Environmental Facts

Facts and Figures to Inspire Action toward Zero Waste

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CATEGORIES

Consumption  Wasting  Recycling Saves
Landfills & Incinerators  Toxins  General Environment
Climate Change  Colorado

CONSUMPTION

In the past 50 years, humans have consumed more resources than in all previous history. U.S. EPA, 2009. Sustainable Materials Management: The Road Ahead.


Total material consumption in the U.S. grew 57% from 1975 to 2000, more than twice the rate of population growth. World Resources Institute, 2005. Material Flows in the United States: A Physical Accounting of the

The use of single-use plastic packaging, which is largely not recyclable, has grown from 120,000 tons in 1960 to 12.7 million tons in 2006. *U.S. EPA, 2006. 2006 MSW Characterization Data Tables.*

Twelve to 24 trees must be cut down to make 1 ton of paper. *Conservatree, 2008.*


Industrial countries—home to less than 20% of global population—cut 74% of the wood used for industrial purposes (lumber, paper, etc.). The United States is the largest consumer. *Worldwatch Institute, 2006. Vital Signs 2006-2007.*


In 2005, total ad spending worldwide reached $88 per person. But in the United States it was more than 10 times this figure at $933 per person. *Worldwatch Institute, 2006. Vital Signs 2006-2007.*
Between 1950 and 2005, worldwide metals production grew sixfold, oil consumption eightfold, and natural gas consumption 14-fold. In total, 60 billion tons of resources are now extracted annually—about 50% more than just 30 years ago. Today the average European uses 43 kilograms of resources daily, and the average American uses 88 kilograms. Worldwatch Institute, 2010. State of the World 2010.


Annual U.S. per capita consumption of metals (837 pounds per person) is nearly double the worldwide average and 9 times greater than that of China. Worldwatch Institute, 2009. World Metal Production Surges.

Every year in the U.S. nearly 200 billion beverage containers are sold, two-thirds of which are landfilled, incinerated or littered. As You Sow and Container Recycling Institute, 2006. U.S. Beverage Container Recycling Scorecard and Report.


In 1900, 41% of the materials used in the U.S. were renewable (e.g., agricultural, fishery, and forestry products); by 1995, only 6% of materials consumed were renewable. The majority of materials now consumed in the U.S. are nonrenewable, including metals, minerals, and fossil-fuel derived products. U.S. EPA, 2009. Sustainable Materials Management: The Road Ahead.

Our reliance on minerals as fundamental ingredients in the manufactured products used in the U.S.—including cell phones, flat-screen monitors, paint, and toothpaste—requires the extraction of more than 25,000 pounds of new nonfuel minerals per capita each year. U.S. EPA, 2009. Sustainable Materials Management: The Road Ahead.

Since the late 1980s, our human footprint has exceeded the Earth’s biocapacity. In 2005, global biocapacity was measured as 2.1 hectares per capita, while the average demand or footprint per person was 2.7 hectares. This ecological “overshoot” means that it now takes about one year and three months for the Earth to regenerate what we use in a single year. World Wildlife Fund, 2008. Living Planet Report.
The ecological footprint of a U.S. resident is estimated at 9.4 hectares, more than four times the global biocapacity per capita. This large ecological footprint is primarily associated with energy production, which in turn is tied to greenhouse gas emissions. *World Wildlife Fund, 2008. Living Planet Report.*

Between 1970 and 1995, the U.S. represented about one-third of the world’s total material consumption. With less than 5% of the world’s population, the U.S. consumes 33% of paper, 25% of oil, 15% of coal, 17% of aluminum, and 15% of copper. *U.S. EPA, 2009. Sustainable Materials Management: The Road Ahead.*

Industrialized countries, with 20% of the world’s population, consume 87% of the world’s printing and writing paper. *Environmental Paper Network, 2007. Understanding Recycled Fiber.*

Products have grown from 8% of our waste in the early 20th century to 75% of our waste in the early 21st century. *Product Policy Institute, 2005. Unintended Consequences: Municipal Solid Waste Management and the Throwaway Society.*


More than 100 billion pieces of junk mail are delivered in the United States each year, which comes out to 848 pieces per household. The production, distribution and disposal of all that
junk mail creates over 51 million metric tons of greenhouses gases annually, the equivalent emissions of more than 9.3 million cars. ForestEthics, 2008. Climate Change Enclosed: Junk Mail’s Impact on Global Warming.

WASTING

Far more materials are being moved or transformed to meet society’s needs than most people realize. In particular, “hidden” wastes such as mining overburden, earth moving, and erosion, account for as much as 75% of the total materials that industrial economies use. World Resources Institute, et al., 2007. Resource Flows: The Material Basis of Industrial Economies.

One half to three quarters of annual resource inputs to industrial economies is returned to the environment as wastes within just one year. World Resource Institute, 2000. Weight of Nations: Material Outflows from Industrial Economies.

Nearly 2.7 billion metric tons of material were returned to the environment as waste (outputs) in 2000. World Resources Institute, 2005. Material Flows in the United States: A Physical Accounting of the U.S. Industrial Economy.

If we continue on the same wasting path with rising per capita waste generation rates and stagnating recycling and composting, Americans could generate 301 million tons per year of
municipal solid waste by 2030, a 20% increase from 2006. B. Platt et al., 2008. Stop Trashing the Climate.


For every ton of discarded products and materials destroyed by incinerators and landfills, about 71 tons of manufacturing, mining, oil and gas exploration, agricultural, coal combustion, and other discards are produced. B. Platt et al., 2000. Wasting and Recycling in the U.S.

U.S. per capita food waste has progressively increased by 50% since 1974, reaching more than 1400 calories per person per day. Hall, K., et al., 2009. The Progressive Increase of Food Waste in America and Its Environmental Impact.

Losses and food waste in the United States could be as high as 40-50%. Up to one quarter of all fresh fruits and vegetables in the U.S. is lost between the field and the table. United Nations Environment Programme, 2009. The environmental food crisis: Environments role in averting future food crises.

In 2005, the production of 10 key metals commodities resulted in more than 3 billion tons of waste materials, more than four times the weight of the metals extracted. Worldwatch Institute, 2009. World Metal Production Surges.

The aluminum industry is among the most energy intensive in the world, accounting for 3% of global electricity use. Producing aluminum from recycled sources uses only 5-10% of the
energy needed to make virgin aluminum, and avoids toxic mining wastes associated with mining bauxite ore. Worldwatch Institute, 2009. World Metal Production Surges.

In 2003, only about 44% of aluminum beverage cans in the United States were recycled. If we had recycled this metal instead of landfilling it, we could have saved 36.7 billion kilowatt-hours of electricity, enough to power 3.5 million U.S. households for a whole year. Worldwatch Institute, 2006. Vital Signs 2006-2007.

An estimated 144 billion beverage containers were landfilled, incinerated or littered in the United States in 2005, approximately two out of every three containers sold. This amounts to 54 billion aluminum cans, 52 billion plastic bottles and jugs, 30 billion glass bottles, and about 10 billion pouches, cartons, and drink boxes. Container Recycling Institute, 2007. Water, Water Everywhere: The growth of non-carbonated beverage containers in the United States.

Approximately 18 million barrels of crude oil equivalent were consumed in 2005 to replace the 2 million tons of PET bottles that were wasted instead of recycled. Container Recycling Institute, 2007. Water, Water Everywhere: The growth of non-carbonated beverage containers in the United States.


LANDFILLS & INCINERATORS

Landfill methane emissions account for at least 5.2% of all U.S. greenhouse gas emissions on a 20-year time horizon. This is more than double the 100-year timeframe (1.8%). B. Platt, et al., 2008. Stop Trashing the Climate.


In 2009, there were more than 2,000 landfills in the U.S., and an additional 1,300 landfills for construction debris. There were also 126 waste to energy facilities. Waste Business Journal, 2010. Directory of Waste Processing & Disposal Sites 2010.

RECYCLING SAVES

U.S. scrap recycling is a $65 billion industry employing 50,000 people and managing 145 million tons of materials every year. Scrap is our second-largest export to China. Institute of Scrap Recycling Industries, 2007. Scrap Recycling Industry Facts.
The United States hosts 56,061 recycling and reuse establishments that employ approximately 1.1 million people, generate an annual payroll of $37 billion, and gross $236 billion in annual revenues. Economic modeling estimated that nearly 1.4 million jobs are maintained in support businesses because of the recycling and reuse industry. R.W. Beck, Inc., 2001. U.S. Recycling Economic Information Study.

The recycling and reuse industry supports 3.1% of the paid jobs in the United States—0.9% through direct employment, and 2.2% (contributed equally) by industry and employee spending in the economy. Some 2.7% of the U.S. gross domestic product (GDP) is attributable to the recycling and reuse industry, with 0.7% provided directly by the industry. R.W. Beck, Inc., 2001. U.S. Recycling Economic Information Study.


Recycling saves 3 to 5 times the energy that waste incinerator power plants generate. When we burn trash, this is akin to spending 3 to 5 units of energy to make 1. J. Morris, 1996. Recycling Versus Incineration: An Energy Conservation Analysis.

By reducing our waste 1% per year and recycling and composting 90% of our discards by 2030, we could save 406 megatons of carbon dioxide equivalent every year. This is the equivalent to shutting down 21% of our nation’s coal-fired power plants. Platt, B., et. al., 2008. Stop Trashing the Climate
There were 7,689 curbside recycling programs in the U.S. in 2004, up from only 1,042 programs in 1988. *BioCycle, 2006. State of Garbage in America.*

Recycling saves 40-75% of the energy needed to produce virgin steel. *Worldwatch Institute, 2009. World Metal Production Surges.*

If the United States cut its office paper use by roughly 10%, we could reduce greenhouse gas emissions by 1.6 million tons, the equivalent of taking 280,000 cars off the road for a year. *Environmental Paper Network, 2007. State of the Paper Industry.*

Making copy paper from 100% recycled content fiber instead of 100% virgin forest fibers reduces total energy consumption by 44%, net greenhouse gas emissions by 38%, particulate emissions by 41%, wastewater by 50%, solid waste by 49% and wood use by 100%. *Environmental Paper Network, 2007. State of the Paper Industry.*

More than 76% of cardboard boxes and 72% of newspaper were recycled in 2006 but less than 50% of printing and writing paper was recycled. *Environmental Paper Network, 2007. State of the Paper Industry.*

The U.S. recycled 83 million tons of our discards in 2008, about 33.2%. This reduces our greenhouse gas emissions by 182 million metric tons of carbon dioxide equivalent annually, comparable to the emissions from 33 million passenger cars. But the ultimate benefits from recycling are cleaner land, air, and water, overall better health, and a more sustainable economy. EPA, 2009. Municipal Solid Waste Generation, Recycling and Disposal in the United States: Facts and Figures for 2008.

Between 1990 and 2000, Americans wasted a total of 7.1 million tons of cans, enough to manufacture 316,000 Boeing 737 airplanes or enough to reproduce the world’s entire commercial airfleet 25 times. Since the first Earth Day in 1970, Americans have thrown away 910 billion cans worth over $25 billion in current dollars. Container Recycling Institute, 2002. Trashed Cans: The Global Environmental Impacts of Aluminum Can Wasting in America.


Steel is the most recycled material worldwide, with almost 75 million tons recycled in 2008. Steel Recycling Institute, 2009. The Inherent Recycled Content of Today’s Steel.


**CLIMATE CHANGE**


The Arctic is warming almost twice as fast as the world average, and most increases occurred in the past 20 years. *United Nations Environment Programme, 2007. Global Environment Outlook 4: Summary for Decision Makers.*

The average global temperature in 2005 was 14.6 degrees Celsius, making it the warmest year ever recorded on Earth’s surface. More than half of the warming over the past century has occurred in the past 30 years, meaning that this warming trend is accelerating. *Worldwatch Institute, 2006. Vital Signs 2006-2007.*


The Intergovernmental Panel on Climate Change (IPCC) projects an increase in the global temperature of 1.8–4°C by the end of this century. This will lead to potentially massive consequences, especially for the most vulnerable, poor and disadvantaged people who contribute to climate change to a lesser extent. Even if atmospheric concentrations of greenhouse gases were to be stabilized today, land and ocean temperatures would increase for decades and sea levels would rise for centuries. United Nations Environment Programme, 2007. Global Environment Outlook 4: Summary for Decision Makers.

While the consumption of fossil fuels has taken the brunt of the blame for anthropogenic greenhouse gas emissions, land-use changes have been responsible for about one-third of the increase in atmospheric carbon dioxide over the last 150 years, mainly through the loss of soil organic carbon. United Nations Environment Programme, 2007. Global Environmental Outlook 4.

More than twice as much carbon is stored in the Earth’s soils as is stored in living vegetation or the atmosphere. C. Rice, 2007. Storing Carbon in Soil.

More carbon entered the atmosphere from soils than from fossil fuel combustion from the 1860s until the 1970s. A large portion of the CO₂ in the atmosphere originated from the mineralization of soil organic carbon. Factors responsible for this include urbanization, land use changes, conventional agricultural practices, open pit mining and other activities that degrade soils. Brown and Leonard, 2004. Building Carbon Credits with Biosolids Recycling.
Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level. *IPCC, 2007. Climate Change 2007: Synthesis Report.*


Average Northern Hemisphere temperatures during the second half of the 20th century were very likely higher than during any other 50-year period in the last 500 years and likely the highest in at least the past 1300 years. *IPCC, 2007. Climate Change 2007: Synthesis Report.*


The atmospheric concentrations of CO₂ and CH₄ in 2005 exceed by far the natural range over the last 650,000 years. Global increases in CO₂ concentrations are due primarily to fossil fuel use, with land-use change providing another significant but smaller contribution. *IPCC, 2007. Climate Change 2007: Synthesis Report.*

Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG concentrations. *IPCC, 2007. Climate Change 2007: Synthesis Report.*
GENERAL ENVIRONMENT

Up to half of amphibian species could be wiped out in coming years through habitat loss and climate change—the biggest mass extinction since dinosaurs disappeared. *World Association of Zoos and Aquariums, 2007.*

Human activities caused $6.6 trillion in environmental costs in 2008, equivalent to 11% of global GDP. The top 3,000 public companies cause over $2.15 trillion, or one-third, of global environmental costs. *United Nations Environmental Programme Finance Initiative. 2010. Universal Ownership: Why environmental externalities matter to institutional investors.*


Over about 20 years, most agricultural soils will have lost about 50% of their organic carbon because of the reliance of industrial agriculture on inorganic fertilizers, rather than organic composts and manures, as a source of crop nutrients, and the extensive use of tillage. *European Commission, 2001. Waste Management Options and Climate Change.*
Nearly one-third of the world’s cropland (1.5 billion hectares) has been abandoned because of soil erosion and degradation over the past 40 years. *Global Education Project, 2010. Food and Soil.*

It takes approximately 500 years to replace 25 millimeters (1 inch) of topsoil lost to erosion. The minimal soil depth for agricultural production is 150 millimeters. From this perspective, productive fertile soil is a nonrenewable, endangered ecosystem. *Global Education Project, 2010. Food and Soil.*

The U.S. Department of Agriculture estimates the total annual cost of erosion from agriculture in the U.S. is about $44 billion per year, or $247 per hectare of cropland and pasture. *Natural Resources Conservation Service, 2001. Land Degradation: an overview.*

The per capita availability of freshwater is declining, in part because of excessive withdrawals of surface and groundwater. If present trends continue, 1.8 billion people will be living in countries or regions with absolute water scarcity by 2025, and two-thirds of the people in the world could be subject to water stress. *United Nations Environment Programme, 2007. Global Environment Outlook 4: Summary for Decision Makers.*


The “hole” in the stratospheric ozone layer over the Antarctic – the layer that protects people from harmful ultraviolet radiation – is now the largest it has ever been and is not expected to recover until between 2060 and 2075. *United Nations Environment Programme, 2007. Global Environment Outlook 4:*

If the world economy used energy today in the same way it did in 1970, it would require the energy equivalent of 11 additional Saudi Arabias—more than all the oil produced in the world. Thus “saved energy” is arguably the world’s leading energy source. Worldwatch Institute, 2006. Vital Signs 2006-2007.

Nearly 80% of the world’s energy comes from oil, coal, or gas. Worldwatch Institute, 2006. Vital Signs 2006-2007


Plastic debris in an area north of Hawaii known as the Northwest Pacific Gyre has increased 5-fold in the last 10 years. The general composition of ocean litter is 60-80% plastics, although it has reached 90-95% in some areas. California Ocean Protection Council, 2008. An Implementation Strategy for the California Ocean Protection Council Resolution to Reduce and Prevent Ocean Litter.

About 40% of the nation’s rivers, 46% of lakes, and 50% of the estuaries are too polluted for fishing and swimming. American Rivers. 2004. America’s Most Endangered Rivers of 2004: Ten Rivers Reaching the Crossroads...
Mercury concentrations in game fish exceed EPA’s recommended levels at 49% of lakes and reservoirs nationwide, and polychlorinated biphenyls (PCBs) in game fish at levels of potential concern at 17% of lakes and reservoirs. U.S. EPA, 2009. National Lake Fish Tissue Study.


75% of marine fisheries are now overfished or fished to capacity. U.S. EPA, 2009. Sustainable Materials Management: The Road Ahead.


An estimated 70% of the world’s coral reefs are now threatened or destroyed. More than 500 million people rely on coral reefs for essential goods and services. The U.N. Environment Programme estimates the overall value of coral reefs at $100,000–600,000 per square


Households that use natural lawn care practices produce nearly $75 in annual ongoing public health, ecological, water conservation and hazardous waste management benefits – from reduced use of synthetic fertilizers and pesticides, switching from gas to electricity for lawn mowing, reduced irrigation, and lower hazardous waste management costs. Morris and Bagby, 2007. Measuring Environmental Value for Natural Lawn and Garden Care.

Collectively U.S. organizations waste $2.8 billion every year powering unused PCs. In 2009, these unused PCs emitted approximately 20 million tons of carbon dioxide equivalent—equal to the annual emissions of 4 million cars. 1E and the Alliance to Save Energy, 2009. PC Energy Report 2009.

The paper and pulp industry is the fourth largest emitter of greenhouse gases among manufacturing industries, the largest user of industrial process water per ton of product and the third largest industrial consumer of energy. More than 40% of the industrial wood harvest is currently used to make paper. Environmental Paper Network, 2007. State of the Paper Industry.

Printing & writing paper, which accounts for 27% of U.S. paper production, averages only 6% recycled fiber. Newsprint averages 32.5% recycled fiber and tissue products average 45%

Roughly half the world’s forests have been burned or cleared and converted to non-forest uses. Human activity has degraded almost 80% of what remains of the planet’s once vast forests. *Environmental Paper Network, 2007. State of the Paper Industry.*

Livestock in the U.S. are responsible for 55% of erosion and sediment, 37% of pesticide use, 50% of antibiotic use and one-third of nitrogen and phosphorus loadings in our waterways. *Food and Agriculture Organization of the United Nations, 2006. Livestock’s Long Shadow: Environmental issues and options.*

Global livestock production accounts for 70% of all agricultural land and 30% of the land surface of the planet. *Food and Agriculture Organization of the United Nations, 2006. Livestock’s Long Shadow: Environmental issues and options.*


Each year, Americans throw away some 100 billion polyethylene plastic bags. Only 0.6 percent of bags are recycled. *Worldwatch Institute, 2004. Good Stuff? Plastic Bags.*
TOXINS

Only a few hundred of the more than 80,000 chemicals in use in the United States have been tested for safety. President’s Cancer Panel, National Cancer Institute, 2010. Reducing Environmental Cancer Risk: What We Can Do Now.

The most environmentally harmful outputs to our environment—synthetic and persistent organic chemicals, radioactive compounds, and heavy metals—increased 24% between 1975 and 2000. World Resources Institute, 2005. Material Flows in the United States: A Physical Accounting of the U.S. Industrial Economy.

Fertilizer consumption has increased exponentially since the 1950s, so much so that 50% of all commercial fertilizer ever produced has been applied since 1984. World Resources Institute, 1998. Nutrient Overload: Unbalancing the Global Nitrogen Cycle.

One half of every metric ton of fertilizer applied to fields never even makes it into plant tissue, but instead ends up evaporating or being washed into local waterways. World Resources Institute, 1998. Nutrient Overload: Unbalancing the Global Nitrogen Cycle.

In 2008, the American Association of Poison Control Centers reported that more than half of the 2 million poisoning incidents each year involve children younger than six years old. Leading causes of poisoning include cosmetics such as perfume and nail polish, deodorant and soap, household cleaning products and medications. US EPA, 2010. Prevent Poisonings in Your Home.

Less than 2% of chemicals on the market have actually been tested for carcinogenicity (tendency to cause cancer). *President’s Cancer Panel, National Cancer Institute, 2010. Reducing Environmental Cancer Risk: What We Can Do Now.*

Pesticides (insecticides, herbicides, and fungicides) approved for use by the U.S. Environmental Protection Agency (EPA) contain nearly 900 active ingredients, many of which are toxic. Many of the solvents, fillers, and other chemicals listed as inert ingredients on pesticide labels also are toxic, but are not required to be tested for their potential to cause chronic diseases such as cancer. *President’s Cancer Panel, National Cancer Institute, 2010. Reducing Environmental Cancer Risk: What We Can Do Now.*

Every year 3 million people suffer from severe pesticide poisoning. Pesticide exposure can lead to cancer, birth defects and damage to the nervous system. Drinking water contaminated by pesticide runoff is a main source of exposure. *Worldwatch Institute, 2006. Vital Signs 2006-2007.*

Less than 20% of all chemicals in cosmetics have been assessed for safety by the industry’s safety panel. Story of Stuff, 2010. Story of Cosmetics.

Since 1938, the FDA has banned just 8 out of over 12,000 ingredients used in cosmetics. Companies are not required to even list all of the ingredients on the label. Story of Stuff, 2010. Story of Cosmetics.

Glass containers are endlessly recyclable, made from all-natural ingredients (sand, soda ash, limestone, and recycled glass), and is the only packaging material accepted by the U.S. FDA as “GRAS” or “generally recognized as safe” for food and beverage contact. Glass is nonporous and impermeable, so there are no interactions between the glass packaging and the contained products that could affect the flavor of foods and beverages. Glass Packaging Institute, 2010. Cradle to Cradle Life Cycle Assessment of North American Container Glass.

COLORADO


Coloradoans recycled 19.6% of our discards in 2008. Excluding scrap metal recycling, our recycling rate drops to 9.3%. We sent 6.8 million tons to landfills for disposal. We generated an average of 8.5 pounds of discarded materials per person per day, far above the national average. Colorado Department of Public Health and Environment, 2010. Annual Municipal Solid Waste Recycling and Diversion.
By recycling and composting nearly 4 million tons of materials in 2008, Colorado saved the energy equivalent of 288 million gallons of gasoline. These diversion efforts also saved 3.8 million metric tons of CO\textsubscript{2}e, the equivalent of taking more than 695,000 cars off the road for a year. Colorado Department of Public Health and Environment, 2010. 2009 Annual Report to the Colorado General Assembly on the Status of the Solid Waste and Material Management Program in Colorado.

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