

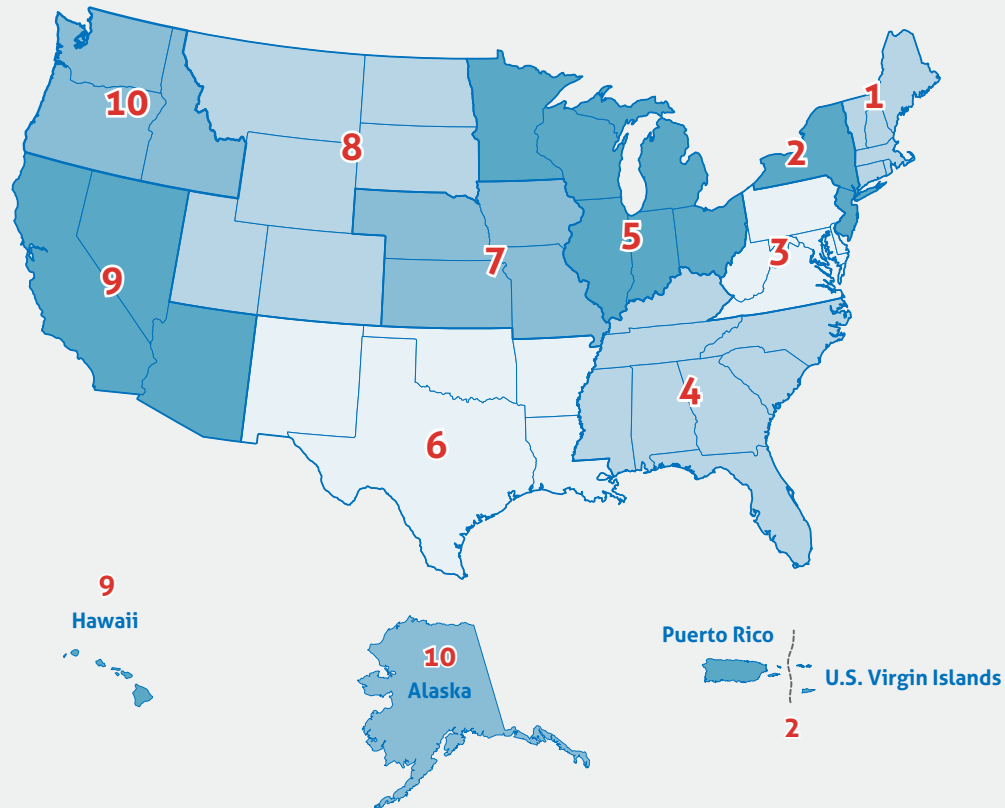
MARCH 2010

Resource Conservation
Challenge Update

MATERIALS
matter



Across the Nation Representative Success Stories in EPA Regions



Region 1

Burlington Sheraton Hotel Implements Successful Composting and Recycling Programs. [See page 10.](#)

Region 2

NY Sports Teams Get Greener. [See page 28.](#)

Region 3

Temple University Recycling Center Keeps Electronics Out of Landfills. [See page 20.](#)

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Chicago Puts the 3Rs in Motion. [See page 17.](#)

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Texas Electric Cooperatives, Inc., Reduces Priority Chemicals in Rural Communities. [See page 23.](#)

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Missouri Rewards Contractors for Using Environmentally Friendly Practices. [See page 27.](#)

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Cheyenne River Sioux Tribe, Environmental Protection Department Helps Make Tribal Schools Safer. [See page 16.](#)

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Brightwater Wastewater Treatment Plant Builds with Sustainability in Mind. [See page 30.](#)

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INTRODUCTION

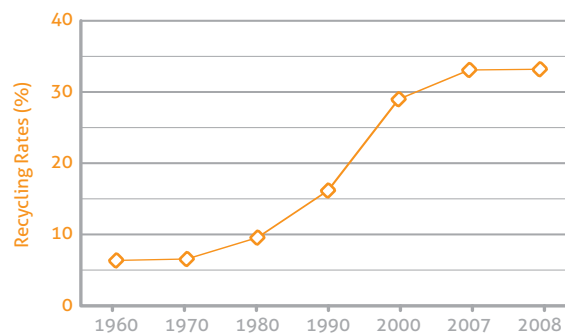
Laying the Foundation: the Resource Conservation Challenge

Through the Resource Conservation Challenge (RCC), the Environmental Protection Agency (EPA) and its stakeholders have made great progress in reducing, reusing, and recycling materials in many sectors of society. On a national level, recycling rates have nearly doubled in the past two decades, demonstrating the impact that education, outreach, and partnerships can have on materials management across the country. In 2008, 83 million tons of materials were recycled and composted, achieving a recycling rate of 33.2% nationwide. On average, Americans recycled and composted 1.5 pounds of our individual wasted generation of 4.5 pounds per person per day.

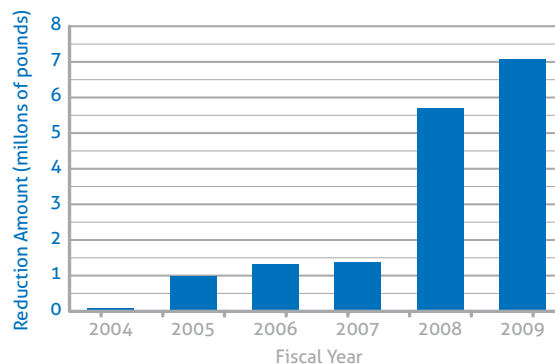
Partnership programs like WasteWise have made a difference, bringing together more than 2,860 members with the common goal to reduce, reuse, and recycle municipal solid waste and selected industrial waste. In addition, the National Partnership for Environmental Priorities (NPEP) has reduced more than 17 million pounds of chemicals from industrial and business processes—all since 2004.

By working with colleges and universities, as well as with supporting programs like RecycleMania, EPA is educating the next generation of citizens about the benefits of resource conservation. During the 2009 RecycleMania Challenge, students across the country recycled and composted 69.4 million tons of materials as part of the 10-week competition.

U.S. Municipal Recycling Rates



National Partnership for Environmental Priorities Fiscal Year Totals for Reported Priority Chemicals Reductions



Materials management is focused on:

- 1) knowing and reducing the lifecycle impacts across the supply chain;*
- 2) using fewer material inputs (reduce, reuse, recycle);*
- 3) using fewer toxic materials and more renewable materials; and*
- 4) considering whether services can be substituted for products.*

This update highlights some of the RCC program accomplishments, and provides examples of work completed in 2009, in the four focus areas of the RCC:

- 1) Municipal solid waste (MSW) reduction, reuse, and recycling;
- 2) Green initiatives, focused on reducing the lifecycle environmental impacts of electronics and green building;
- 3) Industrial materials reduction, reuse, and recycling; and
- 4) Reduction of toxic chemicals in products and waste.

Putting materials to use that would otherwise be considered trash is an important element of materials management; however, it is only *one component* of sustainable materials management. EPA is now focusing on the entire lifecycle of the materials used in the United States, so that policy-makers, program implementers, industry, communities and consumers understand their options as they design programs or choose the goods and services they buy.

To help all stakeholders understand the shift toward lifecycle thinking, in 2009 EPA released the “Sustainable Materials Management: The Road Ahead” report, describing how federal and state environmental agencies can move from a waste management approach to a lifecycle-based materials management approach as they implement their programs.

This report suggests a roadmap for a future based on sustainable materials management, a future that can fulfill human needs and allows our society to prosper, while using less material, reducing toxics, and recovering more of the materials used. This report provides three major recommendations and describes specific measures EPA and state environmental agencies can take to 1) promote efforts to manage materials and products on a lifecycle basis; 2) build capacity and integrate materials management approaches in existing government programs; and 3) accelerate the broad, public dialogue necessary to start a generation-long shift in how we manage materials and create a green, resilient, and competitive economy.

To read “The Road Ahead” in full, visit www.epa.gov/waste/inforesources/pubs/vision.htm

To begin to implement the recommendations from “The Road Ahead,” EPA launched materials management projects to:

- Determine the lifecycle implications of consumer packaging and construction and demolition materials.
- Develop guidance for use and disclosure of lifecycle analysis done in support of environmental claims made on products and materials.
- Explore options for sustainable financing of municipal recycling programs.

A fully-realized, sustainable materials management strategy addresses the recovery and beneficial use of wastes in industrial and product lifecycles, and emphasizes powerful upstream opportunities to reduce and change materials use. In the spirit of the RCC, EPA continues to challenge its partners to transform the materials management landscape so that, together, we can find new ways to make the entire lifecycle of materials and processes less harmful to human health and the environment.



RCC Focus Areas

To target its resources and achieve maximum results, EPA has focused its work in four areas:

I. Municipal Solid Waste

Through the RCC, EPA is challenging consumers, businesses, organizations, and industries to reduce, reuse, and recycle more of the United States' municipal solid waste (MSW), from office paper to product packaging. In 2009, the U.S. recycled 33.2% of its MSW; small choices by every consumer, business, and government can help our country achieve even more, reaping environmental and economic benefits. Through the RCC, EPA encourages America's citizens, industry, and governments to make smart choices in managing materials by considering alternatives to disposal such as reduction, reuse, and recycling.

II. Green Initiatives – Electronics and Green Buildings

The number of computers, televisions and cell phones we purchase, use, and discard is steadily increasing. Through partnerships, the full lifecycle impacts of electronic products, including design, operation, reuse, recycling, and disposal, is gaining national attention. Similarly, EPA is working with the design and construction industries to encourage the use of safe and reusable materials in building construction.

III. Industrial Materials Recycling

Industrial byproduct materials, such as foundry sand, construction and demolition materials, slags, coal combustion products, and gypsum are generated in large volumes every day. However, these materials are not typically seen by the general public, nor is the role these materials play in everyday products—such as highways and sidewalks—widely known. The RCC is helping to take what was once considered industrial waste to create highways, bridges, and other basic infrastructure.

IV. Priority and Toxic Chemical Reduction

While low in volume compared to MSW, priority and toxic chemicals present potential hazards to human health and the environment. EPA is working with business and industry to reduce the volume of highly toxic chemicals in their processes, resulting in a smaller and less toxic waste streams.



OVERVIEW OF

RCC Partners and Stakeholders

In 2009, EPA worked with a diverse array of partners and stakeholders to achieve results.

I. Business and Industry

Office buildings and manufacturing facilities have a significant impact on the environment. From energy used in the physical buildings to the materials companies produce, many opportunities exist to manage materials more efficiently. Many businesses and industries have contributed to the success of programs such as:

- WasteWise, which targets the reduction of municipal solid waste such as corrugated cardboard containers and other packaging materials, office paper, yard trimmings, and wood pallets, as well as selected industrial wastes such as non-hazardous batteries, oil filters, and foundry sands.
- Plug-In to eCycling, a program designed to increase recycling of electronic products such as cell phones, computers, and televisions.
- National Partnership for Environmental Priorities (NPEP), which focuses on reducing the use of potentially hazardous chemicals from products and processes.

II. Federal, State, Local and Tribal Governments

Government organizations wield significant buying power that can positively impact reduction, reuse, or recycling programs across the country. Procurement choices made by government at all levels have a direct impact on suppliers, and on the materials suppliers use in their products. EPA supports government partners through technical assistance, workshops, and development of new tools and resources.

III. Schools and Universities

EPA helps to make K–12 schools safer by reducing chemical exposures and improving chemical management through the Schools Chemical Cleanout Campaign (SC3). RecycleMania capitalizes on the spirit of competition among university students, engaging students so that recycling will become a habit that they will practice throughout their lives.

IV. Communities

Communities across the country are demonstrating that it is possible to increase economic development and improve residents' quality of life in a way that preserves the natural environment for present and future generations. EPA supports communities in their efforts to manage materials more efficiently by sponsoring conferences, hosting forums, and developing tools and case studies to promote communities' innovative efforts.

I. Business and Industry Partnerships

Businesses and industry continue to be important RCC partners. Their willingness to meet RCC challenges and seek solutions to environmental problems benefits their bottom line and the environment.

- WasteWise celebrated 15 years of environmental results in 2009, with 2,860 members contributing to the prevention and recycling of more than 160 million tons of waste.
- The National Partnership for Environmental Priorities (NPEP) celebrated its fifth year in 2009, building on its past success by achieving impressive results in priority chemical reductions. In 2009, NPEP's 260 partners removed more than 7 million pounds of persistent, bioaccumulative and toxic chemicals from their business processes and products.

The examples below describe similar work across the nation. These programs are achieving continued success in reducing the environmental footprint of business and industry.

Learn more about EPA's partnership programs at:
www.epa.gov/waste/partnerships

WasteWise Celebrates 15 Years of Environmental Progress

Americans have been actively recycling since the early 1970s, but the national recycling rate did not reach 15 percent until 1990. A vast majority of recycling efforts in the past focused on residential recycling programs. Even with the expansion of these programs, it became apparent that in order for more materials to be recycled, non-residential recycling had to play a key role. Non-residential settings such as office buildings, commercial establishments, schools, and financial institutions were an untapped resource for recycling. Since 1990, the national recycling rate has risen to more than 33 percent, due in large part to the gains made in commercial and other institutional recycling.

To promote commercial and other institutional waste prevention and recycling, EPA launched the WasteWise program in 1994. The program, now more than 2,860 members strong, provides assistance to organizations developing and implementing waste prevention or recycling programs. For the past 15 years, WasteWise has helped thousands of organizations, large and small, find effective and efficient ways to prevent and recycle wastes. Organizations reduce MSW and select industrial wastes to the benefit of the environment and their bottom lines. Since the program was launched, WasteWise members have reported preventing or recycling more than 160 million tons of materials¹, equivalent to the annual greenhouse gas (GHG) emissions from more than 60 million passenger vehicles.

In 2009, WasteWise launched a new waste management tracking and reporting system, Re-TRAC, that allows members to track their waste reduction and recycling tonnages by material and in realtime. The system also allows members to input their waste reduction and recycling data and run multiple reports to quantify accomplishments. The system uses EPA's Waste Reduction Model (WARM) to calculate GHG savings from waste prevention and recycling activities and provides a climate profile quantifying the results. The system is particularly beneficial for large organizations with multiple facilities that can now report individually, but have their data aggregated at a corporate level.

www.epa.gov/wastewise

Paper was 31 percent of the U.S.'s total waste stream in 2008 with 77.42 million tons generated

¹ This figure represents the total amount of waste prevention and recycling efforts reported by those WasteWise partners who submitted annual reports to EPA. EPA is not claiming that all of the waste prevention and recycling efforts achieved by WasteWise partners are attributable to the WasteWise program. EPA is working on a method to better quantify the impact of WasteWise on business behavior and waste reduction.



EPA Region 3 Launches the Mid-Atlantic Sustainability Partnership

Recycling one ton of paper:

- *Saves enough energy to power the average American home for 6 months*
- *Saves 7,000 gallons of water*
- *Saves 3.3 cubic yards of landfill space*
- *Reduces GHG emissions by one metric ton of carbon equivalent*

In January 2009, EPA launched the Mid-Atlantic Sustainability Partnership. The Sustainability Partnership is a 2-year pilot program in EPA's Region 3 that bundles partnership programs into a single gateway to environmental footprint reduction for businesses, communities, and organizations. The Sustainability Partnership offers major consumers of energy, water, and resources a one-stop shop approach to reducing their overall environmental footprint.

Sustainability Partnership members:

- receive an EPA single point of contact for sustainability programs across the Agency;
- are given tools and educational materials to develop and implement programs;
- receive support in developing sustainability plans and quantifying environmental results;

- receive technical assistance from EPA, state environmental agencies, and/or other partners;
- network and share lessons learned with other members; and
- showcase their success through public recognition.

There are currently 30 partners with numerous other prospective partners in different stages of discussion or review with EPA and within their organizations.

www.epa.gov/reg3wcmd/spp



Burlington Sheraton Hotel Implements Successful Composting and Recycling Programs

The hospitality sector deals with a unique mix of materials management and energy conservation issues. The high volumes of food, the need to launder bedding, napkins, and tablecloths regularly, as well as constant energy use, result in conservation strategies that are often difficult to implement. The benefits, though, are quickly realized.

State environmental agencies in the Northeast are working with EPA and each other to develop compliance and pollution prevention assistance strategies for lodging and restaurants in the region. In 2008, EPA Region 1 worked with the Northeast Waste Management Officials Association to enhance the ability of the state and local agencies to implement effective environmental assistance programs for the hospitality industry.

The Burlington Sheraton, one of Vermont's largest hotels and conference centers, joined the Vermont Green Hotels program in April 2009. The Vermont program is one of many certification programs in the New England states designed specifically for the hospitality sector. EPA has an ongoing 2008 RCC grant with the Northeast Recycling Council to recruit hotels to the Vermont Green Hotels Program, and provide technical assistance and onsite waste audits.

In its first 6 months of becoming one of Vermont's Green Hotels, the Sheraton reduced the amount of waste going to a landfill by 26.8 tons of materials, including:

- 20.5 tons of food waste composted;
- 6 tons mixed recyclables collected; and
- 500 pounds of unused prepared food and 30 pounds of linens donated to the Vermont Food Bank.

In addition to reducing the amount of waste going to a landfill, the hotel eliminated processed food going down the drain. Prior to April 2009, as much as 75 percent of the hotel's food waste was put in the garbage disposal. Since the hotel started collecting food waste for composting, there is no need for the garbage disposal and it has been removed from the kitchen.

As the environmental and economic benefits of efficient, sustainable hotels are highlighted by successful projects like the Burlington Sheraton, the certification programs in New England serve as a model for the hospitality industry and hotel guests alike.

www.newmoa.org/prevention/projects/hospitality

In its first 6 months of becoming one of Vermont's Green Hotels, the environmental benefits of the Burlington Sheraton's recycling and composting efforts include:

- net GHG savings from recycling of 18 metric tons of carbon dioxide equivalent, equal to the carbon dioxide emissions from consuming more than 2,000 gallons of gasoline.*
- more than 100 million BTUs of energy saved, equal to the amount of energy used annually by an average U.S. household.*



Manufacturers Step Up To EPA's TV Recycling Challenge

In 2009, the Plug-In To eCycling program launched a challenge to electronics retailers and television manufacturers: find ways to increase responsible TV recycling as consumers replace analog TVs with digital flat screens. With the digital TV transition on the horizon, time was of the essence to prepare for consumers discarding their old TVs for TVs with a digital signal. Manufacturers had the additional incentive to increase recycling and help out local governments due to voluntary and mandatory state recycling programs.

Launched in January 2009, the TV Recycling Challenge gave manufacturers 6 months to build partnerships and develop innovative, long-lasting electronics recycling channels. The challenge award criteria included innovation, longevity, cooperative partnerships, consumer outreach, accessibility, pounds of TVs collected during the challenge, and ability to ensure that responsible recycling practices were followed.

Leading TV manufacturers, including Samsung, Sony, Panasonic, Sharp, and Toshiba accepted the challenge by expanding recycling opportunities throughout the United States and covering the costs of collection.

EPA named the Electronics Manufacturers Recycling Management Company (MRM), founded by Panasonic, Sharp, and Toshiba, the winner of the TV Recycling Challenge, with 3 million pounds of TVs collected through voluntary state programs. MRM developed a TV collection network with a variety of collection points, including locations at charities and self storage units. MRM plans to expand its recycling network beyond the life of the recycling challenge, adding new partners and new collection points.

www.epa.gov/plugin

By the end of the Plug-In To eCycling competition in August 2009, approximately 8.2 million pounds of TVs had been collected for recycling. As a result of these recycling efforts, millions of pounds of materials—copper, leaded glass, and plastics—were recovered, helping to conserve natural resources and reduce the need to extract and process virgin materials.





II. Federal, State, Local and Tribal Governments

Materials management and recycling programs are critical components of environmental efforts at all levels of government. Through partnerships like the ones described below, the RCC is able to achieve environmental goals and bring together governments across the country to learn from each other and share successes.

Based on a successful EPA Region 9 pilot program deployed in the USPS Pacific Area, the USPS transitioned its national delivery vehicle fleet from using lead containing wheel weights to lead-free alternatives.

Getting the Lead Out of U.S. Postal Service Vehicles

In November 2009, USPS set a goal to reduce 34,000 pounds of lead from its nationwide fleet of 215,000 vehicles. USPS has decided to set an example for all federal agencies with large vehicle fleets based on the success USPS had in 2008 and 2009 in its Pacific Area (California and Hawaii) pilot to remove lead wheel weights from its vehicles.

Lead wheel weights, used to balance vehicle tires, can come off while a vehicle is in use, causing concern for human health and the environment when the wheel weights leach lead into the land and water. In February 2008, the Pacific Area USPS joined the National Lead-free Wheel Weight Initiative and pledged to reduce 7,600 pounds of lead from its fleet. In fact, the goal was exceeded—nearly 11,000 pounds of lead was reduced. Building on that success, the Pacific Area USPS (with a fleet of more than 30,000 vehicles in thirty-four maintenance facilities across California and Hawaii) has agreed to replace the lead wheel weights on all of its delivery vehicles with non-lead containing alternatives.

Tires and electronics collected in the Kickapoo Nation

Kickapoo Nation Conducts Scrap Tire Roundups and E-Cycle Events

Solid waste management touches all aspects of tribal and village life—public health, environmental quality, tribal culture, and land stewardship. However, tribes often have limited resources to dedicate to waste reduction and recycling programs. Competing interests such as education, physical and mental health, employment, and economic development often take precedence over solid waste management and exhaust tribal funds. With so many priorities, solid waste managers have to make the case that materials management is an issue that warrants attention and adequate funding.

The Kickapoo Nation, with more than 1,600 members, located in northeastern Kansas, has firsthand experience elevating the importance of materials management within the tribal structure. The tribe identified two waste materials as priorities: tires and electronics. These materials were chosen because they are not collected by the nation's local waste and municipal recycling service provider.



In 2009, two tire round-up events in the Kickapoo Nation resulted in the collection of more than 1,100 tires. Many of the tires were simply waiting to be collected on residents' property. The tires were shredded, the rubber was used for roadbeds and track surfaces, and the steel was sold locally as scrap metal.

The Kickapoo Nation worked with the Sac and Fox Nation of Missouri, located in northeastern Kansas, and EPA Region 7's General Assistance Program for solid waste implementation, to conduct the first electronics waste drive for the tribes. The event, held in August 2009, collected approximately 40 monitors, 15 televisions, as well as computer keyboards, other computer components, and various office machines. The electronics were shipped offsite for recycling.

By focusing on common wastes that are not regularly collected, such as tires and electronics, the Kickapoo Nation is helping to protect the health of its members and conserve valuable materials.

North Carolina Project Shows Potential for Modernizing Curbside Programs

States across the country run the MSW programs that companies and residents rely on to collect the 250 million tons of trash and the 83 million tons of materials the country collects for recycling per year. While the programs vary depending upon factors such as existing infrastructure and available resources, all share a common goal to reduce, reuse, and recycle materials.

With assistance from an EPA Region 4 recycling grant, North Carolina recently completed a project to demonstrate ways to improve the performance of curbside programs in medium-sized municipalities (approximately 10,000 to 50,000 in population). In the project, North Carolina's Division of Pollution Prevention and Environmental Assistance (DPPEA) provided training, individualized technical assistance and grants to help approximately 30 municipalities upgrade their collection and public outreach efforts.

During Phase I of the project, DPPEA staff produced customized, individual profiles for each municipality to show the communities a baseline of their performance against the potential for improvement with the adoption of Best Management Practices (BMP). The BMP focused specifically on operational changes, such as conversion to single-stream cart systems, and on renewed attention to education programs to boost participation rates.

Phase II of the project delivered direct community assistance to curbside communities, focusing on two main issues: 1) operational changes that can increase efficiency and program tonnage; and 2) educational/promotional initiatives that can increase participation and tonnage.

DPPEA reports that from 2006 to 2009 this project increased recycling by more than 10.8 thousand tons, surpassing the initial goal to increase recycling by 6.7 thousand tons.



Tribal Casinos Find Environmental Solutions

Many tribes in the Pacific Southwest operate gaming facilities, some of which include ancillary facilities such as hotels, resorts, or golf courses. Waste generated at these facilities can be significant, and tribes are leading the way to decrease the environmental impact of operations with innovative retrofit projects and investments that have paid off in many ways.

Tribal casinos like the Santa Ynez Band of the Chumash are retrofitting slot machines with light-emitting diodes (LEDs), which reduce the amount of energy used to operate the machines while saving money on electricity bills. Tribes such as the Picayune Rancheria of Chukchansi Indians have established water recycling projects at their casino that treat and reuse water in landscaping, saving energy and money. Restaurant operations are going green by composting food scraps and using the resulting compost for external landscaping.

To further support tribes in their efforts, in 2009, EPA Region 9 and the Shingle Springs Band of Miwok Indians co-hosted a national Greening Tribal Casinos workshop where tribes heard from experts on ways to “go green” in all aspects of facility operation and management, from the casino floor to the hotel and spa.

Cheyenne River Sioux Tribe Environmental Protection Department Helps Make Tribal Schools Safer

In February 2009, the Cheyenne River Sioux Tribe Environmental Protection Department in North Dakota, along with EPA Region 8 and Pollution Control Industries, collaborated to make the Cheyenne River Sioux Reservation schools a healthier environment for students and staff. Together, they worked to remove unwanted, unneeded, and outdated chemicals from these schools. The tribal environmental protection department gained the support, cooperation, and participation of school administrators and staff, which enabled the tribe to identify unsafe and harmful chemicals. Tradebe Pollution Control Industries, a Schools Chemical Cleanout Campaign (SC3) charter partner, donated its services to safely pack and collect chemicals for shipment and proper disposal. More than 1,500 pounds of chemicals were removed from schools, including neurotoxins, carcinogens, toxic, and ignitable chemicals.



Chicago Puts the 3Rs in Motion

As of 2010, more than 1,000 mayors have signed the U.S. Mayors Climate Protection Agreement, committing to reduce the climate change impacts of their communities. The mayors committed to meet or surpass international targets set by the Kyoto Protocol, and to work within their communities and towns to encourage climate protection. Materials management strategies such as reduce, reuse and recycle and lifecycle analysis are efficient, powerful ways for cities to meet their goals and contribute to climate protection.

As a participant of the U.S. Mayors Climate Protection Agreement, Chicago is incorporating the waste-to-climate change connection in its policies and programs. With a goal to reduce waste by 90 percent by 2020, Chicago is making changes across the

environmental board—saving energy, recycling industrial materials, and encouraging materials reuse through business networks. EPA Region 5 is supporting Chicago's efforts to reduce its waste, green its buildings, and help those in need. With so many projects, Chicago's successes and lessons learned are not going to waste; the city created a "Best Practices Guide" for stadiums after conducting waste assessments at six major stadiums. Chicago also developed a toolkit for multi-family buildings to increase recycling, which resulted in as much as a 30 percent increase in recycling in pilot buildings.

Reuse is a major part of Chicago's progress. Successful reuse programs include:

- Promoting deconstruction, instead of demolition, of Chicago homes, through outreach and the opening of the city's first building materials reuse store.

- Supporting Chicago's successful byproduct synergy program, the Waste to Profit Network, which has diverted more than 165,000 tons of waste from disposal. This diversion has avoided 102,000 tons of carbon dioxide equivalent emissions through a network of more than 200 companies.
- Developing a book donation and recycling program for Chicago Public Schools, resulting in 35,000 pounds of textbooks donated to Africa and Asia. Donating rather than landfilling the textbooks is a source reduction strategy that reduced greenhouse gas (GHG) emissions by 190 metric tons of carbon dioxide equivalent, which is comparable to the annual carbon dioxide emissions produced by the annual electricity use of 25 U.S. homes.
- Recycling an additional 165 thousand pounds of books that could no longer be used. Recycling rather than landfilling the textbooks reduced GHG emissions by 400 metric tons of carbon dioxide equivalent, equivalent to the carbon dioxide emissions from the electricity use of more than 50 U.S. homes.

Chicago's approaches demonstrate steps other cities can take to improve their recycling and reuse rates and minimize the amount of usable product going into landfills.





III. Schools and Universities

EPA and our partners are working to ensure that learning environments are protective of students and school staff while teaching important environmental lessons to our nation's youth.

EPA has made great strides in reducing harmful chemical exposures and improving chemical management in schools. In addition to chemical management, many schools are constructing and renovating buildings with key waste reduction and energy efficiency goals while implementing aggressive recycling campaigns on campus.

Universities across the country continue to develop unique, cost-effective ways to address environmental issues faced by communities and the nation as a whole. For example, schools challenge and educate students with programs like RecycleMania, which can be replicated on campuses of all sizes.

With aspiring environmental leaders eager to develop solutions to materials management issues, our nation's universities continue to embrace the challenge in the RCC.

Educational materials to help students reduce, reuse, and recycle are available at www.epa.gov/waste/education and www.epa.gov/teensgogreen.

RecycleMania Winners Continue to Grow

University students thrive on rivalry. RecycleMania, a program sponsored in part by EPA's WasteWise program, capitalizes on the competitive spirit of colleges and universities and uses it to increase on-campus recycling rates. The annual 10-week challenge rallies students, faculty, and staff to increase recycling rates at a pace faster than their collegiate competitors. This year, California State University–San Marcos won the grand championship title with a recycling rate of 78 percent, out-recycling their closest competitor by 14 percent. From January 18–March 28, 2009, 510 colleges and universities across the country recycled or composted more than 69.4 million pounds of materials, which reduces greenhouse gas (GHG) emissions by 88,740 metric tons of carbon dioxide equivalent. This reduction in GHG is equivalent to eliminating the annual GHG emissions from almost 17,000 passenger cars.

Building on the success of RecycleMania and capitalizing on the competitive spirit, the EPA 2009 Game Day Recycling Challenge made home football games an environmental competition for colleges and universities across the United States. During the 2009 challenge, the eight participating schools across rival conferences diverted more than 40,000 pounds of waste. The reduction in GHGs is equivalent to the carbon dioxide emissions from the consumption of nearly 12,000 gallons of gasoline.

Even K-12 schools are competing. In fall 2009, EPA ran a trial of the K-12 Challenge in the State of Ohio. In 5 weeks, 62 schools and 29,950 students, faculty, and staff collectively recycled or composted 155,815 pounds of waste.

www.recyclemania.org

Computers and other electronics are recycled at rates below the national average, only 18% of computers and 10% of cell phones that are disposed of are recycled each year.



Temple University Recycling Center Keeps Electronics Out of Landfills

More and more organizations are offering collection points for electronics. Collected electronics can be refurbished for reuse or responsibly recycled. Check out www.epa.gov/plugin to find out which retailers and manufacturers offer electronics recycling.

Universities have long been centers of innovation. With national electronics recycling rates at only 18 percent, there is plenty of room for innovation in the electronics lifecycle. Temple University in Philadelphia, PA is in the middle of such an innovation. A Temple graduate, Jonathon Latko, and current students created a new computer recycling center in 2003. Since its inception, 27,000 computers have been through the center, eventually placed back in university departments, sold to students, staff, and faculty, or donated to local community organizations.

Latko's Computer Recycling Center at Temple won EPA Region 3's Mid-Atlantic Environmental Achievement award in 2009. The center also recently became an official Microsoft Authorized Refurbisher.

The center operates based on an "advance recovery fee" that has been added to all computers being purchased by the university. The funds generated from the fee allow consolidated collection and landfill diversion rates near 100 percent. By refurbishing obsolete computers, the useful life of the equipment is extended. The refurbished machines are offered first to university departments, then to students who might not otherwise be able to buy a computer, for the modest fee of \$50. Equipment not claimed by students is then made available to local community groups and non-profits who want to set up small computer labs in an accessible location, giving more communities access to computers. A small percentage of electronics cannot be refurbished and are sent to an electronics recycler. EPA is working with Temple to replicate this model at other colleges and universities. EPA Region 3 plans to host a workshop for colleges and universities in the Mid-Atlantic region in 2010, with the goal of expanding this model to more colleges and universities in the region.



In Missouri, nearly 500 pounds of chemicals were removed and properly disposed of, protecting the health of 1,560 students and 215 school staff at a middle and high school.

Schools Chemical Cleanout Campaign Embodies President Obama's Ethic of Service to Create Healthier School Environments

In the Summer of 2009, President Obama called on the nation to make volunteerism a part of daily life through "United We Serve," an initiative challenging Americans to meet pressing social and environmental needs.

Grandview, MO met the President's challenge when the C4 School District staff, community and industry partners, and Missouri Department of Natural Resources took action to protect Grandview's students from outdated, unknown, and unneeded chemicals as part of EPA's Schools Chemical Cleanout Campaign (SC3).

As a part of United We Serve and the SC3 program, chemicals at the school were inventoried, packed, and safely disposed of. In addition, staff received training at no cost to the school district. Nearly 500 pounds of chemicals, including flammables, explosives, and caustics, were removed from the school and properly disposed of, protecting the health of 1,560 students and 215 school staff.



Some of the 500 pounds of chemicals cleaned out through United We Serve and SC3 in Grandview, MO.





IV. Communities

Communities across the country are learning that using materials and resources more efficiently is a key component of sustainable development. By using energy, water, and materials more efficiently, communities are reducing their environmental impacts, strengthening local economies through job creation and improving the quality of life for their residents.

In 2009, EPA continued to partner with communities to work toward their sustainability goals, conserve energy and materials, and reap the economic benefits from sustainable materials management. The examples provided here include projects in Texas, Atlanta, and community-level projects across the country. In addition to community-specific efforts, EPA's Dallas office (Region 6) hosted the first National Sustainable Communities Conference in March 2009, bringing together local government and community stakeholders from across the country to share information on sustainable community development.

The Texas Electric Cooperatives' compact fluorescent light bulb (CFL) recycling program has increased the number of CFL collection locations, making recycling easier for rural Texas residents. Residents of Wellington, Texas were 100 miles away from the nearest CFL collection site before the program began. Now, they have a convenient local CFL recycling collection location.

Texas Electric Cooperatives, Inc., Takes Back CFLs in Rural Communities

End-of-life management options for products are often limited in rural areas of the United States. The lack of environmentally protective end-of-life options for compact fluorescent light bulbs (CFLs), which contain small amounts of mercury, highlights the difficulties rural communities face when they want to make environmentally friendly choices. The Texas Electric Cooperatives, Inc. (TEC), a statewide organization devoted to supporting electric cooperatives in Texas, worked with the EPA Region 6 National Partnership for Environmental Priorities (NPEP) program to create and promote a new CFL take-back program for their member cooperatives in rural areas of Texas.

TEC is working with the 65 cooperative electricity providers in the state to offer CFL recycling at their regional offices; more than 30 cooperative electricity providers now offer CFL recycling at their regional offices. The residents of rural Texas now have more collection points for proper recycling of bulbs—an environmentally preferable choice for their home, their community, and the environment.

In addition to the CFL take-back program, TEC is also working with member cooperatives to collect batteries containing lead or cadmium for recycling. In 2009, TEC recycled 3,642 pounds of lead as part of the battery take-back program.



EPA Region 6 Sponsors a National Sustainable Communities Conference

Communities across the country are working toward sustainable futures.

To help showcase the progress these communities are making, EPA Region 6 sponsored a National Sustainable Communities Conference in March 2009 in Dallas, TX. With more than 600 participants, the conference brought together municipalities; federal, state, and local agencies; and other stakeholders to learn, network, and identify support for sustainability projects.

Sessions focused on everything from toxic chemical reductions to small town recycling programs. Conference participants discussed community sustainability issues including developing recycling markets, educating citizens on the importance of recycling, collection stations and costs, and fee structures for pay-as-you-throw programs. Participants also met with representatives of the RCC programs to learn more about applying materials management concepts in their communities.

TOOLS FOR LOCAL GOVERNMENTS AND COMMUNITY LEADERS

EPA's Web site "Tools for Local Government Recycling Programs" is designed to help community leaders create viable recycling programs in their communities. This Web site provides resources on how to:

- adjust recycling contract specifications to improve the financial viability of recycling programs;
- consider the impacts of program and policy changes on the economics of recycling;
- take advantage of innovative approaches for increasing participation in residential programs;
- find outreach materials (e.g., brochures and posters) that can be adapted to any community;
- estimate and articulate both the environmental and economic benefits of a recycling program; and
- work with schools and businesses to reduce waste and increase recycling, including at community events.

Visit the Web site at:

www.epa.gov/waste/conserve/tools/localgov/index.htm



Zero Waste Zone Atlanta

Communities across the nation are establishing zero waste goals. Zero waste takes waste management beyond recycling and recognizes the potential benefits of evaluating the complete lifecycle of products to reduce the overall environmental impact of waste. Atlanta, GA is one such community. Atlanta has made a commitment to reducing environmental impacts from homes, workplaces, and communities. Upon declaring part of its city as a Zero Waste Zone in February 2009, Atlanta became one of the nation's first Zero Waste Zones, and the Southeast's first such zone.

Working in conjunction with EPA Region 4 and the Pollution Prevention Assistance Division of the Georgia Department of Natural Resources, Atlanta's initial Zero Waste Zone encompasses the Convention District and the Georgia World Congress Center. Currently in phase one, participants, including the Georgia World Congress Center, the Hyatt Regency and Ruth's Chris Steakhouse, are recycling and reusing spent grease for the local production of biofuel and composting or donating food residuals to drastically decrease the amount of waste going to landfills.

In phase two, Atlanta Recycles and the Green Foodservice Alliance will develop a model and outreach material to expand the program within the convention district. Phase three will expand the Zero Waste Zone outside of the downtown convention district to locations including Buckhead and Midtown. Phase four will expand to other areas of Georgia, and help establish Zero Waste Zones in other southeast states and nationally.



Infrastructure Design, Construction, and Operation

Our nation's highways, bridges, skyscrapers and other built infrastructure provide essential services to individuals and communities. However, the design, construction, operation, and maintenance of these structures can have significant effects on human health and the environment due to the amount of materials that are used and the ways that these materials are produced and managed across their lifecycle.

Each year, industries in the United States produce more than half a billion tons of industrial materials that have the potential to be reused and recycled. Using recycled industrial materials, such as construction and demolition materials; spent foundry sand; scrap tires; iron and steel slags; pulp/paper residuals; and coal combustion products, to avoid the use of virgin materials can help communities be sustainable in infrastructure renovation, construction, and maintenance.

- Greenhouse gas (GHG) emissions are reduced by 2 metric tons of carbon dioxide equivalent for every ton of steel that is recycled, equivalent to the emissions of using more than 200 gallons of gasoline.
- Reusing steel avoids even more GHG emissions—about 3 metric tons of carbon dioxide equivalent for every ton of steel that is reused, equivalent to the emissions of burning more than 300 gallons of gasoline.
- Reusing 10 tons of clay bricks conserves the same amount of energy that is used by the average U.S. household annually.

In 2009, EPA strengthened existing partnerships with federal, state, local governments, and other stakeholders, to emphasize the importance of sustainability in the design, construction, and operation of buildings, roadways, and other infrastructure projects.

Missouri Rewards Contractors for Using Environmentally Friendly Practices

As the environmental and economic benefits of sustainable design and construction become better known, more state governments are looking for ways to encourage environmentally friendly practices in construction projects. The Missouri Department of Transportation (MoDOT) has found that a financial reward might be just the encouragement its contractors need.

In 2009, MoDOT worked with EPA Region 7 to launch a pilot program that offers monetary incentives for contractors who use a variety of environmentally friendly practices on MoDOT's highway construction jobs. The pilot program, called Green Credits, was patterned after the Leadership for Energy and Environmental Design (LEED) rating system, which sets environmental construction standards for the building industry. MoDOT hopes that Green Credits will encourage contractors to generate new ideas for green highway construction, and in the process, promote clean air, increase recycling, and reduce GHG emissions. Specific Green Credits categories include:

- Recycling and reuse of industrial materials;
- Reducing air emissions;
- Using alternative fuels; and
- Using compost for erosion control.

Green Credits contractors who meet or exceed project goals for each category earn credits with monetary awards. The more credits a contractor earns, the higher the award. Conversely, if a contractor establishes a Green Credits goal but fails to meet it, that contractor must pay damages of \$2,500 per unmet credit. By planning ahead and committing to implement key environmental practices, MoDOT is demonstrating that innovative ideas can pay off—for contractors and the environment.

MoDOT's Green Credits program encourages contracting partners to generate new ideas for green highway construction, which promotes cleaner air, increased recycling, and reduced GHG emissions.



Lifecycle Building Challenge: Designing to Reduce Construction and Demolition Materials

Sustainable building design reduces, reuses, and recycles the materials used in projects. For the potential benefits, environmental and economic, of increasing the reuse and recycling of C&D materials to be realized, new building designs and conservation strategies are needed.

EPA's Lifecycle Building Challenge is a sustainable design challenge to professional and student architects, builders, and designers. In 2009, its third year, the challenge received more than 70 innovative building and product ideas. For the first time, the competition was opened to international participation, attracting contestants from Singapore, Taiwan, Argentina, Colombia, France, Egypt, and the United Kingdom. Each design and product incorporated the ideals of lifecycle building, i.e., reusing building materials or designing buildings to be easily deconstructed or modified. Implementing these principles reduces the GHG emissions and energy associated with extraction, production, and transportation of new materials. The winning designs are available at:

www.lifecyclebuilding.org

NY Sports Teams Get Greener

With 31 National Football League stadiums in the country that range from a capacity of 60,000 to 90,000 spectators, football stadiums can have a significant environmental impact. However, through thoughtful design and operation of these stadiums, impacts can be minimized with materials management strategies that consider recycling, industrial materials reuse, and water and energy conservation. Ensuring easily accessible public transportation to these large stadiums can also reduce impacts on the surrounding community.

Building on the success of the New York Mets' new stadium, Citi Field, EPA Region 2 signed a Memorandum of Understanding (MOU) with the New Meadowlands Stadium Company in 2009 for the New Meadowlands football stadium in East Rutherford, NJ. This stadium will host the New York Giants and New York Jets. The MOU details strategies to reduce air pollution, conserve water and energy, improve waste management, and reduce the environmental impact of construction. Goals include:

- cutting the stadium's annual water use by 25 percent, making it 30 percent more energy efficient than Giants Stadium;
- recycling 75 percent of waste generated during construction; and
- increasing total recycling by 25 percent during operation.

www.epa.gov/region02/greenteam

The goal of the Meadowlands agreement is to avoid emissions equivalent to the emissions of nearly 1.68 million metric tons of carbon dioxide during the stadium's construction and its first year of operations. That's equal to the annual emissions of more than 300,000 cars, or the emissions from production of the energy needed to power 150,000 American homes for 1 year.

Deconstruction is dismantling buildings to maximize the reuse and recycling of building materials in a cost-effective manner, a key part of sustainable design.

Pilot Projects Lay the Groundwork for Deconstruction

Recognizing the importance of sustainable design—specifically planning for buildings to be deconstructed—EPA has launched pilot projects throughout the country to stimulate creative ideas in support of deconstruction. Deconstruction is an important technique that considers building materials and construction from a lifecycle perspective, turning much of what is traditionally considered demolition waste into a valuable resource.

Deconstruction and Building Materials Reuse Training is a pilot project to train-the-trainer for building deconstruction and the use of reclaimed building materials. The project targets representatives from the building industry, educators, architects, and other related areas. Sponsored by EPA Region 1, partners included ReCycle North, Habitat for Humanity, Pennsylvania State University, the Building Materials Reuse Association, and the Yestermorrow Design/Build School. Based on the program's success, the Yestermorrow Design/Build School developed a new course, Deconstruction and Materials.

Design for Deconstruction (DfD) promotes a “cradle-to-cradle” approach to building materials management. This approach involves designing for increased longevity as well as eventual disassembly and building materials reuse. Sponsored by EPA Region 4, the Community Housing Resource Center organized a group of experts to formulate DfD principles, design and build a case study based on the principles, and promote cradle-to-cradle residential building design. DfD design elements include moveable walls and waste reduction. The study led to development of a best practices toolkit, *Design for Disassembly in the Built Environment: A Guide for Closed-Loop Design and Building*, for DfD in residential construction, and has become a learning tool to test the viability of DfD.

www.epa.gov/oswer/iwg/pilots/docs/ipco_deconstruct.pdf





To date, the Brightwater team has diverted 67 percent of all C&D materials, reused more than 370,000 tons of material in construction, and saved more than \$500,000 from reuse and recycling of materials.

Environmental benefits include reducing 12,543 metric tons of carbon dioxide emissions from recycling and reuse of fly ash and concrete, which is equivalent to the annual emissions from almost 2,500 passenger vehicles.

Brightwater Wastewater Treatment System: Built with the Environment in Mind

To meet the growing service demands of the Puget Sound region over the next several decades, King County, WA, is building a sustainable wastewater treatment system. This 1.8 billion dollar project, partly funded through the Clean Water Act State Revolving Fund, is King County's largest clean-water capital project in 40 years, and incorporates sustainable design and building practices in all facets of its construction and future operations.

The Brightwater Wastewater Treatment system is a 36-million-gallon-per-day regional waste treatment facility in Woodinville, WA. Facility architects, engineers, and contractors incorporated a variety of sustainable design and building practices. The site includes a salmon habitat, a reforestation area, and an environmental education and community center. The Brightwater team:

- Used 13,800 tons of fly ash as a cement substitute, avoiding emissions of 12,543 metric tons of carbon dioxide equivalent (equal to the emissions from burning more than 29,000 barrels of oil), and reducing energy consumption by more than 73 billion BTUs. Additional reuse and recycling of construction and demolition materials avoided emission of even more GHGs, and conserved even more energy.
- Reused 200 trees and root wads for salmon habitat.
- Produced 15,000 cubic yards of compost material.
- Used recycled materials in the environmental education and community center.

ABOVE LEFT: Construction of three digesters and a mixing tank for the Brightwater Treatment System

RCC Tools, Education, and Outreach

EPA offers a wide array of tools to help individuals and organizations determine the environmental impact of their purchasing, manufacturing, and materials management activities.

New Tools

The Food Waste Management Calculator develops alternative food waste management scenarios based on the facility's waste profile, available diversion methods, and preferences, and then compares the cost estimates for the alternative scenarios. (www.epa.gov/epawaste/conserves/materials/organics/food/tools/index.htm)

iWARM calculates the energy saved by recycling small quantities of common household products and translates the saved energy into the equivalent amount of electricity. For example, recycling an aluminum beverage can rather than landfilling it saves enough energy to operate a 60-watt incandescent light bulb for 4.3 hours, or to operate the equivalent compact fluorescent bulb for 20 hours. (www.epa.gov/iwarm)

SMART BET (Saving Money and Reducing Trash - Benefit Evaluation Tool) is a software program designed to help community waste managers decide whether unit-based pricing for solid waste management (or Pay-As-You-Throw) is the right model for their cities or towns. SMART BET allows users to input information (e.g., tons of waste landfilled and recycled annually, local population, and tipping fees) and compare their data with nationwide average waste data (e.g., disposal tonnages, typical Pay-As-You-Throw results, and GHG emission factors). SMART BET calculates GHG and cost savings that the user is likely to see after implementing a Pay-As-You-Throw economic incentive program. (www.epa.gov/waste/conserves/tools/payt/tools/smart-bet/index.htm)

WasteWise Re-TRAC is a tracking and reporting system that allows partners to track their waste reduction and recycling tonnages in realtime. During 2010, EPA will promote the tracking and reporting system and encourage partners to track and report their progress. (www.wastewise.tms.icfi.com)

Additional Tools and Resources

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 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 their products. (www.epeat.net)

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/greenscapes)

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 to use industrial materials in their projects. (www.epa.gov/epawaste/conserves/rrr/imr/pdfs/tools3-08.pdf)

Municipal Government Toolkit (MGTK), developed by EPA's Region 4, provides local officials with information to evaluate, support, and expand their waste reduction programs. The toolkit presents a collection of economic data, sample legislation, waste reduction efforts, guidance resources, and case studies regarding 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, designed to demonstrate the positive economic impacts of recycling in the eight EPA Region 4 states, encouraging municipal officials to support and fund recycling efforts in their communities. (www.epa.gov/Region4/waste/rcra/mgtoolkit/index.html)

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

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 more than 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)

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/wyecd/waste/calculators/ReCon_home.html)

Recycling Toolkit is designed to help building contractors recycle and use recycled materials. This toolkit contains a collection of resources that can help:

- Contractors who want to reduce, reuse, or recycle construction and demolition materials generated at their job sites.
- Contractors who want to use recycled industrial materials in the construction or renovation of a structure.

EPA developed this online toolkit in cooperation with the Associated General Contractors of America and the Industrial Resources Council. (http://www.agc.org/cs/recycling_toolkit)

Schools Chemical Cleanout Campaign (SC3) Toolkit provides schools and partners with resources to start chemical management programs and/or improve their chemical management practices. The campaign includes fact sheets, guidance documents, and manuals that address a wide range of topics including lab safety, green cleaning, safety in arts 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 that outlines how to develop and implement a chemical management program at a school. The workbook also includes advice for potential partners looking to become involved in SC3 work. (www.epa.gov/epawaste/partnerships/sc3/index.htm)

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

Today, Tomorrow, and Beyond

The Resource Conservation Challenge accomplishments described in this report highlight the many ways that materials management strategies can positively impact the environmental, economic, and social fabric of our nation.

Communities across the country benefit when lifecycle approaches are considered in the construction of buildings, highways, ballparks, wastewater treatment plants, recycling programs and more. The examples in this document demonstrate how productive partnerships can be developed between EPA and consumers, communities, tribes, local governments, industry, and academia. We invite you to consider how you can contribute to improving the lifecycle of materials and processes, which contributes to improved human health and a better environment.



MATERIALS matter



reduce • reuse • recycle

WWW.EPA.GOV/RCC

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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 partner's 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.