



The Right Time to Build a Sustainable Future

Resource Conservation Challenge
UPDATE

Representative Success Stories by EPA Region

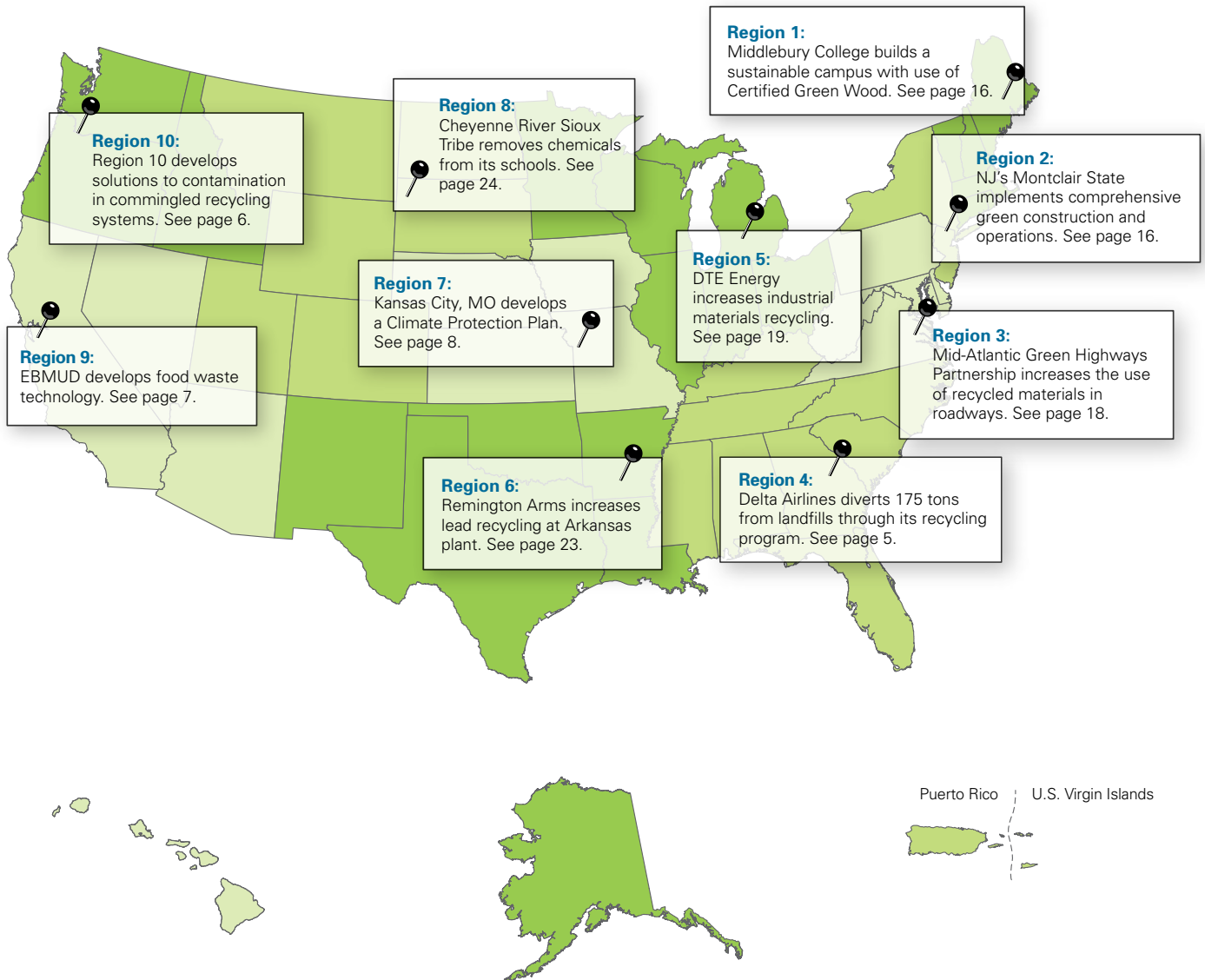




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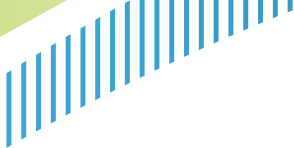
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RESOURCE CONSERVATION CHALLENGE:

Developing Solutions Today

Today more than ever before, Americans are recognizing that the way we use energy and produce goods affects the global environment. The production and use of materials and goods consumes energy, generates greenhouse gases (GHGs), and uses the Earth's diminishing resources. In order to achieve the goals of minimizing climate change and reducing the amount of toxics in our environment, we must develop comprehensive, effective materials management strategies.



In response to these challenges, EPA launched the Resource Conservation Challenge (RCC) in 2002. The RCC promotes resource conservation and pollution prevention by creating awareness of effective resource management strategies and providing publicity, resources, and information to public and private organizations seeking to better manage materials. The RCC responds with renewed urgency to the Congressional charge in the Resource Conservation and Recovery Act (RCRA) and in the Pollution Prevention Act that encourage EPA to develop new ways to encourage resource conservation.

This RCC Update describes the benefits of the RCC partnership programs, provides a snapshot of notable partnership accomplishments during 2007 and 2008, and references tools and educational materials developed by EPA. This Update is designed to challenge partners to continue to build on the practices, tools, and innovative approaches that support a sustainable materials management strategy for future generations.

Through the RCC, EPA's Office of Resource Conservation and Recovery and the Office of Pollution Prevention and Toxics provide a framework of proven, cost-efficient strategies to conserve energy, to reduce GHGs emissions, and to reduce the amount of toxic chemicals in our environment. These strategies target four specific areas:

- Municipal Solid Waste Reduction, Reuse, and Recycling;
- Green Initiatives (Electronics and Green Building);
- Industrial Materials Recycling; and,
- Priority/Toxic Chemicals Reduction.

EPA's partners—which include states, tribes, local governments, businesses, industry, non-profit organizations, and academia—have joined the RCC to demonstrate that product stewardship, resource conservation, GHG reduction, and energy conservation can be achieved through better management of materials and waste.

Confronting the challenges presented by climate change will require a comprehensive strategy involving multiple sectors of society. Each of the groups that participate in the RCC has a leadership role to play. The RCC presents a near term opportunity to address the challenges of climate change and resource conservation. Government at all levels can inform, educate, provide tools, and use its purchasing power to point to sustainable materials management practices. Businesses and industry can make energy and resource conservation a central part of their business decisions. Consumers can consider the impact of their choices both when they buy products and during the end-of-life management of products.



MUNICIPAL SOLID WASTE

Reduce, Reuse, Recycle—Progress to Date and the Mission for the Future

Through its focus on municipal solid waste (MSW), the RCC promotes product stewardship, resource conservation, and energy savings, all of which lead to GHG reductions. EPA is working with states, local governments, and corporate leaders to increase the US recycling rate above current levels and reduce the amount of MSW Americans generate. Through the RCC, EPA and its partners can increase opportunities for recycling, improve the efficiency of manufacturing processes, and reduce the amount of materials used in products.

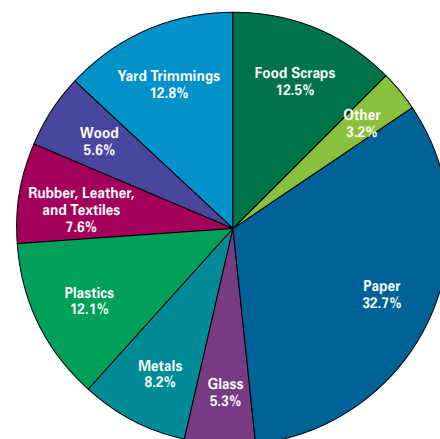
In 2007, the US recycled 33.4 percent of its MSW. By recycling this waste instead of throwing it away, more than 193 million metric tons of carbon dioxide equivalent (MTCO₂E) emissions were avoided; this amount is equal to more than 20 percent of US industrial GHG emissions from fossil fuel combustion. The energy conservation benefits of MSW recycling in 2007 equaled 1.3 quadrillion British Thermal Units (BTUs), equal to about 13 percent of US residential site energy consumption over the same time period. In addition, MSW recycling reduces the environmental impacts resulting from virgin material extraction, transport, and processing (including impacts to land and water, as well as toxic releases to the environment).

A number of economists believe that MSW recycling is a more cost-effective strategy for energy conservation and GHG emission reduction than other approaches such as commercial energy efficiency, wind power, and solar power.^{1,2} By taking advantage of the wide-spread recycling collection and processing infrastructure in the US, increasing recovery rates would make recycling an even

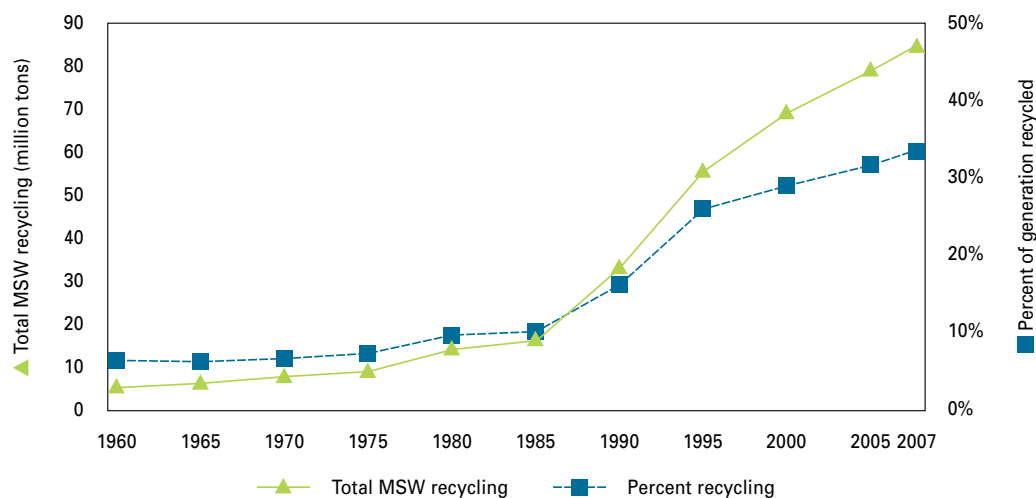
more cost-effective energy and climate strategy by increasing benefits realized per dollar invested through increased economies of scale. For example, increasing the national MSW recycling rate by five percent would not require additional significant infrastructure investments and would result in additional avoided emissions of approximately 9 million MTCO₂E at little additional cost.

The following success stories showcase how EPA and its partners are putting forward-thinking materials management practices to work to reduce waste and GHG emissions.

Total MSW Generation in US by Material in 2007



MSW Recycling Rates, 1960 to 2007



¹ Pathways to a Low-Carbon Economy Version 2 of the Global Greenhouse Gas Abatement Cost Curve, McKinsey & Co., January 2009, <http://globalghgcostcurve.bymckinsey.com/>

² Recycling and Climate Change, by Lisa Skumatz, Skumatz Economic Research Associates, Inc, published in Resource Recycling, October, 2008.



A 40 percent collection rate in Post Office lobbies across the US would result in the recycling of an additional 552,000 tons of material.

WasteWise Members Take Recycling in New Directions



WasteWise is celebrating its fourteenth year as EPA's flagship partnership program to reduce MSW generated by businesses, organizations, and communities. The program has grown to include over 2,100 partners and endorsers from every state, representing nearly 50 industry and government sectors. To date, WasteWise partners have recycled or prevented the creation of nearly 50 million tons of waste. By eliminating more than 12 million tons of waste in 2007, WasteWise partners avoided GHG emissions equal to those created by more than four million passenger vehicles in a year. By expanding WasteWise to include companies from different sectors of the economy, EPA is developing an RCC infrastructure that better enables materials to be reduced, reused, and recycled.

US Postal Service Makes a Business Case for Recycling

The United States Postal Service (USPS), a WasteWise Hall of Fame member and winner of multiple WasteWise awards, launched two major recycling initiatives in 2007 and 2008. USPS recruited all 80 postal service districts as WasteWise partners, resulting in 12,000 new facilities participating in the program. The partners reported nearly 211,000 tons of solid waste reduced or recycled. The recycling efforts alone generated \$7.5 million for the USPS in 2007 from sales of recovered materials.

To build on the success of their existing recycling program, in October 2008 USPS launched a new campaign called *Read, Respond, Recycle* to help recycle mail from the more than 15 million post office boxes in the US. Each box receives roughly 184 pounds of mail a year; the Post Office estimates that as much as 40 percent of that mail can be discarded on the spot in post office lobbies when convenient disposal is available. A 40 percent collection rate in post office lobbies across the US would result in the recycling of an additional 552,000 tons of material. The Post Office is making it easier for millions of Americans to recycle through their conveniently located containers in more than 4,000 participating post offices around the country.

Airline Gets Employees Involved in Recycling

Airports and the airline industry generate significant amounts of waste—as much as 1.28 pounds per passenger per flight. Nationwide, this amounts to over 400,000 tons of trash generated at more than 500 airports annually.³ The RCC is encouraging the airline industry to minimize waste and recycle at terminals, office spaces, shops, restaurants, and on aircrafts by making airports one of the targeted *Recycle on the Go* locations.

Delta Airlines has found creative ways to engage its employees in recycling on board domestic flights. The employees at the Delta Air Lines operation in Atlanta, Georgia are making an important contribution to the company's recycling efforts. On June 1, 2007, Delta Air Lines implemented an

³ *Trash Landings*; Natural Resources Defense Council, December 2006

Visit the *Recycle on the Go* Web site, www.epa.gov/recycleonthego, for more airport recycling success stories, as well as tools and resources for launching an airport recycling program.

in-flight recycling program for all domestic flights into Atlanta. Delta promoted the education of flight attendants and flight crews through signs in attendant lounges, electronic updates, shift briefings, monthly statistics, and senior management endorsement. In addition, Delta distributed information through emails, voicemails, and story boards, and it developed new operating procedures. To encourage passengers to take part, Delta used an in-flight video showing passengers how to sort their recyclables for on board collection. The airline reported that the recycling program diverted almost 175 tons of materials from landfills, avoiding nearly \$80,000 in landfill costs and generating almost \$115,000 in recycling revenues, \$80,000 of which was donated to Habitat for Humanity. As a result of its extensive employee education and outreach efforts, Delta won the WasteWise Gold Achievement Award for Employee Education in 2008.

Solutions to Contamination in Single-Stream Recycling Systems

Single-stream, or commingled, recycling collection systems are growing in popularity across the country. These systems can be convenient for customers, but higher contamination levels in single-stream collections can result in decreased recyclability of materials. To address this issue, EPA's Region 10 launched the Contamination in Commingled Recycling Systems Standards & Guidelines Initiative in 2007. This initiative brought together city and county officials from Washington and Oregon, manufacturers, mills, non-governmental organizations, and collectors to develop new guidelines for materials recovery facilities and tools to educate local governments about contamination solutions. The guidelines they generated defined acceptable contamination levels, set goals to decrease cross contamination, established common terminology, and developed an evaluation protocol.

The Initiative is expected to increase recycled material yields in current commingled systems by approximately seven percent over three years. It is estimated that this seven percent increase in recycled material yields will result in an additional 325,000 tons of recycled material over 3 years, avoiding emissions of approximately 963,000 MTCO₂E, comparable to the annual GHG emissions from more than 176,000 passenger vehicles. This is only the beginning of what can be accomplished as these practices are expanded across the country. Washington and Oregon are in the process of implementing these recommendations to serve as a model for communities across the United States. The complete standards and guidelines are available online at: <http://yosemite.epa.gov/R10/homepage.nsf/topics/ccrs>.

West Coast Forum Connects Climate Change and Waste

In 2008, EPA Regions 9 and 10 jointly launched the West Coast Forum on Climate Change, Waste Prevention and Recovery and Disposal. The Forum served to highlight the importance of materials management as it affects GHG emissions and energy conservation and to encourage effective materials management strategies, such as *Reduce, Reuse, Recycle*, as an integral part of the West Coast climate change strategy. Discussions centered around three Web-based training sessions, or Webinars, which allowed stakeholders to participate in the Forum from their office or home computers, reducing the environmental impact of the Forum.

The three Webinars drew over 400 people each, with discussion sessions held after each Webinar. The topics included an overview of how waste prevention, recycling and materials management can play critical roles in a climate change strategy; a session on landfills; and a session on accounting methods and protocols. As a result of the Forum, EPA is collaborating with the State of California

While food waste accounts for 12.5 percent of the total MSW stream in the US, or 31 million tons, only three percent of this waste is currently recycled.

to develop protocols to account for the benefits of waste reduction and recycling in the Community Greenhouse Gas Inventory protocol, which is currently under development. These protocols are designed to help states develop climate change strategies.

To address the need for continued communication, workgroups were formed to focus on topics including: incorporating materials management benefits in climate change strategies; accounting and inventory methodologies; and prioritizing materials and materials management actions for immediate implementation. The Webinars continue to be accessible online in both audio and transcribed format. This collaborative effort will continue to generate additional tools and resources to address the focus areas in 2009. (www.epa.gov/region10/westcoastclimate)

Tribal Nations Embracing the RCC

The Mille Lacs Band of Ojibwe in Minnesota has a history of accomplishments with the RCC. In 2007 their Grand Casino located in Hinckley, Minn. recycled:

- 926,000 pounds of food waste
- 184,000 pounds of cardboard
- 39,000 pounds of grease
- 16,295 feet of fluorescent lamps

Building on this success, the Mille Lacs joined EPA's National Partnership for Environmental Priorities in 2008, setting ambitious goals to collect and recycle mercury throughout their reservation. Tribal employees can also bring their own mercury containing devices to a central collection location at the casino. The tribe has a vested cultural interest in preventing mercury from contaminating the environment, as Mille Lacs Lake is a primary source of fish, a major food source for the Band members on the reservation.

New Options for Organic Wastes—Building an Infrastructure across the Nation

While food waste accounts for 31 million tons annually—12.5 percent of the total MSW stream in the US—only three percent of this waste is currently recycled. When food scraps are disposed of in landfills or incinerated, communities lose the opportunity to recover the food for donation or to recycle it into compost. Using compost in horticultural or agricultural applications increases water retention and decreases demand for fertilizers and pesticides. Colleges and universities, farms, composting facilities, municipalities and the hospitality industry are making progress toward building a robust food composting infrastructure across the United States. RCC partners are helping reduce the amount of food waste going to landfills and capturing the benefits of recovering food waste.

Wastewater Treatment Facility Develops Food Waste Technology

The East Bay Municipal Utility District (EBMUD) in Oakland, California has developed a technology that reduces GHG emissions, generates renewable electric power, and produces compost. EBMUD received a grant from EPA Region 9 to determine how food waste reacts when co-digested with sewage sludge in the anaerobic digesters at wastewater treatment facilities. By adding food waste from Bay Area restaurants, the facility saw a threefold increase in the amount of methane being produced in the digesters. The methane is then turned into electricity and used onsite. The facility anticipates digesting up to 200 tons of food waste per day. After the food waste is aerobically digested for energy recovery, the residual waste can be further composted and used as a valuable soil amendment. The anaerobic digesters also produce biogas, which can be used as an alternative energy source. The offset of this energy is equivalent to



The United States Botanic Garden's *One Planet—Ours! Sustainability for the 22nd Century* exhibit in Washington, D.C.

about 94,000 MTCO₂E—equivalent to the annual GHG emissions of over 17,000 passenger vehicles. By using anaerobic digesters, EBMUD reduces GHG emissions, diverts food waste from landfills, increases production of energy from alternative sources, and reduces costs through energy savings and decreased tipping fees.

GreenScapes Promotes Sustainable Garden Practices at US Botanic Garden Exhibit in Washington, D.C.

 **GreenScapes** EPA's GreenScapes program joined with the National Wildlife Federation (NWF) at the United States Botanic Garden's (USBG) six month summer exhibition, *One Planet—Ours! Sustainability for the 22nd Century*. EPA's GreenScapes exhibit focused on sustainable landscaping and how to use environmentally-friendly practices to create a greener, healthier yard. The NWF and USBG are active GreenScapes participants, making cost-effective and environmentally friendly landscaping decisions. More information on GreenScapes is available online at www.epa.gov/greenscapes.

Kansas City's Climate Protection Plan

Since September 2006, Kansas City's Climate Protection Plan Steering Committee has worked with City staff and approximately 100 volunteers to develop a Climate Protection Plan for Kansas City, Missouri. EPA Region 7 contributed to the development of the Climate Protection Plan by participating in the Solid Waste Workgroup and by providing information and Webinar support for Workgroup discussions. In July 2008, the Workgroup presented the City Council with a detailed Climate Plan, which was quickly adopted. The Plan emphasizes the substantial benefits that can be realized in Kansas City in terms of energy and financial savings, increased transportation choices, new business and employment opportunities, improved housing quality for residents, and healthier citizens.

Ambitious goals for solid waste reduction were adopted in the Climate Plan. Among these goals is the broad recommendation that the City "flip" the waste paradigm from its 80 percent landfill and 20 percent diversion to 80 percent diverted by 2020.

Region 7 will continue to support the efforts of the community to implement the solid waste recommendations of the Climate Plan. The complete plan is available online at www.kcmo.org/manager.nsf/web/cpp.



GREEN INITIATIVES: ELECTRONICS AND GREEN BUILDINGS

Electronics: Accomplishments and What Remains to be Done

Electronic waste currently accounts for about two percent of MSW, but it's a growing percentage of the waste stream. Electronic waste presents an enhanced opportunity to recover valuable materials that, when reused, reduce the environmental impact of the next generation of electronic products. Since the RCC's inception, EPA has approached electronic waste from a life-cycle perspective; this point of view considers the environmental impact of a product during each phase of its life-cycle, including production, use, and end-of-life management. These considerations exemplify product stewardship.

EPA's web site for electronics recycling, www.epa.gov/ecycling, has recent reports, frequently asked questions, and tools to find an electronics recycling program in your area.

The RCC's goals for electronics are to:

- Foster environmentally conscious design and manufacturing, including reducing or eliminating higher-risk materials (e.g., priority and toxic chemicals of national concern) in electronics products at the source;
- Increase the purchasing and use of more environmentally sustainable electronics; and,
- Increase safe, environmentally sound reuse and recycling of used electronics.

These practices result in significant environmental and economic benefits. Adopting these practices avoids mining additional raw materials, minimizes the impact of extractive industries, reduces energy and resources used in manufacturing, and ensures the safe management of toxic components.

Through programs such as Plug-In To eCycling and the Federal Electronics Challenge, EPA works with industry, governments, retailers, and citizens to increase the rate of recycling and reuse of electronic equipment. These programs leverage existing infrastructure to make recycling and reuse more widely available. Our stakeholders are producing considerable environmental benefits. In 2007, 414,000 tons of electronics—including TVs, computer products, and cell phones—were collected in the US for recycling. This resulted in reduced GHG emissions of 974,000 MTCO₂E, equivalent to the annual GHG emissions of more than 178,000 passenger vehicles. The energy benefit of recycling these electronics was 18 trillion BTUs, equivalent to the energy content of more than 140 million gallons of gasoline.

Computer Models Earning EPEAT Gold Ratings Soar



Models of desktop computers, laptops, and monitors awarded the Electronics Product Environmental Assessment Tool (EPEAT) Gold Rating increased by 82 percent between 2007 and 2008, with 216 models gold-registered in November 2008, compared to 38 in 2007. The Gold Rating represents the highest tier of environmental performance. EPEAT rates desktops, laptops and computer monitors on energy use, recyclability, resource efficiency, packaging, and other environmental attributes. Environmentally-friendly computers are awarded a bronze, silver, or gold rating. To date, EPA has awarded the EPEAT label to 979 models of desktop computers, laptops, and monitors. EPEAT is referenced in Executive Order 13423, which mandates federal agencies to purchase at least 95 percent EPEAT-registered products in relevant product categories. The federal government's example and purchasing power has had an impact: since the Executive Order went into effect in January 2007, a growing number of states, municipalities, universities, corporations, and foreign governments have also adopted EPEAT to guide their purchasing decisions.

Seriously...
 You're not going to use it again.

Recycle your cell phone.
 It's an easy call.

EPA United States Environmental Protection Agency

PLUG-IN TO eCYCLING™ WITH U.S. EPA

To learn how, go to: www.epa.gov/cellphones

This PSA was used in Chicago and the surrounding area as a part of EPA's cell phone recycling campaign.

EPA Responds to Electronics Baseline Study by Bolstering Electronics Recycling

A 2008 EPA report on the sale, use, and end-of-life management of selected electronics found that electronics recycling increased to 18 percent in 2007 from a 15 percent annual recycling rate between 1999 and 2005. The report, *2008 Electronic Waste Management in the United States*, attributes some of the increase in electronics recycling to the development of mandatory collection and recycling programs in several states. The report also estimates that consumers are storing approximately 235 million TVs, computer monitors, and other electronic equipment that they purchased between 1980 and 2007.

The Baseline report and key findings are available at www.epa.gov/waste/conserve/materials/ecycling/manage.htm.

EPA has developed new initiatives designed to take advantage of the opportunities presented by the increased prevalence of electronic waste. Efforts

featured in this update, including the National TV Recycling Campaign and the Responsible Recycling (R2) standards, all seek to improve the end-of-life management of environmental products.

Taking up the Challenge of the DTV Transition

The Digital TV Transition will result in over-the-air stations broadcasting signals only in a digital format. Currently, stations broadcast in both analog and digital formats. This change may prompt consumers to replace their existing televisions. EPA has issued the National TV Recycling Challenge to increase the collection and responsible recycling of televisions. Retailers and manufacturers that take up the Challenge will be developing convenient and environmentally responsible opportunities for consumers to recycle their televisions. The Challenge begins in January and lasts through 2009. EPA will evaluate the results of the Challenge and recognize the most innovative, sustainable, and effective approach.

The Green Scene for cell phone recycling is available in English and Spanish at www.epa.gov/multimedia/mm-video.htm, under solid waste.

If Americans recycled the 100 million cell phones discarded each year, we would conserve enough energy to power nearly 20,000 US households for an entire year.

Give Your Cell Phone a New Life— In English and Spanish



Recycling a cell phone reduces GHG emissions, saves energy, and conserves natural resources. An estimated 100 to 130 million cell phones are no longer being used; many of them are sitting in storage. Many cell phone retailers, manufacturers, and service providers have ongoing collection programs where phones may be dropped off or mailed in, regardless of the age or brand. Despite these opportunities, only 10 percent of discarded cell phones were recycled in 2007. If Americans recycled 100 million phones, we would conserve enough energy to power nearly 20,000 US households for an entire year.

To increase public awareness of the ease and importance of cell phone recycling, EPA launched the *Recycle Your Cell Phone. It's An Easy Call.* Campaign. In 2008, EPA expanded its outreach to the Latino community, releasing a Spanish language campaign at the annual convention of the League of United Latin American Citizens (LULAC). The campaign includes print public service announcements (PSAs) and a podcast in Spanish. It was also featured in EPA's Green Scene in a video cast available in both English and Spanish on EPA's multimedia page. All of these materials highlight the convenience of cell phone recycling as well as its environmental and social benefits.

The Chicago Transit Authority expanded the campaign by displaying EPA's PSAs in many

public transit locations, including major bus lines, rail cars, and depots. From late November 2008 through January 2009, commuters and tourists were exposed to the cell phone recycling message. As a result of seeing the PSAs, the WLS radio station created an audio announcement with EPA to spread the cell phone recycling message to its listeners throughout the Midwest.

New Guidelines Encourage Responsible Recycling of Electronics

The Responsible Recycling (R2) Practices for Use in Accredited Certification Programs for Electronics Recyclers was issued in October 2008 and is the product of an EPA-facilitated, multi-stakeholder group that has developed consensus-based responsible practices for recycling electronics. The practices are a set of guidelines intended to promote better environmental, worker safety, public health, and security practices for electronic recyclers. The R2 standards include general principles and specific practices for recyclers disassembling or reclaiming used electronics equipment, including electronics that are exported for refurbishment or recycling. As part of this program, EPA has agreed to help exporters of e-waste obtain documentation from foreign governments regarding the legality of import of various types of used electronics from the US.

With the guidelines in place, the multi-stakeholder workgroup is now focused on developing implementation plans for the R2 practices. The workgroup expects that the R2 practices will be implemented through certification programs involving

With more than 200 federal facilities taking part in the Federal Electronics Challenge, the Challenge managed to conserve over 700 trillion BTU of energy, almost 138,000 metric tons of primary materials, and save \$18.2 million in 2007.

accredited bodies and third party audits. This will enable customers to readily recognize responsible recyclers in the marketplace.

The complete R2 Guide is available online at: www.epa.gov/epawaste/conserve/materials/recycling/r2practices.htm

Hundreds of Thousands of Federal Facility Employees Involved in Electronic Stewardship

The Federal Electronics Challenge (FEC) helps participating federal agencies and facilities meet the electronics stewardship goals of Executive Order (EO) 13423, Strengthening Federal Environmental, Energy, and Transportation Management. The EO requires federal agencies and facilities to give preference to electronic products registered with EPEAT; install ENERGY STAR® power management features on electronic equipment; extend the life of electronic equipment; and reuse and recycle electronic equipment at end-of-life, in an environmentally responsible manner.

The FEC has 207 federal facility partners, representing more than 660,000 employees. In 2007, the facility partners took actions that conserved over 700 trillion BTUs of energy, almost 138,000 metric tons of primary materials, such as plastics, and saved \$18.2 million. These federal facilities are leading the way in environmental stewardship and saving taxpayer's money.

Department of Energy Wins Top Honors for Electronics Recycling

For the third year in a row, the Office of the Federal Environmental Executive (OFEE) challenged federal agencies and facilities to donate and recycle excess or surplus electronics. The Campaign ran from October 2007 to September 2008, and resulted in the reuse or recycling of more than nine million pounds of electronics. This year's results greatly surpass the 2.4 million pounds reused or recycled during the 2006–2007 campaign. The top honors went to Department of Energy for reusing or recycling 2.2 million pounds of electronics. Full results, including a complete list of the award winners, are available on the Electronics Reuse and Recycling Campaign Web site at www2.ergWeb.com/projects/errc/ResultsERRC.asp



Green Building—Building for the Future

Green building activities under the RCC include recycling and reuse of construction and demolition (C&D) materials, as well as the recycling of industrial byproduct materials such as coal ash, foundry sand, and slags. Green building methods can be integrated into buildings at any stage, including design and construction, operations and maintenance, renovation, and deconstruction at the building's end-of-life. Green building also recognizes that improved environmental performance can be best achieved by understanding the whole building and its impact on the occupants, its surroundings, and the greater environment.

Haworth, Inc.'s new headquarters, above, incorporates lifecycle building techniques. The company won a Lifecycle Building Challenge award for the building design.

Designing green buildings to incorporate industrial materials, such as coal combustion products (CCP), slag cement, and foundry sand, and recycling the C&D materials generated from projects yields environmental, economic, and performance benefits. Industrial materials are often less expensive than virgin materials, reducing material costs, and reusing or recycling C&D materials onsite can reduce hauling and disposal costs while saving energy and reducing GHG emissions. The following success stories put green building principles into action.

Innovators Create Green Buildings of Tomorrow

In 2008, EPA Regions 4 and 9 co-led the second year of a national design competition to promote building material reuse concepts. The Lifecycle Building Challenge 2 (LBC2), a building design competition done in partnership with the American Institute of Architects, the Building Materials Reuse Association, West Coast Green, Southface, and the Collaborative for High Performance Schools, provides recognition for innovative building designs that promote easy disassembly and adaptation to conserve resources. With over 100 million tons of construction and demolition debris sent to landfills each year, Region 4 and Region 9 launched this competition to encourage students and architectural professionals to practice lifecycle building. Lifecycle building strategies significantly improve the ease of material recovery and reuse, conserving valuable material resources and energy.

LBC2 selected students and professionals for awards in Building and Innovation categories. The competition's partners presented Outstanding Achievement Awards to the Best Residential, Best Greenhouse Gas Reduction, and Best School designs. The award-winning projects are designed for rapid assembly, disassembly, and redeployment, because the building components are connected without the use of welding, permanent fasteners, or wet connections.

Creative Building Renovation for Multiple Lifecycles

Designing buildings for adaptability and disassembly is materials management at its best. Haworth, Inc.'s renovation of its corporate headquarters building in Holland, Michigan earned an award from LBC2 and set an example for others to follow. Inside the building and out, Haworth's new headquarters is reducing the company's environmental footprint by incorporating lifecycle design.

The renovation started by stripping the building to its metal skeleton and concrete structure. More than 98 percent of the deconstructed materials were reused, recycled, or donated. Modular building materials replaced conventional construction materials such as drywall and ceiling ductwork. Movable walls, raised access flooring, and modular systems office furniture combine to reconfigure and adapt as necessary, minimizing future waste and potentially extending the building through multiple lifecycles. Should renovation or repositioning of work areas within the building be necessary, walls, floors, and workstations can be reconfigured relatively quickly and with minimal waste and disruption, reducing future renovation costs.

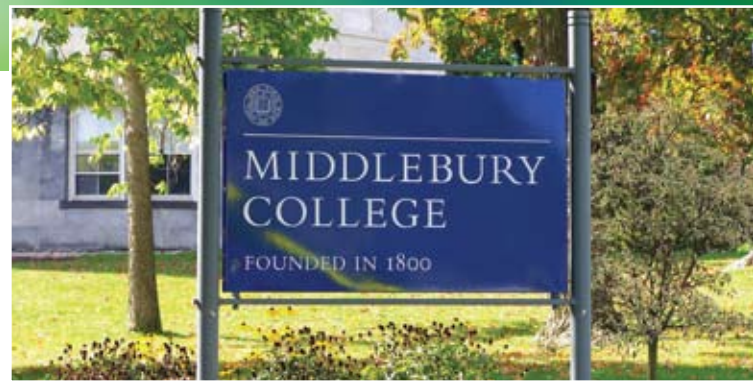
Using EPA's Waste Reduction Model (WARM), Haworth, Inc. calculated that they eliminated more than 21,000 MTCO₂E during their renovation, which is equivalent to removing approximately 3,850 passenger cars off the road for one year.

Middlebury College Uses Green Certified Wood in Sustainable Design and Building

Institutions of higher learning can be leaders in creating a sustainable society by educating future generations and incorporating new ideas into campus design and operations. To this end, Middlebury College championed the establishment and rapid growth of a certified wood industry in Vermont. Over the past five years, Middlebury has created demand by using nearly 200,000 board feet of green certified Vermont wood in campus construction projects. Middlebury has used green certified wood in Bicentennial Hall, in its science center, a residence hall, a dining hall, and a Recycling Center. The library is the most recent construction project. In this project, the college awarded a contract for the manufacture of study carrels and stack ends from certified wood to an employee-owned woodworkers' cooperative in an economically stressed area of the state. Through its support of sustainable building design and construction, Middlebury has educated professionals including local carpenters and architects about the importance of local economies and environmental quality while helping to establish a new industry in Vermont.

Montclair State University's Environmental Stewardship Earns High Grades

New Jersey's Montclair State University (MSU) is receiving high environmental grades for using some of the latest environmentally responsible and sustainable technologies and practices at its 246-acre campus. On June 17, 2008, MSU became the first educational institution to enter into a comprehensive construction and operation Memorandum of Understanding (MOU) with EPA Region 2. The agreement was signed at MSU's new, LEED-certified University Hall, the largest academic building on campus.



MSU has taken on a wide variety of environmental challenges since the signature of the MOU, including:

- Increasing food waste recycling efforts; over 45,000 pounds of food scraps have been recycled into high-quality compost and used for campus landscaping projects;
- Expanding the use of renewable energy; currently MSU uses solar power and a co-generator plant that produced 80 million pounds of steam in 2008; and,
- Competing in the 2009 nation-wide RecycleMania challenge to reduce waste on campus.

MSU plans to make additional environmental improvements in the future, including:

- Joining EPA's WasteWise Program to reduce and recycle MSW;
- Joining the ENERGY STAR® Program to reduce energy usage by 10 percent; and,
- Incorporating LEED standards into the design of the new School of Business building.

Through the achievements reported here, MSU has demonstrated that cross-program environmental approaches, from bolstering infrastructure to student involvement, leads to comprehensive solutions.



INDUSTRIAL MATERIALS RECYCLING

Finding the Opportunities and Reaping the Benefits

Every year, US businesses generate hundreds of millions of tons of secondary industrial materials as byproducts from industrial processes, including coal ash, foundry sand, construction and demolition (C&D) materials, slags, and gypsum. Recycled industrial materials, such as coal combustion products (CCPs), foundry sand, and C&D debris have many of the same properties as, and in some cases perform better than, the virgin materials they replace. Use of these materials as substitutes for raw materials in the development of the nation's infrastructure, including roads, bridges, buildings, and water treatment facilities, can conserve resources, save energy, and significantly reduce GHG emissions.

In 2007, 13.7 million tons of coal fly ash was used as a substitute for Portland cement, resulting in energy savings of nearly 73 trillion BTUs, equivalent to the annual energy consumption of more than 676,000 households.

The RCC's Industrial Materials Recycling (IMR) strategies and partnerships work across industrial sectors to identify and encourage the beneficial use for secondary materials. This results in:

- Reduced materials costs for the end user;
- Reduced disposal costs for the generator;
- Reduced energy demand; and,
- Reduced GHG emissions.

Use of coal fly ash, a coal combustion product (CCP), is one example of the environmental benefits of IMR. In 2007, 13.7 million tons of coal fly ash was used as a substitute for Portland cement in the manufacture of concrete. This material substitution resulted in energy savings of nearly 73 trillion BTUs, equivalent to the annual energy consumption of more than 676,000 households. Use of coal fly ash in concrete manufacture avoided emissions of 12.5 million MTCO₂E, equivalent to the annual GHG emissions of 2.3 million passenger vehicles. In addition to the environmental benefits, using coal fly ash in cement can enhance the strength and durability of the end product. The following success stories demonstrate how IMR can be both good business and good for the environment.

The Mid-Atlantic Green Highway Partnership: Encouraging the Recycling and Reuse of Industrial Materials

The Mid-Atlantic Green Highways Partnership (GHP), launched by EPA Region 3, is a collaborative network of industry, trade and environmental organizations, private sector groups, and government, working to incorporate environmental stewardship into all aspects of the highway development lifecycle. The Mid-Atlantic GHP continues to grow, with recycling and reusing industrial materials as an important component of its success.

Through collaborative partnerships among state environmental and transportation agencies, industry, and academia, the Mid-Atlantic GHP is encouraging the increased usage of recycled materials in roadway applications throughout the Mid-Atlantic Region. In 2008, West Virginia's Department of Environmental Quality and Department of Transportation formed a committee to identify opportunities to foster reuse and recycling of industrial materials in the state. In 2009, the Virginia Department of Transportation and Department of Environmental Quality will continue to work together to develop demonstration projects that will incorporate reused or recycled materials (steel slag, coal ash, foundry sand, asphalt shingles, tires, compost, and recycled asphalt pavement) in various applications.

Photo on opposite page: The Dundas residence in Prescott, AZ was designed by architect Michael Frerking and constructed by P.M. Taylor Development. The project utilized fly ash in the cement and other IMR building techniques.

The C²P² web site explains the benefits of using coal combustion products and has case studies illustrating these benefits.
www.epa.gov/C2P2

As the nation prepares to undertake thousands of new infrastructure projects, the Mid-Atlantic GHP will serve as a model for how the vast quantities of industrial byproducts generated annually can help meet the material needs of construction projects across the country.

C²P² Partners Recycle Coal Combustion Products



With 183 current partners, the Coal Combustion Products Partnership (C₂P₂) program is focused on increasing the beneficial use of CCPs throughout the United States. As a result of this partnership, in 2007, 13.7 million tons of coal fly ash were used as a supplementary cementitious material in place of Portland cement. The work of two C₂P₂ partners, the City of Denver and the Freight Pipeline Company, demonstrate the progress in increasing the beneficial use of CCPs.

Building a Green Concrete Policy in Denver

In 2007, the City of Denver partnered with the University of Colorado Denver (UCD) Sustainable Urban Infrastructure Program to develop an inventory of sources of GHG emissions in the city. The inventory looked at all the buildings and industries located in Denver and the city's critical urban materials, such as water, fuel, cement in urban concrete, and food/packaging to establish a baseline for the city's GHG emission levels. The inventory showed that the use of cement in concrete in construction contributed more than 2 percent to Denver's GHG footprint, almost the same as the energy used in all city buildings, including Denver's airport.

Working with the City of Denver, UCD investigated green concrete alternatives, evaluating the structural strength, durability, economic savings, and GHG mitigation of displacing 20 percent of cement in concrete with fly ash, and using recycled concrete in lieu of virgin aggregates. The fly ash concrete

proved more durable than traditional concrete and resulted in up to 30 percent GHG emissions reductions when lifecycle impacts were calculated. The green concrete was less expensive, too. As a result, the City of Denver passed an ordinance in November 2007 requiring the use of 20 percent fly ash concrete in Denver building projects. This ordinance serves as a model for other communities across the country and is expected to reduce carbon emissions equivalent to removing nearly 10,000 cars from Denver roads each year. Their innovative efforts earned UCD and the City of Denver the 2008 C₂P₂ Partnership Award.

The Greenest Brick Paves the Way

The Freight Pipeline Company won the 2008 C₂P₂ Innovation Award for developing "The Greenest Brick," an alternative to clay bricks. The Greenest Brick is made of 100 percent fly ash and helps address the large amount of fly ash disposed annually while greatly decreasing the amount of energy used and GHGs emitted during the manufacture of bricks. This new fly ash brick is as durable as traditional clay bricks and meets building specifications, but can be made using only 10 percent of the energy used in making clay bricks.

Energy Company Increases Industrial Materials Recycling

DTE Energy is reducing its own energy by using new demolition techniques on their surplus buildings. Instead of traditional demolition techniques, the company employed a deconstruction process that carefully dismantles structures and separates materials for recycling. Reuse and recycling efforts included transplanting landscape vegetation, reusing bricks, and recycling crushed aggregate and stone into road base. Using the deconstruction process, DTE was able to reuse or recycle 99.9 and 98 percent of two buildings in Michigan. DTE recovered 11,500 tons of material from the two buildings for reuse, diverting it from disposal in a landfill.



The Greenest Brick, at left, is made of 100 percent fly ash and can be used in the same building applications as clay bricks.

The deconstruction process is cost-competitive with demolition; one of the Michigan buildings generated more than \$35,000 due to the sale of recovered materials. DTE Energy's reuse and recycling programs garnered the company the WasteWise 2008 Industrial Material Recycling Gold Achievement Award.

California Contractor Working and Building Green

Webcor Builders, a small general contractor for commercial construction, incorporates environmentally friendly practices into its day-to-day operations. Webcor set a recycling goal of 90 percent for 2008, which led to recycling office paper and architectural drawings, buying recycled-content office supplies, reusing glasses and water pitchers instead of using disposable items, and recycling bottles and cans. At its project sites, Webcor reuses furniture from their trailers and all extra wood goes through a wood workshop to be fabricated into temporary equipment. In 2007, the company reused and recycled up to 95 percent of construction waste at five building projects. To ensure materials are reused before they are recycled, the company works closely with resource and charity groups, such as Sustainable Silicon Valley and Rebuilding Together. The efforts at each building project helped to reduce energy use and avoid GHG emissions.

Webcor's efforts in its daily operations go hand in hand with what they build: Webcor has built 2 platinum, 11 gold, 5 silver, and 4 certified buildings under the Leadership in Energy and Environmental Design (LEED) program.

New York Mets Hit an Environmental Home Run

Displaying environmental leadership with encouragement from EPA Region 2, the Queens Ballpark Company, L.L.C., is building the New York Mets' new stadium using some of the latest green technologies and practices. Region 2 and Queens Ballpark Company, L.L.C.'s cooperative approach was formalized with a Memorandum of Understanding (MOU), spelling out design, construction, and operational principles to ensure that the new ballpark, called Citi Field, meets high environmental standards and has a low carbon footprint.

In implementing the MOU, the company used an estimated three million pounds of coal combustion products during construction and more than 11,000 tons of recycled steel. Other green practices and technologies include:

- Use of low-sulfur diesel construction vehicles, reducing the emission of CO₂;
- Installation of metered hands-free faucets, toilet flush-o-meters, and waterless urinals, which will conserve millions of gallons of water a year;
- An 11,500 square foot green roof;
- A well water and on-site storm retention basin for watering needs; and,
- Planting more than 1,000 drought resistant trees and shrubs.

Queens Ballpark Company, L.L.C. plans to continue to address the environmental challenges associated with operating a large public space once the park is open to fans by joining the WasteWise and ENERGY STAR® programs.

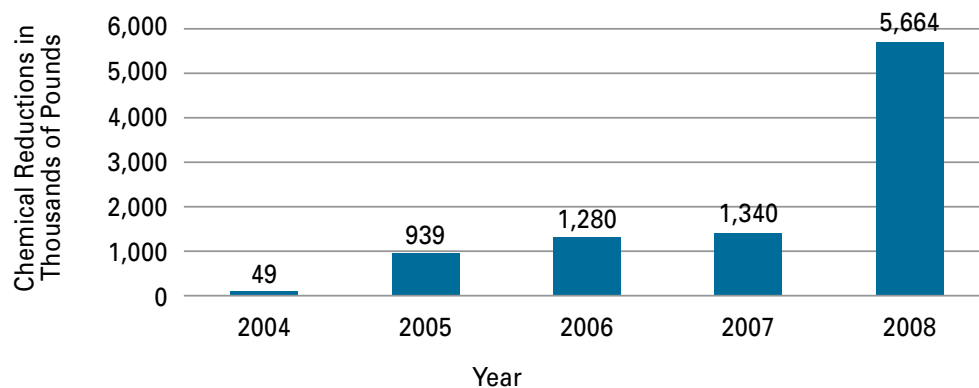


PRIORITY AND TOXIC CHEMICALS REDUCTION

Creating a Safer Environment One Pound at a Time

Reducing the volume of hazardous chemicals in products and waste protects human health and the environment, and reduces or eliminates the need to manage the materials as hazardous. Reduction of hazardous chemicals also makes it easier and more affordable to recycle products. The RCC's Priority and Toxic Chemicals reduction program is designed to reduce the use of priority chemicals—the most persistent, bioaccumulative, and toxic chemicals used in everyday products that currently pose or could pose public health and environmental problems in the future. Through these efforts, EPA involves states, tribes, large and small businesses, federal agencies, schools, communities, and others in changing the way they use these chemicals. Chemical use can be reduced through product redesign, changes in manufacturing processes, commitments to change retail practices, or improving chemical management practices. Through the RCC, EPA and its partners are making the products that we buy and use safer, while saving money for manufacturers and consumers, and improving our environment.

NPEP Annual Partner Reductions



The following initiatives demonstrate how EPA and our partners are improving the environment by reducing, recycling, and eliminating priority and toxic chemicals from industrial processes and consumer products.

National Partnership for Environmental Priorities

Better Environment. Better Neighbor. Better Business.



In October 2008, the National Partnership for Environmental Priorities (NPEP) celebrated its 6-year anniversary and the cumulative reduction of more than 9.2 million pounds of potentially hazardous chemicals since the program's launch in 2002. The program continues to grow and has become a network of more than 215 partners committed to environmental leadership. In the 2008 fiscal year alone, NPEP partners reduced the use of, or recycled, more than 5.6 million pounds of priority chemicals. The program's broad reach is highlighted by the NPEP's work with the US Navy, Con Edison, and Remington Arms Company.

US Navy Installs Amalgam Separators in Navy Dental Treatment Facilities and Reduces Mercury

The Naval Institute for Dental and Biomedical Research, in partnership with the Naval Facilities Engineering Command Atlantic and the Navy and Marine Corps Public Health Center, set an NPEP goal to install amalgam separation equipment in all US Navy dental treatment facilities upon joining NPEP in November 2003. The objective is to remove mercury-containing amalgam, or metal dental filling debris, from the rinse water used in dentists' offices. Amalgam separation equipment has been installed in over 121 dental treatment facilities, helping the Navy reduce mercury releases from these locations by over 96 percent. This effort contributed an estimated 550 pounds of mercury reductions.

Con Edison Recovers and Recycles Lead

Con Edison delivers utility services—gas, electric, and steam—to over 3 million customers throughout New York City and Westchester County, N.Y. Con Edison has embarked on a multi-year project to remove underground utility cables and replace them with a lead-free alternative. Since September of 2007, this effort has eliminated more than

In 2008, NPEP's 215 partners reduced the use of or recycled more than 5.6 million pounds of priority chemicals.

3.7 million pounds of lead from use and potential release into the environment. Con Edison plans to expand this goal by removing additional utility cables in the 2009 fiscal year. Con Edison currently participates in numerous EPA partnership programs including WasteWise, SF₆ (sulfur hexafluoride) Emission Reduction Partnership, and the Natural Gas STAR Program.

Remington Arms Company, Inc. Reduces Lead Sent to Landfill

The Remington Arms Company Lonoke Ammunition Plant in Lonoke, Ark. manufactures small arms ammunition for the sporting and law enforcement sectors. The Lonoke plant uses raw materials such as brass, copper, and lead to produce more than one billion rounds of ammunition annually.

Remington set a goal to reduce the amount of lead shipped off-site for disposal by 175,000 pounds. In 2008, a total reduction of 235,571 pounds of lead was achieved. Remington worked with Region 6's Priority Chemical Reduction team and the state of Arkansas to identify and implement this waste minimization project. This collaborative approach allowed resources to be managed more efficiently and the potential impacts to the environment to be reduced, all while saving Remington money. The reduction of landfilled lead was accomplished by increasing the quantity of lead recycled both on and off site. Manufacturing wastes were reused in the manufacturing process, and lead scraps that could not be reused or recovered on site were sent to a lead smelter for recovery and then sold back to Remington for reuse.

In 2008, 3.3 million pounds of lead were recycled on-site, reducing the amount of lead that needed to be purchased for ammunition production and resulting in a savings of more than \$3.8 million. Furthermore, the reduced number of shipments to landfills resulted in additional savings for Remington while reducing the GHG emissions resulting from waste transportation of waste.

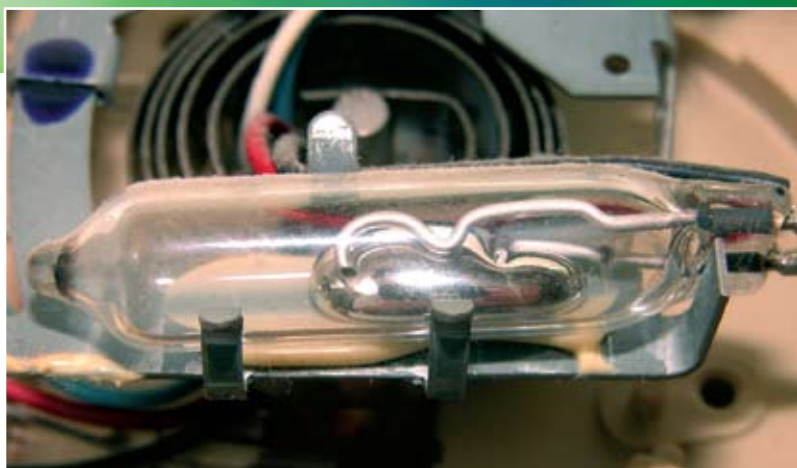
National Vehicle Mercury Switch Recovery Program

Vehicles are the most recycled consumer goods in America. Each year, the steel industry recycles more than 14 million tons of steel from old vehicles, many of which were manufactured before 2003 when mercury switches were still installed in new cars. Most vehicles that have reached the end of their useful life are dismantled, stripped, flattened, shredded, and melted to make new steel. If mercury switches are not removed from retired vehicles, a significant amount of mercury can be released into the environment as air emissions. These air emissions are considered a primary source of mercury that poses a risk to human health and the environment.

As part of NPEP, The National Vehicle Mercury Switch Recovery Program (NVMSRP) celebrated the removal of the 1 millionth vehicle mercury switch in February 2008 in Conley, Ga. This milestone was achieved through a collaborative effort among EPA, automobile manufacturers, steel makers, scrap recyclers, automotive recyclers, states, and environmental groups. The NVMSRP provides dismantlers with information, materials, support, and incentives to remove mercury-containing switches from end-of-life vehicles before they are crushed and sent to furnaces that recycle the steel.

The goal of the NVMSRP is to capture 80 to 90 percent of available vehicle mercury switches by 2017. As of 2008, the NVMSRP consists of more than 7,000 participants who have recovered about 1.8 million mercury switches, which represent more than 2 tons of mercury prevented from entering the environment. To maintain the momentum of the NVMSRP, the program has raised the monetary incentive that automobile recyclers receive from \$1 to \$4 for each convenience lighting mercury switch they recover, and from \$3 to \$6 for antilock break assemblies that contain mercury switches.

Although mercury switches like the one pictured here, are small, their prevalent use in automobiles poses a threat to human health and the environment.



Balancing Wheels and the Environment

EPA estimates that 50 million pounds of lead per year are used for wheel weights in cars and light trucks. It is common for wheel weights to come off when a vehicle hits a pothole in the road or stops suddenly, which results in lead entering the environment. Lead-containing wheel weights also add lead into the environment as they move into the waste stream at the end of product life.

Tire companies, big box stores, and the government have joined together in an innovative partnership to put the brakes on the use of lead wheel weights. Through EPA's National Lead-Free Wheel Weights Initiative, partners have agreed to phase-in the use of lead-free alternative wheel weights and significantly reduce the amount of lead released into the environment by 2011. EPA announced the initiative during the Detroit Belle Isle Grand Prix in Michigan in 2008. Eliminating lead wheel weights is a significant step toward reducing the overall amount of lead released into the environment across the nation.

Helping Schools Manage Outdated and Unused Chemicals

The Schools Chemical Cleanout Campaign (SC3) is creating tools to help schools and community partners start or improve their responsible chemical

management programs. New tools include: *Building Successful Programs To Address Chemical Risks In Schools: A Workbook With Templates, Tips, And Techniques To Build A Successful SC3 Program*; the SC3 Web site, which contains new content targeting future teachers and potential SC3 partners; and a green cleaning fact sheet, which helps schools practice responsible chemical management beyond the classroom.

SC3 is building a national network of government and industry partners who can offer schools an array of services, from conducting chemical inventories to training school personnel. At the first SC3 charter partner meeting in June 2008, the SC3 community came together to share best practices and lessons learned, to discuss challenges, and to generate solutions. Future goals for SC3 and its partners include establishing an outreach program to college students who are training to be teachers to encourage them to view a responsible chemical management plan as a part of their duties. (www.epa.gov/sc3)

Joint effort removes chemicals from South Dakota schools

In 2008, the SC3 partner network was put into action with a call for assistance from EPA Region 8. When the Cheyenne River Sioux Tribe in Eagle Butte, S.D. recognized that they needed help to remove outdated, unneeded, and inappropriate chemicals from five schools, they contacted EPA Region 8. With the health of more than 660 students in mind, a Partner Alert request for

assistance was put into the SC3 partner network, and Pollution Control Industries (PCI) offered to donate their services.

EPA collaborated with PCI and the Cheyenne River Sioux Tribe's Environmental Protection Department to remove and properly dispose of the chemicals. A total of 1,515 pounds of chemicals were removed and properly disposed of, including neurotoxins, carcinogens, suspected carcinogens, strong oxidizers, and corrosive, caustic, toxic, ignitable, flammable, shock sensitive and potentially explosive chemicals.

NYDEC broadens the *Mercury in Schools* program to include other chemicals

As part of their mission to make New York schools more environmentally-friendly, the New York Department of Environment and Conservation (NYDEC) expanded the reach of their existing successful *Mercury in Schools* program to include the responsible management of all chemicals in schools. As part of NYDEC's educational outreach on chemical management, a chemical cleanout pilot project was held in April 2008 at four schools in two school districts.

NYDEC, along with Questar BOCES chemical hygiene staff, conducted walk-throughs at each school's chemistry/biology labs and discovered many examples of poor chemical management. A chemical inventory was conducted and chemical waste was earmarked for disposal. NYDEC then contracted with a hazardous waste hauler to lab pack and remove the waste chemicals from the schools. The cleanout resulted in about 1,400 pounds of chemicals removed from the four participating schools. Recommendations were made to the schools' administrators to improve their chemical management practices. A follow up walk-through was also conducted to evaluate the progress made on the NYDEC's recommendations.

Lessons learned from the pilot project have been incorporated into the educational outreach NYDEC is conducting statewide at workshops targeting teachers, buildings and grounds crew, chemical hygiene officers, and school officials

Design for the Environment Finds Continuing Success in The Market



The Design for the Environment (DfE) Program works in partnership with a broad range of stakeholders to protect human health and the environment by encouraging the use of safer chemical alternatives and through use of its logo on safer products. In 2008, DfE partnerships prevented the use of 335 million pounds of chemicals of environmental and human health concern.

DfE multi-stakeholder, technically based partnerships have enabled entire industries to switch to safer chemicals. Based on a partnership with DfE, industry has moved to safer flame retardants, and reduced the use of lead in electronics. DfE Best Practices for Auto Refinishing reduced the use of asthmagens by over 500,000 pounds last year.

The DfE Safer Product Recognition Program allows safer products to carry the DfE label. The DfE mark enables consumers to quickly identify and choose products that can help protect the environment and are safer for families. When consumers see the DfE logo on a product it means that the DfE scientific review team has screened each ingredient for potential human health and environmental effects and that—based on currently available information, EPA predictive models, and expert judgment—the product contains only those ingredients that pose the least concern among chemicals in their class



MOVING FORWARD

The examples in this Update demonstrate the many ways in which EPA, states, tribes, and our private and public partners are implementing the RCC to create a sustainable materials management approach. Through effective partnerships and innovation, the RCC programs are charting a path towards greater resource conservation, energy savings, and GHG reductions.

2007 Waste Reduction Achievements

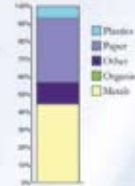
Waste Management Activity	GHG Emission Reductions (MTCO ₂ e)
Waste Prevention	1,053.34
Recycling	2,729.90
TOTAL	3,783.24

These are equivalent to:

- The amount of GHG emissions from the most energy-intensive vehicles: 297, 1,830, 3,741
- The mass acres of cropland based on CO₂ emissions per acre: 27, 28, 27
- The amount of energy consumed from the most energy-intensive of the most energy-intensive of the most energy-intensive per household: 341, 403, 1,234
- This many gallons of gasoline based on CO₂ emissions per gallon: 436,794, 1,236,467, 1,374,641
- The number of propane stoves used for home heating based on CO₂ emissions per stove: 146,927, 417,068, 972,968
- Tons of waste avoided based on CO₂ emissions per ton of waste avoided: 1,202, 3,482, 4,781

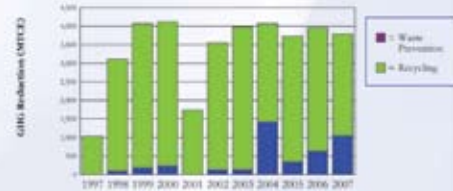
2007 GHG Emission Reductions by Commodity

Commodity	Amount of Waste Prevented and Recycled (pounds)	GHG Reductions (MTCO ₂ e)
Other	1,303,301	461.14
Metals	4,766,217	1,687.53
Plastics	1,230,020	361.62
Paper	3,364,813	1,375.53
Organics	0	0.00
TOTAL	10,664,442	3,783.24



2004 - 2007 GHG Emission Reduction Progress

Activity	GHG Reductions (MTCO ₂ e)			
	2004	2005	2006	2007
Waste Prevention	1,421.51	1,048.69	653.53	1,053.34
Recycling	2,653.44	3,377.72	3,522.34	2,729.90
Total	4,074.95	4,426.41	4,175.87	3,783.24



WasteWise Partnership support includes a customized WARM profile.

RCC TOOLS, EDUCATION AND OUTREACH: Getting the Word Out

EPA offers a variety of tools through the RCC to help individuals and organizations determine the environmental impacts of their purchasing, manufacturing, and waste management activities.

The Waste Reduction Model (WARM) estimates the GHG and energy impacts of solid waste management decisions for 34 materials. A streamlined life cycle model, WARM allows the user to measure the combined upstream and downstream benefits of source reduction, recycling, composting, combustion, and landfilling. (www.epa.gov/warm)

The Electronic Product Environmental Assessment Tool (EPEAT) helps purchasers in the public and private sectors evaluate, compare, and select desktop computers, notebooks, and monitors based on their environmental attributes. EPEAT also provides a clear and consistent set of performance criteria for the design of products and provides an opportunity for manufacturers to secure market recognition for efforts to reduce the environmental impact of its products. (www.epeat.net)

The RCC Web Academy uses Web-based technology to provide information on the RCC to thousands of stakeholders across the country. The Academy provides monthly MSW and recycling training to local, state, and federal agencies, non-profits, and industry stakeholders. Since its inception in 2007, the Academy has reached over 2,100 individual users. The program reduces costs for the audience by decreasing travel needs and utilizing technology and equipment that is readily available, as well as reducing the environmental impacts associated with travel to training sites. (www.epa.gov/rcc/Web-academy)

The Recycled Content (ReCon) Tool estimates the lifecycle, GHG, and energy impacts of purchasing or manufacturing certain materials. It also calculates the GHG and energy benefits of increasing the recycled content of specific materials. (www.epa.gov/climatechange/wyacd/waste/calculators/ReCon_home.html)

The Office Carbon Footprint Tool estimates the GHG impacts of a wide variety of activities including transportation, purchasing, and waste management. This Excel-based tool allows office-based businesses to estimate the GHG emissions associated with their activities and gives suggestions to reduce the business's carbon footprint. (www.epa.gov/epawaste/partnerships/wastewise/carboncalc.htm)

The GreenScapes Calculators compare costs between products made of recycled materials and virgin materials, including asphalt, concrete, brick, lumber, and yard waste. The calculators can aid in the selection and implementation of more sustainable landscape design, construction, operations, and maintenance. (www.epa.gov/epawaste/conserv/rrr/greenscapes/pubs.htm#cost)

The Industrial Materials Recycling Tools and Resources is a collection of references pertinent to the reuse and recycling of industrial materials. It includes fact sheets, guidance and technical documents, regulations, standards, sample contract language, and Web sites to help public, private, and government managers utilize industrial materials in their projects. (www.epa.gov/epawaste/conserv/rrr/imr/index.htm)

The Schools Chemical Cleanout Campaign (SC3) Toolkit provides schools and partners with resources to start chemical management programs and/or improve their chemical management practices. It includes fact sheets, guidance documents, and manuals that address a wide range of topics including lab safety, green cleaning, safety in art classes, and guidance for administrators. The SC3 Workbook, *Building Successful Programs To Address Chemical Risks In Schools: A Workbook With Templates, Tips, And Techniques To Build A Successful SC3 Program*, is a step-by-step guide which walks a person through the steps to develop and implement a chemical management program at their school as well as advice for potential partners who want to become involved in SC3 work. (www.epa.gov/epawaste/partnerships/sc3/index.htm)

The Municipal Government Toolkit, developed by EPA's Region 4, provides local officials with information to evaluate, support, and expand their waste reduction programs. The MGTK presents a collection of economic data, sample legislation, waste reduction efforts, guidance resources, and case studies surrounding the impacts of recycling in the Southeast. Users can find information on key recycling topics, including starting a program, economic impacts, climate change aspects, and community benefits.

The MGTK complements the efforts of an EPA grant to the Southeast Recycling Development Council (SERDC), designed to demonstrate the positive economic impacts of recycling in the eight Region 4 states, encouraging municipal officials to support and fund recycling efforts in their communities. (www.epa.gov/Region4/waste/rcra/mgtoolkit/index.html)

Tools for Local Government Recycling Programs is a collection of tools and information for local governments and community leaders seeking to create or maintain a residential recycling program, including economic information, outreach materials, and sector-based resources. (www.epa.gov/epawaste/conserv/tools/localgov/index.htm)

Office of Resource Conservation and Recovery
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Limits on EPA and Partner Participation in the Resource Conservation Challenge. Please note that EPA does not endorse the purchase of products or services of any company or organization mentioned in this update. EPA is authorized to cooperate with private and public efforts to reduce the adverse effects of releasing solid wastes into the environment and to encourage recycling of industrial and commercial materials. The Resource Conservation Challenge (RCC) program is open to all companies and organizations that wish to join the Agency in this endeavor. Press releases and promotional materials may advise the public of the partners' participation in the RCC program and identify any recognition awards that EPA provides to the partner. However, EPA is prohibited from endorsing the purchase or sale of specific commercial products or services. Our partners cannot create advertising that expressly or implicitly violates this prohibition and remain a partner with EPA. All commitments that EPA makes in this program are subject to the availability of appropriated funds. Neither the Agency nor its partners are under legally binding obligations to continue participation in the program.