Resource Conservation Challenge

UPDATE

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EPA
United States
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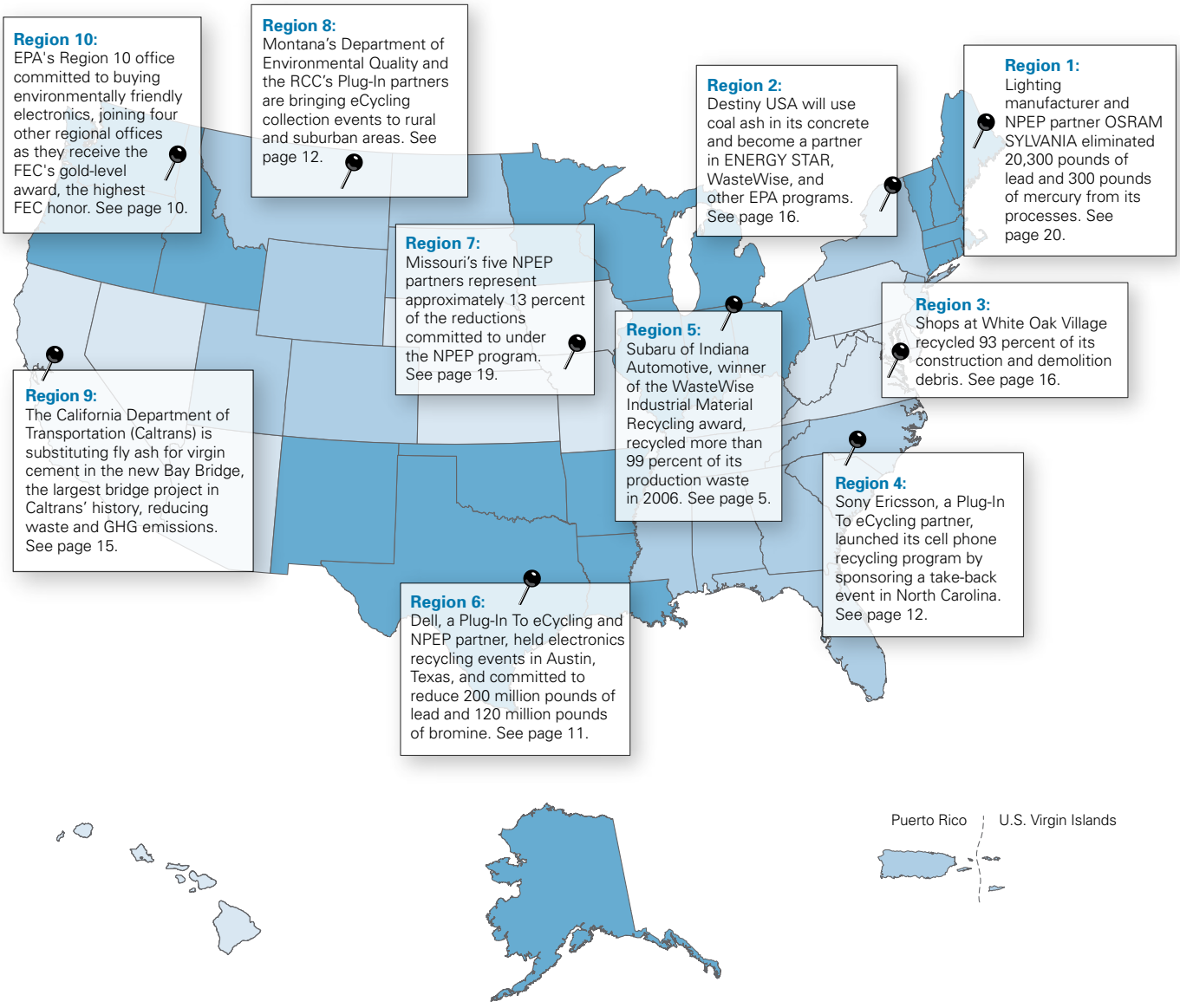
Agency

Managing Materials for a Sustainable Future

Representative Success Stories by EPA Region



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Introduction

Resource Conservation Challenge: An Overview

Launched in 2002, the Resource Conservation Challenge (RCC) implements Congress' charge to the U.S. Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act (RCRA) and the Pollution Prevention Act to prevent pollution and conserve natural resources and energy by managing materials more efficiently. The RCC is a national program that provides renewed urgency to EPA's message of reducing, reusing, and recycling valuable materials habitually discarded by American industry and the general public by linking the importance of these activities to energy conservation and greenhouse gas (GHG) reductions.

While inclusive enough to reach every producer, manufacturer, and consumer, the RCC strategy is disciplined in its focus, targeting four major areas: Municipal Solid Waste, Green Initiatives–Electronics, Industrial Materials Recycling, and Priority and Toxic Chemicals. Most importantly, the RCC brings a shift from a "waste management" to a "materials management" approach: Aluminum cans in a bin are a "waste" only if we do not take advantage of the fact that they are a material that can be recycled again and again, thus saving valuable energy and reducing GHG emissions with every additional extraction and manufacturing cycle avoided. Similarly, in the industrial arena, coal combustion ash destined for landfills can be reused in the production of cement: For every ton of coal combustion ash that is reused, we avoid 1 ton of GHG emissions.

Over the past several years, EPA has focused on fostering partnerships that have the potential to produce significant and measurable environmental results in the areas of waste prevention and increasing recycling. Our WasteWise program targets businesses, institutions, and governments. GreenScapes partnerships address landscaping of commercial buildings. The Coal Combustion Products Partnership (C^2P^2) encourages the use of coal combustion products in transportation and building projects. The National Partnership for Environmental Priorities (NPEP) encourages industries to reduce chemicals of concern (priority chemicals). The Schools Chemical Cleanout Campaign (SC3) encourages academic institutions to remove outdated and unneeded toxic chemicals from the K–12 school environment. Plug-In To eCycling encourages industry, governments, retailers, and citizens

to recycle and reuse electronic equipment. Outreach has been critical to the success of each of these programs in terms of engaging business partners (such as Dell, HP, Wal-Mart, GE, Subaru, and Staples) and the public. To educate and inform the next generation of citizens, EPA has an aggressive educational outreach program targeting youth of all ages, including the Planet Protectors Club program for elementary school children, the Make a Difference Campaign aimed at middle school students, and a recently launched program for high school students.

In addition, EPA recognizes the importance of developing a variety of tools so our partners and others can make environmentally sustainable choices and all of us can quantify the successes, benefits, and accomplishments of partnership programs. Our RCC tools are being widely used not only by our partners, but more generally by members of the business community and the public who want to understand and reduce their environmental footprint. EPA is able to document the following environmental results of the RCC in particular, and more broadly, national efforts at resource conservation:

Municipal Solid Waste—The nation's recycling rate has increased from 29 percent in 2000 to 32.5 percent in 2006. This 32.5 percent recycling rate resulted in GHG emissions reductions of nearly 50 million metric tons of carbon equivalent (MTCE), equivalent to the annual GHG emissions of more than 39 million cars. Our 32.5 percent recycling rate provided an energy conservation benefit of 1.3 quadrillion British thermal units (BTUs), the energy equivalent of 11.3 billion gallons of gasoline, or nearly 13 percent of U.S. residential site energy consumption.

Green Initiatives–Electronics—In 2005, more than 172,000 tons of electronics, consisting of CPUs, cathode ray tubes (CRTs), LCDs, notebook computers, and cell phones, were recycled, resulting in reduced emissions of 151,000 metric tons of carbon equivalent, comparable to the annual GHG emissions of more than 100,000 passenger vehicles. The energy benefit of recycling those five categories of electronic waste was more than 6.5 trillion BTUs, equivalent to the energy content of nearly 53 million gallons of gasoline. In addition, 173,000 tons of other electronics were recycled, yielding additional energy and GHG benefits.

Industrial Materials Recycling—Between 2001 and 2006, C^2P^2 helped increase the recycling of coal combustion ash from 32 percent to 43 percent, resulting in the beneficial use of 15 million tons of coal ash. This resulted in conservation of 80 trillion BTUs of energy, equivalent to the annual energy consumption of more than 420,000 households. The GHG emissions avoided is equal to more than 3.5 million MTCE, equivalent to the annual GHG emissions of 2.5 million cars.

Priority and Toxic Chemicals—NPEP was launched as a major component of the RCC in September 2002. Now in its fifth year, NPEP continues to be a program that delivers positive environmental results. The NPEP program has grown into a network of more than 150 partners in 30 states and Puerto Rico, whose innovative projects have led to reductions of more than 3.5 million pounds of priority chemicals and more than 6.5 million pounds of other potentially hazardous chemicals from their processes and waste streams.

EPA is proud to release this report showcasing recent efforts and accomplishments in strengthening the nation's infrastructure to reduce, reuse, and recycle municipal solid waste, industrial materials, and electronics, and to reduce the amount of toxic chemicals released to the environment. These significant RCC accomplishments are possible through our strong partnerships and collaboration with state and tribal partners, industry, nongovernmental organizations, corporations, other federal agencies, local governments, and individual citizens.

Municipal Solid Waste

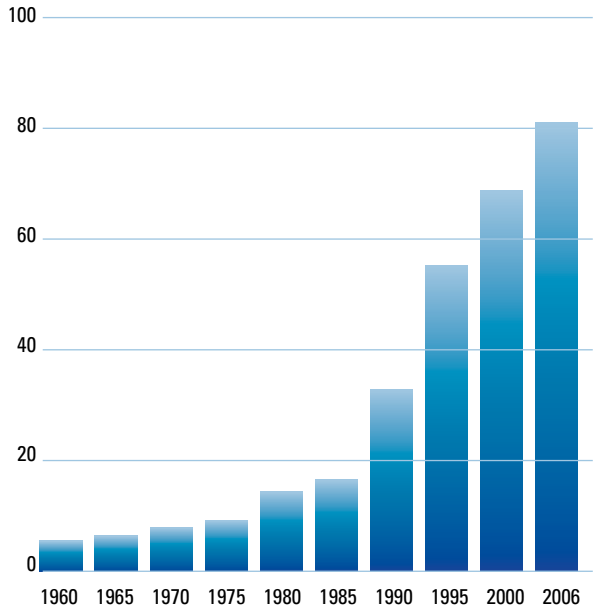
Saving for Tomorrow by Reducing, Reusing, and Recycling Today

In 2006, the U.S. national recycling rate reached 32.5 percent. At this level, the United States reduced its GHG emissions by approximately 50 million metric tons of carbon equivalent and saved 1.3 quadrillion BTUs of energy—enough to power nearly 13 percent of U.S. residences for one year.

EPA is working with states, municipalities, and key corporate leaders to increase the U.S. recycling rate beyond current levels and reduce the amount of municipal solid waste (MSW) Americans generate. Through the RCC, EPA and its partners aim to increase opportunities for recycling, improve the efficiency of manufacturing processes, and reduce the amount of materials used in products. EPA also is educating its stakeholders and the American public about the benefits of recycling through a joint campaign with the National Recycling Coalition (NRC) that focuses on developing a new brand for recycling. EPA and NRC intend to reintroduce recycling to the American public and increase participation in recycling efforts. The following stories showcase how EPA and its partners are greening their supply chains, conserving resources, and managing materials more efficiently.

MSW Recycling Rates, 1960–2006

in millions of tons



Source: *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2006*, U.S. EPA, www.epa.gov/epaoswer/non-hw/muncpl/pubs/msw06.pdf

A 32.5 percent recycling rate is equal to the annual GHG emissions of more than 39 million cars.

Thanks to WasteWise Partners, Recycling Is Up, GHGs Are Down

In 2006, WasteWise's 1,800-plus partners diverted a significant portion of waste from landfills. Large and small businesses, schools, and local communities helped the nation reduce its GHG emissions and conserve energy. WasteWise partners developed their own resource conservation practices, from collecting office products for recycling to composting food scraps. To build on past successes, EPA Region 2 developed a new WasteWise CD geared toward local communities and corporate leaders in New Jersey. The CD, developed as part of the New Jersey Reinvigorating Recycling Initiative action plan, explains how to start waste reduction and recycling programs, thereby expanding the recycling universe in the state.

RecycleMania Crowns Three-Time Collegiate Recycling Champion

RecycleMania is an intercollegiate competition that invites colleges and universities from across the country to compete against each other to see who can recycle the most materials. In 2007, RecycleMania crowned California State University–San Marcos the Grand Champion for the third straight year. With a campus-wide recycling rate of nearly 60 percent, Cal State San Marcos helped raise the 2007 competition-wide recycling totals to more than 43 million pounds. This year's competition also doubled in size, bringing in more than 100 new colleges and universities. This year's top recyclers included Rutgers University, Lamont-Doherty Earth Observatory of Columbia University, Kalamazoo College, and the University of San Francisco.

In addition, through EPA Region 3's involvement and with help from the West Virginia Department of Environmental Protection, both West Virginia University (2006) and Marshall University (2007) started recycling at all of their home football and basketball games. During the 2006 football season, with an average attendance of nearly 59,000 people, WVU collected more than 9 tons of aluminum cans, PET plastics, glass, and corrugated cardboard. Virginia Tech also recently initiated the "Hokie Spirit Recycling Challenge" at its home football games and could collect as much as 10 tons of recyclables.

Subaru: WasteWise Industrial Material Recycling Gold Achievement Award Winner

Subaru won the WasteWise 2007 Industrial Material Recycling Gold Achievement award for reducing the environmental impact of its manufacturing processes. Subaru of Indiana Automotive has pledged to become waste free, save energy, cut GHG emissions, promote green procurement activities, and decrease its environmental footprint. As part of its reuse activities, in 2006 the company avoided the disposal of 3,250 tons of packaging materials. It also recycled more than 13,000 tons of materials, nearly eliminating all of its production waste with a recycling rate of more than 99 percent.

GreenScapes: It's Green in Your Garden and in Your Wallet

EPA's GreenScapes partnership program encourages companies, government agencies, and homeowners to find cost-efficient and environmentally friendly landscaping solutions. In 2006 and 2007, GreenScapes added 83 partners and allies, bringing its total to more than 150. In addition, GreenScapes joined the American Society of Landscape Architects, the Lady Bird Johnson Wildflower Center, the United States Botanic Garden, and other organizations to form the Sustainable Sites Initiative. This initiative will provide standards and guidelines for measuring the sustainability of designed landscapes. Once the standards are complete, the U.S. Green Building Council plans to include them in the next version of the Leadership in Energy and Environmental Design (LEED) Green Building Rating System. The LEED system is used to evaluate and encourage design and development of sustainable

EPA's GreenScapes program provides cost-efficient and environmentally friendly solutions for landscaping.

buildings. Inclusion of these landscaping standards in LEED will enhance the importance of landscaping decisions as a contribution toward sustainability.

Carpet: Finding New Life For Old Floor Coverings

Soft underfoot, yet tough to manage at the end of its useful life, carpeting accounts for more than 1 percent of all MSW by weight, and about 2 percent by volume. The bulky nature of carpet and the variety of materials used in its manufacture often create handling, collection, and recycling challenges for local and state governments.

Over the last few years, the carpet industry has pledged to develop greener products and to decrease the amount of carpet destined for landfills. EPA, state governments, and nongovernmental organizations are collaborating with the carpet industry under the National Carpet Recycling Agreement to establish goals and timelines. The agreement also created a third-party organization, the Carpet America Recovery Effort (CARE), to develop market-based solutions for the recycling and reuse of postconsumer carpet.

One of CARE's primary goals is to divert 40 percent of carpets currently going to landfills by 2012, using 2002 as a baseline. In 2006, more than 130,500 tons, or 5 percent, of carpet were diverted from landfills. Of this, nearly 120,000 tons of carpet were recycled, saving 12.7 trillion BTUs of energy—enough to power more than 67,000 homes for a year. (The remaining 10,500 tons of carpet were diverted to waste-to-energy projects and cement kilns.)

Rolling Back Waste At Wal-Mart

Retail giant Wal-Mart Stores, Inc., has made resource conservation and sustainability part of its company-wide and nationwide environmental efforts. In 2006, EPA helped Wal-Mart work with its extensive supply chain to drive environmental innovation in packaging, which included development of an environmental scorecard. The scorecard, which began its year-long trial in 2007, evaluates the environmental sustainability of the packaging used by Wal-Mart's 60,000 suppliers.

The scorecard bases its evaluation on a number of environmental attributes such as product-to-package ratio and recycled content. Suppliers then can use this information to evaluate the environmental performance of their packaging to identify where additional improvements can be made, driving ongoing innovation. As the scorecard goes live in 2008, Wal-Mart will factor these scores to determine which products to sell in its stores.

As a result of the new scorecard, one Wal-Mart supplier completely redesigned the packaging for a USB drive. The new package, called the EnviroShell, is made with 50 percent recycled corrugated cardboard and 100 percent recycled plastic. This change eliminated the use of more than 47,000 pounds of virgin plastic and used more than 5,000 pounds of recycled PET.

Wal-Mart did not stop at reducing packaging waste. The company also announced that, starting in 2008, consumer electronics suppliers will be asked to fill out a similar

RecycleBank customers earn points redeemable for rewards.

scorecard to measure the sustainability of their products. In addition, the company initiated a partnership with Peterbilt, and its collaborator Eaton, to develop heavy-duty hybrid trucks. This groundbreaking system is expected to save $9,000 per truck per year in diesel fuel costs.

PAYT: Recycle More, Pay Less

Pay As You Throw (PAYT) simply means charging residents for their MSW generation like any other municipal utility—based on how much they throw away, instead of paying for garbage services out of the tax base or a flat fee. This economic incentive strongly encourages people to reduce their waste and to recycle and compost more. And, with a 32–59 percent increase in recycling under the program, PAYT not only rewards those who recycle, but also can save the city more than 20 percent of its MSW budget per year.

In addition to the economic rewards, PAYT also benefits the environment by reducing waste, conserving natural resources and saving energy, which reduces GHG emissions significantly. In fact, EPA estimates that for every 100,000 citizens using PAYT, GHG emissions are reduced by more than 9,000 metric tons of carbon equivalent—the same annual GHG emissions as more than 6,000 cars.

Given these clear economic and environmental benefits, more than 7,000 PAYT communities in the United States—from Portland, Maine, to Portland, Ore.—as well as cities all over the world—from Toronto to Taipei—are cashing in on the perks from PAYT.

RecycleBank: Opening A Branch Near You

In 2004, RecycleBank launched its first incentive-based recycling program in Philadelphia, Pa. Two years later it opened a branch for curbside recyclers in Wilmington, Del. Through an RCC grant, and in partnership with RecycleBank, Wilmington provided single stream collection of recyclables to approximately 8,000 households as a pilot program. RecycleBank's high-tech concept tracks recycling rates electronically by scanning a barcode on the side of each resident's curbside recycling bins. The scanner and barcode facilitate calculating the weight of the recycled materials and then crediting the home with "RecycleBank Dollars." Residents can check their RecycleBank Dollars balance online and find out how many resources they helped conserve. Residents can redeem their RecycleBank Dollars at participating national and local retailers, including Starbucks, HP, Borders, Staples, and many others. In 2007, the RecycleBank Wilmington branch expanded to include the entire city; in addition, branches have opened in New Jersey and Massachusetts.

For More Information...

By working with partners to minimize waste or increase recycling in corporate settings or sporting events, EPA and its partners are saving energy, reducing GHG emissions, and conserving resources. For more information, please visit:

CARE: www.carpetrecovery.org

GreenScapes: www.epa.gov/greenscapes

Organic Materials: www.epa.gov/organicmaterials

Pay As You Throw: www.epa.gov/payt

RecycleBank: www.recyclebank.com

RecycleMania: www.recyclemaniacs.org

WasteWise: www.epa.gov/wastewise

Green Initiatives—Electronics

Plug It in Again

Technology changes almost daily. Americans are demanding and buying the latest electronics, from flat-screen televisions and laptop computers to MP3 players and cell phones. The electronics industry is not only working hard to keep up with the demand for new products but also to improve its environmental performance. In 2005, more than 172,000 tons of electronics, consisting of CPUs, CRTs, LCDs, notebook computers, and cell phones, were recycled, resulting in reduced emissions of 151,000 metric tons of carbon equivalent, comparable to the annual GHG emissions of more than 100,000 passenger vehicles. In addition, 173,000 tons of other electronics were recycled, yielding further GHG benefits.

The states are finding new ways to encourage citizens to recycle their old electronics. By the end of 2007, 14 states had adopted electronics recycling legislation that bans e-waste from landfills, requires some form of financing for recovery of used electronics, or both.

To build on this momentum, EPA and its partners are making electronics recycling, also known as eCycling, more affordable and more convenient. Accomplishing these goals doesn't come without its challenges, because it involves building infrastructure to provide consumers with more recycling opportunities, increasing consumers' awareness of these opportunities, and finding ways to implement cost-effective solutions. The following stories illustrate how EPA, the states, other federal agencies, and industry partners are working together to overcome these challenges by changing the way electronic devices are designed, increasing the use of "green" electronics, and providing recycling options to consumers everywhere.

Environmentally Friendly Designs Earn EPEAT Seal of Approval and Make Recycling Easier

Developed through an EPA grant, the Electronics Product Environmental Assessment Tool (EPEAT) rates laptop and desktop computers and monitors on energy use, recyclability, resource efficiency, packaging, and other environmental attributes. These ratings—bronze, silver, and gold—help consumers evaluate, compare, and ultimately purchase electronic equipment that uses less energy, creates less waste, and contains fewer harmful materials.

Between July 2006 and December 2007, nearly 700 models of desktop computers, laptops, and monitors were awarded the EPEAT label and are available in the marketplace. Of these, 38 have received gold certification—representing the highest tier of environmental performance. U.S. government computer contracts reference almost $42 billion worth of EPEAT-registered products. In January 2007, President George W. Bush signed Executive Order 13423, mandating that federal agencies buy EPEAT-registered products.

According to the Environmental Benefits Calculator, developed by the University of Tennessee under a cooperative agreement with EPA, the first six months of sales (July 2006 through December 2006) for EPEAT-registered computers produced the following environmental benefits when compared with traditional computers:

- Saved 13.7 billion kilowatt-hours (kWh) of electricity, enough to power 1.2 million U.S. homes for a year;
- Saved 24.4 million metric tons of materials, equivalent to the weight of 189 million refrigerators;
- Prevented 56.5 million metric tons of air pollution, including 1.07 million metric tons of GHGs (equivalent to the annual GHG emissions of 852,000 cars);
- Prevented 118,000 metric tons of water pollution;
- Reduced toxic material use by 1,070 metric tons, equivalent to the weight of 534,000 bricks, including enough mercury to fill 157,000 household fever thermometers; and
- Avoided disposal of 41,100 metric tons of hazardous waste, equivalent to the weight of 20.5 million bricks.

EPEAT helps consumers choose laptops and other equipment that use less energy.

Visit the EPEAT Web site at www.epeat.net for a copy of the annual environmental benefits report and information on the Environmental Benefits Calculator. http://eerc.ra.utk.edu/ccpct/eebc/eebc.html

Plug-In To eCycling develops programs based on communities, electronics manufacturers, and retailers to encourage shared responsibility for safe electronics recycling.

Federal Agencies Buy Greener Electronics

Each year the federal government purchases more than $66 billion worth of electronic equipment and services. The Federal Electronics Challenge (FEC) assists federal agencies and facilities in becoming leaders in electronics stewardship by helping them improve their electronics purchasing, use, and disposal. With its purchasing power, the federal government is creating a major market for environmentally friendly electronics as well as supporting the infrastructure for responsible electronics reuse and recycling.

In fiscal year 2006, the environmentally friendly purchasing, use, and disposal decisions of 64 reporting FEC partners saved more than 65 million pounds of virgin materials. Twenty-one percent of federal partner computer purchases were rated EPEAT bronze or higher, and more than 99 percent of nonreusable federal partner computers were recycled. EPA's Office of Solid Waste and Emergency Response and eight other EPA offices and regions received gold-level awards, the highest FEC honor, for reducing the environmental impacts of electronics in all three life-cycle phases (purchase, use, and disposal), as well as participating in a peer mentoring program.

In addition to FEC, the Electronics Reuse and Recycling Campaign (ERRC) challenged the federal government to donate and recycle excess or surplus electronics, instead of storing them. The ERRC is a competition between federal agencies to see which can reuse or recycle the most electronic devices. In the 2006–2007 competition, the U.S. Department of Energy took the top honor, reusing or recycling more than 600,000 pounds of electronics. Overall, almost 2.5 million pounds of electronic devices were reused or recycled, saving nearly 82 gigawatt hours of electricity, enough to power more than 7,000 households for a year (calculated using the Environmental Benefits Calculator at http://eerc.ra.utk.edu/ccpct/eebc/eebc.html).

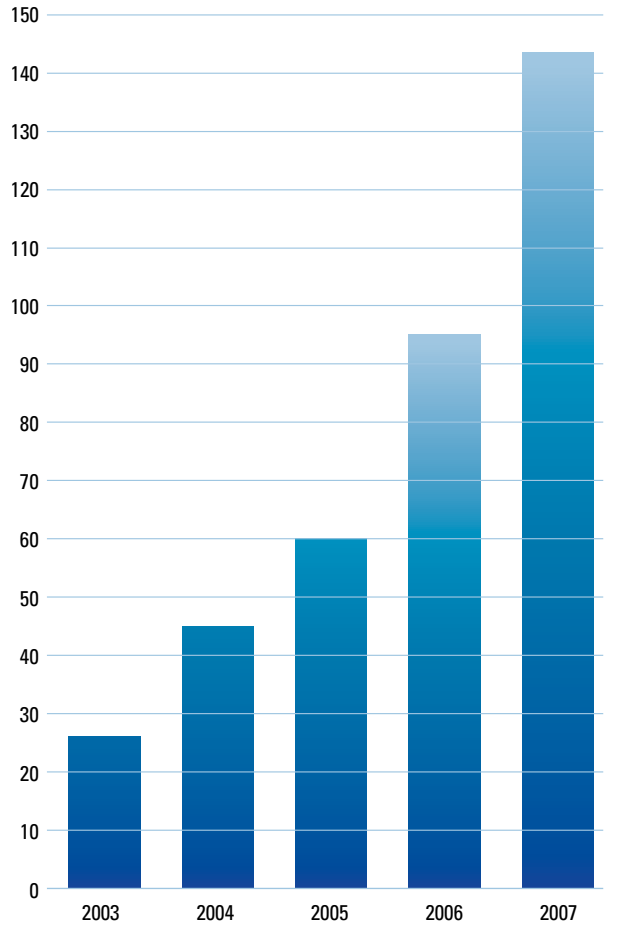
Plug-In To eCycling Makes Reuse And Recycling Convenient And Affordable

Creating safe reuse and recycling opportunities for used consumer electronics, known as eCycling, is at the heart of EPA's Plug-In To eCycling partnership. In 2007, partners collected more than 47 million pounds of electronics. The energy conserved through these recycling efforts is equivalent to the annual GHG emissions of nearly 24,000 cars. Since the partnership began in 2003, Plug-In partners have recycled more than 142 million pounds of unwanted consumer electronics.

Fewer than 20 percent of cell phones are recycled each year. Source: EPA Baseline report, www.epa.gov/ecycling/manage.htm

Plug-In Cumulative Collection Rates

in millions of pounds



Source: Plug-In To eCycling Accomplishment Reports, www.epa.gov/epaoswer/osw/conserve/plugin/index.htm

In 2006 and 2007, Plug-In partners continued to demonstrate innovation and creativity in sponsoring collection events and take-back programs and reaching out to consumers.

Innovative Partnerships And Donation Programs

In 2007, Dell and other Plug-In partners continued to build on their reuse and recycling programs. Dell expanded its Reconnect partnership with Goodwill Industries to include New Jersey and Philadelphia, Pa. Reconnect, a comprehensive electronics recovery, reuse, and environmentally responsible recycling opportunity for consumers, is now providing electronics donation opportunities to several million households. Dell also worked through its partnership with the National Cristina Foundation to offer consumers opportunities to donate their used computers.

In addition to its reuse and donation efforts, in 2007 Dell launched its free, online computer recycling program. This program enables consumers who own Dell computers, printers, and peripherals to send their used equipment back to Dell, regardless of whether they buy a replacement.

Collection Programs

In 2007, Staples, Office Depot, Hewlett Packard, and Sony launched nationwide eCycling efforts. The Staples program, launched in May, lets consumers drop off their computers and other electronic office equipment at any of the company's 1,400 U.S. retail locations. For a small fee, consumers can bring in big ticket items such as cathode ray tube computer monitors. Other electronic products, when brought in with a large item, are collected free of charge. Staples has collected nearly 2 million pounds of unwanted electronics through this effort. Office Depot's program allows consumers to purchase boxes, for a small fee, to use to recycle their used consumer electronics. Office Depot then sends the boxes on behalf of the consumer for recycling.

A new EPA ruling encourages recycling of CRTs.

Sony's Take Back Recycling program, launched in September 2007, allows consumers to take, free of charge, their unwanted Sony-branded electronic products to more than 80 drop-off centers across the country run by Waste Management eCycle America. For a small fee, all other product brands are also accepted. In 2007, more than 15 million pounds of electronics were recycled at drop-off centers in 18 states. These innovative programs are helping bring convenient recycling opportunities to more Americans.

Cell Phone Recovery

ReCYCLE YOUR CELL PHONE It's an easy call

In 2007, EPA teamed up with cell phone manufacturers, service providers, and retailers to increase America's cell phone recycling and donation rate. To raise the public's awareness of the importance and convenience of cell phone recycling and donation, EPA distributed public service announcements and podcasts and increased publicity about available partner recycling programs. Cell phone recycling conserves resources, saves energy, and reduces GHG emissions. If the 134 million cell phones that were ready for end-of-life management in 2006 had been recycled, we would have saved 10 trillion BTUs—enough energy to power more than 259,000 U.S. households for one year.

States Bring eCycling To Rural Communities

Citizens living near urban and heavily populated regions often have more opportunities to recycle electronics. In 2006, Montana's Department of Environmental Quality, located in EPA Region 8, piloted a series of eCycling events to give Americans living in rural and suburban areas the same opportunities to put their old electronics to good use. These events collected more than 330,000 pounds of electronics and set the stage for Montana to develop a statewide electronics recycling program. Plug-In partners Best Buy, JVC, Lexmark, Panasonic, Philips, Sharp, Sony, Staples, and Toshiba cosponsored events in Butte, Helena, and Missoula and paid the cost of recycling their brands.

Plug-In partners also assisted in collection events across West Virginia by paying for the recycling costs of their branded products. Organized by the National Center for Electronics Recycling through a grant from the West Virginia High Technology Consortium Foundation, the events collected and recycled more than 230,000 pounds of electronics. Montana's and West Virginia's efforts serve as models to provide more recycling opportunities in rural areas.

As CRTs Phase Out, Recycling Rushes In

In 2006, EPA issued a rule that ensures cathode ray tubes (CRTs) can be safely and easily recycled. As consumers upgrade to flat-screen LCD and plasma televisions and computer monitors, the number of unwanted CRTs will continue to grow. Specifically, the rule excludes CRTs destined for recycling from RCRA hazardous waste regulation, as long as certain conditions are met. This approach makes it easier to determine how CRTs should be managed safely, thereby encouraging recycling. In addition, the rule requires

Computers and other electronic products contain valuable materials that can be reused as commodities for other products.

exporters of CRTs for recycling to notify EPA and obtain consent from the receiving country before the CRTs are exported. Recycling CRTs at home or abroad saves energy, conserves resources, and allows lead already in commerce to be reused, thereby saving virgin materials.

Developing Safe eCycling Practices

EPA convened a group of stakeholders including states, electronics manufacturers, recyclers, trade associations, and environmental organizations to develop responsible and safe practices for electronics recycling. The workgroup collectively developed a set of practices that not only result in the most significant environmental benefits, but also meet the needs of diverse stakeholders. The practices are slated to be tested in winter 2008.

An eCycling event in Missoula, Mont., enabled rural and suburban residents to drop off their unwanted computer equipment for recycling. *Photo: Montana Department of Environmental Quality.*

For More Information...

Whether promoting eCycling collection events with our Plug-In partners, helping consumers and businesses understand the environmental footprints of their IT investments with EPEAT, or exploring innovative ways to make reuse and recycling easier, EPA is challenging all of its partners to continue to find ways to keep consumers plugged in to eCycling. For more information, please visit:

CRT Rule: www.epa.gov/epaoswer/hazwaste/recycle/electron/crt.htm

Electronics Environmental Benefits Calculator: http://eerc.ra.utk.edu/ccpct/eebc/eebc.html

EPEAT: www.epeat.net

FEC: www.federalelectronicschallenge.net

Green Initiatives—Electronics: www.epa.gov/epaoswer/osw/conserve/priorities/green.htm

Plug-In To eCycling: www.epa.gov/plugin

Industrial Materials Recycling

Building for the Future With Yesterday's Materials

Every year, U.S. businesses generate more than 500 million tons of secondary industrial materials, which could be used beneficially instead of thrown away. Together, EPA and the Industrial Resources Council (IRC), a collaboration among seven manufacturing industry associations, are working to increase the recycling and beneficial use of industrial byproducts that are generated by the nation's manufacturing sector. EPA is also partnering with the Associated General Contractors of America and other federal agencies, such as the Federal Highway Administration, U.S. Department of Energy, and U.S. Department of Agriculture to encourage recycling of these materials. To promote information sharing among our many stakeholders including industry, federal and state governments, and academia, EPA holds its annual Byproducts Beneficial Use Summit. These meetings serve as a catalyst to identify and develop viable markets and educate corporate, industry, state, and local partners on the significant environmental benefits of using or recycling industrial materials.

Finding uses for materials such as coal ash, construction and demolition materials, and foundry sand conserves energy and reduces GHG emissions by decreasing the demand for virgin materials. Recycling industrial materials can reduce materials costs for the end user and reduce disposal costs for the generator. The following stories are examples of how EPA and our public and private partners are using secondary industrial materials to build for the future.

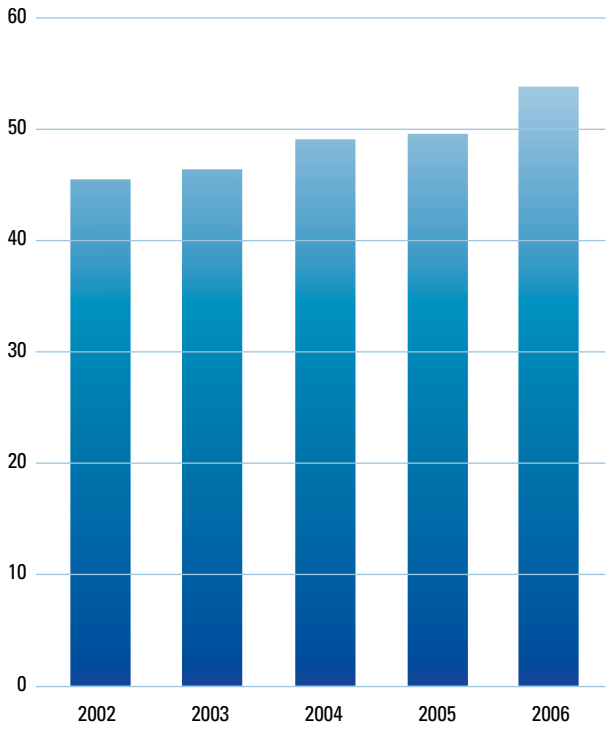
C²P² Partners Help the Nation Reach a 43 Percent Recycling Rate For Coal Combustion Products

COAL COMBUSTION PRODUCTS PARTNERSHIP

Partners in C²P² are working to increase the amount of coal combustion products (CCPs) American businesses recycle each year. In 2006, the CCP recycling rate reached 43 percent—more than 54 million tons. Using 15 million tons of fly ash, a subcategory under CCPs, in place of portland cement saved nearly 80 trillion BTUs of energy—equivalent to the annual energy consumption of more than 420,000 households.

Coal Combustion Products Used

in millions of tons



Source: American Coal Ash Association CCP Annual Survey Results, http://acaa.affiniscape.com/associations/8003/files/2006_CCP_Survey_(Final-8-24-07).pdf

Construction of the new Bay Bridge in California involves use of recycled fly ash.

California Uses Fly Ash In New Bay Bridge

The California Department of Transportation (Caltrans), located in EPA Region 9, is a leader in substituting fly ash for portland cement in its concrete mixes. Fly ash reduces the amount of cement needed in construction projects. The department typically uses about 25 percent fly ash as a replacement for portland cement in its concrete mixes, which reduces statewide GHG emissions. Caltrans recently set a new goal of using up to 60 percent fly ash and 50 percent slag in its concrete mixes, further improving GHG savings and keeping these materials out of landfills.

Caltrans won first place for innovation in the 2006 C²P² awards for the Bay Bridge project. Designed to carry 350,000 vehicles per day and have a lifespan of 150 years, the Bay Bridge is the largest bridge project in Caltrans' history. Caltrans also created the first structural concrete GHG reduction standard, which will encourage contractors and designers to build more bridges and highways with higher amounts of fly ash.

U.S. Recycles Nearly 65 Percent of Construction And Demolition Materials

Increasing the use of construction and demolition materials is a national RCC priority. We estimate that approximately 40 percent of building materials and 88 percent of road surface materials are currently being recycled. This translates to an industrial materials recycling rate of nearly 65 percent.

Artist's illustration of Destiny USA.

Multi-Use Complex Finds Value In Old Building Materials

In Henrico County, outside of Richmond, Va., EPA Region 3 is working with the Forest City Commercial Group to redevelop 44 acres of a former RCRA corrective action site into a hotel and retail complex, with recycling and reuse as an underlying theme.

Redevelopment of this site into the Shops at White Oak Village is not only returning the land to public use, but it also incorporates recycling and sustainable design practices into the construction. Approximately 77,000 tons of concrete were crushed onsite and used for the foundation, sidewalks, and structural support for the White Oak retail complex. Almost 7,500 tons of aluminum, steel, iron, copper, assorted ferrous and nonferrous metals, and electronic equipment in the old building, such as filter boxes, computer systems, and transformers, will be recycled through reclamation buyers around the country. This project recycled an impressive 93 percent of its construction and demolition materials. Moreover, the Forest City Commercial Group plans to use environmentally preferable materials and to adhere to other LEED guidelines for all redevelopment on the site. Project leaders also plan to educate prospective vendors and tenants about green building practices.

Destiny USA to Use Industrial Materials

A major commercial development in Syracuse, N.Y., will be built with recycled industrial materials. In 2006, the developer of Destiny USA, which will be a multi-use complex incorporating shopping, dining, entertainment, and other amenities, met with EPA Region 2 to discuss incorporating a variety of environmentally sustainable practices into the project.

As a result of this coordinated approach, Destiny USA pledged to incorporate more than 3,000 tons of coal fly ash into concrete mixes used onsite, and to participate in a number of EPA initiatives. The developers pledged to employ green building techniques, join EPA's ENERGY STAR® and WasteWise programs, and use WaterSense-approved fixtures and conservation techniques. Further, the developers will retrofit more than 100 construction vehicles and other equipment to reduce air emissions by 85 percent, implement a vehicle idling enforcement program, incorporate hybrid and biodiesel vehicles into their fleet, and promote EPA's SmartWay Transport Partnership to carriers, shippers, and tenants to reduce truck emissions. Using 3,000 tons of coal ash in the concrete alone saves the energy equivalent of 127,000 gallons of gasoline. EPA will monitor and measure benefits as they are generated by this project.



Scrap tires may be recycled by cutting, punching, or stamping them into various rubber products after removal of the steel bead.

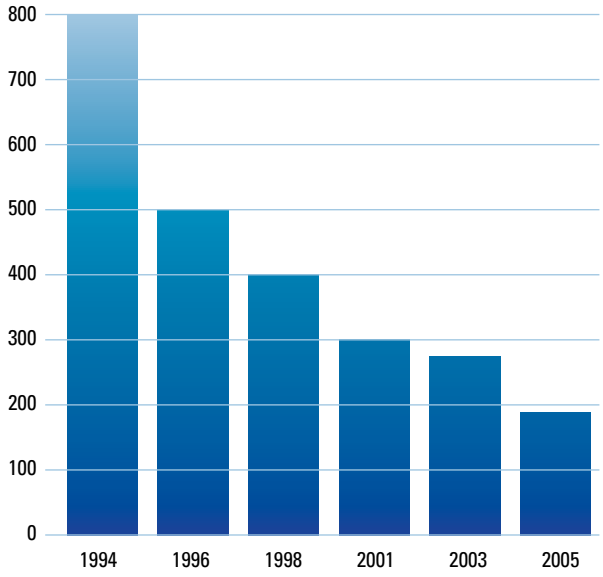
Deflating Tire Piles

Scrap tires can pose significant public health and environmental risks when disposed of improperly. The environmental impacts of tire fires can be far-reaching, and the aftermath frequently includes costly cleanups. Reducing tire piles and increasing tire reuse and recycling will prevent these environmental and health risks. EPA has two aggressive goals for managing used tires: (1) divert 85 percent of newly generated scrap tires to reuse, recycling, or energy recovery; and (2) reduce the number of tires in existing stockpiles by 55 percent by 2008, using 2003 as a baseline.

Annually, Americans discard nearly 290 million scrap tires. In 2005, more than 73 percent of these scrap tires were diverted from landfills. In addition, between 2003 and 2005, scrap tire piles were reduced by about 32 percent. These successes are due in part to increased emphasis on recycling and beneficial use by federal, state, and local governments; industry; and academic institutions.

Scrap Tires Remaining in Tire Piles

in millions of tires



Source: Rubber Manufacturers Association U.S. Scrap Tire Markets 2005 Report, www.rma.org/publications/scrap_tires/index.cfm?PublicationID=11453

For More Information...

EPA's partnership programs are finding that materials once considered waste are in fact usable and valuable. For more information, please visit:

Coal Combustion Products Partnership (C^2P^2): www.epa.gov/c2p2

Construction and Demolition Materials: www.epa.gov/epaoswer/non-hw/debris-new/index.htm

Destiny USA: www.destinyusa.com

Foundry Sand Statement: www.epa.gov/epaoswer/osw/conserve/foundry/index.htm

Industrial Materials Recycling: www.epa.gov/epaoswer/osw/conserve/priorities/bene-use.htm

Tires: www.epa.gov/epaoswer/non-hw/muncpl/tires/index.htm

Priority and Toxic Chemicals

Transitioning to a Safer Tomorrow

Reducing the amount of hazardous chemicals in products and waste is vital to resource conservation and environmental sustainability. Making better decisions upfront about the use of these chemicals makes recycling easier and significantly reduces or eliminates the need to manage them as hazardous waste. EPA is targeting the reduction of priority chemicals—31 of the most persistent, bioaccumulative, and toxic chemicals—and toxic chemicals of national concern (TCNC), which are chemicals that currently pose or could pose a substantial problem in the future on a national level.

EPA continues its work with states and a variety of stakeholders including large and small businesses, federal agencies, schools, communities, and others to change the way they use these chemicals. Our partners are designing products that contain fewer chemicals, reducing or eliminating priority chemicals in manufacturing processes, improving chemical management practices, and safely recycling more materials. These decisions are making their products safer, saving money, and improving the environment. The following stories demonstrate how partner actions are translating into significant environmental improvements.

Better Environment, Better Neighbor, Better Business: NPEP

The purpose of the National Partnership for Environmental Priorities (NPEP) is to reduce or eliminate priority chemicals in products, processes, and waste. In 2007, NPEP partners found innovative ways to remove more than 1 million pounds of hazardous materials from their operations, bringing total partnership reductions (from 2004 to 2007) to more than 3.5 million pounds of priority chemicals and more than 6.5 million pounds of other potentially hazardous chemicals. NPEP's forward-thinking partners are making great strides toward their RCC goal of eliminating 4 million pounds of priority chemicals from waste streams by 2011. NPEP now has more than 150 partners among industry, municipalities, and the federal government working together to achieve this goal.

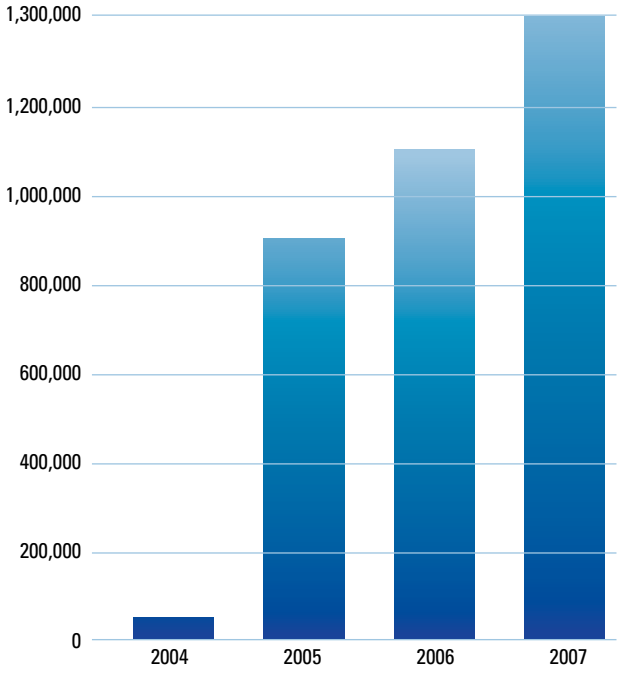
With these reductions, NPEP partners show that U.S. industry is more environmentally conscious than ever. NPEP partners are changing the way they do everything—from improving processes to building sustainable infrastructures. These changes are reducing or eliminating the use of hazardous chemicals, which in turn improves the environment, community relations, and profit margins. The following examples show what NPEP partners are doing to reduce and recycle.

2007 Reductions of Priority Chemicals

In 2007, NPEP partners eliminated 550,000 pounds of lead, 530,000 pounds of naphthalene, 220,000 pounds of polycyclic aromatic compounds (as defined by EPA's Toxics Release Inventory Program), and 7,300 pounds of mercury from the waste stream.

NPEP Reductions of Priority Chemicals (2004–2007)

in pounds



Source: EPA National Partnership for Environmental Priorities program results, www.epa.gov/epaoswer/hazwaste/minimize/npep/index.htm

Honeywell recently eliminated mercury from switches it manufactures for the automotive and other industries.

Honeywell Eliminates the Use of Mercury

For more than 38 years, Honeywell Sensing and Control (S&C) Plant 4, located in Freeport, Ill., in EPA Region 5, manufactured mercury-containing sensors, switches, and control devices for the automotive, health care, appliance, and industrial sectors. Each of these products relied on switches that contained mercury, a priority chemical. Recognizing the environmental value of removing mercury from its products, Honeywell S&C joined NPEP and pledged to stop manufacturing mercury switches. In February 2006, Honeywell S&C did just that and eliminated the use of more than 25,000 pounds of mercury. Honeywell's new, mercury-free switch is meeting customer needs while improving the environment.

Lights Off to Mercury and Lead

Three of the largest lighting manufacturers in the United States are NPEP partners. Their facilities and chemical reductions are listed below.

- In 2006, OSRAM SYLVANIA, located in Hillsboro, N.H., in EPA Region 1, reduced the use of 20,300 pounds of lead and 300 pounds of mercury.
- In 2006, General Electric Consumer Products, with facilities located in Bridgeville, Pa.; Charlottesville, Va.; and Winchester, Va.; in EPA Region 3, and Circleville, Ohio, in EPA Region 5, exceeded its original goal by four times by reducing and recycling the use of more than 950,000 pounds of lead and 49 pounds of mercury.
- By 2010, Philips Lighting Company, located in Somerset, N.J., in EPA Region 2, has pledged to eliminate the use of 1.49 million pounds of lead and 780 pounds of mercury.

Auto Mercury Switches Removed

Many automobiles on the road today are equipped with convenience light switches that each contain approximately 1 gram of mercury. When these vehicles are scrapped, they are shredded and sent to steel mills for smelting. Mercury can be emitted into the atmosphere during the steel production process. That's why EPA partnered with states, auto dismantlers, and steel manufacturers to launch the National Vehicle Mercury Switch Recovery Program (NVMSRP), an initiative to recover the mercury from these switches.

In 2007, NVMSRP reached one of its goals: enlisting 49 states and Washington, D.C., to begin mercury switch collection programs. The 50th state, Maine, has its own state mercury switch collection program. By the end of 2007, more than 6,000 dismantlers and shredders were participating in the program. Collectively, they recovered more than 900,000 switches and



SC3 promotes safe chemical management at middle and high schools.

captured more than 1 ton of mercury. NVMSRP expects to recover at least 4 million switches in the first three years, and 80 to 90 percent over the next 15 years.

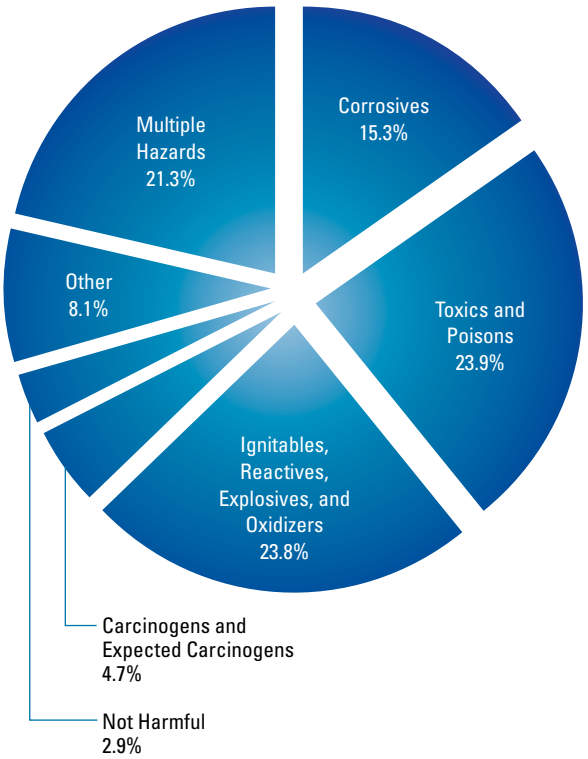
To complement NVMSRP efforts, in October 2007, EPA finalized a significant new use rule (SNUR) under section 5(a)(2) of the Toxic Substances Control Act for elemental mercury used in certain convenience light switches, anti-lock braking system switches, and active ride control system switches. The rule requires persons who, in the future, intend to manufacture or process elemental mercury for auto switches to notify EPA at least 90 days before beginning to manufacture or process the chemical substance for such a new use. The required notification will provide EPA with the opportunity to evaluate the intended use and, if necessary, to prohibit or limit that activity before it occurs.

Helping Schools Manage Outdated and Unused Chemicals

An estimated 33,000—or 75 percent—of all middle and high schools across the country have unnecessary or mismanaged chemicals on their premises. These chemicals, stored in maintenance closets, vocational shops, nurses' offices, and chemistry and art classrooms, represent an unnecessary hazard to students and staff. Accidental spills can result in dangerous exposures as well as lost school days and costly cleanups.

The Schools Chemical Cleanout Campaign (SC3), formally launched in March 2007 at an event near Washington, D.C., is an RCC program that helps schools safely manage these chemicals and avoid costly, and possibly dangerous, accidental spills. The campaign provides schools with a free Web-based toolkit and connects school officials with local experts and industry leaders in chemical management who can assist in safely removing the chemicals from school property. SC3 partners offer a broad range of services, from conducting chemical inventories to training school personnel in responsible chemical management. Partners include federal and state agencies, tribes, teachers' associations, school administrator organizations, and industry leaders. Partners were recognized at the launch and a similar event held in honor of Children's Health Month in October 2007.

Types of Chemicals Removed During SC3 Programs



Source: Evaluation of Results from EPA's Schools Chemical Cleanout Campaign, www.epa.gov/evaluate/sc3result.pdf

Through DfE, industry partners are considering alternative chemistries and technologies to reduce environmental and health concerns.

Forward-Thinking Designs Lead To Safer Environment

EPA's Presidential Green Chemistry Challenge and Design for the Environment (DfE) partnership programs encourage businesses to prevent pollution and reduce the use or generation of hazardous substances. Our partners are in a unique position to reduce or eliminate these chemicals from their processes and the products we depend on every day. As a result of the Presidential Green Chemistry Challenge, program participants annually eliminate the use or generation of more than 1 billion pounds of hazardous substances (enough to fill a freight train pulling more than 5,000 tank cars, which would stretch more than 60 miles long). In addition, partners conserve more than 16 billion gallons of water (enough to supply a city the size of Baltimore, Md.) and avoid emitting 57 million pounds of carbon dioxide—equivalent to the annual GHG emissions of 37,000 automobiles.

EPA's DfE partnerships have reached more than 200,000 facilities and approximately 2 million workers, reducing the use of chemicals of concern by approximately 183 million pounds in 2006. In these partnerships, stakeholder forums consider alternative chemistries and technologies that might replace chemicals that pose health or environmental concerns. DfE partnerships have resulted in use of safer chemicals that include alternatives to the flame retardant pentabromodiphenyl ether in furniture foam and lead solder in electronic products. The Formulator Program, a DfE partnership focused on selecting the safest possible ingredients that permit the formulation of high-performing, cost-effective products, recognizes significant achievements in sustainable product formulation. Each year, formulators blend billions of pounds of chemical ingredients to create a variety of products used by businesses, institutions, and households. The DfE logo differentiates products in the marketplace, indicating that the manufacturer has applied Green Chemistry principles, substituting the safest functional chemical ingredients.

Pharmaceutical Industry Makes Medicine Safer For the Environment

The pharmaceutical sector is one of the largest generators of waste and has the highest usage of organic solvents per pound of product produced of any U.S. industry sector. To reduce the use of toxic chemicals of national concern, EPA's Green Engineering Program, in collaboration with EPA Regions 2 and 3, proposed a project to encourage greener manufacturing practices in this sector. The project has two main goals: (1) to promote process modifications

Pharmaceutical companies are substituting the safest functional chemicals into their processes and products.

that can reduce the use of significant volumes of toxic process chemicals and limit their entry into the waste stream, and (2) to foster a dialogue among leaders in industry, academia, and government to discuss challenges and opportunities to advance pollution prevention and green engineering practices. The ultimate goal is to change the culture of the pharmaceutical industry and infuse it with green manufacturing strategies, leading to a safer environment.

EPA's DfE program has entered into a partnership with the electronics industry to evaluate the life-cycle environmental impacts, performance, and cost of CRT and flat panel display technologies used for desktop computers (LCDs).

For More Information...

EPA's RCC partners reduced or eliminated priority chemicals and TCNCs in their products and processes, improved the efficiency of their operations, and made recycling easier. Their actions translated into social, economic, and environmental benefits that are paving the way to a more sustainable future. EPA challenges its partners to continue to make less toxic, more efficient products that will help us transition into a safer tomorrow. For more information, please visit:

Green Chemistry: www.epa.gov/greenchemistry

Design for the Environment: www.epa.gov/dfe

NPEP: www.epa.gov/epaoswer/hazwaste/minimize/npep/index.htm

NVMSRP: www.epa.gov/epaoswer/hazwaste/mercury/carswich.htm

Priority and Toxic Chemical Reductions: www.epa.gov/epaoswer/osw/conserve/priorities/chemical.htm

SC3: www.epa.gov/sc3

Conclusion

Today, Tomorrow, and Beyond

The accomplishments showcased in this report exemplify the culture shift toward a society in which materials are safely reused and recycled and waste is prevented, to the benefit of our partners, our communities, and the environment. These stories also demonstrate the success that can be achieved through public-private partnerships.

EPA will continue to demonstrate the tangible ways in which our RCC partners save energy and reduce GHG emissions. We invite everyone—businesses, communities, and individuals—to join us to manage materials for a sustainable future.



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.

Office of Solid Waste and Emergency Response (5305P)
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