

The Scrap Recycling Industry: The Original Recyclers

From the earliest uses of scrap thousands of years ago, to the optical scanners, x-rays and air jets separating materials (see bottom image) in today's high-tech shredders, scrap recycling has evolved as the major industry **dedicated to transforming materials to create new products and driving economies by making the old, new again.** Today, the U.S. scrap recycling industry employs more than 130,000 men and women.

As **the original recyclers**, for decades — and indeed, centuries — the scrap recycling industry has been purchasing, processing and brokering old materials to be remade into new products, **providing critical resources for America's manufacturing industries.** Now, with a continuing societal focus on protecting our natural resources and reducing greenhouse gas emissions, the scrap recycling industry is being recognized as one of the **world's first green industries**, while playing a prominent role as an economic leader, job creator, major exporter and environmental steward.

Imagine a world without recycling

The world would be a dramatically different place, with more pollution and greenhouse gases, increased energy use and dramatically faster depletion of our virgin natural resources. The scrap recycling industry **annually transforms more than 130 million metric tons of obsolete materials** from consumers, businesses and manufacturers into useful raw materials. Without scrap recycling, more mining and use of virgin natural resources would be required. The world would be headed in a dangerous direction. **Scrap recycling protects the earth's air, water and land**, allowing society to have less impact on the planet and directly contributing to our quality of life.



In the 21st century, the scrap recycling industry is **uniquely positioned to meet the challenges of today's world**—a leading economic engine for America providing real solutions that help protect and sustain the earth's environment.



Institute of
Scrap Recycling
Industries, Inc.

Voice of the Recycling Industry



THE SCRAP RECYCLING INDUSTRY

More than 60% of the iron and steel made in the United States is manufactured using ferrous scrap.

Recycling one ton of steel conserves 2,500 lbs. of iron ore, 1,400 lbs. of coal and 120 lbs. of limestone.

Nearly 60% of U.S. aluminum consumption comes from domestically recycled aluminum.

Recycling one ton of aluminum conserves up to five tons of bauxite ore and 14 megawatt hours of electricity.

Ninety million tires were processed in 2010 for reuse in a variety of industries.

More than 36% of the raw material used to make new paper products comes from recycled paper.

Recycling one ton of paper saves 3.3 cubic yards of landfill.

Energy saved using recycled materials versus virgin materials up to:

- 92% for aluminum
- 90% for copper
- 87% for plastic
- 56% for iron and steel
- 65% for paper

Sources: EPA, International Aluminum Institute, Recycling Research Institute, SRI, USGS.

1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri



The Scrap Recycling Industry: Economic Leaders and Job Creators

The U.S.-based scrap recycling industry is a sophisticated, capital-intensive industry that has been creating “green jobs” in the United States for decades. As the first link in the manufacturing supply chain, scrap recycling has been integral to the U.S. economy, job creation, resource sustainability, energy savings and global trade for more than 200 years. After having contracted sharply in 2009 as a result of the global recession, the scrap recycling industry rebounded by more than 40 percent in 2010 to more than **\$77 billion in sales**. Despite the lingering effects of the global recession on certain sectors of the U.S. economy, the scrap recycling industry has been at the forefront of job creation, **adding 10,000 jobs to the economy** since the beginning of 2010. The industry is a positive solution in the U.S. manufacturing landscape and employs approximately 130,000 men and women based on environmentally sensitive and sustainable business practices.

Major Exporter – Helping the Balance of Trade

The U.S. scrap recycling industry provides the high value, environmentally friendly and energy-saving raw materials that make America’s manufacturing industries more competitive in the global marketplace. The scrap industry also supplies the world’s rapidly growing demand for all manner of commodities ranging from iron and steel, to paper, nonferrous metals, plastics, electronics, rubber and more. In 2010, commodity grade scrap products were exported to more than 155 countries worldwide, generating nearly **\$30 billion in export sales** and significantly helping the U.S. balance of trade.



The scrap recycling industry has added **more than 10,000 jobs to the U.S. economy** since the beginning of 2010 and employs more than 130,000 men and women nationwide.



Institute of
Scrap Recycling
Industries, Inc.



IMAGINE A WORLD WITHOUT RECYCLING

\$77 billion industry that is helping lead the way in the 21st century global economy.

\$29 billion worth of scrap commodities exported in 2010 to 158 countries.

Recent independent research shows there is enough domestic material to meet U.S. manufacturers’ demand for recycled materials for the foreseeable future.

Leading export destinations include:

130 million metric tons of scrap materials processed annually, including:

- 74 million metric tons of iron and steel
- 47 million metric tons of paper
- 4.6 million metric tons of aluminum
- 3.5 million tons of electronics
- 1.8 million metric tons of copper
- 1.2 million metric tons of lead
- 1.1 million metric tons of plastic
- 162 thousand metric tons of zinc
- 90 million tires

- China
- Canada
- South Korea
- Turkey
- Taiwan
- United Kingdom
- Mexico
- India
- Germany
- Italy

These exports, totaling nearly 44 million metric tons, consist of iron and steel, aluminum, nickel and stainless, copper, paper, plastics, lead, zinc, rubber, and electronics.

1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on @isri



Sources: Sources: ISRI, USITC, USGS, U.S. BLS

The Scrap Recycling Industry: Environmental Stewards

The U.S. scrap recycling industry, which employs more than 130,000 men and women, is also a pivotal player in **environmental protection, resource conservation and sustainability**.

The scrap recycling industry recycled more than **130 million metric tons of materials in 2010**, thereby transforming society's outdated and obsolete products and materials into useful raw materials needed to produce new products. In doing so, the scrap recycling industry has made great savings in both energy and natural resources and thus has had an **extremely positive impact on our environment**. Further, by purchasing products at the end of their life and processing them back into raw materials used in the manufacture of new products, scrap recycling reduces the need for virgin materials, such as iron ore, trees and other natural resources.

Scrap recycling offers **real sustainable solutions** for balancing economic growth and environmental stewardship. Scrap recycling stimulates economies from small towns in rural America to major cities to international trade. The result is **economic and environmental sustainability** for our nation and our world.

Recycling Saves Energy

Recycling reduces greenhouse gas emissions by significantly **saving the amount of energy needed to manufacture the products** that we buy, build and use. The energy saved by recycling can then be used for more important purposes, such as heating our homes and powering our automobiles. The scrap recycling industry takes the job of environmental steward extremely seriously.

Recycling	Saves the Energy Equivalent of:	Reduces Greenhouse Gas Emissions by (CO ₂ Equivalent)
One Car	502 Gallons of Gasoline	8,811 lbs.
One Refrigerator	36 Gallons of Gasoline	566 lbs.
One Computer & CRT Monitor	27 Gallons of Gasoline	404 lbs.
One Washing Machine	24 Gallons of Gasoline	397 lbs.
Four Tires	18 Gallons of Gasoline	323 lbs.
One Television	8 Gallons of Gasoline	81 lbs.
10 lbs. of Aluminum Cans	7 Gallons of Gasoline	16 lbs.
10 lbs. of Cardboard	2 Gallons of Gasoline	40 lbs.

The total estimated **reduction in CO₂ emissions** from scrap recycling globally is approximately 500 million tons per year.

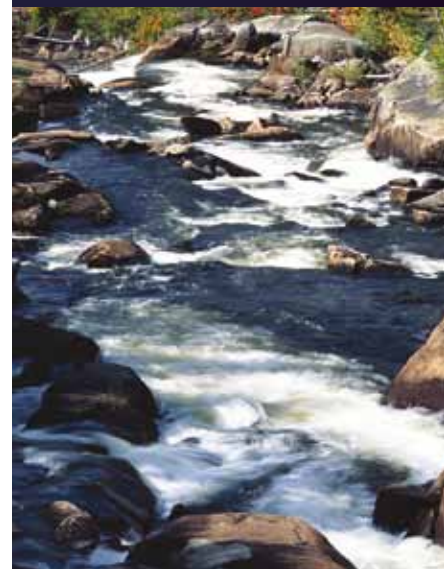
Source: BIR, U.S. EPA Durable Goods Calculator, WARM Calculator
<http://epa.gov/climatechange/wycd/waste/tools.html>



Recycling **reduces energy consumption** and the emission of greenhouse gases that contribute to global climate change, while **helping to maintain a steady supply of raw materials** for the U.S. and global economies.



Institute of
Scrap Recycling
Industries, Inc.



1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri



The Scrap Recycling Industry: **Safely or Not at All**

The scrap recycling industry is committed to the safety of its more than 130,000 workers and hundreds of thousands of customers. We believe that a zero-accident culture is achievable through the development and implementation of aggressive management models that embrace the certainty that safety and productivity can coexist in the scrap processing environment.

This kind of unwavering commitment to safety as a core value requires a business model that places worker and customer well-being at the very top of every decision tree. If a job cannot be done safely, it simply won't be done at all. Because the scrap recycling industry recognizes that no dollar in revenue — or million dollars in revenue — can possibly justify any injury, the industry has chosen to adopt as its rallying cry, "Safely or Not At All."

The scrap recycling industry recognizes that managing for safety is no different than managing for any other business objective. Once the objective is defined (zero accidents), it is communicated throughout the organization, a plan is put in place to achieve the goal and progress is tracked. When problems are encountered, they are addressed and solved.

Years of data show that profits soar when placed second to safety. A safer workplace is cleaner and better organized, making that workplace more efficient. A healthy workforce is reliable and well-trained. Reduced injuries trigger reduced insurance rates. By factoring safety considerations into new installations, one ends up with better-engineered installations. It goes on and on, creating a "win-win-win" situation for the industry, its workers and its customers.

The scrap recycling industry, through its national trade association, the Institute of Scrap Recycling Industries, Inc. (ISRI), offers its members an aggressive slate of training programs and outreach services that are designed to ease the burden of creating and maintaining a safe work environment for employees.

ISRI's programs and services range from the on-site Scrap Safety Blueprint (assessing a company's areas of strengths and weaknesses) to the OSHA 10-Hour Training program (two-day safety workshop recognized by the Occupational Safety and Health Administration) to ISRI's Safety Transportation Program (minimizing driver accidents and injuries) to the ISRI Safety and Environmental Council (ISEC) in which safety issues are discussed openly and thoroughly among safety professionals. Further supporting these efforts are numerous communications tools that help companies fully adopt and effectively implement safety programs throughout a company's operations.

Through hard work and diligent commitment to safety, the scrap recycling industry is making significant and meaningful progress in providing a safe workplace.



ISRI

Institute of
Scrap Recycling
Industries, Inc.

Voice of the Recycling Industry



1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,

find us on



at Institute of
Scrap Recycling
Industries, Inc.,

and follow us

on  @isri



Mixed Sources
Product group from well-managed
forests, controlled sources and
recycled wood or fiber

Cert no. 198-COC-002553
www.fsc.org
© 1996 Forest Stewardship Council

ISRI: The Voice of the Recycling Industry

As the “Voice of the Recycling Industry,” the Institute of Scrap Recycling Industries, Inc. (ISRI), serves our membership through education and advocacy concerning the issues that define the scrap recycling industry: economic expansion, job creation, environmental protection, energy savings and safety.

A Washington, D.C. based trade association, ISRI represents approximately 1,600 private, for-profit companies operating at more than 7,000 facilities in the United States and 30 countries worldwide. **Our members are processors, brokers and industrial consumers of scrap commodities, including ferrous and nonferrous metals, paper, electronics, rubber, plastics, glass and textiles. ISRI's associate members include both equipment and service providers for the scrap recycling industry.**

ISRI is the voice of a multi-billion dollar industry dedicated to strengthening the economy, protecting the environment and providing a safe workplace for the estimated 130,000 men and women it employs. Our members range from Mom and Pop small businesses to multinational corporations. No matter the size, they all make significant contributions to their local, state, federal and global economies.

Despite the lingering effects of the global recession, the scrap recycling industry is strong and growing stronger. Our analysis of 2010 data shows a thriving industry whose monetary value has grown 40 percent since 2009. As one of the oldest green industries and the first link in the manufacturing supply chain, scrap recycling has been a key contributor to the U.S. economy, global trade and resource sustainability for more than 200 years.

ISRI assists its member companies with a wide variety of products and services designed to help them run better, cleaner, safer and more profitable operations. First and foremost, ISRI believes that all members' operations should be carried out “Safely or Not at All.” To that end, the association provides a vast array of services for members ranging from OSHA compliance guidance to the design of a customized safety blueprint that is fashioned at the member's facility by one of the ISRI Safety professionals. ISRI leads the industry in the production and distribution of training materials designed to improve the safety and operations of the scrap industry.

ISRI also provides extensive compliance guidance to assist members comply with federal and international laws and regulations pertaining to the environment, shipping and transportation, licensing and other key areas affecting their businesses.

Implementation of RIOS™ — the Recycling Industry Operating Standard™ — is also a major focus of ISRI's. RIOS™ is the only recycling industry-specific integrated quality, environmental, health, and safety management system and seeks to provide consumers with the same assurances of compliance that they have come to expect from programs like ISO 9001, ISO 14001 and the OSH 18000 standards. R2/RIOS™ is the premium standard for electronics recyclers.

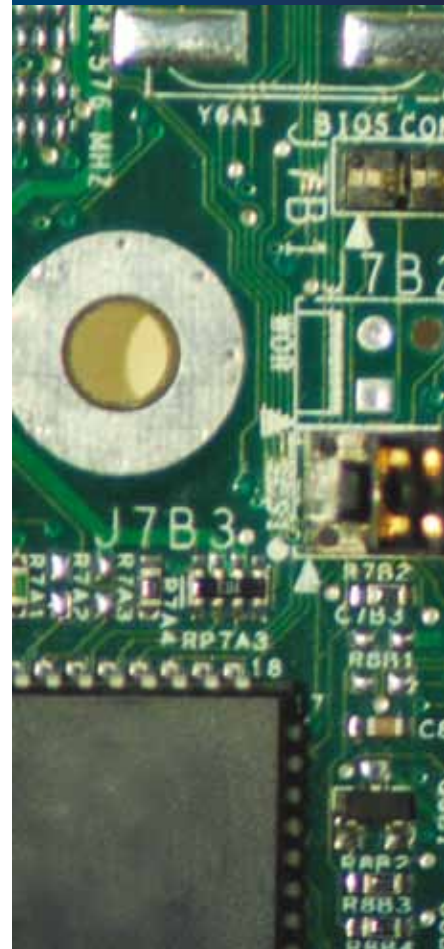
ISRI also publishes the Scrap Specifications Circular, which for more than 85 years has provided specifications for hundreds of grades of scrap designed to ensure consistency and standardization for the worldwide sale and purchase of scrap commodities.

ISRI provides continuing education and training for its members through forums, seminars, workshops, commodity roundtables, publications, an annual convention, and the world's largest annual scrap recycling exposition. Last year, more than 5,000 industry professionals from more than 40 countries attended ISRI's convention.

Among its many services, ISRI promotes public awareness of the value and importance of recycling to the production of the world's goods and services, along with the positive environmental benefits derived from scrap recycling. As part of this effort, ISRI advocates on behalf of the industry before the U.S. Congress, federal and state agencies, state governments and international bodies to help ensure the free and fair trade of scrap commodities globally. ISRI also educates the public about how the scrap recycling industry is uniquely positioned to meet the challenges of today's world — a leading economic engine for the world providing real solutions that help protect and sustain the earth's environment.



Institute of
Scrap Recycling
Industries, Inc.



1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri



The Scrap Recycling Industry: **Kids Recycling Facts:**

1. Recycling one automobile conserves 2,500 lbs. of iron ore, 1,400 lbs. of coal and 120 lbs. of limestone
2. A used aluminum can is recycled and back on the grocery shelf within just 60 days.
3. The United States annually recycles enough copper to provide the copper content of more than 26,000 Statues of Liberty.
4. In 2010, the U.S. scrap industry processed enough stainless steel scrap (928,145 tons) to produce more than 8,400 cloud gate sculptures located in Chicago's Grant Park.
5. Metal can be recycled unlimited times. Paper can be recycled four to seven times.
6. The average North American light vehicle has 2,261 lbs. of iron and steel, 343 lbs. of plastics, 315 lbs. of aluminum, 185 lbs. of rubber, 106 lbs. of glass, and 64 lbs. of copper and brass.
7. If all aluminum scrap processed in the United States were used solely to produce standard soda cans, the lined up cans would stretch more than 25 million miles — the distance from Earth to the planet Venus!
8. The United States annually processes more than 250 billion lbs. of scrap material — the weight of more than 70 million cars.
9. The Gateway Arch in St. Louis used 900 tons of stainless steel in construction — at the time, more stainless steel than any project in history. Enough stainless steel is recycled in the United States each year to build more than 1,000 Gateway Arches.
10. In 2010, the amount of paper recovered for recycling averaged 334 lbs. for each man, woman and child in the United States.
11. The United States recycled enough gold in 2010 to, if beaten into a thin sheet, cover an area of 44 square miles — more than half the size of Washington, D.C.
12. The United States annually recycles enough ferrous scrap, by weight, to build more than 600 Golden Gate Bridges — a bridge stretching nearly 9,000 feet.

1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri



Sources: BIR, USGS, SRI, Wards, AF&PA, ISRI, Golden Gate Bridge Highway and Transportation District,



Institute of
Scrap Recycling
Industries, Inc.



The Scrap Recycling Industry: Ferrous Scrap

Steel is the most recycled material both in the United States and worldwide. In the United States alone, 74 million metric tons of ferrous scrap was processed by the scrap recycling industry last year: more than 55% of the volume of all domestically processed material. Obsolete ferrous scrap is recovered from automobiles, steel structures, household appliances, railroad tracks, ships, farm equipment and other sources. In addition, prompt scrap, which is generated from industrial and manufacturing sources, accounts for approximately half of the ferrous scrap supply.

Both obsolete and prompt scrap are processed by the scrap recycling industry into commodity grade material that is used to produce more than 60% of total raw steel produced in the United States, predominantly at electric arc furnaces. In addition, the United States exports ferrous scrap to approximately 90 countries worldwide. Domestic and foreign steel mills, foundries and other industrial consumers rely on ferrous scrap as a vital, environmentally friendly and cost-efficient raw material for the production of new steel and cast iron products. Depending on the life-cycle of those finished products, the ferrous scrap once again becomes available for recycling in the months and years ahead.

THE FERROUS SCRAP INDUSTRY

In 2010, the U.S. ferrous scrap industry, was valued at \$26.4 billion.

On average, the United States processes enough ferrous scrap daily, by weight, to build 25 Eiffel Towers every day of the year.

In 2010, the U.S. scrap industry recycled more than 54 million metric tons of ferrous metal.

Steel produced by predominantly scrap-fed electric-arc furnaces accounted for nearly 60% of the total raw steel produced in the United States in 2010—nearly 55 million metric tons.

The United States is the largest exporter of ferrous scrap in the world. In 2010, more than 19 million metric tons of ferrous scrap—valued at more than \$8 billion—was exported to approximately 90 countries, including China, South Korea, Turkey, Taiwan, Canada and India.

530 million metric tons of ferrous scrap were consumed globally in 2010

By using ferrous scrap rather than virgin materials in the production of iron and steel, CO₂ emissions are reduced by 58%.

Top exports include:

- 7,438,729 metric tons of shredded steel scrap
- 5,646,271 metric tons of #1 heavy melting steel
- 1,024,206 metric tons of #2 heavy melting steel
- 937,158 metric tons of stainless steel
- 916,105 metric tons of alloyed non-stainless steel

Recycling steel requires 60% less energy than producing steel from iron ore.

Recycling one car saves more than 2,500 lbs. of iron ore, 1,400 lbs. of coal and 120 lbs. of limestone.

The United States recycled nearly 14 million cars in 2009, supplying an estimated 14 million tons of shredded scrap.

2009 Recycling Rate

- for cars: 106%
- for appliances: 90%
- for steel cans: 66.8%
- for structural steel: 98%
- for reinforcement steel: 70%

Sources: ISRI, AISI, BIR, USGS, USITC, ISRI, other industry sources

© 2011 Institute of Scrap Recycling Industries, Inc. All Rights Reserved Rev. 7/11



Steel is the world's most recycled material.



Voice of the Recycling Industry

Institute of Scrap Recycling Industries, Inc.



1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri



Cert no. SWE-COC-002553
www.fsc.org
© 1996 Forest Stewardship Council

The Scrap Recycling Industry: Nonferrous Scrap

Nonferrous metals, including aluminum, copper, lead, nickel, tin, zinc and others, are among the few materials that do not degrade or lose their chemical or physical properties in the recycling process. As a result, nonferrous metals have the capacity to be recycled an infinite number of times. As society's awareness of the economic, environmental and energy savings associated with using recycling materials improves, along with the rapid growth in consumer demand for nonferrous metal-bearing products, the critical role of the reservoir of nonferrous metals in use becomes increasingly apparent. In the United States alone, the value of the nonferrous metal scrap industry jumped to nearly \$40 billion in 2010 — a 28% increase from 2009.

While in terms of volume, nonferrous scrap makes up a small percentage of the total quantity of material recycled in the United States, by value nonferrous metal scrap — including precious metal scrap — accounts for more than half of total U.S. scrap recycling industry earnings. More than eight million metric tons of nonferrous scrap was processed in the United States last year from a wide array of consumer, commercial and industrial sources: everything from copper and precious metal circuitry in electronic devices, to soft-drink containers, automobile batteries and radiators, aluminum siding, airplane parts and more. Nonferrous scrap is then consumed by secondary smelters, refiners, ingot makers, fabricators, foundries and other industrial consumers in the United States and in more than 100 countries worldwide. These consumers rely on nonferrous scrap as a competitive, environmentally preferable and energy efficient input to manufacture brand new products, continuing the nonferrous metals lifecycle.



According to the USGS, in 2010 the United States recovered approximately 8.2 million metric tons of nonferrous scrap. ISRI estimates that **this nonferrous scrap was worth \$39.6 billion.**



Institute of
Scrap Recycling
Industries, Inc.

Voice of the Recycling Industry



INDUSTRY STATS

COPPER

Copper is the best non-precious metal conductor of electricity.

The United States annually recycles enough copper to provide the copper content for 26,000 Statues of Liberty.

Copper alloy scrap provides about half of the copper consumed in the United States each year.

The United States provides 23% of the world supply of recovered copper.

ALUMINUM

If all aluminum scrap processed in the United States were used solely to produce standard soda cans, the lined-up cans would stretch 25 million miles — the distance from Earth to Venus.

In 2010 the United States domestically recycled aluminum cans saved the energy equivalent of 26 million barrels of gasoline — America's entire gas supply for three days.

Energy saved using aluminum scrap vs. virgin materials is up to 92%.

Approximately 60% of the aluminum used in North America is from domestically recycled content.

Lead-acid batteries, a primary use for lead, have a 97% recycling rate.

A used aluminum can is recycled and back on the grocery shelf in as little as 60 days.

Of an estimated total 700 million tons of aluminum produced in the world since commercial manufacturing began in the 1880s, about 75 percent is still in productive use as secondary raw material.

NONFERROUS SCRAP

In 2010, the U.S. scrap industry processed (exports plus domestic recycled) more than:

- 4.6 million metric tons of aluminum
- 1.8 million metric tons of copper
- 1.2 million metric tons of lead
- 162,000 metric tons of zinc
- 2 million tons of nickel/stainless steel

The United States exported \$16.7 billion worth of nonferrous scrap to nearly 100 countries in 2010, including China, Canada, Mexico, South Korea, Japan, Taiwan, Belgium, India and Germany.

1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri



Sources: USGS, USITC, ISRI, other industry sources

The Scrap Recycling Industry: **Electronic Scrap**

The U.S. electronics recycling industry has shown tremendous growth over the past 10 years. This maturing segment of the scrap recycling industry provides a boost of approximately \$5 billion to the U.S. economy (up from less than \$1 billion in 2002) and employs more than 30,000 full time employees (up from 6,000 in 2002).

Last year, the U.S. electronics recycling industry processed 3 million to 4 million tons of used and end-of-life electronics equipment. More than 70 percent of the collected equipment is manufactured into specification grade commodities — including scrap steel, aluminum, copper, lead, circuit boards, plastics and glass. These valuable commodities are then sold to basic materials manufacturers in the United States and globally as raw material feedstock for new products, such as steel, copper, aluminum, plastic and glass.

Electronics recyclers repair, refurbish and resell functioning electronics equipment as used products into domestic and international markets. Companies also provide a number of logistical services, like collection, storage and transportation as well as scrubbing hard drives of sensitive personal and commercial data.

The industry is driven by equipment collected from businesses and commercial interests, comprising up to 75% of the market on a volume basis. The electronics recycling industry is poised to meet the anticipated increased demand for more used products and specification grade commodities, with companies currently operating at about 50% of their operational capabilities.

The electronics recycling industry has seen a dramatic increase in the use of third-party certifications. The marketplace is pushing electronics recyclers to become certified to programs like ISRI's R2/RIOS® program (www.CertifiedElectronicsRecycler.com) to improve operational controls, meet customer demands and secure a competitive advantage.

The reuse of used electronics equipment and consumption of commodity grade materials recovered from electronics to manufacture new products boosts the U.S. economy, creates jobs and sustains the earth's natural resources, conserves impressive amounts of energy in the manufacturing process and reduces greenhouse gas emissions from those facilities.



Approximately
**three million to
four million tons of
electronic equipment
is recycled every year.**



Institute of
Scrap Recycling
Industries, Inc.

Voice of the Recycling Industry



THE ELECTRONIC SCRAP INDUSTRY

Scrap is not waste. Recycling is not disposal. Obsolete electronics are products that contain marketable scrap commodities traded in the global market.

Responsible manufacturing begins with Design for Recycling®, and results in better solutions to the environmental challenges faced at each stage of a product's life.

One metric ton of electronic scrap from personal computers contains more gold than that recovered from 17 tons of gold ore.

Scrap commodity markets are best governed by traditional laws of supply and demand.

Financing mechanisms should only be used to stimulate the recycling of scrap electronics until the markets for those materials are economically viable.

A portion of any fees generated should be spent to develop end-use consumer markets for electronic commodities, such as plastics and glass.

Obsolete recyclable electronics that can be safely and economically recycled should be banned from disposal.

Sources: ISRI's Electronics Recycling Policy & USGS.

1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri



The Scrap Recycling Industry: Recovered Paper

Recovered fiber, also known as recovered paper and board, is one of the most widely recycled materials in the world. Since 1990, Americans have recycled nearly **one billion tons** of recovered fiber as the recovery rate for paper and paperboard in the United States nearly doubled to reach 63.5% in 2010. The paper recycling segment of the scrap recycling industry collects, sorts and processes the recovered fiber into specification grade products that were valued at \$8.9 billion in 2010. These products are sold and transported to paper mills at home and worldwide for production into new packaging, office paper, tissue, newsprint and a multitude of other paper products. In the United States, approximately 77% of paper mills rely on recovered fiber to make some or all of their products due in part to recovered paper's significant cost and energy savings. In addition, the paper and fiber recovered in the United States helps to meet growing overseas demand: recovered paper was exported to 97 different countries last year at a value of approximately \$3.3 billion, not including the tremendous environmental benefits and energy savings, while significantly helping our balance of trade.



Eighty five percent of corrugated containers and 72% of the newspapers consumed were recovered in 2010.



Institute of Scrap Recycling Industries, Inc.

Voice of the Recycling Industry



THE FIBER INDUSTRY

The United States recovered 51.5 million tons of paper in 2010 and this accounts for:

- 63.5% of the paper consumed in the United States
- Approximately 334 lbs. for every person in America

20.8 million tons of recovered paper was exported in 2010 including:

- 2.6 million tons of printed news
- 8.0 million tons of corrugated cardboard
- 4.9 million tons of mixed paper
- 582,000 thousand of high-grade paper
- 2.5 million tons of other mechanical paper
- 2.0 million tons of pulp substitutes.

Recovered paper is exported to 97 countries including: Canada, China, India, South Korea and Mexico.

Eighty-five percent of corrugated containers and 72% of the newspapers consumed were recovered in 2010.

Each percentage point of recovery represents roughly 800,000 tons of fiber — enough weight to fill more than 7,500 railroad cars.

Recycling one ton of paper saves 3.3 cubic yards of landfill space.

More than 36% of the raw material used to make new paper products comes from recycled paper.

In 2010, paper processing was an \$8.9 billion industry in the United States.

Energy saved using recycled materials versus virgin materials is up to 65%.

Nearly 77% of all U.S. papermakers use some recovered paper to make everything from newspaper to paper packaging to office paper.

Some of the world's earliest pieces of paper were made using scrap material.

1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on



at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on @isri



Sources: ISRI, AF&PA, USITC, United States EPA, Pulp&Paper Week

The Scrap Recycling Industry: Scrap Tires

Each year, the American public generates approximately 300 million scrap tires. In the past, scrap tires — generated when an old, worn tire is replaced with a new tire — were often dumped illegally in lakes, abandoned lots, along the side of the road and in sensitive habitats. Today, scrap tires are playing a much different role as an important part of the manufacturing process. Scrap tire rubber is used in the manufacture of new tires, playground surfaces, equestrian mats and rubberized asphalt among other products. Other cutting-edge manufacturers are combining scrap tires with materials such as scrap plastic to produce flower pots, roofing tiles and auto parts.

A tire is a highly engineered and extensively designed product that is meant to be virtually indestructible under a variety of conditions. Because of this, tires can be difficult to recycle, but that has changed. Tire recyclers have invested millions of dollars in technologies and equipment to recycle tires, allowing scrap tires to play an important role in strengthening our economy and protecting our environment.

At tire recycling facilities, the main piece of equipment is the tire shredder, which uses powerful, interlocking knives to chop tires into smaller pieces. Shredding a tire at room temperature using such knives is called **ambient shredding**. Tires can also be shredded through a cryogenic process that uses liquid nitrogen to freeze them at a sub-zero temperature. Such temperatures cause the physical properties of the tires to change dramatically and become very brittle. The tire is placed in an enclosure in which powerful hammers smash the tire apart. **Cryogenic grinding** is used to make fine crumb rubber powders that are then used in products such as synthetic turf.

The non-rubber portions of the tire also are recycled. For example, the steel beads that give the tire its shape and structure are recovered by recyclers and processed into specification grade product used by steel mills for the production of new steel.

Scrap tire rubber is a highly sought material. **In 2010, scrap processors produced more than one billion pounds of crumb rubber that was used in the creation of new products ranging from sidewalks to horse tracks.** Tire recycling is an economically sound, environmentally friendly activity that can contribute to the reduction of a product's overall carbon footprint. In fact, the use of recycled rubber in molded products provides a substantial carbon footprint advantage over the use of virgin plastic resins, having between four and 20 times lower carbon footprint.

The future for tire recycling is strong. Applications for scrap tire rubber — such as a paving as rubberized asphalt has become recognized for its preferable properties. gaining in prominence and widespread use as rubberized asphalt has become recognized for its preferable properties. Many states already use rubberized asphalt when they design, reconstruct or repair their roadways and it is used for several simple and straightforward reasons: it can cost less, provide safety benefits and last longer than conventional asphalt. When it comes to recycling tires, what comes around keeps going around.

THE SCRAP TIRE INDUSTRY

Approximately 84% of scrap tires come from passenger cars, while 15% come from light and heavy trucks. The remaining 1% comes from heavy equipment, aircraft, and off-road tires.

Rubberized asphalt on the roadway uses about 1,000 tires per lane mile per one inch of thickness.

Rubberized asphalt has been shown to reduce road noise by up to 4db. This can either eliminate or reduce the need for sound barriers.

Twenty-seven million tires were processed in 2010 and used as lightweight fill for road embankments, landfill construction and other engineering uses.

A quick rule of thumb to calculate scrap tire generation is to equate one tire for every person living in the United States. With a US population of roughly 300 million, approximately 300 million scrap tires are generated in the United States every year.

There are approximately 2.5 pounds of steel belts and bead wire in a passenger car tire.



In 2010, more than one billion lbs. of crumb rubber was produced using 50 million tires.



Institute of Scrap Recycling Industries, Inc.

Voice of the Recycling Industry

1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri



Sources: Recycling Research Institute, Institute for Environmental Research and Education, City of Colorado Springs, CalTrans, Rubber Manufacturers Association



The Scrap Recycling Industry: Plastics

The manufacture and distribution of plastics is everywhere. Between 1950 and 2009, the global production of plastics grew at an average rate of nine percent annually and all indications point to continued growth at a similar rate. With the explosive growth in the manufacture of plastics comes the need to ensure that these materials are recycled in an environmentally responsible manner once they reach the end of their useful lives.

From an environmental perspective, recycled plastic can provide enormous benefits over the use of its virgin counterparts. For example, plastic lumber made with scrap plastic bags, and other materials, conserves trees and eliminates the need to use hazardous chemicals to treat wood that will be used outdoors. According to the U.S. Environmental Protection Agency (EPA) plastic recycling results in significant energy savings (an estimated 50–75 MBtus/ton of material recycled) compared with production of new plastics using virgin materials.

While most people are familiar with the “blue bin” they place at their curbside, plastic recycling is far “Bigger than the Bin.” While it is important that consumers recycle the plastic containers that hold food, beverages, and household cleaners as well as other plastics that arise in the home, recycling of engineered and industrial plastics is where it is really at! Engineered and industrial plastics are typically high grade materials used as components in all types of equipment. They may be the sprocket wheel in an electric motor or the imitation wood that adorns your vehicle interior. Engineered and industrial plastics are used as internal and external component of everything from refrigerators to computers, automobiles to boats, and medical equipment to sheet materials used in construction.

Despite the ubiquity of plastics, plastic recycling is still a young industry because no one really thought about recycling when plastics were first put into use. The technology to cost effectively sort and recycle plastics has been developed only over the past 20 years. While one can picture so much opportunity for growth in plastics recycling, there are many challenges that confront this nascent segment of the recycling industry, ranging from the false perception by many that recycled materials are somehow inferior to virgin materials to archaic laws and regulations that never contemplated the possibility of recycling plastics.

It is incumbent upon all of us to educate manufacturers about the merits of using plastics made from scrap and for those same manufacturers to Design for Recycling®, giving due consideration during the design stage to their products end-of-life. In addition to these operational challenges, a patchwork of state laws and a lack of direction from industry stakeholders make the collection and recycling of scrap plastic difficult. These challenges are not insurmountable and plastic recyclers are providing leadership to overcome them. The next time you tote that box to the curb remember, plastics recycling is much Bigger than the Bin!



In 2009, 479 million lbs. of post-consumer non-bottle rigid plastics were recovered. This is a 47% increase since 2007.



Institute of
Scrap Recycling
Industries, Inc.

THE PLASTICS INDUSTRY

In 2009, 479 million lbs. of post-consumer non-bottle rigid plastics were recovered. This is a 47% increase since 2007.

Fifty-one percent of the non-bottle rigid plastic was used to manufacture products in North America. The remainder was exported to manufacturing facilities across the globe.

In 2009, 854,377,000 lbs. of post-consumer plastic film were collected for recycling.

Composite lumber is the primary end market for post-consumer plastic film.

In 2010, the US exported more than \$940 million plastic scrap

In 2010, 9.2 billion pounds of plastic was recycled, including 5.3 billion pounds of post-industrial plastic and 3.7 billion pounds of post-consumer plastic.

There is an 80–90% reduction in energy consumption when producing recycled plastic compared to producing plastic from virgin materials.

Recycling 5 PET bottles produces enough fiber for one t-shirt.



1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on @isri



Source: Scrap Magazine, American Chemistry Council, BIR, PlasticsEurope, U.S. EPA, Waste & Recycling News.

© 2011 Institute of Scrap Recycling Industries, Inc. All Rights Reserved Rev. 7/11

The Scrap Recycling Industry: **Recycled Glass**

Glass is made from readily available domestic materials, such as sand, soda ash, limestone and **“cullet,” the industry term for furnace-ready scrap glass.** Glass can be recycled again and again with **no loss in quality or purity.** In 2009 (the latest data available), 31 percent of all glass containers were recycled.

For every ton of glass recycled, more than a ton of raw materials is saved, including 1,300 lbs. of sand, 410 lbs. of soda ash, 380 lbs. of limestone and 160 lbs. of feldspar.

Recycled glass is substituted for up to **70% of raw materials used in making new glass.** An estimated 80% of recovered glass containers are made into new glass bottles. In 2009, the latest figures available, 39 percent of beer and soft drink bottles were recovered for recycling. Another 18 percent of wine and liquor bottles and nearly 18 percent of food jars also were recycled.

Manufacturers benefit from recycling in several ways: it **reduces emissions and consumption** of raw materials, **extends the life of plant equipment** (such as furnaces) and **saves energy.** Glass recycling creates no additional waste or byproducts.

Glass manufacturers are requiring more and more high-quality recycled container glass to meet market demands for new glass containers. **Color-sorted, contaminant-free recycled glass** helps ensure that these materials are recycled into new glass containers.

While curbside collection of glass recyclables can **generate high participation and large amounts of recyclables,** drop-off and commercial collections programs are also effective at yielding high-quality container glass.



For every ton of glass recycled, more than a ton of raw materials is saved.



Institute of Scrap Recycling Industries, Inc.

Voice of the Recycling Industry

THE RECYCLED GLASS INDUSTRY

Recycling glass requires 34% less energy than producing glass from natural materials.

Glass bottles and jars are 100% recyclable and can be recycled endlessly without any loss in purity or quality.

Recycling one glass bottle saves enough energy to light a 100-watt bulb for four hours, power a computer for 30 minutes or a television for 20 minutes.

For container glass, a relative 10% increase in cullet reduces particulates by eight percent, nitrogen oxide by four percent and sulfur oxides by 10%.

For every six tons of recycled container glass used, one ton of the greenhouse gas carbon dioxide is reduced.

Today's glass containers are more than 40% lighter than they were 20 years ago.

Glass companies can generally incorporate up to 80% cullet into their glass mixtures.



1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and 
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on  @isri

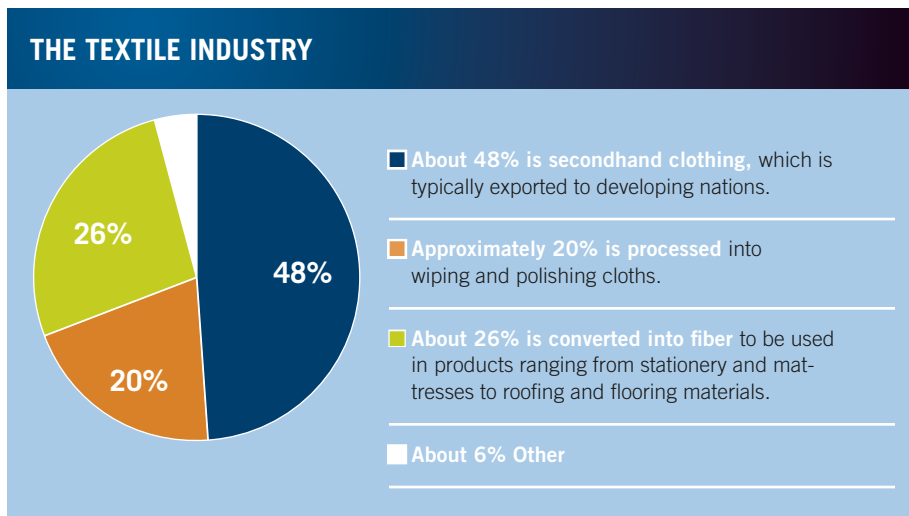


Sources: Glass Recycling, “Kirk-Othmer Encyclopedia of Chemical Technology” 4th edition, 1999, Glass Packaging Institute

The Scrap Recycling Industry: Scrap Textiles

The textile segment of the recycling industry processes billions of pounds of **cotton, wool, synthetic and synthetic-blend products** each year. These scrap materials come from a number of sources, ranging from apparel and home furnishing manufacturers to textile mills and consumers.

Each year, 1.1 million tons of textiles recovered from individuals (post-consumer) and manufacturers (pre consumer) are recycled as **new raw materials for the automotive, furniture, mattress, coarse yarn, home furnishings, paper and other industries**. This translates to about eight lbs. of textiles per person in the United States in 2010.



Used clothing collected from households is graded into a number of categories. Garments in good condition are exported for resale in parts of the world where new clothing is not affordable for many. **This trade provides employment** not only among the exporting nations, but also in the importing countries.

Sources: Council for Textile Recycling



The recycling industry in the United States recycles approximately **8 lbs. of textiles per person** each year.



Institute of
Scrap Recycling
Industries, Inc.



1615 L Street,
NW, Suite 600
Washington, DC
20036

Visit us at
www.isri.org,
find us on
 and
at Institute of
Scrap Recycling
Industries, Inc.,
and follow us
on @isri

