states to support a wider range of carbon reducing activities, [including] existing carbon negative waste-to-energy generation."

---

1EPA Clean Power Plan, 40 CFR 80 Subpart UUUU
Waste-to-energy (WTE) 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 WTE.** 31 states, the District of Columbia, and two territories have defined waste-to-energy as renewable energy in various state statutes and regulations, including renewable portfolio standards.

- **Communities with WTE Have Higher Recycling Rates.** Studies have demonstrated that average recycling rate of communities served by waste-to-energy is higher than the national average.

- **WTE 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 waste-to-energy as a renewable resource.

---

### Federal Statutes and Policies Establishing WTE as Renewable (as of 4/30/16)

- EPA’s Clean Power Plan
- Consolidated Appropriations Act, 2016
- Tax Increase Prevention Act of 2014
- American Taxpayer Relief Act of 2012
- Tax Relief and Healthcare Act of 2006
- Energy Policy Act of 2005
- American Jobs Creation Act of 2004
- Biomass Research and Development Act of 2000
- Public Utility Regulatory Policies Act (PURPA) of 1978
- Federal Power Act
- Pacific Northwest Power Planning and Conservation Act
- Internal Revenue Code (Section 45)
- Executive Orders 13123, 13423, 13514, and 13693
- Presidential Memorandum on Federal Leadership on Energy Management (12/5/13)
- Federal Energy Regulatory Commissions Regulations (18 CFR.Ch. I, 4/96 Edition, Sec. 292.204)

### States Defining Waste-to-Energy as Renewable

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<tr>
<td>Iowa</td>
<td>N. Mariana Islands</td>
<td>Wisconsin</td>
</tr>
<tr>
<td>Louisiana</td>
<td>Ohio</td>
<td>Oklahoma</td>
</tr>
<tr>
<td>Maine</td>
<td>Oklahoma</td>
<td></td>
</tr>
</tbody>
</table>
Waste-to-energy facilities are subject to standards that are among the most stringent in the world. Under the Clean Air Act, more than $1 billion was invested in upgrades to air quality control systems at America’s waste-to-energy facilities. The results were so dramatic that the U.S. Environmental Protection Agency wrote that the “upgrading of the emissions control systems of large combustors to exceed the requirements of the Clean Air Act Section 129 standards is an impressive accomplishment.”

In addition to combustion controls, waste-to-energy facilities employ sophisticated air quality control equipment, such as selective non-catalytic reduction” or “SNCR”, scrubbers, activated carbon injection, and fabric filter baghouses.

As a result of the controls employed at these plants, dramatic reductions in emissions have been achieved, leading EPA to conclude that the emissions performance of waste-to-energy “has been outstanding.” (Stevenson, EPA, 2007)
The WTE sector serves three main functions: 1) managing post-recycled waste; 2) recycling post-consumer metals; and 3) producing energy. The revenues, employment, and labor earnings derived from these activities are the direct economic benefits of waste-to-energy. In addition, these activities generate indirect impacts as well as induced impacts. These impacts were calculated using multipliers from the U.S. Bureau of Economic Analysis RIMS II Handbook.

**Total Gross Sales Output**

Total gross sales numbers were used to approximate the economic output of the sector. Gross sales of the industry encompass revenues generated from: 1) tip fees—amounts paid to the WTE plant to dispose of refuse; 2) energy sales revenues; 3) recycling sales revenues. **Total output (sales revenues) was $3.2 billion. The total national economic impact of these revenues is $5.6 billion**, including the initial $3.2 billion produced by the waste-to-energy sector directly.

**Every $1 of revenue generated by the WTE sector injects $1.77 into the economy**

*(through intermediate purchases of goods and services and payments to employees)*

**Employment and Wage Earnings**

According to Berenyi’s report, the WTE sector employs about 5,350 people nationwide. This number includes workers at specific sites, as well as off-site employees of the several regional and national firms that own and operate waste-to-energy facilities and local government personnel dedicated to plant oversight and maintenance. The WTE sector also creates an additional 8,600 jobs outside of the sector.

Employees at waste-to-energy plants are technically skilled and are compensated at a relatively high average wage. For the purposes of this study a national average salary of $85,700 (inclusive of fringe benefits) was used. Employees in the waste-to-energy industry receive about $460 million in annual salary and benefits. The effect of this direct spending on employee compensation generated another $429 million of compensation for workers across various associated industries.

**Conclusion**

The waste-to-energy sector provides significant economic value to the communities it services. In addition to the revenues generated by the sector, waste-to-energy facilities provide stable, long-term, well-paying jobs, while pumping dollars into local economies through the purchase of local goods and services and the payment of fees and taxes. In addition to the opportunities to provide baseload renewable electric generation, recover metals for recycling, and reduce greenhouse gas emissions, these facilities significantly contribute to the green economy in the communities in which they operate.

Access the full report here:

[http://energyrecoverycouncil.org/resources](http://energyrecoverycouncil.org/resources)
In 2014, Eileen Brettler Berenyi, Ph.D. published a report entitled *A Compatibility Study: Recycling and Waste-to-Energy work in Concert, 2014 Update* in which she answered the following question: Does a community’s use of a waste-to-energy plant to dispose of its waste impact the level of recycling in that community? Through significant research and analysis, the answer is a resounding no. This report can be found at: [http://energyrecoverycouncil.org/resources](http://energyrecoverycouncil.org/resources).

Berenyi found that the recycling rate of communities served by WTE facilities was slightly higher than the state average in 16 out of 21 states utilizing WTE.

Berenyi also found that state solid waste policies, not a community’s reliance on WTE for disposal, determines local recycling behavior and rates.
The Circular Economy is a business model focused on maximizing and leveraging the value of all materials and resources throughout their production/service cycles. Resource management in a circular economy entails reuse, refurbishment, remanufacturing, and recovery. Energy recovery’s place in the Circular Economy is obvious when one considers that 1 billion tons of trash are being buried each year globally. In particular, energy recovery is important when materials are not easily recyclable (i.e. soiled or contaminated materials, composite materials) or for low-value materials, including those that are cost/time-intensive to collect, handle and recover.

The EU’s Circular Economy Package is the most active Circular Economy policy debate.

Synergies between WTE and the Circular Economy

The EU’s Circular Economy Package is the most active Circular Economy policy debate.
Although there are still a few deniers, the effects of climate change on this planet and its ecosystems have been documented by many scientific studies. As shown in the IPCC 2014 Assessment Report, to which WTERT contributed, sustainable management of the billions of tons of industrial and municipal wastes, the unavoidable by-product of economic development, offers a good opportunity to reduce greenhouse gas emissions and, also, conserve non-renewable fuels and metals.

Since the last publication of the ERC Directory in 2014, WTERT has conducted over two dozen studies on ways to advance the various means of waste management. One of these studies convinced EPA that the best way to dispose filter bags was by sending them to the combustion chamber.

Another study showed that the amount of dioxins emitted by all U.S. WTEs, in one year, were about 3 grams; in contrast, spontaneous fires in U.S. landfills emitted an estimated 1,300 grams. On the global scale, a WTERT study showed that, in relation to GDP per capita, South Korea was doing the best job in managing their solid waste; to a large part, this was due to good planning and legislation at the national level. For the same reason, China built sixty WTE plants in 2012-2014; at that scale, plants were built at a lower CAPEX per ton of capacity. By now, China has become the No.2 user of WTE in the world, preceded by Japan and followed by the U.S.

One of these studies convinced EPA that the best way to dispose of filter bags was by sending them to the combustion chamber.

Figure 1 shows how the fifty states compare on the U.S. “ladder of sustainable waste management”: states who do less landfilling, by means of a combination of recycling + composting + WTE, are higher up on this “ladder”. The state of Connecticut is at the top of the U.S. ladder.

The mission of the waste-to-energy research and technology (WTERT) Council, in the U.S. (Columbia, CCNY-CUNY) and abroad through our sister organizations (Brazil, Chile, China, India, Italy, etc., etc.), 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 WTERT publications, web pages, and meetings.

The guiding principle is that “wastes” are resources that must be managed on the basis of science and best available technologies and not on ideology or economics that exclude environmental costs.
SUSTAINABLE WASTE MANAGEMENT IN THE U.S.

The “ladder” of sustainable waste management in the U.S.
SUSTAINABLE WASTE MANAGEMENT IN THE WORLD

Source: Global WTERT Council
WTE DIRECTORY: KEY TERMS

City: The city in which the facility is physically located.

County: The county in which the facility is physically located.

U.S. Congressional District: The U.S. congressional district in which the facility is physically located in the 113th Congress (2013-2014).

Owner: The current owner of the facility is listed. Whether the owner is a private or public entity is noted parenthetically.

Operator: The current operator of the facility is listed. Whether the operator is a private or public entity is noted parenthetically.

Project Startup: The actual year in which commercial operation began.

Operating Status: Indicates whether the facility is operating, inactive, or under construction in 2016.

Technology: Indicates whether the facility is mass burn, modular, or refuse derived fuel (RDF).

Throughput Capacity (TPD): Expressed in tons per day, the throughput capacity is the aggregate trash capacity for all units located at a facility.

No. of Boilers: The number of boilers (or units) in use at the facility.

Gross Electric Capacity (MW): Expressed in gross megawatts, the nameplate capacity of the turbine generators located at the facility. This figure represents the largest amount of gross electrical output that can be achieved.

Gross Steam Capacity (lbs/hr): The gross amount of steam that can be generated. For combined heat and power facilities, this amount represents the typical amount of steam exported expressed in pounds per hour, in addition to electric generation.

Full-time Employees: The approximate number of full-time employees that work at a facility. This number is an estimate and fluctuates over time.

People Served: Indicates the number of individuals that are served by the facility in the “waste catchment area”.

Certifications: Indicates whether the facility has achieved STAR status under the U.S. Occupational Safety and Health Administration (OSHA) Voluntary Protection Program (VPP) or is ISO certified.

State Based Information

WTE Facilities: The number of facilities located in that state.

Total Waste Capacity: The aggregate trash capacity of all facilities located in that state.

Total Electric Capacity: The aggregate gross electric capacity of all facilities located in that state.

Total Steam Capacity: The aggregate gross steam capacity typically exported (expressed in lbs/hr) of all facilities located in that state.

Population in 2015: The 2015 population estimates by the U.S. Census Bureau

MSW Managed in 2011: The total amount of MSW processed at all facilities in the state in 2011, as reported by the 2013 Columbia University EEC Survey.

% of MSW Managed by WTE in 2011: The percentage of the state’s waste processed by WTE in 2011, as reported by the 2013 Columbia University EEC Survey.

Energy Produced by WTE in a State is enough to power (#) homes: The figure is derived by expressing energy capacity (electric and steam) in megawatts and dividing it by EIA’s estimate that each household uses 1.24 kilowatts of capacity per hour (10,837 kwh per year).

Recycling Rate of WTE Communities: The aggregate recycling rate of all WTE communities in the state, as reported by Eileen Berenyi’s 2014 Recycling compatibility report.

Jobs at WTE Facilities: The aggregate FTE jobs at facilities in the state listed in the directory.

Total Jobs (Direct, Indirect, & Induced) Created by WTE: The total number of direct, indirect, and induced jobs created by WTE in the state, as reported by Eileen Berenyi in the 2013 National WTE Economic report.

Total Economic Output (Direct, Indirect & Induced) by WTE: The total number of direct, indirect and induced economic output created by WTE in the state, as reported by Eileen Berenyi in the 2013 National WTE Economic report.
Huntsville Waste-to-Energy Facility

The Huntsville facility sells steam to the U.S. Army’s Redstone Arsenal, which for more than 50 years has been the Army’s center for rocket and missile programs.

**Location:** Huntsville, AL // Madison County  
5th US Congressional District

**Owner:** Solid Waste Disposal Authority of Huntsville (public)

**Operator:** Covanta Huntsville, Inc. (private)

**Started:** 1990

**Technology:** Mass Burn

**Capacity:** 690 tons per day

**Boilers:** 2

**Capacity:** 178,620 lbs/hr

**People Served:** 277,000

**Certifications:** VPP STAR

**Websites:**  
www.swdahsv.org  
www.covanta.com
The Commerce facility demonstrates that refuse-to-energy is a viable alternative method of solid waste management in the South Coast Air Basin, where air pollution requirements are the toughest in the world.
Southeast Resource Recovery Facility (SERRF)

118 Pier S. Ave, Long Beach, CA 90802

SERRF has long helped process special waste that cannot be landfilled. This facility began destroying narcotics in 1992. Since its inception the program has successfully destroyed an average of 17,000 pounds of narcotics each month.

<table>
<thead>
<tr>
<th>Location</th>
<th>Long Beach, CA // Los Angeles County 47th US Congressional District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td>Southeast Resource Recovery Facility (public)</td>
</tr>
<tr>
<td>Operator</td>
<td>Covanta Long Beach Renewable Energy corp. (private)</td>
</tr>
<tr>
<td>Started</td>
<td>1988</td>
</tr>
<tr>
<td>Technology</td>
<td>Mass Burn</td>
</tr>
<tr>
<td>Capacity: (MSW)</td>
<td>1,380 tons per day</td>
</tr>
<tr>
<td>Boilers</td>
<td>3</td>
</tr>
<tr>
<td>Capacity: (Gross Electric)</td>
<td>36 MW</td>
</tr>
<tr>
<td>People Served</td>
<td>500,000</td>
</tr>
<tr>
<td>Websites</td>
<td><a href="http://www.lacsd.org/solidwaste">www.lacsd.org/solidwaste</a> <a href="http://www.covanta.com">www.covanta.com</a></td>
</tr>
</tbody>
</table>

Stanislaus County Resource Recovery Facility

4040 Fink Road, Crows Landing, CA 95313

The facility is located about 25 miles from Modesto in the farmlands of California’s central valley. This 16.5-acre facility is a zero water discharge plant, which means that all wastewater generated on-site is treated and reused in the process.

<table>
<thead>
<tr>
<th>Location</th>
<th>Crows Landing, CA // Stanislaus County 10th US Congressional District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner</td>
<td>Covanta Stanislaus, Inc. (private)</td>
</tr>
<tr>
<td>Operator</td>
<td>Covanta Stanislaus, Inc. (private)</td>
</tr>
<tr>
<td>Started</td>
<td>1989</td>
</tr>
<tr>
<td>Technology</td>
<td>Mass Burn</td>
</tr>
<tr>
<td>Capacity: (MSW)</td>
<td>800 tons per day</td>
</tr>
<tr>
<td>Boilers</td>
<td>2</td>
</tr>
<tr>
<td>Capacity: (Gross Electric)</td>
<td>224 MW</td>
</tr>
<tr>
<td>People Served</td>
<td>521,497</td>
</tr>
<tr>
<td>Certifications</td>
<td>VPP STAR</td>
</tr>
<tr>
<td>Websites</td>
<td><a href="http://www.stancountywte.com">www.stancountywte.com</a> <a href="http://www.covanta.com">www.covanta.com</a></td>
</tr>
</tbody>
</table>
Most of the energy generated by the Bristol facility is sold to Connecticut Light and Power. Covanta owns and operates the plant under a 25-year agreement with the Bristol Resource Recovery Facility Operating Committee (BRRFOC), a consortium made up of these towns: Berlin, Branford, Bristol, Burlington, Hartland, New Britain, Plainville, Plymouth, Prospect, Southington, Seymour, Warren, Washington and Wolcott.
**Mid-Connecticut Resource Recovery Facility**

The CT MIRA installed an odor control system that has the capacity to exchange the air inside Madison Square Garden twice in one hour. Since installation, the number of odor-related complaints has been drastically reduced.

| Location: | Hartford, CT // Hartford County 1st US Congressional District |
| Owner: | Materials Innovation and Recycling Authority (public) |
| Operator: | NAES Corp. (private) |
| Started: | 1988 |
| Technology: | RDF |
| Capacity: (MSW) | 2,850 tons per day |
| Boilers: | 3 |
| Capacity: (Gross Electric) | 69 MW |
| People Served: | 1,208,813 |
| Websites: | www.ctmira.org www.naes.com |

**Southeastern Connecticut Resource Recovery Facility**

The Southeastern Connecticut Regional Resource Recovery Authority (SCRRRA) consists of 12 cities and towns in Southeastern Connecticut. The facility has been operational since 1992. It received the State of Connecticut DEP Green Circle Award in 2010.

| Location: | Preston, CT // New London County 2nd US Congressional District |
| Owner: | Covanta Company Southeastern CT (private) |
| Operator: | Covanta Company Southeastern CT (private) |
| Started: | 1991 |
| Technology: | Mass Burn |
| Capacity: (MSW) | 689 tons per day |
| Boilers: | 2 |
| Capacity: (Gross Electric) | 17 MW |
| People Served: | 248,233 |
| Certifications: | VPP STAR |
| Websites: | www.covanta.com |
Wheelabrator Bridgeport

6 Howard Avenue, Bridgeport, CT 06605

Wheelabrator Bridgeport plays a significant part in the City of Bridgeport’s revitalization. The facility directly employs 70 Connecticut residents, many of whom live in Bridgeport, and last year created approximately $32 million of economic activity throughout the region.

| Location:     | Bridgeport, CT // Fairfield County 
               | 47th US Congressional District |
|--------------|--------------------------------------------------|
| Owner:       | Wheelabrator Bridgeport, L.P (private)         |
| Operator:    | Wheelabrator Bridgeport, L.P (private)         |
| Started:     | 1988                                            |
| Technology:  | Mass Burn                                       |
| Capacity:    | 2,250 tons per day                             |
| Boilers:     | 3                                               |
| Capacity:    | 67 MW                                           |
| (Gross Electric) |                                            |
| People Served: | 815,807                                         |
| Certifications | VPP STAR                                       |
| Websites:    | www.wtienergy.com                              |

Wheelabrator Lisbon

425 South Burnham, Highway Lisbon, CT

Wheelabrator Lisbon supplies enough electricity to power the equivalent of 13,000 Connecticut homes in addition to its own operations. It processed 190,880 tons of waste last year and recovered 1,660 tons of metals.

| Location:     | Lisbon, CT // New London County 
               | 2nd US Congressional District |
|--------------|--------------------------------------------------|
| Owner:       | Eastern CT Resource Recovery Authority (public) |
| Operator:    | Wheelabrator Lisbon, Inc. (private)             |
| Started:     | 1995                                            |
| Technology:  | Mass Burn                                       |
| Capacity:    | 500 tons per day                               |
| Boilers:     | 2                                               |
| Capacity:    | 15 MW                                           |
| (Gross Electric) |                                            |
| People Served: | 225,000                                         |
| Certifications | VPP STAR                                       |
| Websites:    | www.wtienergy.com                              |
|              | www.ecrra.org                                   |
Bay County Waste-to-Energy Facility

6510 Bayline Drive, Panama City, FL 32404

The Bay County Waste-to-Energy Facility is operated by Engen, LLC. Engen LLC meets the environmental management standards of ISO 14001-2004.

Location: Panama City, FL // Bay County 2nd US Congressional District
Owner: Bay County (public)
Operator: Engen, LLC (private)
Started: 1987
Technology: Mass Burn
Capacity: 500 tons per day
Boilers: 2
Capacity: 15 MW
People Served: 169,560
Certifications: ISO 14001
Websites: www.engenllc.com
### Hillsborough County Resource Recovery Facility

**Location:** Tampa, FL // Hillsborough County  
14th US Congressional District

**Owner:** Hillsborough County (public)

**Operator:** Covanta Hillsborough, Inc. (private)

**Started:** 1987 (units 1-3); 2009 (unit 4)

**Technology:** Mass Burn

**Capacity:** 1,800 tons per day

**Boilers:** 4

**Capacity: (Gross Electric)** 46.5 MW

**People Served:** 1,234,010

**Certifications:** VPP STAR

**Websites:** [www.covanta.com](http://www.covanta.com)

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The Hillsborough County Resource Recovery facility's capacity expanded in 2009. The facility recycles secondary sewer treatment runoff from an adjacent wastewater treatment plant. In addition, the facility generates carbon credits for sale on the voluntary trading carbon markets.

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### Lake County Resource Recovery Facility

**Location:** Okahumpka, FL // Lake County  
10th US Congressional District

**Owner:** Covanta Lake, Inc. (private)

**Operator:** Covanta Lake, Inc. (private)

**Started:** 1991

**Technology:** Mass Burn

**Capacity:** 528 tons per day

**Boilers:** 2

**Capacity: (Gross Electric)** 14.5 MW

**People Served:** 288,379

**Certifications:** VPP STAR

**Websites:** [www.covanta.com](http://www.covanta.com)

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The Lake County Resource Recovery facility is designated a Voluntary Protection Program Star facility by the U.S. Occupational Safety and Health Administration (OSHA) for workplace safety.
Lee County Resource Recovery Facility

10500 Buckingham Rd, Fort Myers, FL 33905

In 2007, the facility was expanded by 636 tons per day. Covanta Lee uses reclaimed water from a city-owned waste water treatment plant for all of its process water and it is equipped with both ferrous (steel) and non-ferrous (brass, copper, aluminum) recovery systems to remove metals from the ash residue.

| Location: Ft. Myers, FL // Lee County 19th US Congressional District |
| Owner: Lee County (public) |
| Operator: Covanta Lee, Inc. (private) |
| Started: 1994 (units 1-2); 2007 (unit 3) |
| Technology: Mass Burn |
| Capacity: (MSW) 1,836 tons per day |
| Capacity: (Gross Electric) 57.3 MW |
| People Served: 626,502 |
| Certifications: VPP STAR |
| Websites: www.leegov.com/solidwaste www.covanta.com |

Miami-Dade County Resource Recovery Facility

6990 NW 97th Avenue, Miami, FL 33178

The facility processes about 1.2 million tons of waste annually, with 240,000 tons being processed into a biomass fuel for export. The energy generated by the facility is enough to operate the plant and supply the electrical needs of approximately 45,000 Florida homes.

| Location: Miami, FL // Miami-Dade County 25th US Congressional District |
| Owner: Miami-Dade County (public) |
| Operator: Covanta Dade Renewable Energy, LLC (private) |
| Started: 1982 |
| Technology: RDF |
| Capacity: (MSW) 3,000 tons per day |
| Boilers: 4 |
| Capacity: (Gross Electric) 77 MW |
| People Served: 2,531,789 |
| Certifications: VPP STAR |
Palm Beach Renewable Energy Facility #1

6255 North Jog Road, West Palm Beach, FL 33412

The facility processes about 624,000 tons of waste annually. It generates enough electricity to supply the power needs of the Authority’s North Jog Road facilities and approximately 30,000 homes. The Solid Waste Authority sells the excess power generated by the facility to Florida Power and Light.

Palm Beach Renewable Energy Facility #2

6751 North Jog Road, West Palm Beach, FL 33412

The Palm Beach REF #2 processes more than 1 million tons of post-recycled municipal solid waste annually. It features a unique rooftop rainwater collection system that includes a 2 million gallon cistern. This system provides a portion of the water necessary to operate the facility, reducing REF 2’s use of treated water. It is the first new WTE facility constructed in the United States in twenty years.
Pasco County Solid Waste Resource Recovery Facility

14230 Hays Road, Spring Hill, FL 34610

The 72-acre facility processes up to 1,050 tons per day of municipal solid waste, generating 31.2 megawatts of renewable energy. The facility uses treated tertiary water from a nearby wastewater treatment plant. The facility is also beneficially reusing bottom ash as an aggregate substitute in county roads.

Pinellas County Resource Recovery Facility

3001 110th Avenue North, St. Petersburg, FL 33716

Covanta Pinellas assumed operational responsibility for the facility in late 2014. The facility can process up to 3,150 tons per day of solid waste while generating up to 75 megawatts (MW) of clean, renewable energy.
McKay Bay Refuse-to-Energy Facility

107 North 34th Street, Tampa, FL 33605

Tampa’s McKay Bay Waste-to-Energy Facility recovers enough metal to produce 4000 automobiles per year. The steam is routed to a turbine generator to make electricity, which is purchased by Tampa Electric Company. The McKay Bay facility underwent a significant retrofit project between 1999-2001.

Wheelabrator South Broward Inc.

4400 South State Road 7, Ft. Lauderdale, FL 33314

The Wheelabrator South Broward facility is capable of producing 66 MW of electricity, enough to power 39,000 homes as well as its own operations. The facility uses as much as 2,250 tons of everyday household and business waste each day as local fuel.
Honolulu Resource Recovery Venture—HPOWER

91-174 Hanua Street, Kapolei, HI 96707

H-POWER, owned by the City & County of Honolulu, generates enough energy to meet nearly 8% of Oahu’s energy needs. The electricity is sold to Hawaiian Electric and distributed to customers. H-POWER added a third mass burn boiler in 2012 in addition to other equipment.
The Indianapolis Resource Recovery facility can process 2,175 tons per day of solid waste and produces 4,500 pounds of steam sold per ton. Citizens Thermal Energy (CTE) purchases the steam to power the downtown heating loop, which includes nearly all downtown businesses, as well as Indiana University, Purdue University’s Indianapolis campus, and Eli Lilly, the area’s largest pharmaceutical manufacturer.
Arnold O. Chantland Resource Recovery Plant

The facility processes waste into Refuse Derived Fuel, or RDF, which is piped to the City’s power plant. It is used as a renewable, supplemental fuel in the coal boilers to generate electricity. The facility produces enough electricity to meet the power needs of 4,600 homes each year.

Location: Ames, IA // Story County
Owner: City of Ames (public)
Operator: City of Ames (public)
Started: 1975
Technology: RDF
Capacity: 175 tons per day
Boilers: 1
Capacity: 4 MW
People Served: 68,898
Websites: www.cityofames.org
ecomaine provides comprehensive long-term solid waste solutions in a safe, environmentally responsible, economically sound manner, and is a leader in raising public awareness of sustainable waste management strategies. It was the first public waste-to-energy plant in the country to earn the International Standards Organization’s (ISO) 14001.
MMWAC processes about 70,000 tons of trash annually. Since 2009, MMWAC has processed over 1 million tons of solid waste. This has offset the need for 2 million barrels of foreign oil. It has also saved about 1.75 million cubic yards of landfill space.

**Penobscot Energy Recovery Company**

Penobscot Energy Recovery Company L.P. (PERC), was organized in 1983. The facility processes over 300,000 tons of municipal solid waste (MSW) annually and relieves communities of their waste disposal problems by providing a stable, long-range and low cost disposal option for one-third of Maine’s households.
Montgomery County Resource Recovery Facility

The facility received a 2014 US EPA Clean Air Technology Award for upgrading its emission control system to an LN™ (Low NOx) system that lowers emissions of nitrogen oxides. Covanta Montgomery, Inc. is a Maryland Green Registry member.

Location: Dickerson, MD // Montgomery County
6th US Congressional District
Owner: Northeast Maryland Waste Disposal Authority (public)
Operator: Covanta Montgomery, Inc. (private)
Started: 1995
Technology: Mass Burn
Capacity: 1,800 tons per day
Boilers: 3
Capacity: 63.4 MW
People Served: 971,600
Certifications VPP STAR
Websites www.nmwda.org
www.covanta.com
Wheelabrator Baltimore has contributed to the City of Baltimore’s revitalization for the past 30 years, helping the city reduce its carbon footprint while providing Tier 1 renewable energy to Maryland homes and businesses. The facility recovered 14,470 tons of metals in 2015.

1801 Annapolis Road, Baltimore, MD 21230

Wheelabrator Baltimore, L.P. (private)

Location: Baltimore, MD // Baltimore County 3rd US Congressional District
Owner: Wheelabrator Baltimore, L.P. (private)
Operator: Wheelabrator Baltimore, L.P. (private)
Started: 1985
Technology: Mass Burn
Capacity: 2,250 tons per day
Boilers: 3
Capacity: 170,000 lbs/hr
People Served: 1,427,232
Certifications: VPP STAR
Websites: www.wtienergy.com

Center for American Progress

Energy from Waste Can Help Curb Greenhouse Gas Emissions

[Excerpt] The United States currently generates 390 million tons of trash per year, or 7 pounds per person per day. Although many states have the physical space for trash, it is environmentally unsustainable to take garbage and bury it in the ground at landfills, where it decomposes and releases potent greenhouse-gas pollution. Though garbage is not something we tend to actively think about on a daily basis, specifically as it relates to climate change, the United States must begin developing policies to limit the environmental consequences that result from our generation of garbage.

There is an alternative waste management option that America has not significantly utilized but that could help stem the flow of waste, and thus pollution emissions, in our country: energy-from-waste facilities. According to the EPA, for every ton of garbage processed at an energy-from-waste facility, approximately one ton of emitted carbon-dioxide equivalent in the atmosphere is prevented.

Read the full article:

The Center for American Progress is a progressive public policy research and advocacy organization.
Haverhill Resource Recovery Facility

100 Recovery Way, Haverhill, MA 01835

The air pollution controls used at the facility include Martin Stoker combustion controls, low nitrogen oxide control systems, selective non-catalytic reduction (SNCR) injection systems, lime injection scrubbers, and a carbon injection system.

Location: Haverhill, MA  //  Essex County
3rd US Congressional District

Owner: Covanta Haverhill, Inc. (private)

Operator: Covanta Haverhill, Inc. (private)

Started: 1989

Technology: Mass Burn

Capacity: 1,650 tons per day

Boilers: 2

Capacity: 44.6 MW

People Served: 475,000

Websites: www.covanta.com
During its operating history, the facility has offset the use of 27,000 gallons of oil per day, thereby reducing the need for additional oil or coal-fired utilities in the sensitive Pioneer Valley region. This facility was one of the first in the United States to successfully co-combust wastewater treatment plant sludge and fats, oil, and grease.

188 M Street Extension, Agawam, MA 01001

The Southeastern Massachusetts Resource Recovery Facility (SEMASS RRF) is operated and managed by Covanta SEMASS Partnership. This RDF facility recovers about 40,000 tons of ferrous and non-ferrous metals annually. SEMASS saves about 40 million gallons of water annually by reusing storm water and industrial wastewater and landfill leachate (run off) from nearby landfills.
**Wheelabrator Millbury**

**Location:** Millbury, MA // Worcester County  
2nd US Congressional District

**Owner:** Wheelabrator Millbury Inc. (private)  
**Operator:** Wheelabrator Millbury Inc. (private)

**Started:** 1987

**Technology:** Mass Burn

**Capacity:** 1,500 tons per day

**Boilers:** 2

**Capacity:** (MSW) 46 MW

**People Served:** 750,000

**Certifications:** VPP STAR

**Websites:** www.wtienergy.com

Wheelabrator Millbury helped to establish the Worcester-based Broad Meadow Brook Conservation Center & Wildlife Sanctuary, the first urban wildlife sanctuary in Massachusetts, in a 20-year partnership with Mass Audubon, including the introduction and sponsorship of Millbury Days, granting residents four free visits to the sanctuary throughout the year.

**Pittsfield Resource Recovery Facility**

**Location:** Pittsfield, MA // Berkshire County  
1st US Congressional District

**Owner:** Covanta Pittsfield, LLC (private)  
**Operator:** Covanta Pittsfield, LLC (private)

**Started:** 1981

**Technology:** Mass Burn

**Capacity:** 240 tons per day

**Boilers:** 2

**Capacity:** (MSW) 0.9 MW

**Capacity:** (Gross Steam) 68,000 lbs/hr

**People Served:** 70,000

**Certifications:** VPP STAR

**Websites:** www.covanta.com

Each year, the Pittsfield Resource Recovery Facility produces over 400 million pounds of steam as well as 3.5 million kWh hours of electricity used in-house for facility operations. On a daily basis, the steam generated by the facility and delivered to Crane & Co. enables Crane to run its currency paper manufacturing facility and avoid utilizing 16,000 gallons of oil per day.
Wheelabrator North Andover

285 Holt Rd., North Andover, MA 01845

Wheelabrator North Andover provides renewable energy for up to 41,000 homes in the Merrimack Valley region. The facility recovered 7,060 tons of metal in 2015 and avoided the use of 982,000 barrels of oil for power.

Location: North Andover, MA // Essex County 6th US Congressional District
Owner: Wheelabrator North Andover Inc. (private)
Operator: Wheelabrator North Andover Inc. (private)
Started: 1985
Technology: Mass Burn
Capacity: 1,500 tons per day
Boilers: 2
Capacity: 40 MW
People Served: 426,000
Websites
www.wtienergy.com

Wheelabrator Saugus

100 Salem Turnpike, Saugus, MA 01906

Wheelabrator Saugus maintains the Bear Creek Wildlife Sanctuary, a 340-acre reserve located behind the facility. The facility's conservation program demonstrates how business operations can support ecosystems. In addition, Wheelabrator Saugus contributes $23 million in economic activity to the local area.

Location: Saugus, MA // Essex County 6th US Congressional District
Owner: Wheelabrator Saugus Inc. (private)
Operator: Wheelabrator Saugus Inc. (private)
Started: 1975
Technology: Mass Burn
Capacity: 1,500 tons per day
Boilers: 2
Capacity: 38 MW
People Served: 850,000
Certifications VPP STAR
Websites
www.wtienergy.com
Detroit Renewable Power

5700 Russell St., Detroit, MI 48211

Since 1991, the facility has disposed of nearly 18 million tons of solid waste, generated more than 9,000,000,000 kWh of electricity, and prevented more than 400 acres from becoming landfill. The Detroit facility provides steam to the Detroit steam loop. It will also export process steam that will be used to heat and cool portions of GM's Detroit-Hamtramck assembly plant, helping GM achieve its renewable energy goals.

Location: Detroit, MI // Wayne County
Owner: Detroit Renewable Energy LLC (private)
Operator: Detroit Renewable Energy LLC (private)
Started: 1989
Technology: RDF
Capacity: (MSW) 3,300 tons per day
Boilers: 3
Capacity: (Gross Steam) 228,300 lbs/hr
Capacity: (Gross Electric) 68 MW
People Served: 1,000,000
Certifications: VPP STAR
Websites: www.detroitrenewablepower.com
www.gdrra.org
Kent County Waste-to-Energy Facility

950 Market Ave. SW, Grand Rapids, MI 49503

About 183,000 tons of municipal solid waste is incinerated for energy recovery annually. Approximately 25% of the volume of solid waste generated in Kent County is utilized to produce electricity and steam. The facility has been designated a Clean Corporate Citizen (C3) by the Michigan Department of Environmental Quality.

Location: Grand Rapids, MI  //  Kent County
3rd US Congressional District

Owner: Kent County (public)

Operator: Covanta Kent, Inc. (private)

Started: 1990

Technology: Mass Burn

Capacity: 625 tons per day

Boilers: 2

Capacity: 16.8 MW

People Served: 605,213

Certifications: VPP STAR

Websites: www.covanta.com
https://www.accesskent.com/Departments/DPW/waste_to_energy.htm

NAWTEC The premier conference and trade show focusing on the municipal waste-to-energy sector.

NAWTEC is co-sponsored by the Energy Recovery Council (ERC) and the Solid Waste Association of North America (SWANA), in partnership the Waste- to-Energy Research and Technology Council (WTERT). NAWTEC will celebrate its 25th anniversary in 2017.

1993 – Islip, NY
1994 – Boston, MA
1995 – Washington, DC
1996 – Atlantic City, NJ
1997 – Research Triangle Park, NC
1998 – Miami Beach, FL
1999 – Tampa, FL
2000 – Nashville, TN
2001 – Miami, FL
2002 – Philadelphia, PA
2003 – Tampa, FL
2004 – Savannah, GA
2005 – Orlando, FL
2006 – Tampa, FL
2007 – Miami, FL
2008 – Philadelphia, PA
2009 – Chantilly, VA
2010 – Orlando, FL
2011 – Lancaster, PA
2012 – Portland, ME
2013 – Ft. Myers, FL
2014 – Reston, VA
2015 – Tampa, FL
2016 – West Palm Beach, FL

http://nawtec.org
Great River Energy - Elk River Station

12300 Elm Creek Blvd., Maple Grove, MN 55369

The facility began commercial operation in 1950 and was retrofitted in 1989 to combust RDF. Ash remaining from the combustion process is transported to the Becker ash landfill in Becker, MN. The facility diverts as much as 300,000 tons of waste per year from landfills in Minnesota annually.
### Hennepin Energy Resource Center (HERC)

**Location:** Minneapolis, MN // Hennepin County 5th US Congressional District

**Owner:** Hennepin County (public)

**Operator:** Covanta Hennepin Energy Resource Co., Inc. (private)

**Started:** 1989

**Technology:** Mass Burn

**Capacity: (MSW)** 1,212 tons per day

**Boilers:** 2

**Capacity: (Gross Steam)** 20,000 lbs/hr

**Capacity: (Gross Electric)** 36.7 MW

**People Served:** 1,156,212

**Websites**
- www.covanta.com
- www.hennepin.us/HERC

Through a steam line, HERC provides steam to buildings in downtown Minneapolis, including Target Field, home of baseball’s Minnesota Twins.

### Olmsted Waste-to-Energy Facility (OWEF)

**Location:** Rochester, MN // Olmsted County 1st US Congressional District

**Owner:** Olmsted County (public)

**Operator:** Olmsted County (public)

**Started:** 1987 (Units 1-2); 2010 (unit 3)

**Technology:** Mass Burn

**Capacity: (MSW)** 400 tons per day

**Boilers:** 3

**Capacity: (Gross Steam)** 61,000 lbs/hr

**Capacity: (Gross Electric)** 9.5MW

**People Served:** 140,000

**Websites**
- www.co.olmsted.mn.us

The OWEF produces steam and electricity for 37 buildings in the Olmsted County District Energy System (OCDES) and decreases the volume of waste going to landfill by about 90%. Since the facility opened in 1987, it has converted over 1.8 million tons of waste into energy.
Perham Resource Recovery Facility

**Location:** Perham, MN // Otter Tail County 7th US Congressional District

**Owner:** Prairie Lakes Municipal Solid Waste Authority (public)

**Operator:** Prairie Lakes Municipal Solid Waste Authority (public)

**Started:** 1986; 2014 (expansion)

**Technology:** Mass Burn

**Capacity:** 200 tons per day

**Boilers:** 2

**Capacity:** (Gross Steam) 30,000 lbs/hr

**Capacity:** (Gross Electric) 4.5 MW

**People Served:** 75,000

**Websites**

This facility is operated through a joint powers agreement between Becker, Otter Tail, Todd, and Wadena counties. An expansion project adding a waste heat boiler, additional air pollution control equipment and a material recovery facility is under construction and will be completed in 2014.

Polk County Solid Waste Resource Recovery Facility

**Location:** Fosston, MN // Polk County 7th US Congressional District

**Owner:** Polk County (public)

**Operator:** Polk County (public)

**Started:** 1988

**Technology:** Modular

**Capacity:** (MSW) 80 tons per day

**Boilers:** 2

**Capacity:** (Gross Steam) 21,000 lbs/hr

**People Served:** 90,000

**Websites**

This facility takes municipal solid waste from Beltrami, Clearwater, Mahnomen, Norman and Polk counties. It is attached to a Material Recovery Facility (MRF) that processes materials out of the waste stream prior to incineration. Of the approximately 33,000 tons of waste received each year, about 8,000 tons are removed for reuse or recycling prior to disposal.
### Pope/Douglas Waste-to-Energy Facility

**Location:** Alexandria, MN // Douglas County 7th US Congressional District

**Owner:** Pope/Douglas Solid Waste Joint Powers Board (public)

**Operator:** Pope/Douglas Solid Waste Joint Powers Board (public)

**Started:** 1987 (units 1-2); 2011 (unit 2)

**Technology:** Mass Burn

**Capacity: (MSW)** 240 tons per day

**Boilers:** 3

**Capacity: (Gross Steam)** 36,000 lbs/hr

**Capacity: (Gross Electric)** 0.5 MW

**People Served:** 42,000

**Websites**

- [www.popedouglasrecycle.com](http://www.popedouglasrecycle.com)

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### Xcel Energy - Red Wing Steam Plant

**Location:** Red Wing, MN // Goodhue County 2nd US Congressional District

**Owner:** Xcel Energy (private)

**Operator:** Xcel Energy (private)

**Started:** 1987

**Technology:** RDF

**Capacity: (MSW)** 720 tons per day

**Boilers:** 2

**Capacity: (Gross Electric)** 24 MW

**People Served:** 1,280,891

**Websites**

- [http://www.xcelenergy.com](http://www.xcelenergy.com)

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Pope/Douglas Solid Waste Management is a partnership created by Pope and Douglas Counties in 1983. The solid waste management system is owned and governed by Pope County at 25% and Douglas County at 75%. The facility uses the Continuous Emission Monitoring System, which constantly monitors burn temperature, oxygen, carbon monoxide, opacity, sulfur dioxide, nitrogen oxide.

Red Wing's two units were converted in 1986 to burn refuse-derived fuel. Each year the Red Wing plant incinerates 200,000 tons of RDF, producing enough electricity to power 50 percent of Red Wing homes.
Originally built as a coal-fired generating facility, Wilmarth's two units were converted in 1987 to burn refuse-derived fuel (RDF). In order to reduce emissions, the plant employs a scrubber, which treats flue gas with a water spray and lime slurry, and baghouse, which traps particulate by forcing gas streams through large filter bags.

**Location:** Mankato, MN // Blue Earth County 1st US Congressional District
**Owner:** Xcel Energy (private)
**Operator:** Xcel Energy (private)
**Started:** 1987
**Technology:** RDF
**Capacity:** 720 tons per day
**Boilers:** 2
**Capacity:** 19 MW
**Websites** http://www.xcelenergy.com

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**SPOTLIGHT: Waste-to-Energy Carbon Offsets**

Credits represent verified reductions in net greenhouse gas emissions achieved by generating renewable energy from waste at a WTE facility.

To date, three WTE expansions (Honolulu, Lee County, and Hillsborough County) have been validated as carbon offset projects in North America by the Verified Carbon Standard (VCS), a global standard for the approval of credible voluntary offset credits. The Lee and Hillsborough County facilities in Florida have been selling carbon credits into the voluntary market for several years. The credits represent reductions in net greenhouse gas (GHG) emissions achieved by generating renewable energy from waste at the facility. In addition, for the credits to be approved under the standard, they must also meet strict program requirements and be independently verified by a qualified third party.

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**Waste-to-Energy Carbon Offsets**
Wheelabrator Concord has a strong commitment and track record of providing a safe and healthy environment for our neighbors to enjoy for years to come. Wheelabrator Concord is committed to supporting Concord-area organizations such as the Concord YMCA, Penacook Community Center, Concord Payson Center for Cancer Care and the Concord Education Fund.

Location: Penacook, NH // Merrimack County
2nd US Congressional District

Owner: Wheelabrator Concord, L.P. (private)

Operator: Wheelabrator Concord, L.P. (private)

Started: 1989

Technology: Mass Burn

Capacity: 500 tons per day

Boilers: 2

Capacity: 14 MW

People Served: 169,000

Certifications: VPP STAR

Websites: www.wtienergy.com
Covanta acquired the Camden facility in August 2013 from Foster Wheeler, which was the original designer, builder, owner and operator of the facility. The facility generates approximately 170 million kilowatts of electricity each year—enough electricity to operate the plant and provide power to 25,000 homes.
Covanta Warren Energy Resource Company Facility

218 Mt. Pisgah Ave., Oxford, NJ 07863

Covanta Warren has been a recipient of the Environmental Stewardship Award from the NJ Dept. of Environmental Protection, an award that highlights environmental stewardship among the regulated business community. The energy generated by the facility is sold to Jersey Central Power and Light, a First Energy Company.

<table>
<thead>
<tr>
<th>Location:</th>
<th>Oxford, NJ // Warren County 5th US Congressional District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner:</td>
<td>Covanta Warren Energy Resource Co., L.P. (private)</td>
</tr>
<tr>
<td>Started:</td>
<td>1988</td>
</tr>
<tr>
<td>Technology:</td>
<td>Mass Burn</td>
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<tr>
<td>Capacity: (MSW)</td>
<td>450 tons per day</td>
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<td>2</td>
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<tr>
<td>Capacity: (Gross Electric)</td>
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<td>People Served:</td>
<td>35,000</td>
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<td>Certifications:</td>
<td>VPP STAR</td>
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<tr>
<td>Websites:</td>
<td><a href="http://www.covanta.com">www.covanta.com</a></td>
</tr>
</tbody>
</table>

Essex County Resource Recovery Facility

112, 202 Blanchard St., Newark, NJ 01705

Each unit was originally equipped with electrostatic precipitators (ESPs) and spray dry scrubber systems. The ESPs are currently being replaced with state-of-the-art fabric filter baghouses and will be completed on all lines by the end of 2016. Additionally, the units are equipped with ammonia injection and Covanta’s proprietary Low NOx system for NOx control as well as carbon injection for heavy metal control.

<table>
<thead>
<tr>
<th>Location:</th>
<th>Newark, NJ // Essex County 8th US Congressional District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owner:</td>
<td>Covanta Essex Company (private)</td>
</tr>
<tr>
<td>Operator:</td>
<td>Covanta Essex Company (private)</td>
</tr>
<tr>
<td>Started:</td>
<td>1990</td>
</tr>
<tr>
<td>Technology:</td>
<td>Mass Burn</td>
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<tr>
<td>Capacity: (MSW)</td>
<td>2,277 tons per day</td>
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<tr>
<td>Boilers:</td>
<td>3</td>
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<tr>
<td>Capacity: (Gross Electric)</td>
<td>66 MW</td>
</tr>
<tr>
<td>People Served:</td>
<td>1,200,000</td>
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<tr>
<td>Certifications:</td>
<td>VPP STAR</td>
</tr>
<tr>
<td>Websites:</td>
<td><a href="http://www.covanta.com">www.covanta.com</a></td>
</tr>
</tbody>
</table>
New Jersey

Union County Resource Recovery Facility

The Union County Resource Recovery facility, which is owned by the Union County Utilities Authority, includes three mass-burn, waterwall boilers and a turbine generator nominally rated at 45 MW. The facility has a permitted processing capacity of 1,540 tons of solid waste per day, or about 562,000 tons per year.

1499 Rt. 1 North, Rahway, NJ 07065

Location: Rahway NJ // Union County
10th US Congressional District
Owner: Union County Utilities Authority (public)
Operator: Covanta Union, LLC (private)
Started: 1994
Technology: Mass Burn
Capacity: 1,440 tons per day
Boilers: 3
Capacity: (Gross Electric) 42.1 MW
People Served: 500,000
Certifications: VPP STAR
Websites: www.unioncountyutilitiesauthority.org
www.covanta.com

Wheelabrator Gloucester Company

The Wheelabrator Gloucester facility converts up to 500 tons of waste per day into fuel. It features an enhanced system for metals recovery that will help raise the county’s recycling rate to 42 percent—well above the national average. Wheelabrator Gloucester created and maintains a wildlife refuge and nature trail on 150 acres of wetlands surrounding the energy-from-waste facility, including a habitat restoration for the Bobwhite Quail population.

600 US Route 130, Westville, NJ 08093

Location: Westville, NJ // Gloucester County
1st US Congressional District
Owner: Wheelabrator Gloucester Company, L.P. (private)
Operator: Wheelabrator Gloucester Company, L.P. (private)
Started: 1990
Technology: Mass Burn
Capacity: 500 tons per day
Boilers: 2
Capacity: (Gross Electric) 14 MW
People Served: 263,000
Certifications: VPP STAR
Websites: www.wtienergy.com
Babylon Resource Recovery Facility

125 West Gleam St., West Babylon, NY 11704

The facility processes 750 tons per day of solid waste and generates up to 17 MW of renewable energy. Given a landfill moratorium on Long Island, the facility provides an environmentally safe alternative to dispose of waste. This facility also operates with a “zero discharge” of process water, meaning all wastewater generated on-site is treated and reused.

Location: West Babylon, NY // Suffolk County 3rd US Congressional District
Owner: Covanta Babylon, Inc. (private)
Operator: Covanta Babylon, Inc. (private)
Started: 1989
Technology: Mass Burn
Capacity: 750 tons per day
Boilers: 2
Capacity: 16.8 MW
People Served: 430,000
Websites: www.covanta.com
## New York

### Covanta Hempstead

**Location:** Westbury, NY // Nassau County  
**4th US Congressional District**

**Owner:** Covanta Hempstead Co. (private)

**Operator:** Covanta Hempstead Co. (private)

**Started:** 1989

**Technology:** Mass Burn

**Capacity: (MSW)** 2,505 tons per day

**Boilers:** 3

**Capacity: (Gross Electric)** 72 MW

**People Served:** 1,000,000

**Certifications:** VPP STAR

**Websites**

- www.covanta.com

The Covanta Hempstead facility is Long Island's largest energy-from-waste facility. It is the first U.S installation of mass mass-burn technology by Deutsche Babcock Anlagen. Covanta Hempstead accepts delivery of waste 6 days a week and processes 24 hours a day every day. Steam created in the combustion process drives an 80 MW turbine generator, producing electricity for in-plant use and for sale to the local utility. The facility won the 2014 Silver SWANA waste-to-energy excellence award.

### Dutchess County Resource Recovery Facility

**Location:** Poughkeepsie NY // Dutchess County  
**18th US Congressional District**

**Owner:** Dutchess County Resource Recovery Agency (public)

**Operator:** Wheelabrator Dutchess County (private)

**Started:** 1987

**Technology:** Mass Burn

**Capacity: (MSW)** 450 tons per day

**Boilers:** 2

**Capacity: (Gross Electric)** 9.8 MW

**People Served:** 293,562

**Certifications:** VPP STAR

**Websites**

- www.dcrra.org
- www.wtienergy.com

The facility has a capacity of processing 164,000 tons of waste per year and has a turbine that converts energy from the waste, which is then sold to Central Hudson Gas and Electric. The facility generates enough electricity to power approximately 10,000 homes. The facility also recovers 10 to 14 million pounds of ferrous metals for recycling each year. In July 2014, Wheelabrator assumed operations of the facility under a new contract that runs through June 30, 2027.
Huntington Resource Recovery Facility

99 Town Line Rd., East Northport, NY 11731

The Huntington Resource Recovery facility serves the towns of Huntington and Smithtown. The facility processes 750 tons per day of solid waste, which generates up to 25 MW of renewable energy that is sold to PSEG Long Island.

MacArthur Waste-to-Energy Facility

4001 Veterans Memorial Hwy, Ronkonkoma, NY 11779

The MacArthur Waste-to-Energy facility employs a mass burn technology to reduce the volume of waste by 85%-90% (excluding metals). The facility processes 486 tons per day on average of residential and commercial municipal solid waste. Steam is recovered to generate electricity that is used to power the facility and sold to the Long Island Power Authority. The facility won the 2007 ASME Large Combustion facility award.
Niagara Falls Resource Recovery Facility

100 Energy Blvd. at 56th St. Niagara Falls, NY 14303

Covanta Niagara teamed with two local organizations to aid in the completion of an expansion project of the Niagara Floral Center and Greenhouse in Wheatfield, NY. The new greenhouse building, which was designed to be fully accessible to people with disabilities, provides more than three times the space than previously available for horticulture and vocational programs.

Onondaga Resource Recovery Facility

5801 Rock Cut Rd., Jamesville, NY 13078

For more than 15 years, Covanta Onondaga has provided resources and personnel as the largest benefactor of the Central New York Envirothon. This hands-on educational competition challenges student teams on their knowledge of aquatics, forestry, wildlife, soils and landscape, and current environmental issues.
The Oswego County Energy Recovery facility was completely retrofitted from 1999 to 2000. A state-of-the-art emissions control system was installed. The facility was upgraded in 2009 to recover and recycle ferrous metals.
## Wheelabrator Hudson Falls

**Location:** Hudson Falls, NY // Washington County
- 21st US Congressional District

**Owner:** Wheelabrator Hudson Falls LLC (private)

**Operator:** Wheelabrator Hudson Falls LLC (private)

**Started:** 1991

**Technology:** Mass Burn

**Capacity:** 500 tons per day

**Boilers:** 2

**Capacity:** 15 MW

**People Served:** 345,966

**Certifications:** VPP STAR

**Websites:** www.wtienergy.com

93 River Street, Hudson Falls, NY 12839

The Wheelabrator Hudson Falls energy-from-waste facility serves homes and businesses in Washington and Warren counties. The electricity generated by the facility not only powers its own operations, but also the equivalent of 15,000 New York homes. In 2015, the facility recovered 2,470 tons of metals and avoided the use of 72,000 tons of coal for power.

## Wheelabrator Westchester

**Location:** Peekskill, NY // Westchester County
- 17th US Congressional District

**Owner:** Wheelabrator Westchester, L.P (private)

**Operator:** Wheelabrator Westchester, L.P (private)

**Started:** 1984

**Technology:** Mass Burn

**Capacity:** 2,250 tons per day

**Boilers:** 3

**Capacity:** 18,000 lbs/hr

**Capacity:** 60 MW

**People Served:** 855,000

**Certifications:** VPP STAR

**Websites:** www.wtienergy.com

One Charles Point Ave., Peekskill, NY 10566

The Wheelabrator Westchester energy-from-waste facility serves homes and businesses in Westchester County. The electricity generated by the facility not only powers its own operations, but also the equivalent of 67,000 New York homes. The facility also provides steam to White Plains Linen, partnering with the commercial laundry operation in a newly constructed steam line to power their operations and reduce their reliance on fossil fuels.
The Covanta Tulsa Renewable Energy facility won the bronze SWANA Waste-to-Energy excellence award in 2013. The steam from the facility is primarily sold to the Holly Frontier refinery.
Marion County Solid Waste-to-Energy Facility

4850 Brooklake Road, NE, Brooks, OR 97305

The Marion County Energy-from-Waste facility began commercial operation in March 1987, serving the solid waste management needs of the approximately 300,000 people of Marion County, Oregon. The facility was the first mass-burn waterwall resource recovery facility combusting MSW in the United States to use dry flue gas scrubbers and fabric filter baghouses to control acid gases and particulates.

Location: Brooks, OR // Marion County
5th US Congressional District

Owner: Covanta Marion, Inc. (private)

Operator: Covanta Marion, Inc. (private)

Started: 1987

Technology: Mass Burn

Capacity: 550 tons per day

Boilers: 2

Capacity: 13.1 MW

People Served: 314,866

Certifications: VPP STAR

Websites: www.covanta.com
Covanta Plymouth Renewable Energy

1155 Conshohocken Rd., Conshohocken, PA 19428

The Covanta Plymouth facility began commercial operation in February 1992 and serves municipalities in eastern Montgomery County, Pennsylvania. The facility is equipped with a water-cooled turbine-generator condenser that converts steam to water for continuous cycling of water through the boilers.

**Location:** Conshohocken, PA // Montgomery County
13th US Congressional District

**Owner:** Covanta Plymouth Renewable Energy L.P. (private)

**Operator:** Covanta Plymouth Renewable Energy L.P. (private)

**Started:** 1982

**Technology:** Mass Burn

**Capacity:**
- Tons per day: 1,216
- (MSW) tons per day

**Boilers:** 2

**Capacity:**
- (Gross Electric): 32 MW

**People Served:** 421,786

**Certifications:** VPP STAR

**Websites:** www.covanta.com
Delaware Valley Resource Recovery Facility

**Location:** Chester, PA // Delaware County
**Owner:** Covanta Delaware Valley, L.P. (private)
**Operator:** Covanta Delaware Valley, L.P. (private)
**Started:** 1992
**Technology:** Mass Burn
**Capacity:** 2,688 tons per day
**Boilers:** 6
**Capacity:** 87 MW
**People Served:** 1,000,000
**Certifications:** VPP STAR
**Websites:** www.covanta.com

10 Highland Ave., Chester, PA 19013

Covanta began operating the facility in 2005. In 2012, Covanta became the owner and operator of the facility when the company purchased the facility from GE Energy Financial Services. The plant processes up to 3,510 tons of municipal and commercial solid waste each day.

Lancaster County Resource Recovery Facility

**Location:** Bainbridge, PA // Lancaster County
**Owner:** Lancaster County Solid Waste Mgmt. Authority (public)
**Operator:** Covanta Lancaster, Inc. (private)
**Started:** 1991
**Technology:** Mass Burn
**Capacity:** 1,200 tons per day
**Boilers:** 3
**Capacity:** 33.1 MW
**People Served:** 420,000
**Certifications:** VPP STAR
**Websites:** www.lcswma.org

1911 River Rd. Bainbridge, PA 17502

This 56-acre facility on the banks of the Susquehanna River is a “zero discharge” facility, meaning that all the wastewater generated on-site is treated and reused in the waste management process. Covanta Lancaster also uses secondary sewage treatment runoff from a nearby treatment plant for all of its process water.
Susquehanna Resource Management Complex

1670 South 19th St., Harrisburg, PA 17104

Owned by the Lancaster County Solid Waste Management Authority, (LCSWMA) the facility is part of a larger Integrated System that serves the solid waste management needs of both Dauphin County and Lancaster County. LCSWMA acquired the facility in December 2013. Covanta has been the operator since 2007.

Location: Harrisburg, PA // Dauphin County
11th US Congressional District
Owner: Lancaster County Solid Waste Mgmt. Authority (public)
Operator: Covanta Harrisburg, Inc. (private)
Started: 1972; 2006 (retrofit)
Technology: Mass Burn
Capacity: 800 tons per day
Boilers: 3
Capacity: 20.8 MW
People Served: 100,000
Websites
www.lcswma.org/srmc
www.covanta.com

Wheelabrator Falls

1201 New Ford Mill Road, Morrisville, PA 19067

The Wheelabrator Falls facility generates enough electricity to power approximately 41,000 Bucks County homes. As part of its special waste capabilities, Wheelabrator Falls features a powerful industrial drum shredder that enhances its ability to process industrial waste, and can shred as much as 150 tons per hour while achieving up to 80 percent volume reduction.

Location: Morrisville, PA // Bucks County
8th US Congressional District
Owner: Wheelabrator Falls Inc. (private)
Operator: Wheelabrator Falls Inc. (private)
Started: 1994
Technology: Mass Burn
Capacity: 1,500 tons per day
Boilers: 2
Capacity: 53 MW
People Served: 550,000
Certifications VPP STAR
Websites
www.wtienergy.com

Websites

Certifications VPP STAR
The York County Resource Recovery Center is currently undergoing major improvements, including tipping hall and pit expansion, scalehouse relocation, and a new education center, which will be constructed to better serve the large number of school students, civic groups, and individuals who tour the facility.

<table>
<thead>
<tr>
<th>Location:</th>
<th>York, PA // York County 4th US Congressional District</th>
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<tbody>
<tr>
<td>Owner:</td>
<td>York County Solid Waste Authority (public)</td>
</tr>
<tr>
<td>Operator:</td>
<td>Covanta York Renewable Energy LLC (private)</td>
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<tr>
<td>Started:</td>
<td>1989</td>
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<tr>
<td>Technology:</td>
<td>Mass Burn</td>
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<tr>
<td>Capacity:</td>
<td>1,344 tons per day</td>
</tr>
<tr>
<td>Boilers:</td>
<td>3</td>
</tr>
<tr>
<td>Capacity: (Gross Electric)</td>
<td>42MW</td>
</tr>
<tr>
<td>People Served:</td>
<td>450,000</td>
</tr>
<tr>
<td>Certifications:</td>
<td>VPP STAR; ISO 14001</td>
</tr>
<tr>
<td>Websites:</td>
<td><a href="http://www.ycswa.org">www.ycswa.org</a></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.covanta.com">www.covanta.com</a></td>
</tr>
</tbody>
</table>

The U.S Congress Relies on WTE to improve its environmental sustainability

In 2011, Congress began sending approximately 90 percent of its trash to a waste-to-energy facility in Alexandria, VA. The Architect of the Capitol reported that in the first nine months, 3,700 tons of non-recyclable solid waste from Congressional facilities has processed by waste-to-energy.

"Congress has made huge strides to improve our environmental sustainability,"
- then-House Administration Chairman Dan Lungren (R-Calif.).

The positive report is good news for the House Administration and Senate Rules and Administration which is responsible for managing the waste generated in the U.S. Capitol and congressional office buildings. In 2011, Rep. Jim Moran (D-Va.), the ranking member of the Appropriations Subcommittee on the Interior and Environment, has praised the waste-to-energy program last October. "It’s the appropriate thing to do, burning our waste and getting energy from it," he said. "We do it in my district, and it’s something we studied carefully when I was the mayor of Alexandria."
The steam from the Davis Energy Recovery facility is used by Hill Air Force Base to heat base facilities. Enough electricity is generated from the steam to power site operations with a portion sold to PacifiCorp.
Alexandria/Arlington Resource Recovery Facility

5301 Eisenhower Ave., Alexandria, VA 22304

The Alexandria/Arlington Resource Recovery Facility began commercial operation in February 1988 and serves about 300,000 residents of the County of Arlington and the City of Alexandria, which jointly own the site. The facility is on the smallest site of any Energy-from-Waste facilities operated by Covanta.

Location: Alexandria, VA
8th US Congressional District

Owner: Covanta Arlington/Alexandria, Inc. (private)

Operator: Covanta Arlington/Alexandria, Inc. (private)

Started: 1988

Technology: Mass Burn

Capacity: 975 tons per day

Boilers: 3

Capacity: (Gross Electric) 22 MW

People Served: 300,000

Certifications: VPP STAR

Websites: www.covanta.com
### Hampton-NASA Steam Plant

**Location:** Hampton, VA
- 2nd US Congressional District

**Owner:** NASA and City of Hampton  (public)

**Operator:** City of Hampton  (public)

**Started:** 1980

**Technology:** Mass Burn

**Capacity:** 240 tons per day

**Boilers:** 2

**Capacity: (Gross Steam)** 66,000 lbs/hr

**People Served:** 180,000

**Websites**
- [www.hampton.gov](http://www.hampton.gov)

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### I-95 Energy/Resource Recovery Facility (Fairfax)

**Location:** Lorton, VA // Fairfax County
- 11th US Congressional District

**Owner:** Covanta Fairfax, Inc. (private)

**Operator:** Covanta Fairfax, Inc. (private)

**Started:** 1990

**Technology:** Mass Burn

**Capacity:** 3,000 tons per day

**Boilers:** 4

**Capacity: (Gross Electric)** 93 MW

**People Served:** 1,651,647

**Certifications** VPP STAR

**Websites**
- [www.covanta.com](http://www.covanta.com)
Wheelabrator Portsmouth serves homes and businesses in Portsmouth, Norfolk, Chesapeake, Virginia Beach, Franklin, Suffolk, Southampton County and Isle of Wight County in Virginia. The facility generates enough electricity to power the equivalent of 32,000 Virginia homes in addition to its own operations. It also provides steam to the neighboring U.S Navy shipyard in Norfolk.

Location: Portsmouth, VA
3rd US Congressional District

Owner: Wheelabrator Portsmouth Inc. (private)

Operator: Wheelabrator Portsmouth Inc. (private)

Started: 1988

Technology: RDF

Capacity: 2,000 tons per day

Boilers: 4

Capacity: 322,000 lbs/hr

(Gross Steam)

Capacity: 60 MW

(Gross Electric)

People Served: 1,127,790

Websites: www.wtienergy.com

Third Way’s Report recommends a mass-based approach to leverage a wider range of carbon-reducing technologies, including WTE

Getting it Right: The Next Fifteen Years of Energy

By Matt Goldberg

Excerpt—"We first highlight how a mass-based approach allows states to support a wider range of carbon reducing activities, zeroing in on four key examples: energy efficiency retrofits for commercial and public buildings, existing carbon negative waste-to-energy generation, carbon capture and storage retrofits for existing fossil plants, and existing zero-emitting nuclear power. We then explain how the mass-based approach provides a simpler path to compliance, better compatibility with existing state energy policies, and greater environmental integrity compared to a rate based approach."

Access the full report here:
http://www.thirdway.org/report/getting-it-right-the-next-fifteen-years-of-energy
The facility can handle up to 800 tons per day and can generate enough electricity to power 13,000 homes. The power generated is sold to Spokane’s Avista Utilities and earns about $5 million in power sales annually. The City of Spokane took over operations of the plant in November 2014.
Since the facility began operation in 1986, it has sold steam to Saputo Cheese, USA. The electricity produced is enough to power the facility’s operations. Excess electricity is sold under contract to Xcel Energy.
Xcel Energy French Island Generating Station

53,273 tons of refuse were burned for fuel in 2013 at the French Island waste-to-energy plant, generating enough electricity to power approximately 10,000 Wisconsin homes.

Location: La Crosse, WI // La Crosse County
3rd US Congressional District

Owner: Xcel Energy (private)

Operator: Xcel Energy (private)

Started: 1988

Technology: RDF (co-fired 50-50 with coal)

Capacity: 400 tons per day (RDF)

Boilers: 2

Capacity: 28 MW (attributed to RDF)

People Served: 250,000

Websites
https://www.xcelenergy.com

The Energy Recovery Council (ERC) celebrates its 25th anniversary in 2016. It was formed in 1991 as the Institute for Resource Recovery. Shortly thereafter, it operated as the Integrated Waste Services Association. In 2008, the organization became known as the Energy Recovery Council. ERC President Ted Michaels says, “While our name has changed, our mission has always remained true to promoting waste-to-energy (WTE) technology as an important component of community waste management systems.”

The broad goal of the ERC is to create an environment in which waste-to-energy can thrive and grow. The association accomplishes this through a focus on advocacy, public information, and engagement, and the development and dissemination of research. The ERC has approximately 60 members, roughly half of which are local governments. “Like any successful trade association, our members form the foundation of everything that we do and we are delighted by the long-term support of our membership,” says Michaels.

More information about ERC is available at www.energyrecoverycouncil.org
To keep plastic waste from reaching the ocean, Ocean Conservancy has identified treatment of waste by using gasification or incineration with energy recovery as an important strategy and evaluated several different methods of energy recovery (see table below). To understand the drivers of commercial viability for different waste-treatment options, Ocean Conservancy spoke with independent experts and industry representatives about conversion of waste to solids (by recycling plastic and creating fillers in non-plastic goods), oil (through pyrolysis), gas (through gasification), and electricity (through industrial and nonindustrial incineration), as well as various forms of landfilling.

Their analysis demonstrated that the most proven treatment option across all five metrics is incineration with energy recovery, followed by gasification. Incineration with energy recovery could be economically attractive for a subset of their focus countries (China, Thailand, and Vietnam). This is based on local electricity prices or feed-in tariffs, and incineration’s ability to consume large quantities of mixed waste even at low specifications. While incineration with energy recovery has received some favorable momentum in terms of government policies in many countries, it was one of the most controversial treatment options considered in this study. The report found that making gasification profitable requires high local-market prices for electricity, government-set feed-in tariffs for electricity, or high tipping fees for traditional waste disposal—conditions that are sometimes but certainly not always present.

The report also found that over the next five years, new technologies for valorizing low-value plastic, such as pyrolysis, must become commercially viable, which means high-leakage countries should provide the conditions that enable it. Therefore, change initiatives must promote market access for and the ability to deploy state-of-the-art waste management technology providers. Most importantly, this will require providing companies with secure feedstock, defined by waste composition and mass, and creating clear investment parameters in areas such as energy prices and feed-in tariffs, offtake agreements, and local public-finance options. Thus, expanding technology markets will also help bring down treatment costs. For example, based on the experience of the ethanol fuel sector, we found that investing in the expansion of pyrolysis capacity could reduce its annualized costs by 25 to 35 percent, making it commercially viable in a broad

**What leakage-reduction solutions are available?**

- Closing leakage points within the collection system
- Increasing waste-collection rates by expanding collection service
- Using a variety of waste-to-fuel (e.g., gasification) or waste-to-energy (e.g., incineration with energy recovery) technologies to treat waste
- Manually sorting high-value plastic waste and converting much of the remainder to refuse-derived fuel (RDF).
The Energy Recovery Council is the trade association representing companies, organizations, and local governments engaged in recovering energy and materials from waste.

www.energyrecoverycouncil.org

@ERC_WTE

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