



# EMBRACING THE ZERO WASTE CHALLENGE

SUSTAINABILITY REPORT 2012



## OUR COMPANY

Message from the CEO .....	2
Waste Management in Summary .....	4
Sustainability Goals and Progress to Date .....	5
Our Business Mix .....	6
Awards .....	8
Sustainability Key Performance Indicators .....	9
About this Report .....	10
Global Reporting Initiative .....	10

This report is structured in three major sections, or “books.”

**Book 1 Our Company**

A high-level overview of our operations, sustainability goals and progress

**Book 2 Our Performance: Committed to Sustainability**

Detailing our efforts and performance in running our company sustainably

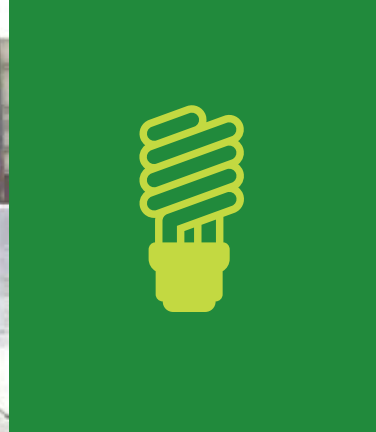
**Book 3 Our Future: Maximizing Value from Waste**

Highlighting our work to convert waste into resources

In keeping with our commitment to sustainability, and to save paper, we have created this report in a modular fashion. If you are reading a shorter, executive summary version, you will have Book 1 and Book 3. If you are reading the longer, full report, you will also have Book 2. The table of contents for Book 1 is above; the tables of contents for Books 2 and 3 can be found on their respective covers. We have also developed an Appendix, which includes supplemental information and is referred to in a number of places in this report. All three Books and the Appendix can be read online at: [www.wm.com/sustainability](http://www.wm.com/sustainability).



ZERO WASTE =  
TRANSFORMING  
WASTE INTO  
VALUABLE  
RESOURCES



IN 2011,  
WE MANAGED  
NEARLY  
**13M TONS**  
OF RECYCLED  
COMMODITIES



IN 2011  
WE CREATED  
ENOUGH  
ENERGY  
TO POWER  
**1.17+M**  
HOMES



WE HAVE  
DEDICATED  
**26K**  
ACRES TO  
WILDLIFE  
HABITATS

## MESSAGE FROM THE CEO



Dear Valued Stakeholder,

Sustainability is a central motivation for our transformation from a waste collection and disposal company to one that views and uses waste as a resource.

At Waste Management, environmental stewardship is linked inextricably to our business performance. As recycling volumes rise and the demand for recycled commodities grows, our revenues from this part of the business rise. As the demand for renewable energy increases, driven by governmental and customer sustainability goals, so do Waste Management revenues from green energy. And, of course, as demand falls or the value of recycled goods or renewable energy declines, our revenues from these activities fall as well.

We take a long-term outlook, however. Despite periodic dips in recycling and green energy prices, we continue to develop new ways to convert waste into valuable resources. In 2011, for example, we expanded our recycling capacity by 1 million tons, and we are setting up “eco-opportunities” at our transfer and disposal facilities to extract and repurpose recyclables otherwise destined for landfill. We also extended our efforts to educate consumers and provide incentives for them to recycle by partnering with Recyclebank on our Greenopolis and Oceanopolis programs.

Waste Management has provided recycling services for decades, but today we are determined to expand recycling to more, and more challenging, venues and waste streams. For example, as the title sponsor of the Waste Management Phoenix Open in 2012, we issued a “Zero Waste Challenge” to make the golf tournament the “Greenest Show on Grass.” We set goals to divert more than 90 percent of the discards from the tournament away from landfill, and to recover more than 70 percent for further use through donation to charity, recycling and composting. We exceeded those goals — diverting 97 percent of the waste and recovering 82 percent. We also encouraged the more than half a million people who attended this event — and the millions of others who watched the tournament on TV — to think about ways to repurpose materials and avoid waste.

As our own business evolves, we are determined to help our customers meet their sustainability goals — and perhaps even to inspire new goals. Our vision is to remake our company into a “one-stop shop” for customers seeking sustainability solutions. The progress we are making toward our sustainability goals, which were first announced in 2007, also reflects the success of our long-term business strategy. Despite the economic headwinds of 2010 and 2011, I’m pleased to report on major milestones in our progress.

**Recycling** Our recycling business prospered in 2011. Although volatility in the commodity markets has continued into 2012, we have seen an expansion in revenue from our recycling operations. With almost 13 million tons of recyclables handled in 2011, we are nearly two-thirds of the way to meeting our 2020 sustainability goal. We are building our capacity to take on difficult-to-recycle materials such as electronics, as we partner with our customers and outside experts to certify the safety of these processes. We also have grown our organics processing to over 2.5 million tons handled in 2011.

**Green Energy** Waste Management alone produces more energy than the entire U.S. solar industry. And we continue on a steady pace to increase our renewable energy generation. In 2011, we produced enough energy to power more than 1.17 million homes. To meet our 2020 goal of generating enough energy to power 2 million households, we will need to expand our overall capacity with new ways of generating energy. This focus is a main driver of our investments in new technologies to convert waste to fuel. It also motivates our expansion into partnerships in Europe and Asia to help meet the growing global interest in low-carbon, waste-based energy production.

We are committed to finding the “next big things” — or even the small profitable things — that will relegate the landfill to the last resort for waste after all possible value has been extracted. We recognize that it takes time to develop the innovative technologies necessary to derive new uses for waste streams, and we are realistic about the challenge of finding the right innovations. That is why we have invested in a portfolio of more than 30 partnerships focused on alternative energy technologies. In this way, we function as venture capitalists for entrepreneurs looking for new ways to transform waste into useful products such as fuels and chemicals. As we work together, we gain insights from what fails as well as what succeeds.

**Fleet Efficiency** In 2011, we exceeded our 2020 goal to reduce carbon dioxide (CO<sub>2</sub>) emissions from our fleet, and we can report dramatic improvement in per-mile emissions of nitrogen oxides (NO<sub>x</sub>) and particulate material. After several years of experimentation, we have determined that converting our fleet to natural gas is our best option today to improve efficiency and reduce greenhouse gas emissions. As of second quarter 2012, we operate more than 1,600 natural gas collection vehicles — the largest heavy-duty natural gas fleet in the country. We continue to invest in public fueling stations for our fleet, as well as other local natural gas fleets. We are also improving fuel efficiency with steps such as optimizing routing and maintaining proper tire pressure.

Our innovative services help, too. The Bagster collection bag eliminates half the transport of a disposal bin, and our Solar Compactors mean we avoid trips to pick up half-full containers — minimizing emissions, saving fuel and saving our customers money.

**Habitat Conservation** We met our 2020 goal of creating 100 certified wildlife habitat sites and protecting 25,000 acres a decade ahead of time. These certified habitats are a source of pride for our employees, are good for the environment and are assets to the communities we serve. We’ve established habitats at our large facilities; now we’re beginning to focus on smaller, more urban sites where wildlife preservation is a valuable community amenity.

We are charting new territory at Waste Management. We’re no longer merely in the business of picking up the trash and putting it somewhere safe. Keeping the environment — and our people and neighbors — safe remains our most fundamental commitment. We increasingly recognize, however, that we have a new role to play. Our customers, and the communities in which we operate, want more sustainable ways to deal with what they discard. When they generate waste, we see opportunities to produce low-carbon power and turn what can be recycled into feedstocks. We’re realistic in our approach. Each year we get better at finding ways to recycle more and recycle more challenging commodities. We also believe that what can’t be recycled at a price the customer is willing to pay can be transformed into energy, fuel or chemicals — and in the process generate fewer emissions and a lower carbon footprint. The fact that more customers each year come to us for sustainable waste management solutions tells us that this direction is a solid base on which to transform our business for 21st century success.

Respectfully,



**David P. Steiner**  
Chief Executive Officer

## WASTE MANAGEMENT IN SUMMARY

Waste Management is the leading provider of comprehensive waste management and environmental services in North America. We are also a leading developer, operator and owner of waste-to-energy and landfill-gas-to-energy facilities in the United States. Headquartered in Houston, Texas, the company is publicly traded (NYSE:WM) and operates through subsidiaries providing a full range of environmental services. We serve over 21 million customers with environmentally sound management of solid wastes and the transformation of waste into usable resources.



## 2020 SUSTAINABILITY GOALS AND PROGRESS TO DATE, 2011

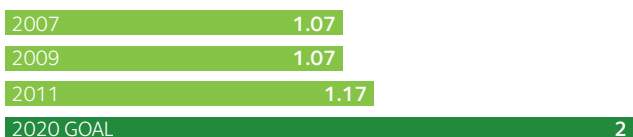
### TONS OF RECYCLABLES MANAGED

(million tons)



### WASTE-BASED ENERGY PRODUCTION

(million households)



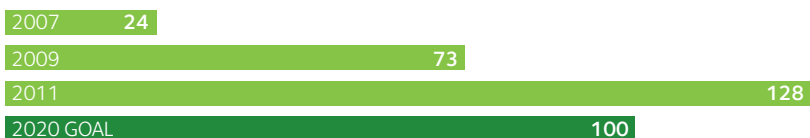
### FLEET EMISSIONS

(percent reduction in CO<sub>2</sub> equivalent (CO<sub>2</sub>e) emissions)

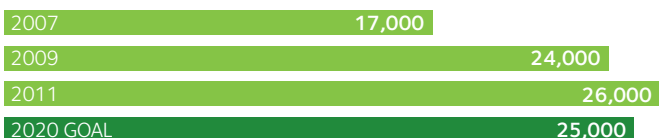
2007 emissions: 2.14M tons CO<sub>2</sub>e



### NUMBER OF WILDLIFE HABITAT SITES



### NUMBER OF ACRES PROTECTED



## OUR BUSINESS MIX

Four years ago, we began reporting on our activities in a new way. We distinguished our operations that extract value from waste — what we term “green services” — from those that isolate it in a safe disposal site (the traditional landfill model). We described this allocation in terms of the revenue generated from each of these activities. (The top two pie charts at right illustrate the revenue percentages for 2011 and 2007.)

Green services include all forms of recycling, as well as waste-to-energy and landfill-gas-to-energy projects and revenue from collections that feed these projects. The green category includes our consulting work helping other enterprises reduce and recycle waste as well as produce green energy. It also includes our work with partners to develop new ways to convert waste into a valuable resource, in particular the development of new low-carbon fuels and even chemicals not derived from fossil fuels.

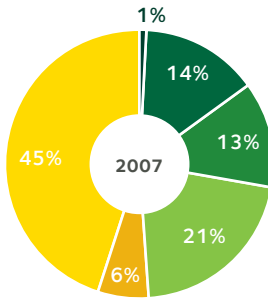
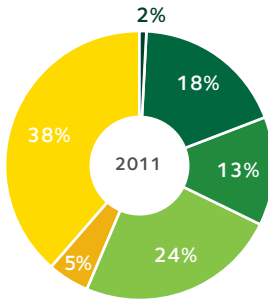
Our ultimate goal is to use all of the waste we receive and leave nothing discarded. When that happens, we will have only one revenue chart — green services. But we are realistic about the effort — and the time — it will take to get there. In 2011, we saw very promising signs. The revenues from our innovative services lines, for example, doubled from 1 percent to 2 percent. That number is a comparatively small contribution to our revenue today, but it tells an interesting story. We are working with over a dozen teams of scientists, engineers and entrepreneurs to develop new ways to convert wastes into high-value goods. Some of these partnerships may revolutionize the way we think of waste; all tell us something about what’s practical as we work to convert waste into new products.

Another way to look at our mix of business is to separate our revenues from the collection of waste from what we make for “doing something” with the waste — whether it’s processing, recycling or converting the waste to fuel or power. Looking at our 2011 revenues in this way, we can see that we made more than \$5 billion from activities other than waste collection. The pie chart at the bottom of the opposite page indicates our allocation of revenue among disposing, recycling, treating and generating energy or fuels from waste and our work consulting with others on how to manage their waste.

This way of looking at our non-collection revenues captures the importance of recycling to Waste Management, as well as the promise of the innovative services we describe later in this report. We already make nearly half as much revenue from our innovative service lines as we do from disposal at traditional landfills. That tells us we are on the right track.



## WASTE MANAGEMENT MIX OF BUSINESS



### GREEN SERVICES

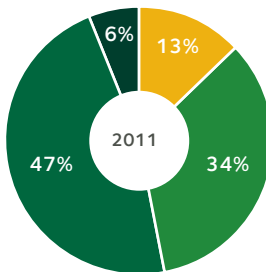
- **Newest Innovative Service Lines**  
 Includes Organic Growth Group/Upstream revenues, and Healthcare Solutions.
- **Recycling**  
 Includes Waste Management Recycling Services, Recycling Material Sales and Brokerage, landfill revenues from Revenue Generating Cover and Redirected Waste, Organics and recycling revenue within the collection line of business.
- **Green Energy Production Facilities**  
 Includes Wheelabrator Technologies' green energy facilities, Waste Management renewable energy and landfill-gas-to-energy facilities, and landfills with bioreactors.
- **Green Collection/Transfer**  
 Includes inter-company revenues from collection/transfer station operations to Waste Management "green" facilities (landfills generating energy, waste-to-energy facilities, recycling facilities).

### TRADITIONAL SERVICES

- **Traditional Landfill**  
 Includes revenues from disposal in landfills not used for energy recovery. Hazardous waste revenue is included in this category.
- **Traditional Collection/Transfer**  
 Includes traditional collection and transfer station lines of business.

Source: Full-year 2007 and 2011 revenue data

## MIX AMONG NON-COLLECTION REVENUES



- Traditional Landfill
- Green Energy
- Recycling
- Innovative Service Lines

## AWARDS

We were honored to receive the following awards and accolades.

2012



Top Waste and Disposal Service Company: World and North America indexes



Top 10 Best Corporate Citizen, *Corporate Responsibility Magazine*, Services Category

CARBON DISCLOSURE PROJECT

Top 10 percent of industrial companies for efforts to reduce emissions and mitigate the risks of climate change



Global Benchmark Index Company

2011



HOUSTON CHRONICLE  
chron.com



### Waste Management a “Most Ethical Company”

For the fifth consecutive year, Waste Management in 2012 was named one of the world’s most ethical companies by the Ethisphere Institute, a research-based organization advancing recognition of corporate social responsibility, business ethics, anti-corruption and sustainability best practices. One hundred and forty-five companies representing over three dozen industries were listed on their 2012 “WME Index,” with Waste Management the only environmental services or waste industry company to be named. Collectively, Ethisphere reports that these companies performed significantly better than the S&P 500 — even through the worldwide recession.

**MOST  
ETHICAL  
COMPANY  
AWARD  
5 YEARS RUNNING**

## SUSTAINABILITY KEY PERFORMANCE INDICATORS, 2009-2011

KEY PERFORMANCE INDICATORS	2009	2010	2011
<b>Greenhouse Gas (GHG) Footprint<sup>1</sup> (Metric Tons CO<sub>2</sub> Equivalents)</b>			
• Process	21,552,559	22,503,371	16,448,441
• Transportation	1,754,977	1,817,830	1,773,307
• Energy use	357,141	479,356	488,738
<b>Potential avoided GHG emissions from<sup>2</sup></b>			
• Renewable energy generation	3,504,234	3,502,225	4,005,380
• Waste-derived fuels produced and sold	23,976	13,954	18,647
• Reuse and recycling of materials	5,621,788	6,659,259	8,447,023
• Carbon permanently sequestered in landfills <sup>3</sup>	17,703,584	16,268,622	15,593,412
<b>Waste-Based Energy Benefits<sup>4</sup></b>			
• Tons of coal equivalent	5,591,000	5,350,000	6,089,000
• Barrels of oil equivalent	21,563,000	20,462,000	23,494,000
<b>Resource Savings Achieved through Recycling</b>			
• Energy savings – equivalent (number of households/year)	1.4 million	1.5 million	1.8 million
• GHG savings – per passenger car equivalent (number taken off the road/year)	4.8 million	5 million	6.3 million
Total Recordable Injury Rate	3.1	3.3	3.1
Vehicle Accident Rate (driver hours without accident)	12,066	12,981	13,298
Percent of Waste Management's Modern Landfills with Offsite Contaminated Groundwater <sup>5</sup>	0	0	0
Charitable Giving	\$12,861,665	\$13,331,857	\$13,983,472

<sup>1</sup> 2009 was the base year for Waste Management's carbon footprint, so data from previous years are not available. Please see pp. 18-21 of Book 2 for discussion of the footprint and data notes.

<sup>2</sup> We are reporting this data to inform our customers and the public about the potential GHG reduction benefits associated with carbon storage in landfills, our renewable energy production and the recyclable materials we collect and process. We are not presuming to characterize how emerging regulatory programs will allocate credit for these avoided emissions, so we do not claim these greenhouse gas reduction benefits as our own, nor attempt to deduct these reductions from our carbon footprint.

<sup>3</sup> For a discussion of the protocols that govern this calculation of carbon storage or sequestration, see p. 23 of the Appendix.

<sup>4</sup> Equivalent number of households that could be powered by Waste Management's energy production. Note that standard industry assumptions about household energy use differ for the waste-to-energy and landfill-gas-to-energy sectors. See pp. 7-11 of Book 2 for details.

<sup>5</sup> Modern landfills are post-1993 and permitted under 40 CFR Part 258 Subtitle D. Offsite contamination is regulatory corrective action required to address offsite impacts to groundwater.

## ABOUT THIS REPORT

Waste Management is committed to issuing a detailed sustainability report every two years. This report updates our 2010 Sustainability Report, providing data for 2010 and 2011 and discussing key developments in 2012 where information was available prior to publication. Notes on the scope of the data are included with the data charts or in endnotes.

This report covers Waste Management's wholly owned operations, all of which are located in North America. In 2009, Waste Management entered into new business partnerships to develop waste-to-energy projects in the United Kingdom, Western Europe and China, and we had planned to report on those partnerships in this report. At this time, however, Waste Management is a minority partner in these projects, and most are still in the development phase. Should this change, we will include these projects in the scope of our reporting.

We focus our reporting on the following themes that we have identified through internal and external consultation to be the most material:

- Focusing on our customers' sustainability needs
- Reducing and recycling wastes generated by others
- Converting waste into renewable energy, fuels and chemicals
- Managing our waste treatment, materials processing and disposal facilities to exceed regulatory obligations
- Serving as responsible stewards of the land

## GLOBAL REPORTING INITIATIVE

This report is aligned with the Global Reporting Initiative (GRI) G3 Sustainability Reporting Guidelines at a self-checked application level of "B." The Appendix contains a complete index of GRI indicators. More information on GRI and the application levels can be found on the [GRI website](#).

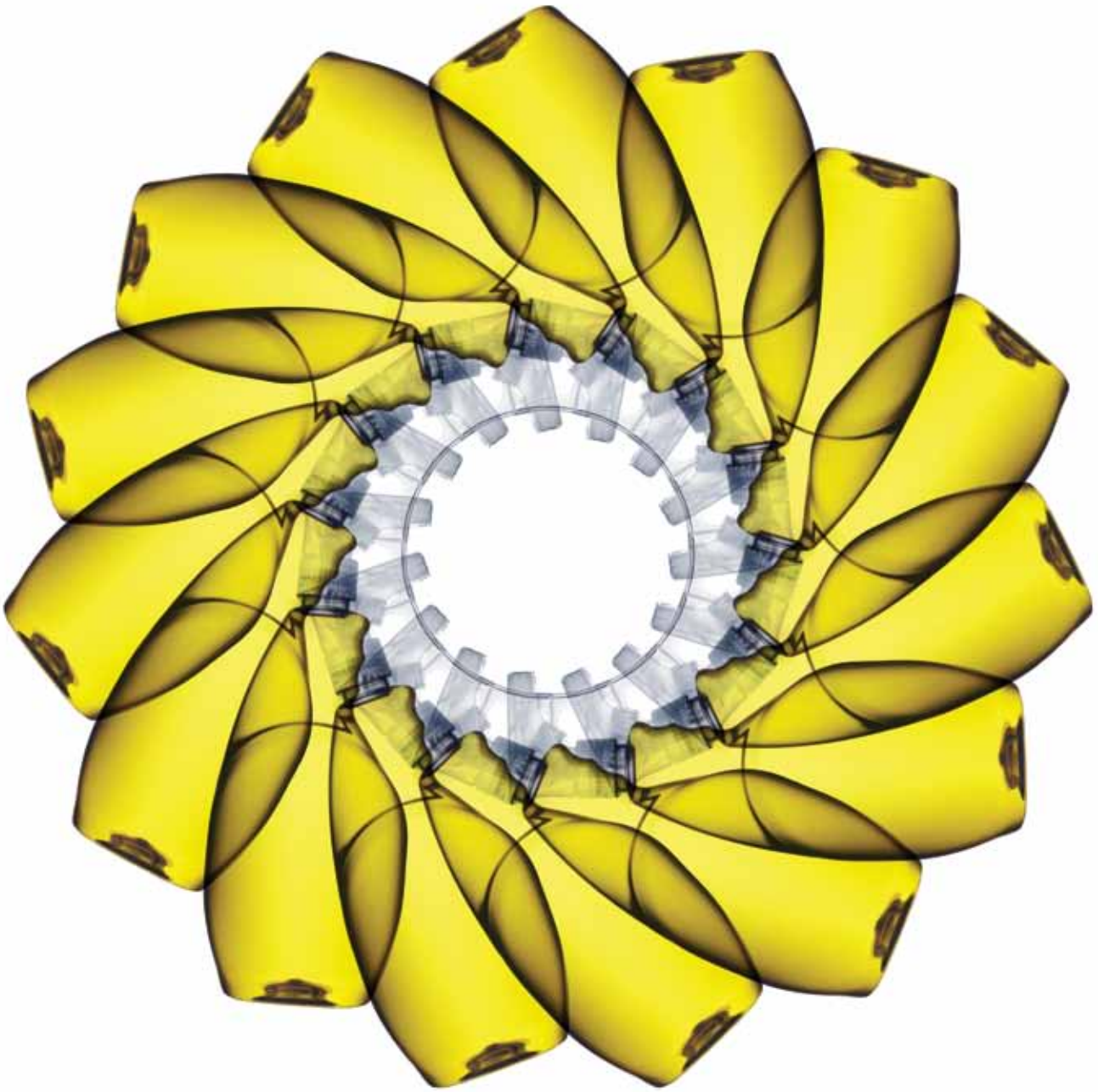
We welcome your feedback on this report, as it helps us to improve future reports. Please contact:

**Lynn Brown**

Vice President, Corporate Communications and Community Relations  
lynnbrown@wm.com  
(713) 394-5093

**Sue Briggum**

Vice President, Federal Public Affairs and Public Policy  
sbriggum@wm.com  
(202) 639-1219



## **OUR PERFORMANCE COMMITTED TO SUSTAINABILITY**

Providing Environmental Services .....	2
Safeguarding the Environment .....	18
Creating a Good Place to Work .....	34

## PROVIDING ENVIRONMENTAL SERVICES

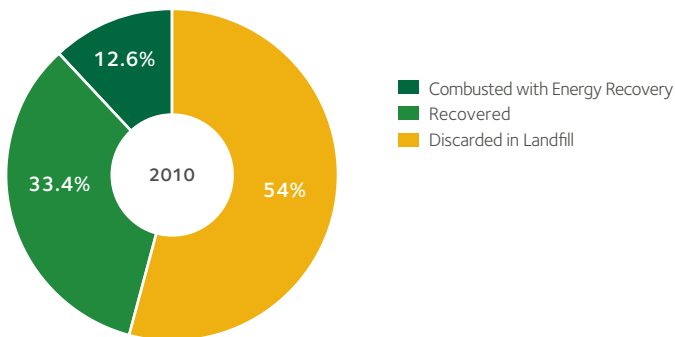
When customers put their trash out for pickup, it's just the beginning. From the moment waste leaves the curb, it can go to a recycling center to be repurposed for further use; to a clean power plant for use as fuel to provide renewable energy; to a composting facility where organic waste can be converted into a nutrient-rich soil amendment or a fuel; or to a landfill where it creates energy as it decomposes.

Through our work with municipal customers and manufacturers alike, we are developing strategies to reduce, reuse, recycle and recover value from waste. This both minimizes environmental impact on the planet and saves our customers money. In the United States in 2010 (the most recent year for which data are available), on average, over half of the municipal solid waste generated by people and businesses went to landfill. But this reality does not have to be a wasted opportunity. Valuable commodities can be reclaimed and energy can be recaptured from the waste stream. At Waste Management, we are helping our customers find innovative ways to turn trash into treasure.

### Where Does the Trash Go?

As the leading provider of comprehensive waste management and environmental services in North America, Waste Management handles on average nearly 100 million tons of waste each year. We look for valuable end uses for the materials we are charged with managing, and we provide our customers with expertise on reducing and repurposing their waste. We are striving to expand our recycling programs to reclaim raw materials that can be introduced back into the supply chain. Our waste-to-energy facilities reduce the volume of trash by up to 90 percent, save valuable landfill space and generate electricity by using waste as fuel. Where the disposal of waste is necessary, our landfills are a secure disposal alternative and are tapped as a source for renewable energy.

### MANAGEMENT OF MUNICIPAL SOLID WASTE IN THE UNITED STATES



## RECYCLING SERVICES

Waste Management is North America's largest recycler of post-consumer waste. In 2011, we extracted almost 12.9 million tons of recyclables from the waste stream — 61 percent more than our baseline in 2007. Our goal is to manage more than 20 million tons a year of recyclable materials by 2020.

Our commitment to recycling is stronger than ever. We continue to invest in new ways to recycle — and ways to recycle new things. In 2012 and beyond, we expect the amount of material handled to grow even faster than in the past as we employ advanced technologies, expand our single-stream recycling capacity, build our infrastructure to collect and process organic materials, and invest in new ways to unlock more value from organic waste.

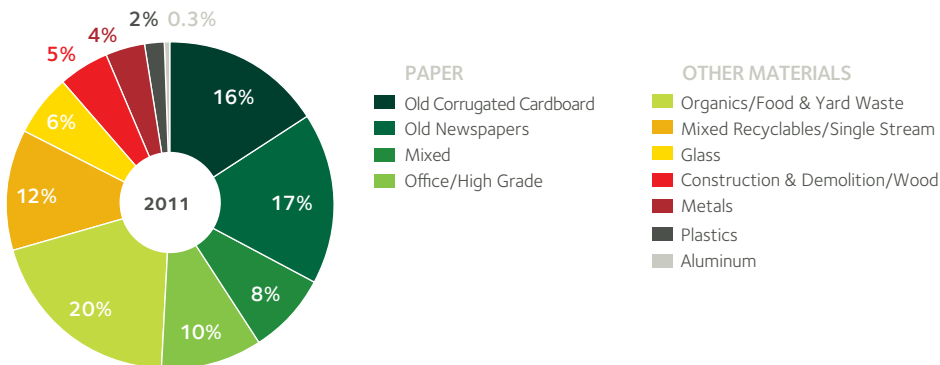
During our reporting period, the economy experienced fluctuations and uncertainty. Though commodity prices were volatile, we continued to invest in recycling facilities and companies. Our overall recycling volumes increased substantially, for two key reasons:<sup>1</sup>

- We opened or acquired a net of 14 new materials processing plants in 2011, including three single-stream recycling plants. (A number of those occurred at the end of 2011, and therefore tonnages processed at these facilities were not yet incorporated into our tracking and reporting systems; they will be accounted for in our next report.)
- We saw significant growth in organics collection and processing, which reached 2.5 million tons in 2011 — compared to no organic material reported in 2007.

Put another way, we purchased nearly 1 million tons of new materials processing capacity in 2011 (three-quarters for recycling plants and acquisitions and one-quarter for organics recycling).

Manufacturers — including many of our industrial customers — are increasingly incorporating the idea of recyclability into the design of consumer goods. When products are disposed at their end of use, it's ideal if we can extract the value from those discards to use as raw material inputs for new production. Waste Management is actively working with our customers to help them design with recyclability in mind. (To learn more about our activities in this area, see [p. 2 of Book 3.](#))

### WASTE MANAGEMENT MIX OF RECYCLED MATERIALS, 2011\*



\* Percentages add up to more than 100 percent due to rounding.

## FINDING TREASURE AMONG THE TRASH: INCREASING RECYCLING RATES<sup>2</sup>

Waste Management has been recycling many materials, including paper, glass and metals, for decades. Today, as we work to increase our recycling volumes to meet our 2020 goal, we are capturing as much value from the waste stream as we can, including items as diverse as electronic waste (or e-waste) and waste from construction and demolition. Here are some highlights and their corresponding environmental savings.

### IN 2011 WE RECYCLED...

#### 6.6 MILLION TONS OF PAPER

Resulting in savings of:

107 million trees,  
23 million cubic yards of landfill space,  
27 billion kilowatts of energy, and  
46 billion gallons of water.<sup>3</sup>



Energy use savings =  
937K households powered<sup>4</sup>

#### NEARLY 229,000 TONS OF PLASTICS

Resulting in savings of:

1.7 million cubic yards of landfill space and  
1.6 billion kilowatt-hours of electricity.<sup>3</sup>



Energy use savings =  
123K households powered<sup>4</sup>

#### MORE THAN 38,000 TONS OF ALUMINUM

(CANS, LITHO PLATES AND E-SCRAP)

Resulting in savings of:

167,000 cubic yards of landfill space and  
472 million kilowatt-hours of electricity.<sup>3</sup>



Energy use savings =  
73K households powered<sup>4</sup>

#### MORE THAN 615,000 TONS OF CONSTRUCTION & DEMOLITION MATERIALS

Including concrete, wood, asphalt, shingles  
and inert materials.

#### MORE THAN 2.5 MILLION TONS OF MIXED ORGANIC MATERIAL

(TRANSPORTED FOR PROCESSING  
OR MANAGED)

Including yard waste, food waste, brush and branches.

#### NEARLY 741,000 TONS OF GLASS

Resulting in savings of:

1.5 million cubic yards of landfill space.



Energy use savings =  
19K households powered<sup>4</sup>

A used aluminum can is recycled  
and back on the grocery shelf as  
a new can in as little as 60 days.<sup>5</sup>

The energy saved from recycling one  
glass bottle can run a 100-watt  
light bulb for four hours or a compact  
fluorescent bulb for 20 hours.<sup>6</sup>





PAPER

4.4M



PLASTIC

78K



ALUMINUM

105K

TOTAL  
**GREENHOUSE  
GAS SAVINGS**

IN 2011

measured in cars off the road equivalent<sup>4</sup>



GLASS

48.5K



ORGANICS

183K



CONSTRUCTION  
& DEMOLITION

66K

## WASTE-BASED ENERGY PRODUCTION

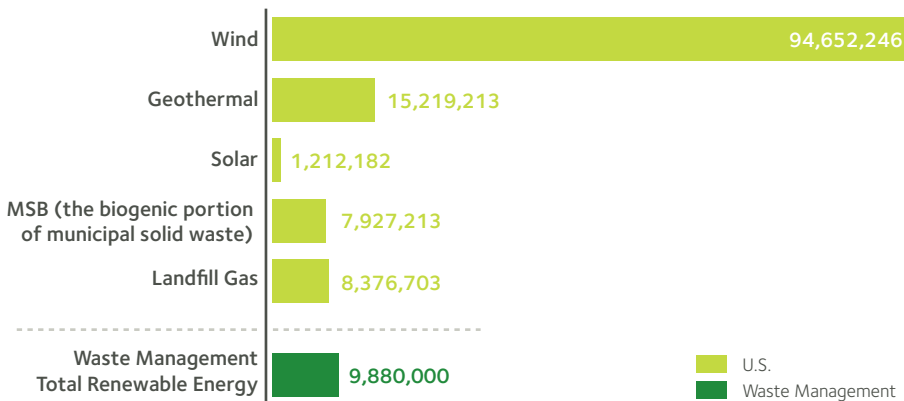
The demand for renewable energy continues to grow around the world, as does the search for reliable, cost-effective means to produce it. For more than three decades Waste Management has been leading the way in the creation of energy from waste, as one part of the energy mix. In our specially engineered plants, we use ordinary garbage — household trash as well as business and industrial nonhazardous waste — to produce energy. There are two main ways we do this: by recovering the energy in trash through “waste-to-energy” (WTE) combustion and by harvesting landfill gas as a combustible fuel, known as “landfill gas to energy” (LFGTE).

The Federal Energy Regulatory Commission considers waste a renewable energy source, just like wind or solar power.<sup>7</sup> Electric utilities place a high value on waste-based energy because it is a base load, continuous electrical generation source available 24 hours a day, seven days a week for over 90 percent of the time annually — in contrast to wind and solar energy, which ebb and flow daily, monthly and seasonally.

In 2011, Waste Management facilities created enough energy from waste to power nearly 1.2 million homes — the equivalent of almost 23.5 million barrels of oil or nearly 6.1 million tons of coal. According to the U.S. Department of Energy, in 2011 we produced eight times more renewable energy than the solar industry.<sup>8</sup>

## RENEWABLE ELECTRICITY PRODUCTION IN 2011 BY ENERGY SOURCE

net U.S. generation (megawatt hours)<sup>9</sup>



Source: [www.eia.gov/cneaf/electricity/page/eia906\\_920.html](http://www.eia.gov/cneaf/electricity/page/eia906_920.html)

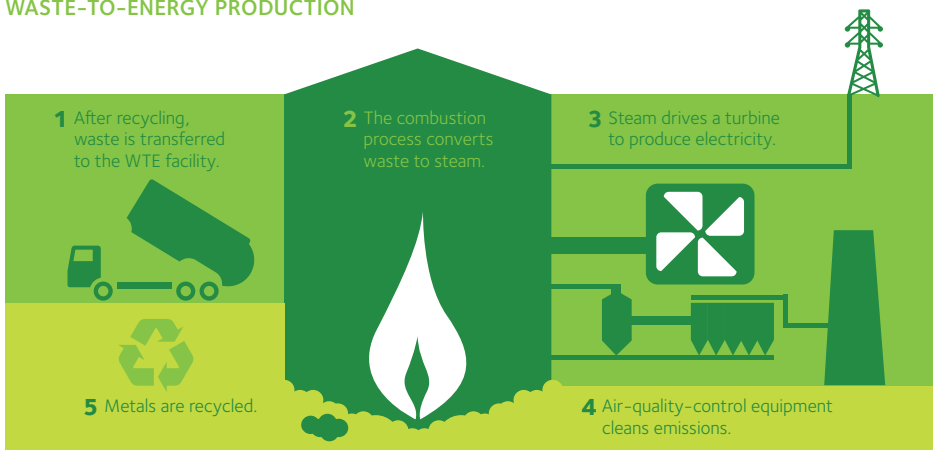
## Waste to Energy

Modern WTE facilities generate electricity by using municipal solid waste as a fuel. Municipal solid waste is converted to energy through carefully controlled combustion, using advanced emissions-control equipment. WTE plants reduce the volume of the waste up to 90 percent, saving valuable space in landfills, and they provide a clean alternative to the use of fossil fuels.

Our wholly owned Wheelabrator Technologies unit operated 17 WTE plants in 2010 and 2011. Processing more than 23,000 tons of waste per day, these plants can produce 669 megawatts, capable of powering 705,000 homes.

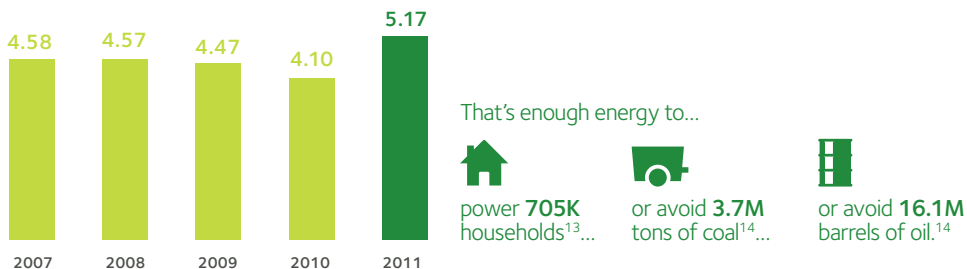
Studies demonstrate that communities with WTE facilities have higher recycling rates on average than those that do not have such facilities.<sup>10</sup> Many of the communities we serve with our WTE facilities have implemented progressive waste prevention and recycling programs and have set ambitious goals for encouraging public participation and increasing recycling rates.

### WASTE-TO-ENERGY PRODUCTION



### WHEELABRATOR TECHNOLOGIES RENEWABLE ENERGY PRODUCTION, 2007-2011<sup>11</sup>

(kilowatt-hours sold, in billions of hours)<sup>12</sup>



## Waste Management WTE Facility Will Benefit Northeast Maryland

Wheelabrator Technologies is partnering with the Northeast Maryland Waste Disposal Authority to develop a WTE facility in Frederick County that is projected to process an average of 1,500 tons per day of post-recycling solid waste. At that rate, the facility would generate approximately 51 megawatts of electricity, providing enough energy to power an estimated 45,000 homes. As a state-classified Tier 1 renewable energy source, it would also assist Maryland in achieving its energy goals. Construction is slated to begin within the next two years. During the estimated two-and-a-half years it will take to build the facility, the project is expected to create approximately 1,600 private-sector jobs, with an additional 1,000 jobs created in supporting industries. It is also projected to bring more than \$260 million in new economic activity to the region. Once built, the facility will create an estimated 80 permanent new jobs during its 20- to 30-year operations period, including 50 full-time jobs at the facility and more than 30 jobs in supporting businesses.

## WTE Facilities Noted for Low Emissions

With some of the most stringent emissions standards in the world, waste-to-energy facilities have been noted as having “less environmental impact than almost any other source of electricity” by the U.S. Environmental Protection Agency (EPA). This chart from the Energy Recovery Council highlights the reductions made in emissions from these facilities between 1990 and 2005.<sup>15</sup>

POLLUTANT	PERCENT REDUCTION 1990 - 2005
CDD/CDF, TEQ basis*	99+%
Mercury	96%
Cadmium	96%
Lead	97%
Particulate Matter	96%
HCl	94%
SO <sub>2</sub>	88%
NO <sub>x</sub>	24%

*\*Dioxin/furan emissions in units of toxic equivalent quantity (TEQ), using 1989 NATO toxicity factors*

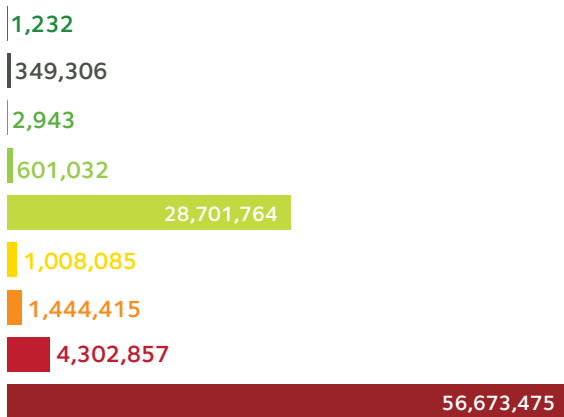


### Relative Emissions: WTE Plants Compared to Other Sectors

The following charts from the EPA showcase the relative environmental impacts of waste-to-energy versus other industrial sectors. All data is for 2005, the most recent year for which EPA comparisons are available. Waste-to-energy facilities continually rank among the lowest in terms of total impacts, including total hazardous air pollutant emissions and mercury emissions.

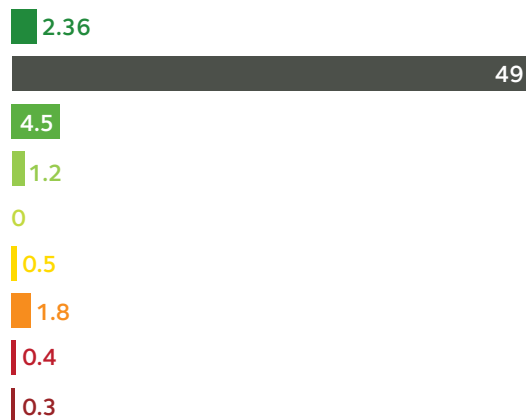
#### NATIONAL TOTAL HAZARDOUS AIR POLLUTANT EMISSIONS, 2005

(tons)



#### NATIONAL MERCURY EMISSIONS, 2005

(tons)



- Waste-to-Energy Facilities
- Industrial Processes (Cement Manufacturing)
- Waste Disposal (Open Burning)
- Fossil Fuel Electricity Generators
- Wildfires
- On-Road Vehicles (Diesel)
- Iron and Steel Mills
- Industrial Disposal (Chemical Manufacturing)
- On-Road Vehicles (Gasoline)

#### Dioxins and WTE Facilities

Dioxins are a group of chemical compounds, sharing certain characteristics, that are known to cause cancer in animals, and likely in humans. Dioxins may also cause reproductive or developmental effects. These compounds are not present in waste, but are by-products created when chlorinated wastes are combusted. Improved combustion and air controls have greatly reduced the quantity of dioxins emitted from WTE facilities. The EPA estimates that known and quantifiable WTE dioxin emissions in the United States have been reduced by more than 99 percent from 1990 levels.

*Source: U.S. Environmental Protection Agency, Letter from Walt Stevenson to Large MWC Docket (EPA-HQ-OAR-2005-0117), August 10, 2007.*

## Landfill Gas to Energy

As waste decomposes in a landfill, it naturally produces methane, the major component in natural gas fuel and a potent greenhouse gas. Rather than simply burning off the methane, as is common at many landfills in the United States, at LFGTE facilities we capture the gas and use it as an alternative energy source. This process reduces methane emissions and helps offset the impacts of power production that otherwise would occur from the burning of fossil fuels.

As the largest LFGTE developer and operator in North America, we are harnessing this energy to power homes, provide fuel for industrial uses and even fuel vehicles. At the end of 2010, we had 127 projects that use landfill gas for fuel (up from 119 in 2009). By 2011, we had 131 active LFGTE projects, totaling 615 megawatts capacity, generating enough electricity to power more than 466,000 homes. This energy generation is the equivalent of burning of more than 2.3 million tons of coal.

Our goal is to have our total installed electrical generating capacity from LFGTE approach 700 megawatts by the end of 2012.

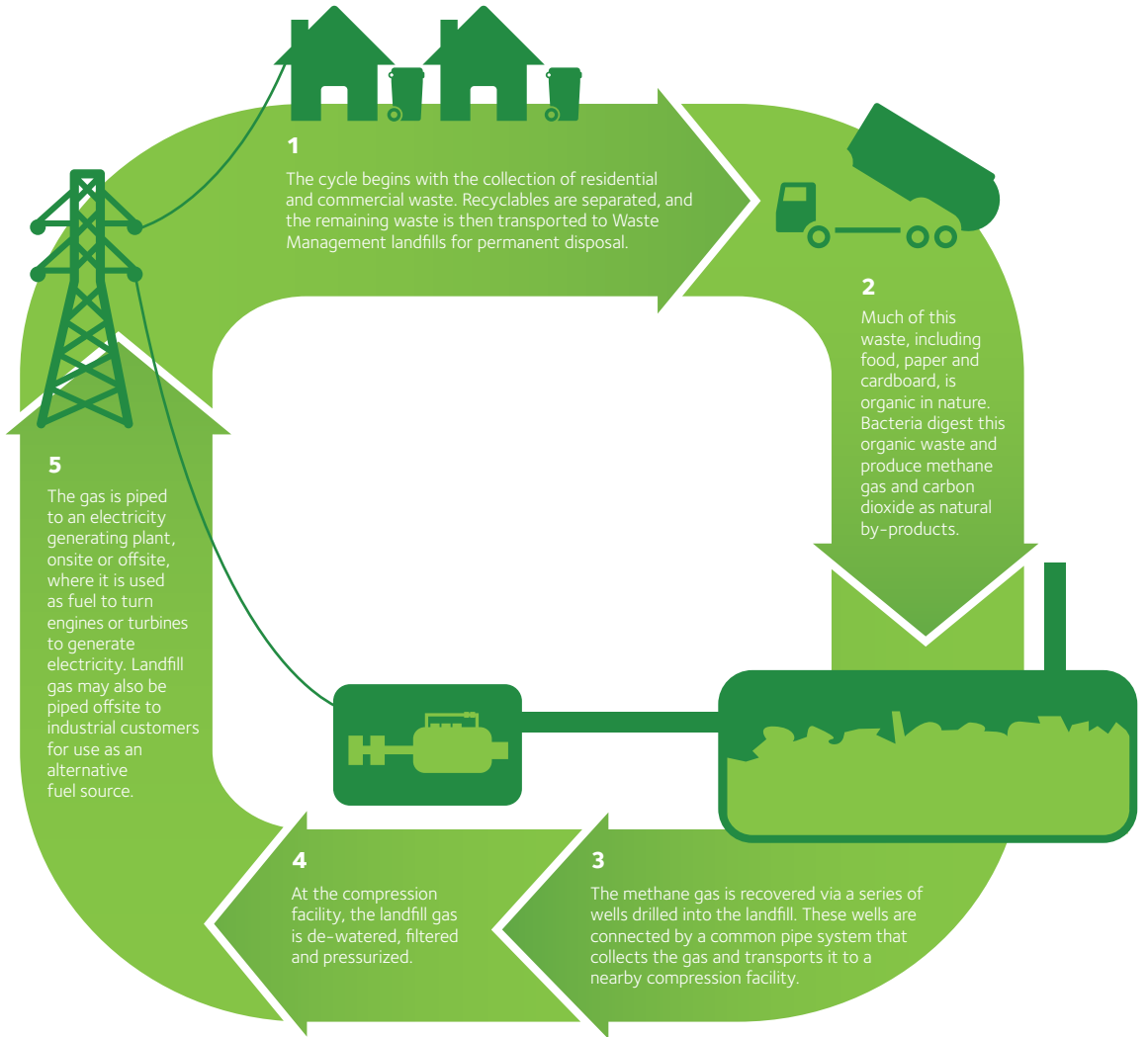
### WASTE MANAGEMENT LFGTE PRODUCTION, 2007-2011

	2007	2008	2009	2010	2011
Megawatts installed by end of year	459	491	542	586	615
Number of households this could power <sup>16</sup>	374,000	400,000	441,000	450,000	466,000
Kilowatt-hours annual capacity	3.51B	3.76B	4.15B	4.40B	4.51B
Coal use this could avoid (tons)	1,830,000	1,960,000	2,160,000	2,293,000	2,351,000
Oil use this could avoid (barrels)	5,730,000	6,130,000	6,770,000	7,280,000	7,380,000

#### Waste Management Named Partner of the Year

The EPA's Landfill Methane Outreach Program named Waste Management its 2011 Industry Partner of the Year for our leadership in developing waste-based renewable energy. As a pioneer in the field of landfill gas projects, we developed many of the technologies that are in use today across the industry.

## LANDFILL-GAS-TO-ENERGY PRODUCTION



## MANAGING MATERIALS

### Collection Services

We provide solid waste collection services to more than 21 million customers across North America — from single, residential households to large companies with hundreds of locations. To handle this volume, we operate more than 18,000 transfer and collection vehicles, the largest trucking fleet in the waste industry. Our fleet routes are designed to maximize collection efficiency and reduce fuel use and unnecessary miles. For the past three years, we increasingly have used on-board computing, which provides real-time information on each customer through wireless communication, to optimize our routes and improve service delivery. This ensures that we provide service exactly when and only when customers actually need it — reducing costs and improving customer satisfaction. With every diesel truck we take off the road as a result of routing efficiencies, we reduce our greenhouse gas emissions by over 102 metric tons per year.<sup>17</sup>

### Waste Management Collects on Campus

Boston University, one of the first colleges to invest in our Solar Compactors, has reduced collections from seven or eight per week to only two per week after placing 33 units on its campus in October 2009. In 2011, implementing a Waste Management plan that included the use of single-stream recycling, the University of Notre Dame achieved a nearly 40 percent recycling rate and is on course to meet its goals of a 50 percent recycling rate by 2016 and a 67 percent rate by 2030.



*Self-powered, self-monitoring, connected — our Solar Compactor is the smartest trash can on the planet.*



### Reducing Inefficiencies in Collection

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In Seattle, Waste Management has used on-board computers in all of its trucks for the past three years. On-board computers have transformed the way we are providing service in Seattle, reducing time on the streets spent servicing missed collections. In 2011, we completed an average of 264,000 scheduled collections each week in the city, averaging just 28 missed collections per week, or 0.01 percent. In addition, the computerized system has reduced paper use by more than 1 million sheets per year, as on-board computing eliminates the need to print daily route sheets. This new approach is saving time and money and reducing fuel use across our fleet.

Solar technologies are also helping us eliminate unnecessary collection trips in high-traffic areas and urban centers. Our Solar Compactor, which debuted in 2009, is completely self-powered through solar panels. Developed through collaboration with renewable energy innovator BigBelly® Solar, the compactor's internal sensors trigger when trash needs to be compacted. This gives each 35-gallon receptacle a 180-gallon capacity — five times that of traditional receptacles. When the compactor is full, a wireless system signals for pickup, cutting both vehicle service miles and the fuel use required for collection by up to 80 percent. Our Solar Compactors have been placed in a wide variety of public spaces — ranging from Fenway Park to the Alamo.<sup>18</sup>

For customers in need of a larger-scale solution, in 2011 we introduced the solar-assisted SmartEnergy Compactor. These compactors can store large volumes of trash in tight spaces, and they offer a feature allowing users to run cycles only when the battery is fully charged. By using the same BigBelly® technology found in our smaller models, SmartEnergy Compactors can reduce electricity consumption by up to 70 percent over traditional compactors.

### Monitored Compactors Aid Disposal and Save Fuel

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Waste Management's Compactor Monitoring Solutions (CMS) is working with customers to save space, fuel and money. Monitored compactors are typically smaller, take up less space in loading docks, and can be equipped with ozone systems that eliminate odors. They also enable customers to maximize loads and decrease pulls through the use of pressure sensors that notify Waste Management when the compactor is full.

## Bagster Service: Convenient Collection for Every Need

Waste Management's Bagster service — also known as “dumpster in a bag” — provides a convenient and more sustainable collection solution for a wide variety of projects. Suitable for anything from home renovations to disaster cleanup and available at local home improvement stores, each bag is designed to hold up to 3,300 pounds of debris. By cutting out the delivery of dumpsters to our customers and collecting up to 15 bags on one route, we eliminated 3.4 million truck miles in the United States alone through the use of Bagster bags in 2011, saving 851,049 gallons of diesel and reducing greenhouse gas emissions by 10,839 metric tons. Also in 2011, we used Bagster bags to help Norwegian Cruise Line meet the challenge of offloading more than 1,500 television sets from one of its ships. The television sets were then safely and efficiently transferred to a Waste Management e-cycling facility.



## Transfer Services

Since much of the waste we collect goes to our own recycling centers and landfills, our network of transfer stations provides an important link to increase recycling and reduce vehicle miles to disposal. Strategically located, our transfer stations serve to consolidate, compact and load waste from collection vehicles into long-haul trailers, into barge containers or onto rail cars for transport.

In a continuing effort to extract more value from the waste stream, we have begun mining our 100 largest transfer stations for cardboard that can be resold and reused. We currently are diverting an average of 13,000 tons of cardboard each month from disposal in our landfills, and we continue to explore the opportunities for transfer station mining.

### Taking the Waste Train Out of New York City

Waste Management entered into a public-private partnership in 2009 with the City of New York to develop and operate a rail-based system at one of our transfer facilities that will safely, efficiently and reliably transport much of Brooklyn's waste out of the city. The project will avoid almost 546,000 metric tons of greenhouse gas emissions per year — the equivalent of taking more than 107,000 cars off the roads annually.



“By exporting 950 tons of residential and municipal waste per day by rail, we’re eliminating more than 40 long-haul tractor trailer trips each day — or about 13,000 trips per year. That’s not only going to help reduce congestion on the borough’s streets and highways, it also will reduce the city’s greenhouse gas emissions and improve the air we breathe — especially in communities that have long been unjustly saddled with handling other people’s waste.”

—Michael Bloomberg, Mayor, New York City

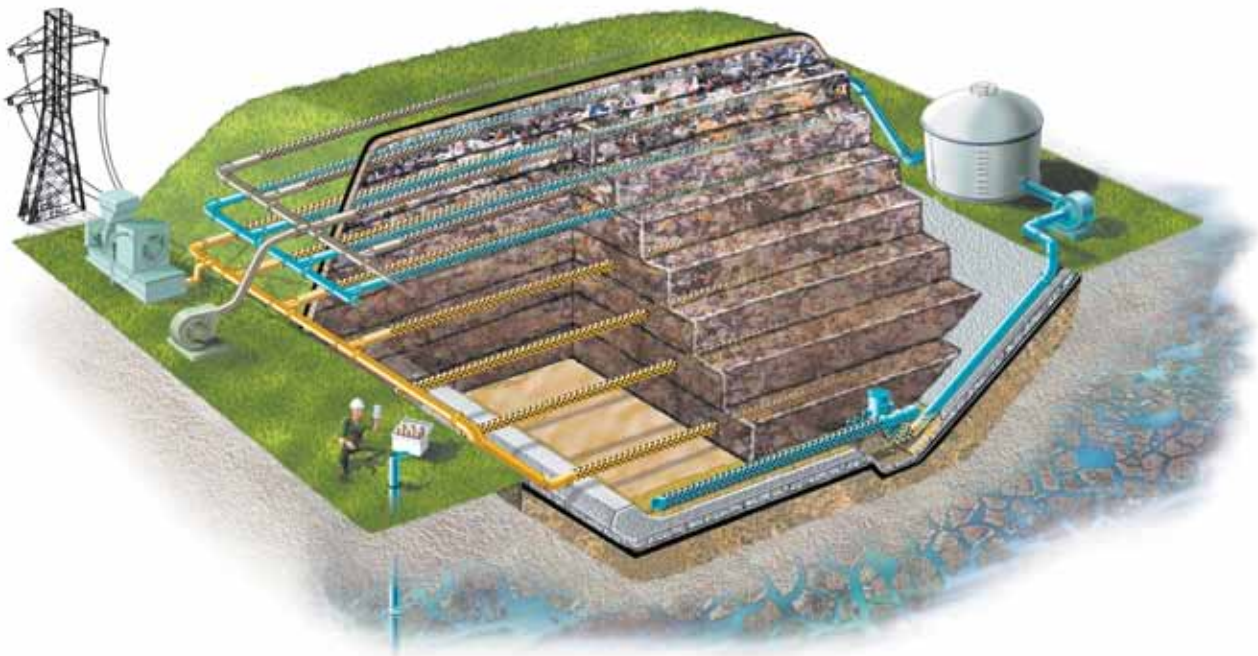
## Disposal Services

Waste Management continually strives to improve the safety and environmental security of our disposal facilities, and we are committed to reporting the results of these efforts. More than ever, we are seeking ways to avoid the disposal of materials that can be reused or recycled, and we review our disposal contracts for new recycling opportunities. We also are working to reduce the lifecycle impacts of discarded materials by improving collection and disposal logistics, facilitating the safe and efficient handling of household and medical waste, and helping our customers track and document the safe recycling or disposal of their products.

### LANDFILL CAPACITY

Modern landfills are no longer merely the place where waste is sent. As examples of sophisticated engineering, they provide secure containment systems for the storage of waste, and they are managed to ensure they can provide valuable future use for commerce, conservation and recreation. Landfills also provide the opportunity to capture value through the efficient conversion of waste to energy. Total carbon emissions from landfills in the United States have declined 27 percent over the last two decades.<sup>19</sup>

Waste Management operates the largest network of landfills in our industry and manages the disposal of nearly 100 million tons of waste each year. Our sites are operated in accordance with internal company safety and environmental policies intended to ensure that our landfills go beyond regulatory requirements. We strive to avoid conditions that cause concern for neighbors and communities (e.g., odors, noise), regardless of whether those conditions are covered in our regulatory obligations. We continue to develop next-generation bioreactor units at our landfills, and currently have 11 permitted bioreactors, with more pending. To learn more about new advances in landfill technology, see [www.thinkgreen.com/how-we-think-green](http://www.thinkgreen.com/how-we-think-green), as well as our website.<sup>20</sup>



## MEDICAL WASTE HANDLING

Our focus on meeting customer needs has driven us to innovate ways to make managing a wide range of waste streams easier, safer and more cost-effective.<sup>21</sup> In 2011, Waste Management Healthcare Solutions (WMHS) launched two partnerships with Becton, Dickinson and Company (BD), a leading medical technology and supply company, to create closed-loop medical waste recovery solutions. One service, known as the BD ecoFinity™ Life Cycle Solution, will recycle medical “sharps” waste — such as single-use syringes — and use the recycled material to manufacture new products. Based on a pilot program at Rady Children’s Hospital–San Diego, BD believes that this partnership will enable them to recover and recycle more than 70 percent of their overall sharps waste rather than permanently dispose of it in landfills. Currently, WMHS is recycling sharps waste from more than 700 BD service locations.<sup>22</sup>

In 2011, WMHS began a dialyzer recycling pilot with DaVita, Inc., a leading provider of kidney care services. The first of its kind in North America, this initiative is operating in 106 DaVita clinics in southern California and has the potential to offset 350,000 pounds of dialyzer waste. The dialyzer recycling pilot follows a similar process to the ecoFinity™ program: WMHS will treat and recover recyclable materials from the dialyzers and sell the material to manufacture new products.

## HOUSEHOLD DISPOSAL

For residential customers, we have developed a convenient way to safely dispose of hazardous materials commonly found in household use, such as pesticides, chemicals, medical sharps, batteries, fluorescent lamps, used oil and paint. Often, this waste is collected in less-than-convenient ways, for example, at permanent drop-off centers, or at special one-day collection events. Through our “At Your Door” service, customers are mailed a kit that includes a bag, labels and simple instructions, and they can arrange a pickup of these materials at their home. We are able to recycle approximately 75 percent of the materials collected through this safe, cost-effective disposal alternative. As of June 2012, At Your Door is available to customers in California, Colorado, Oklahoma, Illinois, Pennsylvania and Texas.

## SAFEGUARDING THE ENVIRONMENT

How we manage environmental impacts and opportunities is a critical element of being a sustainable enterprise. It includes avoiding spills and adverse impacts on land and water; conserving water and energy; and reducing our greenhouse gas emissions. It also includes opportunities to enhance communities by preserving wildlife habitats.

### GREENHOUSE GAS EMISSIONS

Waste Management recognizes climate change as an important global issue that poses both risks and opportunities. Emerging greenhouse gas policies at the state and federal levels will likely affect our operations, though the nature of these impacts is uncertain. Regulatory programs to address reductions in GHG emissions will present significant challenges and opportunities for the company, since we have operations that emit GHGs but also employ innovative technologies that reduce and prevent GHG emissions, including our renewable energy operations and the development of alternative fuel technologies. These opportunities represent some of the exciting new directions for our company discussed in [Book 3](#).

When we first set our sustainability goals in 2007, we took up the task — as an industry leader and environmental steward — to measure and reduce our GHG emissions and help our customers do the same. Our first step was to analyze and report on our unique and complex carbon footprint. Using our GHG footprint as a guide, we prioritized our actions. We are working to reduce the use of fossil fuels in our facilities and our fleet, improve energy efficiency and use renewable energy sources, including those produced by our own operations. Three of our four sustainability goals help to drive progress toward GHG emission reductions: doubling our renewable energy generation; tripling the amount of recyclable materials we manage; and cutting our fleet emissions by 15 percent.

These goals build on our tradition of leadership within our industry, beginning as a founding member of the Chicago Climate Exchange (CCX), continuing as a Climate Action Leader in the California Climate Action Registry (CCAR), and now as a GHG offset developer with the Climate Action Registry (successor to CCAR) and an Emissions Performance Generator with Alberta Environment. In 2010, we published our first comprehensive carbon footprint. Also, we fulfilled our commitment to CCX by reducing our GHG emissions by 6 percent by 2010, as compared to our 1998–2001 baseline average emissions. As our approach has evolved, we are shifting from participating in carbon trading programs to implementing sustainable business practices company-wide. We believe this yields energy, fuel and commodity savings directly to our bottom line while reducing GHG emissions on a much broader scale.

Managing our own footprint has also informed the work of our Waste Management Sustainability Services consulting team, which uses our knowledge and experience to help our customers meet their own environmental goals, including GHG goals. (See [p. 16 in Book 3](#) for more detail.)

## Our Greenhouse Gas Footprint — An Overview

For three years, we have tracked the carbon footprint of the facilities in North America that we own and over which we have operational control. From 2009 to 2010, direct GHG emissions from Waste Management’s landfill operations increased by approximately 844,000 tons CO<sub>2</sub>e; from 2010 to 2011, these emissions decreased by 6,371,139 tons.

These trends were the result of changes to three factors. First, the severe drought that affected much of the United States in 2011 also impacted landfill gas generation. Moisture is needed for landfill gas generation, which drops profoundly when the waste matrix is starved of water.

Second, the amount of waste we landfill overall is dropping, and the waste we receive has less of the organic content that gives rise to landfill gas. This is attributable to the efforts of our company and our customers to increase the recycling of materials that otherwise would be landfilled, and also to the increased diversion of organic materials to composting and other landfill alternatives.

Finally, in 2010, we used the landfill gas generation and emissions calculations imposed by the EPA’s GHG Mandatory Reporting rule. Subsequent monitoring revealed that the rule resulted in an overestimation of landfill gas generation for sites in arid locations and an underestimation of landfill gas cover oxidation. In 2011, we used industry-specific protocols to improve the precision of our estimates.

### WASTE MANAGEMENT GREENHOUSE GAS FOOTPRINT

	2009	2010	2011
GHG Emissions (Metric Tons CO <sub>2</sub> Equivalents)			
Process	21,552,559	22,503,371	16,448,441
Transportation	1,754,977	1,817,830	1,773,307
Energy Use	357,141	479,356	488,738
Potential Avoided Emissions <sup>23</sup>			
Renewable Energy Generation	3,504,234	3,502,225	4,005,380
Waste-Derived Fuels Produced and Sold	23,976	13,954	18,647
Reuse and Recycling of Materials	5,621,788	6,659,259	8,447,023
Carbon Permanently Sequestered in Landfills <sup>24</sup>	17,703,584	16,268,622	15,593,412

See p. 22 in the [Appendix](#) for a closer look at our GHG footprint and a description of the methodology we use.

#### Waste Industry Greenhouse Gas Footprint

Overall, the waste sector is a very small contributor to total U.S. GHG emissions — just 1.8 percent. From 1990 to 2010, net methane emissions from landfills decreased by 27 percent (39.9 Tg CO<sub>2</sub> equivalent) as a result of increases in the amount of landfill gas collected and combusted.

Source: U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990–2010, EPA 430-R-12-001 (Washington, DC: U.S. EPA, April 2012).

# A GUIDED TOUR OF OUR GHG FOOTPRINT

## RECYCLING

Our **recycling** facilities process wastes to recover resources that can be used to make new goods. These facilities have direct CO<sub>2</sub> emissions from the use of fuel onsite and indirect GHG emissions due to their use of electricity. Recycling paper, plastics, aluminum, glass and other materials can avoid GHG emissions by decreasing the amount of energy needed to convert raw materials into usable commodities, conserving landfill capacity, preventing the mining and initial processing of petroleum products, metal ores and sand, and preventing the harvesting of trees, thereby allowing forests to continue to sequester (i.e., store) carbon dioxide from the atmosphere.



## GOODS

Many of the **goods** people buy, use and eventually discard contain carbon. When these items are burned or decompose, they release CO<sub>2</sub> and/or methane, two important GHG gases.



## WASTE






**Waste** typically includes a mix of biogenic<sup>25</sup> carbon-containing materials (e.g., paper, wood, food waste), manmade carbon-containing materials (e.g., plastics, tires, synthetic textiles) and noncarbon-containing materials (e.g., metal, glass, stone). Biogenic CO<sub>2</sub> emissions are viewed as having a neutral greenhouse gas impact because they result from biological processes in which emissions from the decomposition or burning of waste are balanced by the uptake of carbon dioxide from living and growing plant materials. Burning manmade (anthropogenic) carbon-containing materials such as plastics or synthetic textiles releases carbon that was stored eons ago in fossil fuel deposits. Likewise, burning fossil fuels releases carbon dioxide that is not balanced by the biosphere and is thought to be the primary source of the greenhouse effect. Our carbon footprint, therefore, reports only the manmade or anthropogenic GHG emissions from our operations.



## COLLECTION

Our **collection** trucks emit CO<sub>2</sub> from the combustion of diesel and other fossil fuels.

### KEY

-  CO<sub>2</sub> emissions
-  Indirect emissions
-  Avoided emissions, or replaces fossil fuels
-  Methane emissions
-  Refrigerant emissions





## OFFICE/ADMIN

GHG emissions associated with Waste Management's offices and similar facilities include CO<sub>2</sub> from onsite energy use, indirect emissions from electricity use and emissions of greenhouse gases associated with refrigeration.<sup>27</sup>



## BIOMASS PLANT

Waste Management operates two power plants fueled by waste (not purpose-harvested) biomass. These plants emit biogenic CO<sub>2</sub> and also avoid the CO<sub>2</sub> emissions that would result if fossil fuels were used to generate the same amount of electricity.

## TRANSFER FACILITY

**Transfer facilities** process wastes and direct them to waste-to-energy plants or landfills. Transfer facilities have direct CO<sub>2</sub> emissions from the use of fuel onsite and indirect GHG emissions due to their use of electricity. At some facilities, materials coming into the transfer station can be "mined" for valuable recyclables such as cardboard.

## FLARE

Collected landfill gas may be **flared** (burned), which converts methane into biogenic CO<sub>2</sub>.



## LANDFILL

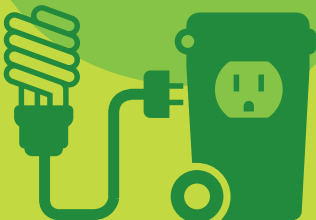
Some of the carbon-containing waste in landfills decomposes, creating GHGs — mostly methane and CO<sub>2</sub>. Other waste remains intact, sequestering the carbon indefinitely.<sup>26</sup> Modern landfills prevent most of the methane from escaping, through use of gas collection and landfill cover management systems. We are working with the EPA and the California Energy Commission to better understand and quantify methane emissions from landfills (see [p.19 of this Book](#) and [p. 22 in the Appendix](#)).

## TURBINE

131 of our landfills use landfill gas as fuel for **landfill-gas-to-energy** plants, releasing biogenic CO<sub>2</sub> but preventing the release of methane and avoiding CO<sub>2</sub> emissions that result from burning fossil fuels to **generate electricity**.

## WASTE-TO-ENERGY FACILITY

Waste Management's 17 **waste-to-energy** plants emit about 65 percent biogenic CO<sub>2</sub> and 35 percent manmade CO<sub>2</sub> as carbon-containing waste is burned to produce renewable electricity. These plants also avoid CO<sub>2</sub> emissions that would result from burning fossil fuels to generate the same amount of electricity. Metals are recovered at waste-to-energy plants for recycling, thereby avoiding additional GHG emissions needed to produce metal from ore.



## PROTECTING GROUNDWATER

High-quality groundwater is essential to natural ecosystems and human communities alike. To ensure its protection, we routinely monitor the groundwater conditions surrounding our facilities through a comprehensive, regulated network of more than 6,000 groundwater monitoring wells. Our modern municipal solid waste (MSW) landfills are performing as designed and are protecting groundwater at adjacent properties. None of Waste Management's modern landfills has had to undertake corrective action to clean up groundwater under a neighboring property.

Modern landfill standards, developed under the federal Resource Conservation and Recovery Act (RCRA), apply to our landfills across the United States and mandate rigorous siting evaluation, site characterization and scientific engineering design. These standards, called the "RCRA Subtitle D" standards, require a comprehensive permitting process with public notification and comment, as well as extensive regulatory approvals. The current RCRA Subtitle D standards mandate the use of engineered liners and covers, collection and treatment systems for leachate (rainwater that accumulates in waste), collection and control systems for landfill gas, and monitoring and reporting.

We work with experts in the public and private solid waste sectors to understand what happens within landfills after they are closed. Studies have documented that conditions at MSW landfills improve in predictable patterns over time, with landfills steadily producing less gas as well as less and cleaner leachate.<sup>28</sup> With proper planning and design, landfill properties can be converted safely to a wide range of recreational, conservation, commercial and industrial uses.<sup>29</sup>

## CONSERVING WATER

In a world in which freshwater supplies are under increasing stress, we recognize the importance of using water sparingly and protecting its quality. In fact, one of our four sustainability goals, the preservation of natural habitats for wildlife, is related to our efforts to conserve water. The ecosystems that support these wildlife habitats require an abundant supply of clean water. We are pleased to have exceeded our goal for habitat protection by preserving more than 26,000 acres of habitat in 2011 (see [p. 27 in this Book](#) for more information).

Waste Management's subsidiaries employ a staff of more than 140 professional engineers, environmental scientists, regulatory experts and technicians who work to ensure that every facility implements processes and best management practices designed to protect surface water, storm water and groundwater from potential impact from our operations. Managed basins, tanks, containment structures and separators contain water that comes in contact with waste or contaminants, redirecting it for proper disposal and treatment. We monitor to ensure that any water leaving a facility's property is acceptable for discharge, will not negatively impact the environment and meets discharge standards. We also conduct formal and frequent facility parking lot inspections and strive to clean spills and leaks within 24 hours. All of our landfill facilities utilize monitoring strategies (many incorporating sophisticated statistical evaluation developed by science professionals) of adjacent surface water and groundwater bodies to ensure that water quality is not impacted.

For fiscal year 2011, we reported to the Carbon Disclosure Project that we withdrew 700.20 megaliters of municipal water in the United States.<sup>30</sup> To help us better understand our consumption and conservation of water, we used the World Business Council for Sustainable Development's Global Water Tool to map the location of our market areas against water-stressed regions. This analysis determined that 27 percent of our market areas are located in water-stressed regions. We plan to use this mapping as a management tool for our water conservation efforts and to prioritize our company's future LEED certification projects. We will continue to evaluate our water conservation efforts to determine, for example, the effect of employing LEED principles in new Waste Management construction, particularly in regions identified as water-stressed.

#### SmartSponge™ Soaks Up Storm Water

According to the EPA, storm water pollution is the leading cause of water-quality problems in the United States. To help address this issue, in 2011 Waste Management became the exclusive waste and environmental services distributor of SmartSponge. SmartSponge uses an innovative and patented sponge-like material with polymers to filter, absorb and solidify petroleum hydrocarbons. It also removes or reduces other pollutants, including coliform bacteria, from roads and other paved surfaces during wet weather, during cleaning or from direct spills. After use, the product can be safely and responsibly disposed at a waste-to-energy facility as an alternative fuel to produce electricity.



## OUR APPROACH TO WATER CONSERVATION

APPROACH	OUTCOME
We use rainwater and nonpotable water to wash trucks and control dust. In some cases, leachate is used for dust control on lined areas of a landfill. At some facilities, we have installed biotreatment systems to capture and reuse 100 percent of the water used to wash our trucks.	Conserve potable water.
We conserve and reuse reclaimed wastewater in boilers for steam turbines at select renewable energy projects. All of our waste-to-energy facilities collect contact water and process water for reuse in other operations.	Conserve potable water.
At sites where it is environmentally appropriate and allowed under state regulation, we use wastewater, rather than potable water, in constructing landfill units, and we recirculate landfill leachate for conversion into renewable energy.	Conserve potable water.
We treat water onsite (using methods such as reverse osmosis or onsite spray irrigation within a confined unit for biologic treatment), which returns water from industrial use to the environment at drinking water quality.	Maintain or improve quality of local water supplies.
At bioreactor landfills, commercial and industrial wastewater is received for biotreatment within the landfill, converting the organics in these materials into renewable energy collected for beneficial use.	Provide biological water treatment with the added benefit of energy production.
Our Environmental Protection department oversees an environmental management program, which includes the control and monitoring of storm water, avoidance of storm water contact with waste, and implementation of best management practices designed to minimize the formation of leachate.	Maintain quality of local surface water supplies.
Our Groundwater Protection department is dedicated to preserving water quality and avoiding impacts from our disposal operations on any neighboring property's ground or surface water. The program employs standardized and professionally reviewed evaluation procedures as well as construction and monitoring protocols.	Maintain quality of local subsurface water supplies.
Our facilities have started to adopt high-efficiency plumbing fixtures during building retrofits and fixture change-outs. We also started to look at water requirements in landscape irrigation for all our facilities, incorporating high-efficiency landscaping devices and weather sensors when necessary.	Conserve potable water.

### Water Conservation at the Phoenix Open

Waste Management tries to reduce the use of potable water whenever possible when servicing community events. At the 2011 Waste Management Phoenix Open, the annual Professional Golf Association tournament held in Scottsdale, Arizona, we sponsored a "graywater" initiative. Portable restrooms throughout the course utilized rerouted drain water from kitchens, laundries and hospitality areas, saving 1,476 gallons of fresh water in a water-stressed environment.

### Conserving Water at Our Facilities

Waste Management Sustainability Services offers a LEED certification program that includes training modules on water efficiency and resource management. The program primarily offers LEED consulting services to third parties, but it also helps to LEED-certify our own facilities. We intend to pursue additional LEED certifications as we move, build or remodel offices and other facilities. See [p. 28 in this Book](#) for more information on our LEED facilities.

At our LEED Gold Vehicle Maintenance Facility in Moreno, California, (pictured below), we achieved a 54 percent reduction in water used for the building and a 59 percent reduction in water used for landscape irrigation.



## CONSERVING ENERGY

As a major supplier of renewable energy, Waste Management increasingly uses renewable sources — wind, solar, waste heat and landfill gas — to power our own facilities. We disclose our energy use as part of our Climate Disclosure Project submission, require energy conservation at our LEED-certified sites, and encourage conservation initiatives throughout our company. As of 2011, our energy use costs are equal to about 0.28 percent of our total revenues.

Lighting accounts for at least 21 percent of the total electricity consumption at our facilities. In 2011, in partnership with Sylvania Lighting Services, we launched a 24-month lighting efficiency retrofit initiative to improve our efficiency in this area. Through upgrades to our existing lighting systems, we expect to reduce our current annual electrical consumption of 82.7 million kilowatts per hour (kWh) by as much as 30 million kWh nationwide. We estimate this will cut the cost of lighting our facilities by nearly 40 percent.

Our efforts to conserve energy and utilize renewable sources also include the use of:

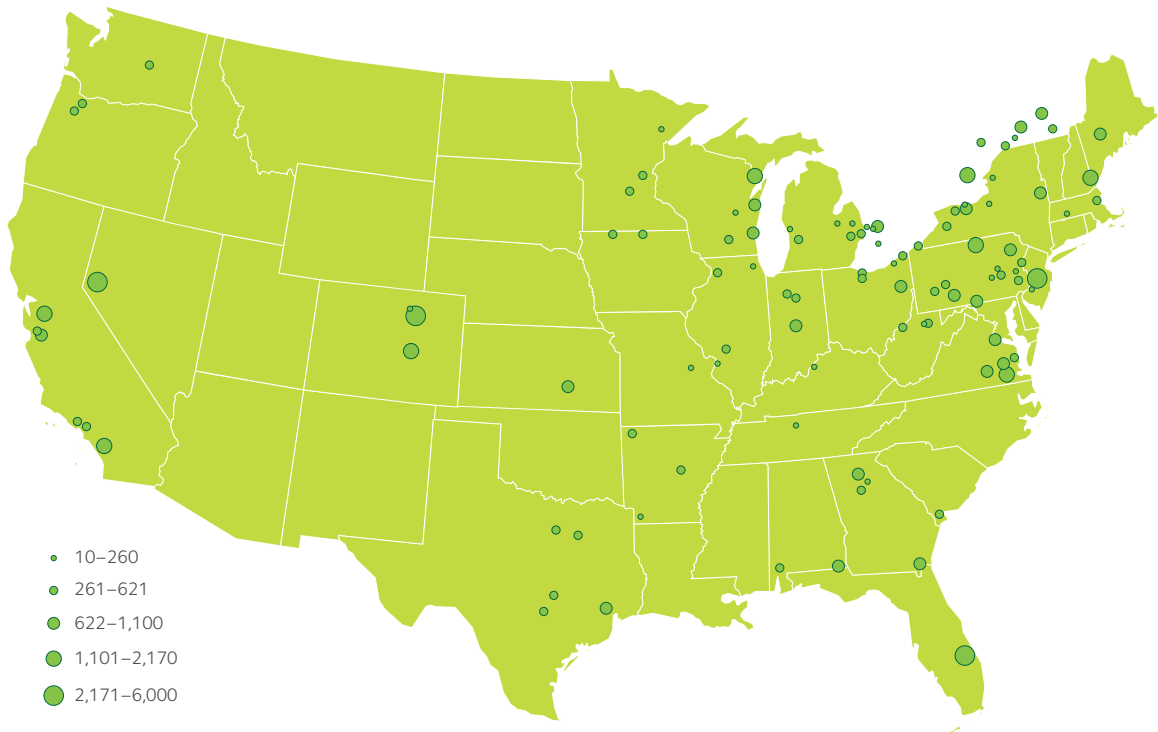
- Wind- and solar-driven landfill gas control devices
- Wind- and solar-driven leachate extraction pumps
- Waste heat to power other devices onsite (in design)
- Variable frequency drives to reduce electricity use
- Landfill gas produced onsite for greenhouse and horticultural education centers nearby
- Energy-efficiency audits conducted at California facilities, resulting in energy savings from heat pump and lighting retrofits

## PROTECTING AND ENHANCING WILDLIFE HABITATS

Waste Management owns properties that range in size from small urban offices to large, hundred-acre facilities in suburban and rural settings. At our larger properties, which are mostly open and closed landfills, substantial areas are set aside as clean buffer zones. In these areas, we have the opportunity to enhance the natural value of the land, provide habitat for wildlife and offer educational opportunities and aesthetic amenities to the surrounding community.

### WASTE MANAGEMENT LOCATIONS WITH WHC-CERTIFIED PROGRAMS

total site acreage



#### Waste Management and the Wildlife Habitat Council (WHC)

The Wildlife Habitat Council is a nonprofit, non-lobbying group of corporations, conservation organizations and individuals dedicated to restoring and enhancing wildlife habitat. The WHC's Corporate Wildlife Habitat Certification/International Accreditation recognizes commendable wildlife habitat management and environmental education programs at individual sites through the organization's Wildlife at Work program. The WHC also recognizes community-oriented educational efforts through its Corporate Lands for Learning program. In 2011, Waste Management had 110 Wildlife at Work and 18 Corporate Lands for Learning certifications. The above map displays the locations of these 128 WHC-certified programs.

In 2007, we set an ambitious goal to provide wildlife habitat on our properties. Our commitment stated that, by the year 2020, we would manage at least 100 facilities certified by the Wildlife Habitat Council and set aside approximately 25,000 acres of land as conservation and wildlife habitat. We are pleased to report that we met and exceeded that goal in 2010.

By the end of 2011, we had 128 WHC-certified programs located at 110 facilities, with more than 26,000 acres created, enhanced or protected for wildlife across North America.<sup>31</sup> Though landfills comprise the bulk of our certified facilities, we are increasing the number of other sites, such as recycling and disposal centers and transfer stations, that qualify for WHC recognition.

In addition to the wildlife habitats certified at our active and closed facilities, Waste Management leases our unused property for productive use by farmers and ranchers. As of 2011, more than 16,500 acres in the United States and Canada were used for this purpose.

#### **A Closed Landfill Becomes a Wildlife Habitat**

Waste Management's Hoot Landfill in Fouke, Arkansas, offers a notable example of how a waste facility can be transformed into a thriving wildlife habitat. Closed in 1997, the site is now known locally as the Sulphur River Waterfowl Educational Facility. It has received two different certifications from the WHC: one for the Wildlife at Work program in 2009, the other for the Corporate Lands for Learning program in 2011. Waste Management, along with others, participates in the operation of the 215-acre habitat, which offers educational programs for children and adults on the interdependence of ecology, economics and social structures.



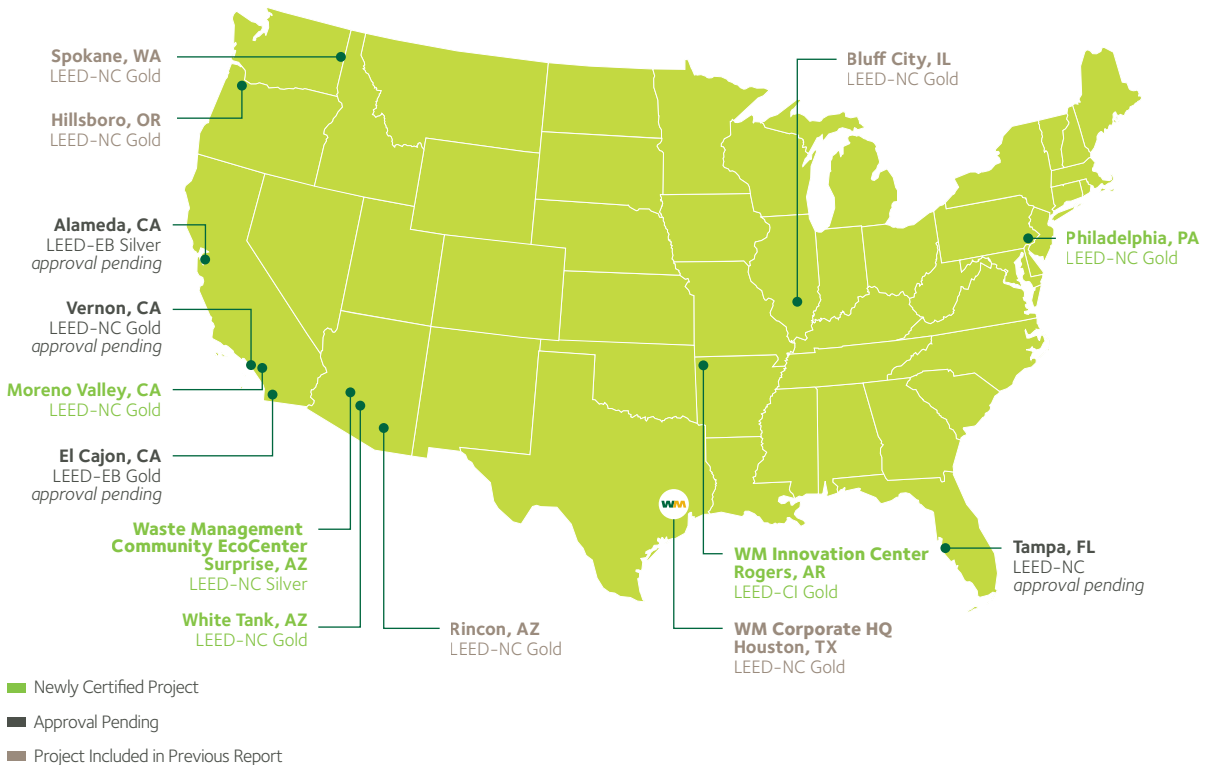
## SUSTAINABILITY AT OUR FACILITIES

Since much of our business aims to help our customers meet their environmental goals, we take seriously the need to reflect that same spirit of stewardship in our own operations. We are implementing sustainability practices at our facilities that improve operational efficiencies and achieve cost savings. Several of our facilities, including our company headquarters in Houston, Texas, are certified according to Leadership in Energy and Environmental Design (LEED) standards. LEED provides independent, third-party verification that a building meets the environmentally friendly design and performance standards established by the United States Green Building Council. Between 2010 and 2011, we aggressively pushed green building initiatives into our new construction, resulting in:

- Five Waste Management facilities achieving LEED certification by the Green Building Certification Institute
- Four more facilities in the process of obtaining LEED certification
- Two LEED-designed facilities in the pipeline for 2012 construction

For more information on our LEED-certified facilities, including our new Waste Management Sustainability Center, see [p. 17 in Book 3](#).

### WASTE MANAGEMENT LEED SITES\*



\*LEED-NC is for new construction, LEED-EB is for existing buildings and LEED-CI is for commercial interiors.



## WASTE MANAGEMENT LEED FACILITY HIGHLIGHTS

### LEED GOLD (2010)

#### Philadelphia Material Recovery Facility

PHILADELPHIA, PENNSYLVANIA

- Sorts and processes more than 20,000 tons of recyclables per month
- Constructed on a former brownfield site using 47 percent recycled content and 42 percent regionally sourced materials, promoting land reuse
- Includes a green roof made of 80 percent recycled content, reducing heating and cooling costs, contributing to water quality by controlling storm water runoff, improving air quality and extending the life of the roof
- Includes bike racks and preferred parking spaces for low-emission vehicles
- Features floor tiles made of 46 percent recycled material and 23 percent rapidly renewable material; carpet made of 50 percent recycled material; paints low in volatile organic compounds (VOCs); lumber certified by the Forest Stewardship Council; and countertops made of 70 percent recycled material
- Reused or recycled over 95 percent of waste generated during construction



### LEED GOLD (2011)

#### Vehicle Maintenance Facility

WHITE TANK, ARIZONA

- Reduces water use throughout the site by 61 percent
- Reuses 100 percent of truck-wash water through a biotreatment system
- Used 100 percent low-VOC paints and sealants in the interior space
- Earned certification for Green Cleaning from the GREENGUARD Environmental Institute
- Recycled 98 percent of waste generated during construction



**LEED SILVER (2011)**

**Waste Management Community  
EcoCenter Material Recovery Facility**  
SURPRISE, ARIZONA

- Processes 500 tons of recyclable municipal solid waste per day
- Built on a former brownfield site, promoting land reuse
- Offers educational opportunities through an Environmental Education Center on premises, for community groups to learn about recycling and waste management
- Maximizes the use of gravity-powered conveyors where possible in recyclable processing
- Features four TITECH optical sorters, which use a state-of-the-art scanner and air blowers to sort recyclables, reducing labor time and increasing efficiency and sorting accuracy
- Received a 2011 Bronze Recycling Systems Excellence award from the Solid Waste Association of North America

**LEED GOLD (2011)**

**Vehicle Maintenance Facility**  
MORENO VALLEY, CALIFORNIA

- Reduces facility water use by 54 percent and water used for landscape irrigation by 59 percent
- Constructed with 30 percent recycled material
- Features 70 percent building materials that were extracted, mined, grown and manufactured within a 500-mile radius of the project, reducing energy used for construction and related greenhouse gas emissions
- Saves 44 percent annually in energy costs, compared to similar buildings
- Features energy-efficient design, including evaporative cooling, interior lighting that adjusts to maintain constant levels as exterior conditions change, and fluorescent lighting
- Recycled or reused more than 95 percent of waste generated during construction



## OPERATING A CLEAN AND EFFICIENT TRUCK FLEET

It's no secret that garbage trucks outfitted with complicated, heavy machinery — not to mention tons of waste — are among the least fuel-efficient vehicles in the world. The frequent stops and idling that occur as a matter of course along regular routes also drag down fuel economy. With more than 31,000 collection and support vehicles on the road throughout North America, our trucks are a familiar sight — and they represent one of our most visible environmental impacts.

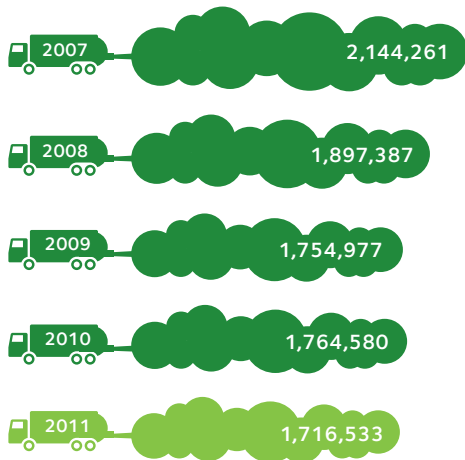
To lessen the impact our trucks have on the environment, we've set a goal to increase our fleet's fuel efficiency by 15 percent and reduce our total fleet emissions by 15 percent by 2020.<sup>32</sup> By investing up to \$500 million a year over the 10-year period begun in 2007, we aim to save:

- 350 million gallons of fuel,
- about 3.5 million metric tons of CO<sub>2</sub> emissions, and
- \$1 billion in operational costs.

In December 2009, we completed an inventory of our fleet that estimated our 2007 baseline emissions, allowing us to track our progress over time toward our 2020 goal. Key to developing this inventory has been our work with the EPA's SmartWay Transport Partnership.<sup>33</sup> SmartWay assists transport and freight companies seeking to make improvements in their environmental performance, and provides models for tracking fuel consumption and efficiency. We were awarded SmartWay Partnership status in 2010, and were the first company with a vocational fleet (e.g., construction, heavy hauling, mining, logging or refuse) to become a SmartWay Partner.

### OUR FLEET EMISSIONS OVER TIME

(tons CO<sub>2</sub>e)



Emissions data has been recalculated using the 2009 (most recent) SmartWay model.

### FLEET SNAPSHOT, 2011

Number of Vehicles

**31,312**

Number of Natural Gas Vehicles

**1,365**

Fleet Investment

**\$580M**

CO<sub>2</sub> Emissions

**1,716,533T**

Driver Hours Reduced

**450,000**

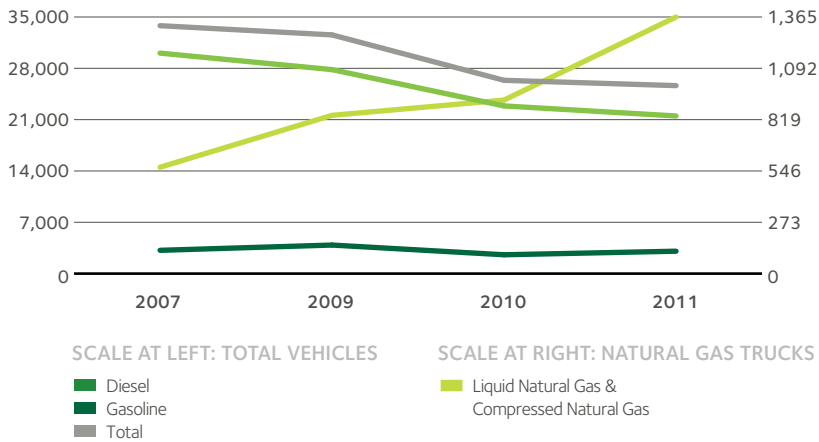
Average Yearly Driver Training  
(40 in classroom, 40 on road)

**80 HRS**

## Rolling Out the Collection Vehicles of Tomorrow — Today

One of our primary strategies for reducing emissions and increasing fuel efficiency is to transition our collection fleet of over 18,000 vehicles from diesel to natural gas. In 2011, we purchased 358 natural gas trucks, bringing our total to 1,365 by the close of 2011 (1,600 by mid-2012). Since 2007, we have cut our number of diesel vehicles by 29 percent while nearly doubling the size of our natural gas fleet.

### NUMBER OF VEHICLES



For every heavy-duty collection truck that we convert to natural gas, we reduce our diesel use by 8,000 gallons per year and our greenhouse gas emissions by 22 metric tons of CO<sub>2</sub>e per year. This amounts to a 21 percent emissions reduction per truck when compared to the use of diesel fuel. Natural gas is also quieter and lighter than diesel. It both reduces idling noise and cuts smog-producing nitrogen oxide emissions by up to 50 percent compared to the cleanest diesel trucks. We have begun tracking emissions per mile as an indicator of progress in greening our fleet.

### WASTE MANAGEMENT FLEET AVERAGE EMISSIONS

(grams/mile)

	2007	2009	2010	2011
NOx	23.8	19.5	16.8	16.0
PM	0.888	0.732	0.653	0.644
GHG	3,020	2,965	3,027	2,963

Our fleet average emissions are calculated across our entire fleet of on-road diesel, gasoline, liquified natural gas and compressed natural gas. This table reflects the grams of emissions per mile traveled. Nitrogen oxide (NOx) and particulate matter (PM) emissions are calculated using the EPA's SmartWay model. GHG emissions are calculated using the EPA's SmartWay model for CO<sub>2</sub> emissions and The Climate Registry's model for nitrous oxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>) emissions.

In 2011, Waste Management replaced 457 diesel trucks with natural gas trucks — displacing the use of 3.6 million gallons of diesel fuel with cleaner-burning natural gas and reducing GHG emissions by 9,788 metric tons/year.

We continue to invest in alternative fueling infrastructure and production. By the end of 2012, we will have natural gas trucks operating in 28 U.S. states and two Canadian provinces, and our public fueling stations will be active in 14 states. These stations refuel Waste Management's local fleets and sell compressed natural gas to commercial fleets and individuals at prices typically one-third below the cost of gasoline and diesel. For more on our fleet improvements, see [p. 20 in the Appendix](#).



#### The Benefits of Converting Our Fleet to Natural Gas

- Nitrogen oxide emissions are reduced by up to 50 percent compared to 2010 diesel engines.
- Greenhouse gas emissions are reduced by over 21 percent compared to standard diesel trucks.
- Greenhouse gas emissions can be reduced by over 80 percent when using landfill-gas-derived compressed or liquid natural gas.
- Every collection truck that is transitioned to natural gas eliminates the use of 8,000 gallons of diesel fuel.

#### Waste Management of California Earns Green Fleet Certification

In 2011, the Association of Equipment Management Professionals awarded its Green Fleet Silver-level Certification to Waste Management of California. The award recognizes the improvements we have made to our heavy-equipment fleet, upgrading and retrofitting our vehicles to meet the higher emissions standards set by the California Air Resources Board. In addition, we retired more than 150 heavy-equipment units that could not be upgraded or retrofitted. One of the replacements for these units is a new hybrid bulldozer, the D7E, designed primarily for waste-hauling. The first of its kind to use diesel-electric drive technology, it increases efficiency by 25 percent and reduces fuel consumption by 10 to 30 percent.

## CREATING A GOOD PLACE TO WORK

Our employees are the cornerstone of our success, and we work diligently to provide them with the tools they need to grow and succeed in their careers. One of our strategic business goals is to be a “best place to work.” To achieve that, we strive to develop a diverse workforce and a safe, positive and productive work environment.

We aim to reflect our core values and exhibit the highest ethical standards in our workplace culture — both together as a company and as individuals. We train all of our employees in our company Code of Conduct, and we expect them to comply. For the last five years, we have been named to the Ethisphere Institute’s list of the “World’s Most Ethical Companies.” For 2012, we were the only company listed in the environmental services category. (See p. 4 in the [Appendix](#) for more about our values and Code of Conduct.)

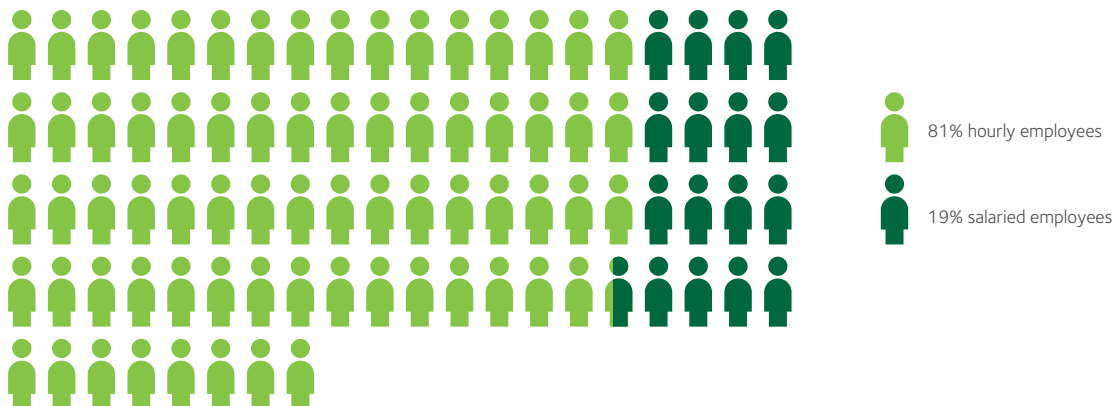
### DIVERSITY AND INCLUSION

As an equal opportunity employer, we are committed to an employment environment free from discrimination. We believe it is important to maintain a vibrant and diverse workforce that reflects the diversity of the customers and communities we serve. Employment decisions are made by placing the most qualified person in each job without regard to race, color, sex, sexual orientation or other protected group status as defined by federal, state or local laws.

As of December 2011, 39 percent of our employees were minorities, and 18 percent were women. Twenty-five percent of our executive leadership team was minority or female. Among company officials and managers, about 18 percent were minority and 18 percent were women. Our Board of Directors was 22 percent minority and 11 percent female. (See p. 21 in the [Appendix](#) for additional diversity data.)

### TOTAL EMPLOYEES

41,435 U.S. employees and 2,929 Canadian employees



## Waste Management and Veterans

Waste Management has been recognized for our outstanding employment outreach efforts to veterans:

**G.I. Jobs** 2010–2012 “Top Military Friendly” Employer

**Military Times** 2010–2011 “Best for Vets” Employer

**CivilianJobs.com** 2011 “Most Valuable Employer” for Military

## WORKFORCE SAFETY

Our worker safety efforts focus on helping workers avoid vehicle accidents and safely operate heavy equipment. Since trash collection, processing and disposal rank among the most dangerous occupations in North America, we are constantly looking for ways to ensure the safety of our employees and enhance worker safety in our industry overall. Our drivers and collectors must navigate residential and urban traffic and lift heavy items — both of which can lead to injuries. Employees at our facilities must be constantly alert to avoid serious injury as they work with sophisticated heavy equipment.

Waste Management’s safety performance has ranked among the best in our industry in recent years, even as overall rates in our industry have continued to improve. We work actively with our trade association, the National Solid Wastes Management Association, in its efforts to educate the public on how they can make day-to-day sanitary service operations safer for everyone.<sup>34</sup>

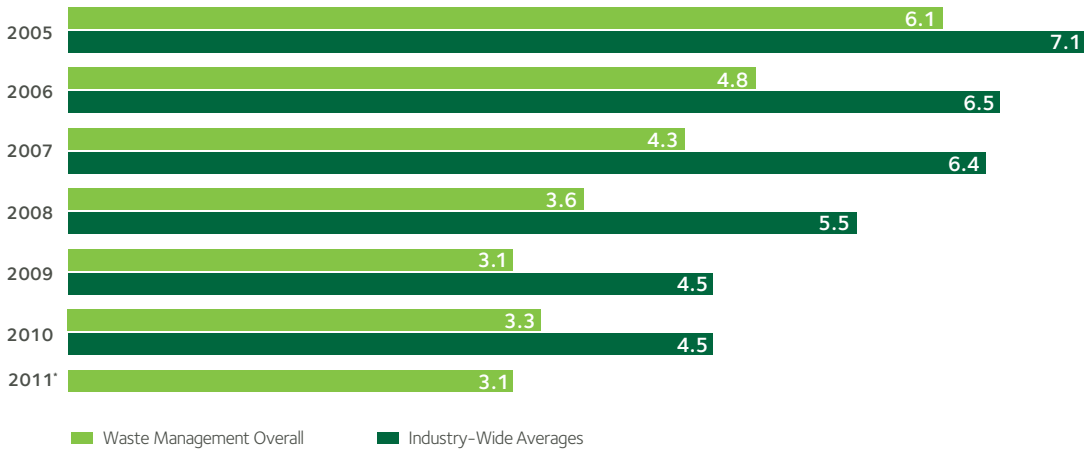
### Continuous Improvement

About a decade ago, we made a commitment to overhaul our safety culture and to put processes and systems in place that would make every site and each individual responsible for safe behaviors. As a result, we launched an internal safety philosophy that we call Mission to Zero™ or M2Z. The core of the M2Z philosophy is zero tolerance for unsafe behaviors by all employees, with a goal of zero accidents or injuries. All operational employees benefit from the program’s safety training, rulebooks, fleet processes and standard practices. Over the years, the M2Z approach has resulted in programs that have improved safety performance, including worker injury rates, vehicle collision prevention and safety leadership development. The program, which ranks among the most far-reaching and comprehensive worker safety plans in our industry, involves classroom instruction, route observation, monitoring of safety data and driver training. Since its adoption, we have seen significant improvements, including:

- A decrease of 86 percent in our Total Recordable Injury Rate (TRIR) — i.e., non-fatal illnesses and injuries — between 2000 and 2011. In 2011, our TRIR of 3.09 put us well below the 2010 industry average of 4.5, the most recent government statistic available.
- An improvement of 76 percent in our Vehicle Accident Recordable Rate (VARR) between 2005 and 2011.

## TOTAL RECORDABLE INJURY RATE

Number of injuries per 100 employees; 49% improvement since 2005



Source: Bureau of Labor Statistics, Incidence Rates of Non-Fatal Occupational Injuries and Illnesses (data for the waste management and remediation services industry).

\*Government data on the industry-wide average for 2011 has not yet been released.

## Vehicle Safety and Driver Training

As a demonstration of our commitment to employee safety, Waste Management each year invests approximately \$500 million in the maintenance of collection vehicles and \$100 million in maintenance and repairs for heavy equipment. We believe this investment has contributed to our 76 percent decline in reported vehicle accidents between 2005 and 2011. We service our fleet monthly, inspect each vehicle twice daily to ensure proper operation and tie preventative maintenance inspections to vehicle usage rates.

In on-the-job training and evaluation programs for our drivers, we exceed U.S. Department of Transportation (DOT) requirements. Newly hired drivers undergo 80 hours of training, split evenly between the classroom and on the road with an experienced driver. We hold safety briefings each morning before drivers begin their routes.

As part of the training process, evaluations are given at 30, 60 and 75 days. We follow federal regulations for the maximum number of hours spent behind the wheel and require all drivers to pass a general physical and meet DOT physical requirements.

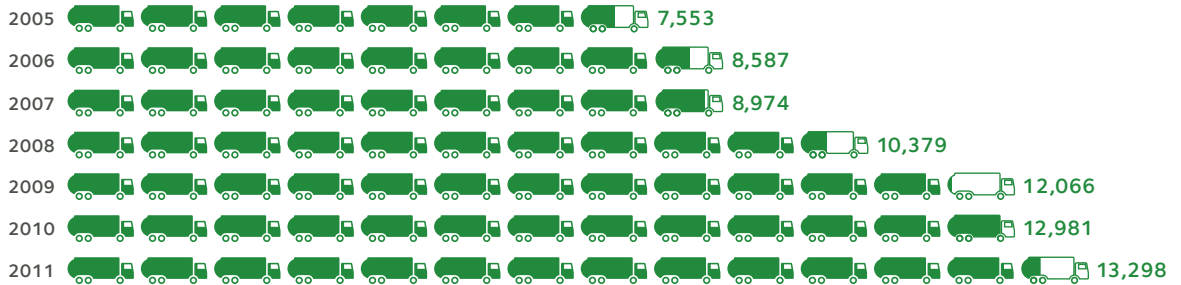
### Protecting Mobile Workers

Waste Management Security Services partnered in 2011 with Blackline GPS to provide monitoring services for Blackline's suite of Loner® mobile worker safety solutions. The technology detects falls in real time with virtually no false alarms. Incorporating an emergency button and GPS, Loner products communicate safety alerts to the Security Services monitoring center, where personnel can manage a rapid emergency response. Waste Management Security Services currently provides around-the-clock electronic security monitoring for Waste Management and its customers, and uses Blackline's Loner GPS safety device for monitoring employees working at both company facilities and offsite.



## VEHICLE ACCIDENT RECORDABLE RATE

Driver hours without an accident; 76% improvement since 2005



One truck equals 1,000 hours

### Increasing Safety on the Road through Simulation

At Waste Management's corporate training facility in Tampa, Florida, our drivers learn how to handle potentially dangerous scenarios in the safety of our tactical truck simulator. The simulator takes drivers through everyday situations, from driving on the highway to urban city settings. Preprogrammed to respond like one of several vehicles in our fleet, including a loaded 13-ton waste truck, the training courses include lifelike interactive weather elements, traffic signals, pedestrian facsimiles and virtual vehicles that stop suddenly or change lanes erratically. Drivers have a multi-screen view that imitates the actual view from their vehicle. The steering wheel and seat in the simulator provide realistic sensations — so that the driver feels the bumps in the road and the pull of the steering wheel. At the end of a full training session, drivers receive a comprehensive evaluation of their performance in key safety areas.

### Collaborating with OSHA

Waste Management participates in the Voluntary Protection Program (VPP) Corporate Pilot overseen by the U.S. Occupational Safety and Health Administration (OSHA). We were one of just eight companies — and the only member of the waste industry — selected for this invitation-only program. VPP tests new processes for companies that have already demonstrated a strong commitment to employee safety and health. Twenty-one of Wheelabrator Technologies' 22 energy generation facilities are VPP certified. In 2007, our Carlsbad, California, facility became the first waste and recycling service hauling plant in the nation to achieve VPP Star designation, which is OSHA's highest national rating for voluntary safety practices. In 2010, the Waste Management transfer station in Irvine, California, likewise became the first of its kind to receive the VPP Star designation.

## BOOK TWO ENDNOTES

- <sup>1</sup> Improvements in data mining and tracking tools also helped us uncover opportunities to recycle tonnages we receive at transfer stations as well as from third-party collectors/processors. This incremental increase also added somewhat to 2011 recycling volumes.
- <sup>2</sup> This section analyzing recyclables handled by Waste Management was drawn from the centralized database for Waste Management Recycling Services, Waste Management recovery programs and other specialty recycling operations such as organics and mercury recovery. These figures appear in the summary of Waste Management's key indicators (Book 1, p. 9).
- <sup>3</sup> Based on internal calculations using the specialty "Waste Management Green Sheet Calculator" developed by Waste Management Sustainability Services separately for each commodity.
- <sup>4</sup> Calculated using the National Recycling Coalition/EPA WARM Model, developed by the EPA and modified by the National Recycling Coalition – [www.nrcrecycles.org](http://www.nrcrecycles.org). Updated 7/2008.
- <sup>5</sup> See [earth911.com/news/2007/04/02/facts-about-aluminum-recycling/](http://earth911.com/news/2007/04/02/facts-about-aluminum-recycling/).
- <sup>6</sup> See [www.gpi.org/recycle-glass/top-ten-reasons-to-recycle-gla.html](http://www.gpi.org/recycle-glass/top-ten-reasons-to-recycle-gla.html).
- <sup>7</sup> See [www.wte.org/faq](http://www.wte.org/faq).
- <sup>8</sup> Note that Waste Management's figure includes landfill gas used to generate electricity as well as its direct use as a fuel (for example, by a nearby manufacturing plant or in leachate evaporation projects). The Department of Energy's Environmental Information Agency reports electrical production from power plants using landfill gas as fuel.
- <sup>9</sup> As of June 2012, the most recent year for which national figures were available was 2010; Waste Management's data is from 2011.
- <sup>10</sup> Eileen Brettler Berenyi, Recycling and Waste-to-Energy: Are They Compatible? 2009 Update (Westport, CT: Governmental Advisory Associates, Inc., 2009). See [www.energyrecoverycouncil.org/waste-energy-recycling-compatible-a2975](http://www.energyrecoverycouncil.org/waste-energy-recycling-compatible-a2975).
- <sup>11</sup> Renewable energy figures include 17 WTE plants and 2 biomass-to-energy plants, one using waste wood and the other waste wood and tires. Output in any given year will fluctuate somewhat, reflecting economic trends that are positive or negative as manifest in the generation of more or less waste.
- <sup>12</sup> Note that this number includes only energy sold, not the additional energy generated but used to power the facilities themselves.
- <sup>13</sup> Calculations based on standard WTE industry reporting: 1,000 households per installed megawatt.
- <sup>14</sup> Avoided coal and oil use is based on a comparison of the amount of coal or oil needed to produce the same number of kilowatt-hours of electricity that Waste Management produces from renewable components of MSW, woody biomass and tires.
- <sup>15</sup> Source: [www.energyrecoverycouncil.org/waste-energy-superior-emissions-a2976](http://www.energyrecoverycouncil.org/waste-energy-superior-emissions-a2976).
- <sup>16</sup> Calculations based on standard LFGTE industry reporting: 815 households per installed megawatt.
- <sup>17</sup> See [www.wm.com/products-and-services/residential-curb-side-pickup/index.jsp](http://www.wm.com/products-and-services/residential-curb-side-pickup/index.jsp).
- <sup>18</sup> See [www.wm.com/products-and-services/small-business-commercial-pick-up/compactor-monitoring.jsp](http://www.wm.com/products-and-services/small-business-commercial-pick-up/compactor-monitoring.jsp).
- <sup>19</sup> According to the EPA, greenhouse gas emissions from landfills across the United States have decreased by 27 percent since 1990, while total overall emissions across industries have increased by 10.5 percent since that time. See [www.epa.gov/climatechange/emissions/usinventoryreport.html](http://www.epa.gov/climatechange/emissions/usinventoryreport.html).
- <sup>20</sup> See [www.wm.com/sustainability/protection-and-management.jsp](http://www.wm.com/sustainability/protection-and-management.jsp).
- <sup>21</sup> See [www.wm.com/enterprise/healthcare/index.jsp](http://www.wm.com/enterprise/healthcare/index.jsp).
- <sup>22</sup> See [www.wm.com/enterprise/healthcare/index.jsp](http://www.wm.com/enterprise/healthcare/index.jsp) and [www.thinkgreenfromhome.com/SyringesAndLancets.cfm](http://www.thinkgreenfromhome.com/SyringesAndLancets.cfm).
- <sup>23</sup> We are reporting this data to inform our customers and the public about the potential GHG reduction benefits associated with carbon storage in landfills, our renewable energy production and the recyclable materials we collect and process. We are not presuming to characterize how emerging regulatory programs will allocate credit for these avoided emissions, so we do not claim these GHG reduction benefits as our own, nor attempt to deduct these reductions from our carbon footprint.
- <sup>24</sup> For a discussion of the protocols that govern this calculation of carbon storage or sequestration, see the [Appendix at p. 23](#).
- <sup>25</sup> Substances produced by living organisms or biological processes.
- <sup>26</sup> Both the UN Intergovernmental Panel on Climate Change and the EPA's National GHG Emissions Inventory account for carbon sequestration of undecomposed wood products, yard trimmings and food wastes disposed of in landfills.
- <sup>27</sup> GHG emissions from refrigerant use are de minimus and therefore are not reflected in the summary.
- <sup>28</sup> UIC, Terra-Dynamics, and Geosyntec, Municipal Solid Waste Landfill Leachate Characterization Study (Raleigh, NC: Environmental Research and Education Foundation, 2007).
- <sup>29</sup> See [www.wm.com/sustainability/protection-and-management.jsp](http://www.wm.com/sustainability/protection-and-management.jsp).
- <sup>30</sup> Calculated using gallons per employee per day (GED) based on the Energy Policy Act of 1992 Water Usage Requirements.
- <sup>31</sup> Total acreage for wildlife habitat in 2011 remained relatively consistent with the 2010 acreage of more than 26,000. Previously, we had included sites with wildlife programs before certification was final; now we only count acreage for certified sites.
- <sup>32</sup> A small amount of the 15 percent reduction will result from EPA-mandated standards for 2007 and 2010 engines. The longer-term reductions will require new technology.
- <sup>33</sup> Emissions were estimated using the EPA's NONROAD 2008 and SmartWay 1.0 models for particulate matter and nitrogen oxides, while California Climate Registry conversion factors were used to estimate emissions of carbon dioxide, methane and nitrous oxide, the primary greenhouse gases. Waste Management vehicle duty cycles are significantly different from the on-road long-haul vehicles for which SmartWay is designed. The addition of heavy compacting machinery to our trucks, combined with frequent route stops and idling while the machinery operates, equates to an effective 30 percent reduction in fuel economy. We are taking the lead in working with SmartWay in the near future to refine their model to better address our vocational fleet.
- <sup>34</sup> See [www.environmentalistseveryday.org/solid-waste-management/environmental-waste-garbage-safety-first/index.php](http://www.environmentalistseveryday.org/solid-waste-management/environmental-waste-garbage-safety-first/index.php).



# OUR FUTURE MAXIMIZING VALUE FROM WASTE

Working to Minimize Waste & Maximize Value.....	2
Innovative Recycling Technologies.....	4
Transforming Organics.....	10
Post-Recycling Processing.....	12
Waste Management Sustainability Services.....	16
Partnering with Communities.....	22

# WORKING TO MINIMIZE WASTE & MAXIMIZE VALUE

At Waste Management, we care about the planet. We feel a responsibility to leave it to future generations in better shape than we were given it. We're doing our part by helping businesses and communities transform what they used to send to landfill into valuable resources.

## CAPTURING VALUE FROM WASTE

We are contributing to a more sustainable world by:

- advancing technologies to reduce waste
- increasing recycling and reuse
- developing sources of renewable energy
- sharing the benefits of our learning and innovation with our clients and collaborators

## WHAT DOES *ZERO WASTE* MEAN?

The term *zero waste* has become a common phrase. While it means different things to different customers, it universally represents a commitment to reducing waste and recycling as much as possible. Many of Waste Management's commercial customers have taken the concept a step further and created their own "zero waste to landfill" goals. Through waste reduction and recycling efforts, combined with waste-to-energy solutions, we are helping our customers lessen or eliminate waste.

## OUR VISION

WE WANT TO HELP OUR CUSTOMERS ACHIEVE THEIR ZERO WASTE GOALS

## GOALS BY 2020

2 MILLION HOMES POWERED BY WASTE

20 MILLION TONS OF RECYCLABLES RECOVERED

## THINK GREEN® AWARD AND THE LIFECYCLE OF INNOVATION

Our investment in innovation reaches into universities for the best new green ideas. We partner with scientists on promising and practical ways to convert waste into resources. We also see a benefit to supporting the pipeline of new environmental innovators. As part of this “lifecycle of innovation,” we have partnered with Rice University as sponsor of the Think Green® Award, the world’s largest graduate-level business plan competition.


Organized by the Rice Alliance for Technology and Entrepreneurship, the competition provides funding and guidance for young entrepreneurs working to commercialize

promising technologies. Waste Management’s Think Green \$100,000 investment prize is designed to encourage the development of new and innovative technologies in the clean tech area, including recycling and renewable energy.

Since its inception in 2010, the Think Green Award has been awarded to Biogas & Electric, LLC, and ReGenerate Solutions, LLC. A startup from the University of California, Los Angeles, Biogas & Electric has developed technology to significantly reduce emissions of nitrous oxide generated during the combustion of methane-rich biogas from anaerobic digestion

facilities. Improving the emissions of turbines and engines powered by biogas can help these systems generate more renewable energy while enhancing local air quality.

ReGenerate Solutions, a startup from the University of Michigan, developed technology that uses bacteria in a sealed metal bioreactor to convert food waste — onsite — at restaurants, cafeterias and supermarkets. The process converts waste into methane that can be used to heat water and into nonhazardous composting material that can be packaged and sold.



## FUELING OUR FUTURE

We are partnering with universities to find innovations in clean technology. The sky is the limit!

## WHAT WE DO TO MINIMIZE WASTE

Together with our customers, we're reinventing the way we all think about waste. And we're working to give a second life to items that have served their use and been discarded, by converting them back into raw materials, energy and new products.



### CONSULTING

We work with customers to help them reduce waste, and to find new and better uses for the waste they do create.



### GOODS



### DISCARDS



### COLLECTION



### RECYCLING

We work to recapture value from waste streams by using new technologies (see Innovative Recycling, pp. 4-5 in this Book).



## SORTED MSW TO ELECTRICITY FUEL, OR CHEMICALS

(see Post-Recycling Processing, pp. 12-15)



## PLASTIC TO FUEL OR CHEMICALS

(see Post-Recycling Processing, pp. 12-15)



POST-RECYCLING  
PROCESSING

## INVESTING IN TECHNOLOGY

Emerging technologies help us process residual materials into renewable energy and fuels, compost and chemicals.



ORGANICS  
PROCESSING



## ORGANICS TO ELECTRICITY, FUEL OR CHEMICALS

(see Transforming Organics, pp. 10-11)



## COMPOST

(see Transforming Organics, pp. 10-11)



RESIDUALS TO  
ENERGY



## LANDFILL GAS TO ENERGY AND WASTE TO ENERGY

Value from waste recycling technologies (see Recycling Technologies, pp. 12-15).

# INNOVATIVE RECYCLING TECHNOLOGIES

A typical single-stream plant

According to the EPA, recycling rates in the United States have reached more than 34 percent. But we clearly can do more. Curbside recycling is the backbone of residential recycling, and it is evolving.

We believe that we can continue to make recycling easier, more efficient and more productive. Single-stream recycling, where all recyclables are mixed together in one collection bin, is one way to improve recycling rates. In addition to being easy on consumers, single-stream collection reduces vehicle miles for collection trucks and related tailpipe emissions.

## SINGLE-STREAM RECYCLING

The amount of material processed in our single-stream plants has nearly tripled since 2002. In 2011, our 36 single-stream facilities processed 2.77 million tons of material. An even bigger increase is in store in 2012 and beyond as we steadily grow our investment in single-stream recycling facilities.

We continually improve the technology of our single-stream plants to improve the quality of the commodities we can produce. In 2011, we purchased 1 million tons of additional recycling capacity, including nearly 750,000 tons of capacity to improve our network of facilities and expand our single-stream service area, and 250,000 tons of capacity for organics processing.

### Single-Stream Recycling...

Greatly increases recovery — on average at least **50 percent more recyclable materials collected.**

Helps **lower costs and emissions** associated with collection.

Employs **advanced technologies**, including magnets, screens and optical scanners to automate and maximize the sorting of recyclables.



Recycling sorting technology innovations such as disc screens (left) and optical sorters (right) have led to more efficient processing of recyclable materials.



1



### MATERIAL IN-FEED

Trucks are weighed and directed to the tip floor. Material is unloaded, inspected and stored, until it's ready to be fed to a conveyor.

2



### PRE-SORT STATIONS

Sorters remove rejected items and film, which is vacuumed away. Bulky materials, inert materials and large pieces of plastic are also removed and in some cases sent for additional recycling.

3



### CORRUGATED SCREENS

Material crosses a triple-deck Old Corrugated Cardboard (OCC) screen, which skims off the OCC from the rest of the material stream. The OCC floats over the screen, where it is inspected before being conveyed to storage bunkers.

5



### PAPER MAGNET

Material left in the main flow is now mostly containers. These materials flow over a paper magnet, designed to extract paper from the stream. It uses powerful vacuum technology to hold two-dimensional paper flat to the conveyor, while round three-dimensional containers continue on the flow.

4



### NEWSPAPER SCREENS

At this stage, the materials pass through a series of disc screens, which separate containers, cans and bottles from old newspapers and remove any remaining fiber material.

6

### STEEL MAGNET

Next, a steel magnet removes and stores ferrous materials from the material stream.

7

### GLASS SORTER

Whole glass bottles are broken and fed via conveyor belt to the glass crusher, which crushes the glass and moves it to a storage area.



8



### OPTICAL SORTING

Bottles and cans that make it through the glass sorting area run through a series of optical scanners. These scanners separate out the last of the paper from the commingled stream, as well PET soda/water bottles, HDPE milk/detergent bottles, and aseptic milk/juice cartons. Each are stored separately.

9



### EDDY CURRENT

The remaining material is delivered to an eddy current that automatically separates aluminum by use of a rare earth electro current, which repels the aluminum over a baffle where it drops to a chute and is blown into a bunker for storage.

12



### SHIPPING

Bales are shipped to end users around the world via truck, rail or ship, where they are used as feedstock for new products.

11



### FINISHED PRODUCT

Forklifts move the bales to a finished product storage area where they are checked for quality.

10

### BALING

Interior storage bunkers accumulate large quantities of each separated material stream, which are subsequently processed in ultra-high-efficiency equipment for compaction into "bales" for shipment to end-use markets.

# INCREASING RECYCLING RATES

Our customers often ask for our help to increase recycling rates across their operations, or to recycle more of specific materials. Our commitment to helping them maximize the benefits of recycling is stronger than ever.

## RECYCLEBANK PARTNERSHIP

In 2011, we announced a strategic investment in Recycle Rewards, Inc., whose subsidiary, Recyclebank®, rewards people for taking everyday green actions by offering discounts and deals from local and national businesses. As part of the investment, Recyclebank assumed Waste Management's Greenopolis recycling platform, and Waste Management agreed to provide its North American customers access to Recyclebank's green rewards program over the next several years. The investment brings together Waste Management's curbside collection infrastructure — the largest in the nation — with Recyclebank's vast online community and incentive platform, enhancing growth prospects for both companies and motivating and mobilizing more people, communities and schools to recycle.

Recyclebank's rewards-for-recycling program is currently in more than 300 communities in the United States and the United Kingdom. Greenopolis's web-based rewards catalog will be incorporated into Recyclebank's rewards program to offer even greater incentives to its member base. Recyclebank will also assume management of the Greenopolis social media platforms, including Greenopolis.com, RecyclePix and Oceanopolis, the Facebook game that uses social gaming to reward recycling in real life and the virtual world.

Recyclebank has been recognized as a Technology Pioneer by the World Economic Forum, a Champion of the Earth by the United Nations Environment Programme and for Outstanding Excellence in Public/Private Partnerships from the U.S. Conference of Mayors. Recyclebank was also named as one of the top 10 percent of B Corp companies for its overall impact on the world by the nonprofit organization B Lab, which is dedicated to using the power of business to address the world's most pressing challenges.

Recyclebank, a Philadelphia-based startup-turned-international-service-provider, develops programs that incentivize green activities through an emerging science called "gamification," or the use of game mechanics to modify behavior. By engaging in online activities, users are prompted to adjust their lifestyles offline in ways that let them live a little lighter on the planet. The company calls this "gaming for good." Research commissioned by Recyclebank has found that 8 percent of users who engaged in their Green Your Home Campaign were more likely to turn off the lights in their houses, and 10 percent switched to compact fluorescent or eco-friendly light bulbs after participating in the campaign.

8%

of users were more likely to turn off lights

10%

of users switched to CFLs or eco-friendly light bulbs



## REVERSE VENDING MACHINES

Working in partnership with Keep America Beautiful, Recyclebank and beverage manufacturers, Waste Management is a proud sponsor of an initiative to encourage consumers to recycle plastic and aluminum by using a “reverse vending machine” to return drink containers and reap rewards. Located in high-traffic areas, the machines allow individuals to earn reward points or donate cash to charities for each recycled container deposited. Some manufacturers enhance this incentive by making annual contributions to charities.



## DART DIVERSION TOOL

Our Diversion and Recycling Tracking Tool (DART) helps project planners, contractors, architects and building owners measure their green performance during construction, renovation and demolition projects. The service, available across the United States and Canada, operates online and is accessible 24 hours a day to monitor recycling, tabulate total diversion rates and provide documentation to support LEED certification.

# 2,673

tons construction and demolition  
waste diverted in 2011

# MAKING PROGRESS ON HARD-TO-HANDLE RECYCLABLES

Items like cell phones, computers, batteries and compact fluorescent light bulbs have traditionally been difficult to recycle. Yet many of their component parts can be reused, and when disposed of improperly, they can leak toxins into the environment. Waste Management is working to provide recycling alternatives.

## HANDLING SPECIAL WASTES IN THE MAIL... OR AT CURBSIDE

Compact fluorescent light bulbs (CFLs) are energy-efficient and save money over the long term. But they also contain mercury, and if broken they can release mercury vapor, which is harmful to humans. Waste Management's LampTracker service provides mail-in containers that enable the safe transport and recycling of fluorescent bulbs and tubes for businesses across the United States, as well as for residential consumers through Waste Management's Think Green from Home program. LampTracker also provides mailable recycling services for other common wastes such as batteries, small electronics and computers.

In 2010, Waste Management launched a new program enabling communities to recycle used CFLs in standard curbside pickup, alongside existing residential recycling programs. In a pilot program in Florida, residents received specially designed VaporLok™ containers that can safely store up to 12 standard CFLs. In addition to CFLs, customers can safely recycle syringes and lancets as well as bottles and paper, using Think Green from Home mail-in kits. Waste Management processed and recycled approximately 80 million lamps in 2011, up from 75 million in 2010 and 58 million in 2009.

### DIVERTING PLASTICS FROM LANDFILL WITH MICROGREEN

In 2010, we made a strategic investment in MicroGREEN, an innovative start-up working to ensure that plastics used for food containers, product displays and point-of-purchase materials end up having many lives instead of a one-way trip to the landfill.

The company's Ad Air® technology inserts bubbles into virgin, blended or recycled PET plastic, increasing

the length and width of plastic sheeting by 150 percent and the thickness by 200 percent. The technology expands the plastic while it's still in a solid state, allowing for very precise control, while eliminating the need to use the potentially harmful foaming agents found in other types of plastics.

A lifecycle analysis by Franklin Associates found that the MicroGREEN technology took the least amount of energy to produce a hot beverage cup and had the

lowest total solid waste, as measured in both volume and density, when compared to other cups. The technology greatly reduces the environmental impact of plastic containers by reducing the amount of source material used, thanks to incorporating up to 50 percent recycled content and being 100 percent recyclable as #1 PET plastic. The product was honored by *The Wall Street Journal* as a 2010 runner-up for its Technology Innovation Award.



# 200+

collection depots in North America,  
gathering phones, batteries, laptops  
and more

## E-CYCLING GROWS

Electronics recycling, or e-cycling, is the fastest growing commodity in the waste stream. According to the 2011 Electronics Recycling Industry Survey, the U.S. market for electronics recycling now stands at about \$5 billion a year.

As of 2012, Waste Management operated more than 200 collection depots in North America, gathering phones, batteries, laptops and other manufactured products. To process the material we gather, we operate eight Product Recovery Centers. In addition to recovering component parts, we mine the electronics for rare earth elements, which are of increasing importance in technology applications but can also be difficult and costly to extract from mining and subject to price swings.

All of these centers have earned the Responsible Recycling (R2) and Recycling Industry Operating Standard (RIOS) certification. R2/RIOS is a major certification process that covers, among other things, the way that e-waste is separated from traditional waste streams to ensure materials such as lead, mercury and cadmium are handled properly. Our facilities have also earned the Basel Action Network eStewards certification, as well as ISO 9001 certification.

# TRANSFORMING ORGANICS

As much as 30 percent of the waste stream across the United States can be counted as organic waste, with certain sectors — such as grocery stores and restaurants — running as high as 60 percent organic waste. We see a big opportunity for resource recovery. We've established strategic partnerships with the following organic innovators, each of which specializes in a different process for recovering value from organic waste.

## PENINSULA

**INVESTMENT SINCE 2011  
WILMINGTON, DELAWARE**

Peninsula owns and operates the Wilmington Organics Recycling Center, in Wilmington, Delaware, the largest composting facility in the eastern United States. The company uses an innovative system to protect compost material from the elements for a reliable composting process, while efficiently trapping odors and other emissions such as dust and VOCs.

## GARICK LLC

**INVESTMENT SINCE 2010  
CLEVELAND, OHIO**

Our investment in Garick has resulted in an expansion of market demand for the value-added products they create from organics, such as compost and soils, organic fertilizer, mulch products and nursery/greenhouse growers' blends.



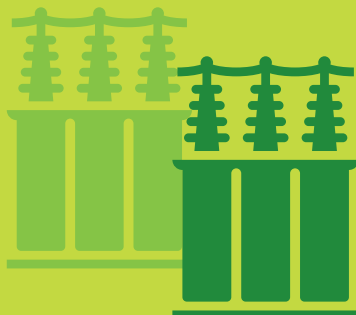
## GROWING ORGANICS MANAGEMENT

2011 was a year of growth for us in organics waste management. By the end of 2011, our network of 36 company-operated compost facilities, partners' facilities and third-party operations had expanded to manage more than 2 million tons of organics, converting it to beneficial uses such as mulch and compost. To help increase the amount of organic material we manage, we broadened our portfolio of investments to encompass a range of emerging technologies. In 2011, Waste Management was recognized by *Biofuels Digest* as one of the top 50 hottest bioenergy companies.

# HARVEST POWER

## INVESTMENT SINCE 2010 UNITED STATES & CANADA

This company, named to the prestigious 2011 Global Cleantech 100 list by Cleantech Group, a research firm focused on global clean technology innovation, uses anaerobic digestion to create clean biogas and nutrient-rich compost. We first invested early in 2010, providing raw materials for composting and working to help the company expand to serve more cities.



# RENMATIX

## INVESTMENT SINCE 2012 KING OF PRUSSIA, PENNSYLVANIA

Renmatix's proprietary Plantrose™ process converts cellulosic-rich materials into sugars using supercritical hydrolysis (water-based) technology. This technology cost-effectively transforms organic wastes into base sugars for manufacturing bio-based renewable chemicals and fuels.



# POST-RECYCLING PROCESSING

To extract the most value possible from the materials we handle, we have partnered with a portfolio of over 30 technology companies. Our partnership with these emerging technologies helps us process residual materials from waste streams into renewable energy, renewable fuel and even green chemicals.

## RECOVERING VALUE AFTER RECYCLING

After the waste stream has been mined for recyclable material, residual material remains. Waste Management is investing in conversion technologies to turn this "leftover" material into useful products. We expect to develop a suite of technology solutions over time, working with our partners to divert more material to higher-value uses. Many of these newest technologies are in the pilot phase and will remain so for the next several years. This is an industry that is evolving quickly, and the technologies themselves are likely to change as they develop. We recognize that there is no single solution. That's why we're helping to develop promising technologies, such as those of our partner companies.





# FULCRUM

**INVESTMENT SINCE 2011**  
**PLEASANTON, CALIFORNIA**

Focused on producing ethanol from municipal solid waste, Fulcrum uses a dual-stage gasification process that has been tested over the past two years at smaller scales. The company's first plant is fully permitted and will be built in Storey County, Nevada.

# ENERKEM

**INVESTMENT SINCE 2010**  
**MONTRÉAL, CANADA**

The feedstocks at Enerkem plants include carbon-rich waste such as nonrecyclable municipal solid waste. The company's gasification technology converts these wastes into fuel and chemicals, made without petroleum. Use of this fuel can reduce GHG emissions by more than 60 percent compared to gasoline. Enerkem has facilities in development in Edmonton, Alberta, and Pontotoc, Mississippi, each of which is designed to have a capacity of 10 million gallons of ethanol per year.



# AGILYX

**INVESTMENT SINCE 2011**  
**BEAVERTON, OREGON**

Agilyx converts low-value, hard-to-recycle and contaminated plastics into a high-value, synthetic crude oil. This provides an economical and environmentally responsible solution for processing mixed plastic resins from industrial/residential waste. The company's pilot plant is operating in the Portland, Oregon, area, and a second plant is in development.

# INENTEC

**INVESTMENT SINCE 2009**  
**BEND, OREGON**

Plasma gasification technology will produce flexible, clean fuels and energy from feedstocks such as nonhazardous medical waste and other segregated industrial and commercial wastes. The company's first facility has been constructed in Arlington, Oregon, with commissioning beginning in 2012.



# AGNION

**INVESTMENT SINCE 2012**  
**PFAFFENHOFEN, GERMANY**

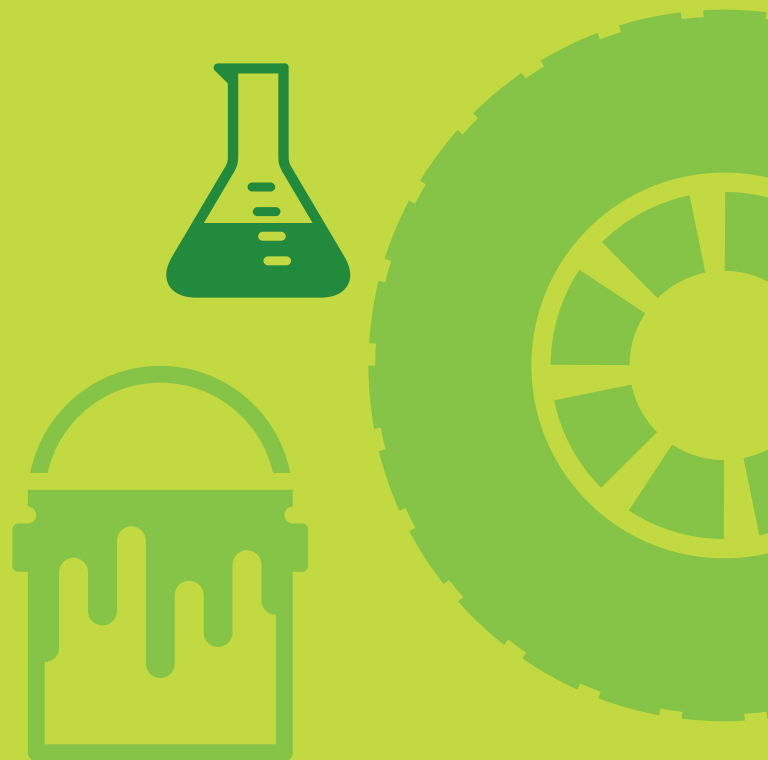
Innovative gasification technology converts solid biomass feedstock into a high hydrogen and carbon monoxide-rich synthesis gas with exceptionally high heating value. Typical customers would include schools, universities, warehouses and distribution centers, shopping malls, hotels and hospitals. Agnion's first commercial biomass gasification plant is currently under construction in the Bavarian town of Grassau.



# GENOMATICA

**INVESTMENT SINCE 2010**  
**SAN DIEGO, CALIFORNIA**

Winner of the Presidential Green Chemistry Challenge Award, Genomatica researches and advances the production of chemicals from municipal solid waste. The company creates specially designed organisms and manufacturing processes to convert syngas into chemical products. This is the first biology-based process making this conversion.



# WASTE MANAGEMENT SUSTAINABILITY SERVICES

We're in an age when businesses are expected to run smarter: produce less waste, recycle more and create more efficient operations. Operating sustainably is the new business imperative. Waste Management Sustainability Services was created to help our customers meet the challenge.

Waste Management Sustainability Services is a nationwide network of environmental professionals combining environmental expertise and project management to help clients advance along the path toward sustainability. The consulting group has already helped hundreds of clients in the United States and Canada realize their environmental goals by recommending business practices that reduce waste, save energy and provide a "next life" for resources they no longer need. The new group combines the professional service divisions formerly known as Green Squad and Upstream, and provides integrated environmental solutions that are sustainable, cost-effective and ISO 9001/14001 certified.

## → ZERO WASTE INITIATIVES

Helps customers meet goals ranging from "zero waste to landfill" to source material reduction to closed-loop, fully recyclable products.

## → CARBON FOOTPRINTING

Helps measure and assess customers' carbon footprints as well as suggest opportunities to reduce them.

## → SUSTAINABLE EVENT PLANNING

As "greening" large public and privately sponsored events grows in popularity, builds strategies that incorporate waste reduction, diversion and recycling.

## → SUSTAINABILITY REPORTING

Generates the data needed to meet external stakeholders' demands for information about sustainability efforts and results.

## → SUSTAINABILITY ROADMAPPING

Provides a practical, valuable, head-to-toe assessment of customers' sustainability performance and innovative ways to improve.

## → LEED CONSULTING

Implements LEED principles into construction planning.

## → SUSTAINABLE INITIATIVE PROJECT MANAGEMENT

Supports company sustainability teams in achieving milestones.

## WASTE MANAGEMENT SUSTAINABILITY CENTER

Launched in 2011, the Waste Management Sustainability Center, located in Rogers, Arkansas, enables us to use “white board” techniques to brainstorm zero waste strategies with customers. LEED Gold certified on January 2012, the Sustainability Center features nontoxic and highly recycled and recyclable construction. Filled with technological thought-starters, the Center is designed to help businesses envision the specific strategies, tactics and solutions needed to make their environmental goals a reality.



Waste Management Sustainability Center,  
Rogers, Arkansas, a LEED Gold Facility



## Achieving Zero Waste to Landfill with General Motors

General Motors has a global goal to send zero waste to landfill. Many assembly plants have already met the challenge. GM's Fort Wayne, Indiana, plant employs more than 3,300 people and produces 870 full-size pickup trucks each day. Using recycling, waste-to-energy technology and other creative reuse programs, Waste Management Sustainability Services (WMSS) helped the plant become GM's first in North America to achieve a zero-waste-to-landfill status.

Among GM's zero waste achievements:

- Achieved zero-waste-to-landfill status in January 2011
- Recycled 15,915 tons in 2011
- Has enjoyed more than \$17 million in savings and rebates since 2000

# \$17M

in savings and rebates since 2000



## Reducing, Reusing and Recycling at Allison Transmission

Since 2008, WMSS has been partnering with Allison Transmission, a manufacturer of commercial-duty automatic transmissions and hybrid propulsion systems, to uncover every opportunity to eliminate, reduce, reuse and recycle. Since we began our work, we've reduced the general plant trash volume by 56 percent and greatly increased recycling.

In 2011, we expanded the company's plastics recycling program, installing centralized recycling stations within each plant and point-of-use recycling bins in high-volume areas, increasing the amount of plastic recycled by more than 17 percent from the previous year. We also began a styrofoam recycling program, reducing disposal costs. Other achievements include a more than 55 percent increase in aluminum recycling, an overall reduction in plant trash volume of 7 percent from 2010 levels, and the recycling of 132 tons of cardboard. Proceeds from the sale of the cardboard were donated to local charities near the company's headquarters.

# 55%

increase in aluminum recycling



## Soaring Recycling Rates at Brandywine Realty Trust

In 2011, Brandywine Realty Trust, a full-service real estate company, asked WMSS to help them reach a goal of recycling 80 percent of the waste generated at properties where they use Waste Management for waste removal.

Following a detailed assessment of their waste stream, WMSS designed a custom program incorporating best practices for placing, labeling and lining bins; improved signage in interior workstations, common areas, break rooms and kitchens; and a comprehensive education program for janitorial staff and building tenants. Detailed monthly reports helped to monitor the success of the program and identify areas for improvement in real time.

Within only four months, Brandywine was recycling more than 83 percent of their waste and achieving cost savings of more than 30 percent. Their recycling rates continue to increase, due to changes implemented through the WMSS program.

# 83%

of waste recycled, saving more than 30 percent in disposal costs



## Coaching Caterpillar to Cut Waste

We've been working with a Caterpillar manufacturing plant in Illinois to help them significantly reduce waste, identifying and collecting materials from the assembly line that can be recycled, including scrap wood and metal, concrete, light bulbs, and even the gloves worn by employees. To make it easier for employees to recycle, we installed a conveyor belt system to sort waste on the spot, onsite. Three months after the system's installation, the plant was able to divert 40 percent of its assembly line trash away from landfill, instead recycling the equivalent of 200 tons a year and saving the company more than \$200,000 annually.

To boost recycling in other plant areas as well, we installed Greenopolis recycling kiosks, solar-powered recycling bins and food digesters in the cafeteria. In a little over a year, the plant increased its overall monthly recycling rate from 30 percent to more than 80 percent.

# 40%

of assembly trash diverted away from landfill after 3 months

# The Waste Management Phoenix Open: The Greenest Show on Grass

In 2010, when Waste Management became the title sponsor of the Phoenix Open, the best-attended golf tournament on the PGA Tour, we saw an enormous opportunity to put sustainability principles to work and use the event as an educational platform.

In 2011, we issued ourselves a “zero waste challenge” for the event. Together with the tournament organizers, Waste Management’s Sustainability Services team worked to develop creative solutions to achieving zero waste at an event attracting more than 500,000 people. For the first time in PGA Tour history, no trash cans were present at the course. Vendors were required to use compostable or recyclable serving materials and containers and to educate patrons about the proper disposal of materials in either recycling or compost bins. Volunteer recycling ambassadors were stationed throughout the course to ensure materials went in the appropriate bins, and a dedicated operations team behind the scenes sorted materials.

Everything was measured and captured in a master sustainability scorecard, and our tally of the final diversion and recovery rates was better than expected.

- More than 97 percent of waste generated at the tournament was diverted from landfills, exceeding the 90 percent tournament goal.
- Eighty-two percent of materials were recovered from the waste stream through recycling, composting, material reuse and charitable donations — far exceeding the goal of 70 percent.



A variety of methods were used to recover materials at the 2012 Waste Management Phoenix Open. Highlights include:

## RECYCLING

Plastics (including LDPE, HDPE and PET), aluminum, paper, cardboard, glass and metal were sent to our Waste Management Community EcoCenter Material Recovery Facility for processing.

## COMPOSTING

Food, napkins, plates and cups used during the tournament were processed in a digester to produce high-quality compost for surrounding communities.

## REDUCING ENERGY USE & EMISSIONS

Energy use and greenhouse gas emissions were reduced by using 60 Solar Compactors, solar light towers and the first solar array on the PGA Tour, as well as purchasing 100 percent renewable energy from the local utility provider and replacing diesel waste hauling trucks with trucks run on compressed natural gas.

## TRANSFORMING EVENT MATERIALS

All of the scrap wood from the event was processed (i.e., ground into mulch) by a local organic lawn and garden company. Turf and green mesh were sent to a company that recovers the energy and mineral components from waste for use as fuel and product additives for manufacturing processes.

## PROMOTING REUSE THROUGH CHARITABLE DONATIONS

The hosts of the tournament, Phoenix-based organization The Thunderbirds, distributed \$5.6 million to local charities through proceeds raised at the tournament.

Carpet was donated to a local Habitat for Humanity ReStore to be sold to the public. Proceeds from the carpet sales will help Habitat achieve its mission of building homes, communities and hope.

While not included in the tournament recovery goals, the approximately 140,000 used golf balls filling the Waste Management water feature on the lake at the 18th hole were donated to The First Tee, a youth charity teaching life skills through the game of golf.





FINAL LANDFILL DIVERSION RATE

**97.58%**

GOAL: 90%

FINAL MATERIAL RECOVERY RATE

**82.08%**

GOAL: 70 %

# PARTNERING WITH COMMUNITIES

Our transformation from a company focused on safely disposing of wastes to a company focused on repurposing discarded resources has been shaped in profound ways by the communities in which we operate.

Through one-on-one conversations, small and larger meetings with those living around our operations, polling, surveys, and participation in more structured dialogues as part of multi-stakeholder groups, communities over the years have told us:

Focus less on developing and expanding landfills, and more on **alternatives to landfilling**.

**Extract greater benefits from the wastes you handle** – in the form of recycling and generating renewable energy.

Use your size and the skills of your staff to find **better technologies** to reduce emissions and environmental impacts from handling waste.

Commit to making your properties a **community resource** and places where **native habitat is preserved**.

These perspectives are reflected in our sustainability goals, and we give credit to the visions of these host communities, which have helped point us to what we believe is a more sustainable business strategy. We've learned from what we've heard, and we appreciate the dialogue.



### **Monroe Ecopark Leads the Way in Hazardous Disposal**

With the opening of its innovative **ecopark**, residents of Monroe County, near Rochester, New York, now have the opportunity to protect their local environment in a hands-on way. Operated by Waste Management, the park offers a one-stop drop for difficult-to-dispose hazardous waste, pharmaceuticals, and recyclables such as tires, scrap metal, fluorescent lights and bulky plastics. The property operates as a disposal, recycling and hands-on education center in one.

### **Houston Marathon Gets Silver**

Waste Management Sustainability Services consultants were key in helping the Chevron Houston Marathon earn Silver ReSport Certification in June 2012. The Council for Responsible Sport (ReSport) Certification takes into account waste, energy and water use, procurement and giveaways, transportation, greenhouse gas emissions and community relations. Initiatives such as paperless race registration, unused food donations, environmentally conscious portable toilets and compost collection allow Waste Management to help raise the sustainability bar for athletes and sporting events. Eighty-three percent of the trash from the marathon was diverted from landfill. The team also worked to “green” a U.S. Olympic Trials marathon event, held the same weekend, diverting 79 percent of trash from it, as well as recent Ironman events in Florida, Texas and Arizona, achieving diversion rates of 45-65 percent at these events.





### Portland, Oregon, Targets Citywide Zero Waste Goal

Long considered one of the most sustainable cities in the country, Portland, Oregon, a Waste Management customer, became the largest city in the United States to move to every-other-week garbage collection service, in the fall of 2011. At the same time, food waste was added to the city's existing yard waste collection program. The next move for Portland? The city is targeting a zero waste goal by increasing the diversion of food waste from commercial businesses and banning food waste from the garbage of large commercial generators.

### Composting in Oakland Schools

In the San Francisco Bay Area, the power of partnership is helping transform the public schools of Oakland. Superintendent Dr. Anthony (Tony) Smith asked businesses and the community to work together to improve the overall well-being of Oakland students and their families. With decades of service in the Oakland Unified School District, Waste Management rose to the challenge. A bilingual recycling coordinator gave hands-on demonstrations showing students, teachers and staff how to recycle, and implemented a composting program at 30 schools throughout the district (with more on the way), explaining nature's process of decay and renewal and how composting returns valuable nutrients to the soil.

The results of our partnership:

- The District achieved a 43 percent diversion rate through recycling and food waste collection programs.
- Trash was reduced by 20,000 pounds/week during the 2010-2011 school year.

### Going Zero Waste at California Farmers Market

The city of West Sacramento worked with the local Chamber of Commerce to open the city's first farmers market in the spring of 2011. With Waste Management's guidance and support, it became one of the region's first "zero waste" farmers markets. Thousands of customers attended the weekly market during its first season. As a result of this community effort, 4,800 pounds of material were composted and recycled in the market's first year.



### Helping the Bronx Get Green

Waste Management of New York is a founding partner and driving force behind Get Green: South Bronx Earth Fest, an annual community festival designed to build environmental awareness and foster sustainability. Waste Management's Harlem River Yard transfer station is located in the South Bronx, which historically has had one of the lowest recycling rates in New York City. Every year since 2007, environmental and community groups have come together with Waste Management to organize a day of free, eco-oriented activities, education and entertainment for local residents. The event typically draws over 1,500 local residents to St. Mary's Park in the South Bronx, as well as numerous New York City officials and community leaders, to discuss the importance of sustainability.



#### CHARITABLE GIVING AND VOLUNTEERISM

Waste Management also supports communities through charitable giving and company volunteerism. In 2011, our employees self-reported just over 11,700 volunteer hours. Our Greenworks program, in which employees who volunteer at least 40 hours at a nonprofit organization can request that charity receive a \$250 grant from Waste Management, logged 137 requests, for a total of \$34,250 in donations.

#### CASH CONTRIBUTIONS

2011	<b>\$11,044,496</b>
2010	<b>\$9,731,474</b>

#### IN-KIND DONATIONS

2011	<b>\$2,938,976</b>
2010	<b>\$3,199,190</b>

## NATIONAL PARTNERSHIPS

Waste Management is proud to have longstanding relationships with three bellwether organizations at the national level.

### Keep America Beautiful

For more than 25 years we've been supporting Keep America Beautiful (KAB), contributing in recent years more than \$1 million annually through cash contributions and in-kind support to promote the prevention of litter, reduce waste, promote recycling and improve communities through beautification projects.

Waste Management is a national sponsor of KAB's signature event, the Great American Cleanup,<sup>™</sup> the nation's largest community improvement program, providing in-kind equipment, manpower and logistical support to millions of volunteers in local efforts. We also support numerous smaller activities in local communities through associated KAB chapters.



### Habitat for Humanity

Waste Management has partnered with Habitat for Humanity since 2008, providing a variety of disposal services to help keep Habitat build sites organized, clean and safe. Our financial support has enabled Habitat for Humanity International to help families in 28 states and 111 cities in North America, and Waste Management employees have provided hundreds of hours of volunteer support at build sites across the United States and in Canada. In addition to working to improve the quality of life in communities, we share Habitat's commitment to being environmentally conscious. Waste Management sponsored the first-ever LEED-certified Habitat house, in the Minneapolis-St. Paul metropolitan area.



### Wildlife Habitat Council

The Wildlife Habitat Council (WHC) shares our desire to restore and enhance wildlife habitat. Our work with the WHC has enabled us to establish 110 sites with WHC-certified programs, including 26,000 acres created, enhanced and protected for wildlife. Waste Management is active in two of the WHC's marquee programs: Corporate Lands for Learning, a certification program for lands used to promote community learning around conservation, and Wildlife at Work, a management certification tool helping to create, conserve and restore wildlife habitats on corporate lands.





## ENVIRONMENTAL JUSTICE

In recent decades, low-income communities and communities of color in the United States have raised the concern that, when compared to more affluent communities, they have borne a disproportionate environmental burden. These communities and their advocates have called for fairness in the siting of landfills, waste-processing facilities and other industrial facilities — an element of what is frequently referred to as “environmental justice.” This is a concern that Waste Management takes very seriously. For more than 20 years, we have expressed our commitment to environmental justice through our collaboration with regulators, community groups, academics, advocates and others in industry to ensure that communities that host our facilities are treated fairly. But more than that, we want to assure our stakeholders that our facilities are distributed equitably across the country and are not concentrated in communities where race or lower income might affect fair access to the local decision makers who determine where industrial facilities can be sited.

We disclosed our company’s demographic footprint in our 2010 Sustainability Report. We believe we were the first company to do so. Using the methodology designed by environmental justice experts and recommended by the EPA, we mapped our landfills and waste-to-energy facilities — the sites for which local community groups and national advocacy organizations most frequently raised concern. Following the 2010 report, we reached out to environmental justice advocates and other

stakeholders for feedback. They told us they were encouraged by our disclosure, but they urged us to go further and map the location of all of our operations. In response, we are disclosing our comprehensive footprint in this report, which can be found in [the Appendix on p. 32](#).

Our facilities are generally as likely to be located in communities above the state average income level as below. Out of 1,423 facilities, 58 percent are located in communities with higher non-Hispanic white representation than the state average, and 48 percent are in communities with higher incomes than the state average.

We will update our footprint again in 2014, when block-level data from the 2010 U.S. Census become available.

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**WASTE MANAGEMENT**

1001 Fannin, Suite 4000

Houston, Texas 77002

**DESIGN** Celery Design Collaborative

**CONTENT** BuzzWord

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