ISRI

Voice of the Recycling Industry™

2018

Recycling Industry Yearbook







Executive Summary

As the global scrap marketplace evolves ever more rapidly, there has never been a more pressing need for accurate, up-to-date information about the state of the recycling industry. *The 2018 Recycling Industry Yearbook* is designed to fill that void, providing the latest information and statistics about the U.S. and global scrap industries. In addition, the yearbook aims to provide readers with a clearer understanding of what the scrap industry actually is and how it works, along with the tremendous economic, environmental, energy, and trade benefits the industry generates globally.

Despite the continued international trade and industry-specific challenges faced by scrap recyclers in 2017, preliminary trade data indicate approximately 110 million tons of scrap worth more than $105 billion were exported globally, according to data from the United Nations Comtrade database.

U.S. exports of scrap totaled nearly 38 million metric tons valued at $17.85 billion and were shipped to industrial consumers in 145 countries around the world in 2017. In the United States, scrap recyclers processed a total of approximately 130 million tons of scrap metal, paper, plastics, electronics, textiles, glass, and rubber last year for domestic and overseas consumption. Those efforts created significant energy savings, reduced greenhouse gas emissions, saved natural resources, and limited the amount of material that would otherwise have been sent to landfills. In addition to these critical environmental benefits, the scrap recycling industry also provided much needed support to the U.S. economy and trade balance.

Independent research conducted by John Dunham & Associates confirms that in the United States, the scrap recycling industry directly and indirectly supports more than 534,000 well-paying jobs while generating nearly $117 billion in economic activity and $13.2 billion in federal, state, and local tax revenue.

In addition to providing an overview of the U.S. scrap industry, the *2018 Recycling Industry Yearbook* also describes what we mean when we're talking about scrap (hint: it's not waste), where scrap comes from, how it gets processed, and who uses it. In addition, the *2018 Yearbook* contains updated and expanded information on nearly every aspect of the global industry. For more information about ISRI and the global scrap recycling industry, visit the ISRI website at **ISRI.org.**

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CHAPTER 1: Introduction to ISRI

ISRI is the Voice of the Recycling Industry™, promoting safe, economically-sustainable, and environmentally-responsible recycling through networking, advocacy, and education. ISRI represents approximately 1,300 member companies operating more than 4,000 locations in the United States and 41 countries worldwide. ISRI members process, broker, and consume the entire range of recycled commodities including ferrous and nonferrous metals, recovered paper and fiber, tires and rubber, plastics, glass, electronics, and textiles. Our members range in size from small family-owned firms to large multinational corporations.

ISRI promotes the best interests of the recycling industry; fostering the trade and commerce of its members; promoting free and fair trade; and aiding the industry by seeking to eliminate abusive and disruptive business practices and unfair competition.

Headquartered in Washington, DC, ISRI raises public awareness of the vital role recycling plays in the economy, global trade, the environment, and sustainable development. ISRI members benefit from a wide array of services including: safety and compliance training; networking and education; market research and reporting; regulatory and legal information; industry-specific publications; and industry representation. For more information or to join, visit **ISRI.org**.

Brian Shine
Chair
Manitoba Corp.

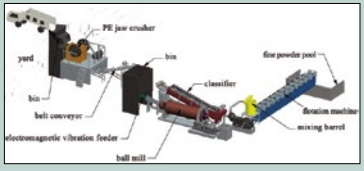
Robin K. Wiener
President
ISRI

Commodities Origins

Responsibly maximizing the value of materials extracted from natural resources by recycling saves energy, protects ecosystems, and maintains the economic freedom and security of a nation. To understand the value of recycling, it is important to understand how these materials are initially created from our natural resources.

METALS

Mining
Ore is mined from mineral rich deposits. Hematite, Bauxite, Chalcocite, Limonite, and Galena are examples of ores used to extract base metals.



Beneficiation
Beneficiation is a process where ores are crushed and sorted to concentrate pieces that will have higher yields when refined through smelting.

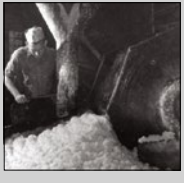
PLASTICS

Drilling
Crude oil and natural gas are extracted from deposits beneath the ground surface and seabeds. Oil tanker ships are some of the largest ships on the open seas. They're often as long as the World Trade Center is tall and several times wider.

Refining
Crude oil is refined through a complex distillation process where chemicals with varying properties are extracted and separated to create products such as kerosene, gasoline, naphtha, paraffin, and asphalt.

PAPER

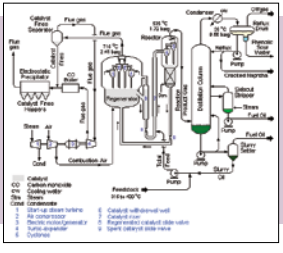
Forestry
Trees, and other fibrous plants, provide the basic raw material that is processed into paper. It is important to note that paper is a byproduct of deforestation. As trees are processed for lumber and fuel, the chips and sawdust are collected for pulping, which is about 15 percent of the total volume of trees cut down.



Pulping
Sawdust, wood chips, and other fibrous media are mechanically or chemically broken down in order to separate the fibers into a pulp. Mechanical pulping requires more energy than chemical pulping but produces higher yields. However, the paper strength from chemical pulping is higher.

Smelting and Refining

Beneficiated ore is heated until it melts with reducing agents that remove non-metallic elements such as oxygen and sulfur. The resulting liquid metal is separated from the slag similar to how the impurities are skimmed when making broth and formed into working pieces such as ingots or billet. The process to raise the temperature of the ore above 2000˚ F requires enormous amounts of energy.



Polymer Cracking

Petroleum distillates are often long complex chains of hydrocarbons and natural gas is a mix of several types of hydrocarbon gases. In order to create more uniform and adaptable products, those hydrocarbons are put into a chamber with catalysts to lower energy costs that will "crack" apart the longer chains into smaller blocks, such as ethylene and propylene, which are used to build new polymer chains, also known as plastics.

Paper Milling

Fibrous pulp is spread out on screens and absorptive mats that move through heated rollers stretching, compressing, and extracting moisture from the fiber. This process adheres the fibers together to create a roll of paper.

The scrap recycling industry connects the ends of the manufacturing supply chain. It has evolved in response to changing market dynamics and represents a key component in creating a circular economy.

2017 Volume of Scrap Material Processed in the United States *(metric tons)*

Iron and Steel	66,000,000
Paper	46,100,000
Aluminum	5,268,000
Copper	1,862,000
Lead	1,056,000
Zinc	67,000
Plastics	815,000 (2016)
Electronics	5 million+ (est.)
Tires (# of tires)	110,000,000 (2016)

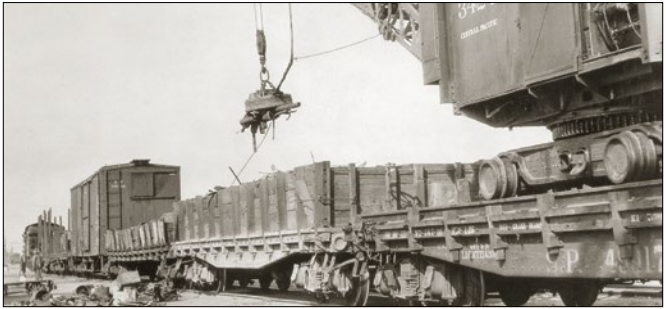
History of Scrap Recycling

Since the dawn of civilization and the earliest attempts at manufacturing, humans have recognized the intrinsic value of scrap and the benefits associated with using and re-using existing products to create new goods.

In the early days of recycling, scrap peddlers would typically buy and trade relatively small quantities of used household items, used farm equipment, and other goods.

As manufacturing ramped up and became more complex in response to society's expanding needs, scrap recycling took on even greater importance, adapting not only to market drivers, but also shifting priorities in the context of our finite natural resources.

In the second half of the 20th century, the scrap recycling industry continued to grow, becoming more innovative, competitive, and capital-intensive. In the last several decades, the introduction of containerization and the surge in commodities demand from China and other developing economies helped to create an even more globalized scrap marketplace.



What Is Scrap and Where Does It Come From?

Scrap is a valuable commodity. It is not waste. Recyclers process scrap from a number of sources, including used and end-of-life products, off-spec and overrun material from manufacturing processes, and recyclables from commercial and industrial operations and municipal programs. Recyclers process scrap into specification-grade products that manufacturers--such as steel mills, foundries, paper mills, compounders, extruders, and fabricators--purchase and use as ingredients in the manufacture of new products. In its processed form, ferrous (iron and steel) and nonferrous (copper, aluminum, lead, nickel, and zinc) metals, paper, plastic, rubber, electronics, glass, and textiles are produced into hundreds of different grades, each meeting globally accepted specifications that are designed to meet the needs of manufacturers worldwide.

There are two major sources of scrap supply. **Obsolete scrap** comes from a wide range of used products including end-of-life cars and trucks, old newspapers and magazines, used appliances, demolished buildings, used beverage containers, consumer goods, and much more.

Scrap generated by the manufacturing process, known as **prompt, prime, or new scrap**, comes in a variety of forms including metal clippings, stampings, and turnings. Because new products are continually entering the marketplace, scrap recyclers need to be extremely innovative in order to keep up with commodity and end-use market developments.

Scrap can be grouped into categories including: ferrous scrap, which includes items made from iron and steel like old automobiles and machinery; nonferrous scrap made of other metals such as aluminum, copper, lead, zinc, nickel, and tin; electronics scrap including used TVs, computers, cell phones, and other electronic equipment; and nonmetallic scrap such as recovered paper and fiber, plastics, rubber and tires, glass, and textiles.

ISRI estimates that approximately 900 million metric tons of scrap metal, recovered paper and fiber, plastic scrap, used electronics, and other scrap commodities were consumed last year by manufacturers around the globe. As the world's largest supplier of scrap, the United States annually processes approximately 130 million metric tons of scrap commodities per year, providing vital raw materials to manufacturers and helping to fuel global growth.

How is Scrap Processed?

Regardless of the commodity being recycled, the basic goal of all scrap processing is the same: to transform unprocessed recyclable materials into smaller and/or denser forms of specific composition that meet a commercial-grade specification. With this rigorous processing, the finished scrap products are easier to handle and transport, and they are ready to use in manufacturing processes.

Unprocessed scrap usually arrives at a recycling operation by truck and is weighed on a scale. Then the truck is emptied and weighed again to determine the weight of the delivered scrap. The recycler determines how much to pay the seller based on the type of material in the load and its net weight. Recyclers purchase scrap materials from numerous suppliers each day to keep up with the demands of their customers, which use the scrap to make new products.

At the weighing-in stage, recyclers use a combination of sophisticated equipment and best practices, including radiation detectors, visual inspections, source control, and a nationwide theft-alert notification system to minimize the possibility of receiving unwanted materials in incoming loads of recyclable materials.

Sorting is most often the first step in the actual processing of scrap. Trained employees use forklifts, wheel loaders, or material handlers equipped with magnets or grapples to sort materials into basic commodity groups. The scrap is then processed using machines like shears, balers, shredders, granulators, wire choppers or briquetters. Recyclers increasingly have on place advanced sorting and recovery systems that use eddy-current separators, optical scanners, X-rays, air jets, and other technologies to further refine the scrap into the grades required by their customers for manufacture into new products.

Throughout the recycling process, the industry is committed to worker health and safety as well as environmental protection. To meet those goals, more recyclers are pursuing certification under programs such as the Recycling Industry Operating Standard™, or RIOS™

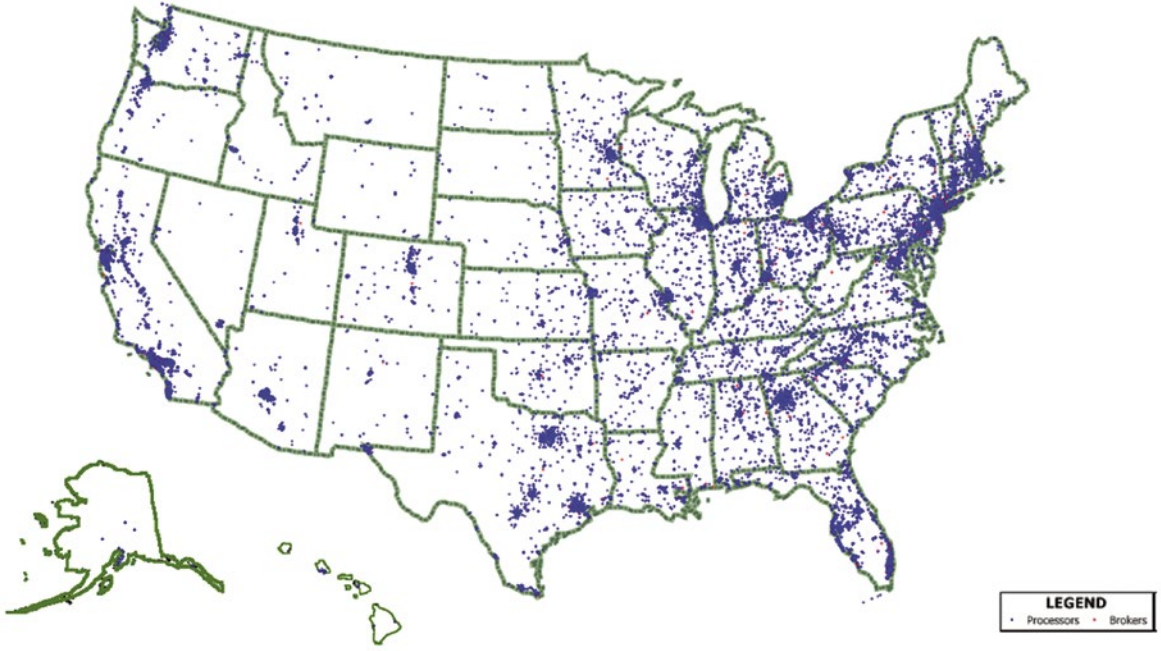
While recycling facilities vary considerably in size and layout, key variables that affect a plant's efficiency include maintaining a smooth flow of traffic and minimizing the number of times that material is handled. Scrap facilities have traditionally been located near major manufacturing centers. Today, recycling facilities are found all across the United States and throughout the world.

MRFs, or Materials Recovery Facilities, are recycling facilities that contract with municipalities specifically for processing residentially-sourced scrap. These are complex facilities that utilize a complicated series of conveyors, optical and infrared scanners, blowers, sink float pools, and hand sorting lines to separate paper from plastics from glass bottles from aluminum cans, and so on.

In addition to outdoor recycling plants, an increasing number of high-tech facilities with advanced sorting systems for processing plastics, electronics, recovered paper, and other commodities are located indoors.

Where are Scrap Recycling Facilities Located?

U.S. Census Bureau data show that there are more than 8,000 recycling facilities operating in the United States.



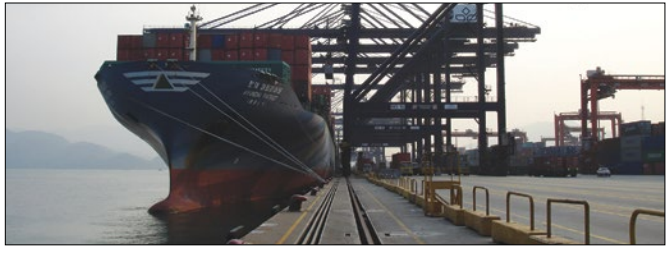
How Is Scrap Transported?

The three most common modes of U.S. domestic scrap transport are by truck, rail, and barge, in addition to intermodal shipments that use more than one mode. Each mode of shipment has its own costs and benefits.

While shipping via trucks can be a high per-unit cost option, trucks are a significant mode of domestic transport for scrap, especially for intra-regional scrap flows. Shipment by rail can be a less costly option per ton than trucking, and railcars have a greater tonnage capacity than trucks, although during times of tight railcar availability this mode of transport can be less predictable. In the United States, according to figures from the Association of American Railroads, 41 million tons of scrap and waste materials originated on Class I railroads in 2017.

Barges and domestic waterborne shipments are a third major mode of transport for scrap. While adverse weather conditions can significantly impact barge traffic, barges are often the lowest-cost option on a per-unit basis.

The containerization of scrap shipments opened overseas markets to a much wider range of U.S. scrap processors, although a large portion of U.S. scrap exports are still shipped as bulk (unpackaged) cargo. In 2017, the United States exported nearly 38 million metric tons of scrap around the world. According to preliminary data from the United Nations Comtrade database, approximately 110 million tons of scrap valued at more than $105 billion were exported globally in 2017.



How is Scrap Consumed?

Scrap dealers and brokers sell scrap commodities to a wide range of consumers at home and abroad such as paper mills, plastic manufacturing plants, steel mills, foundries, copper wire and brass mills, secondary aluminum smelters, and other customers.

Manufacturers prize scrap as a raw material input due in part to the cost and energy savings gained through using scrap. For example, domestic steelmakers rely on iron and steel scrap to make roughly two out of every three pounds of steel produced. Copper scrap accounted for 34 percent of total U.S. apparent copper consumption in 2017. Metal scrap can practically be melted and re-melted an infinite number of times to make products and parts for everything from cell phones to automobiles, bridges, and buildings. Manufacturers also rely on scrap commodities to produce a wide array of nonmetallic goods including new paper and cardboard products, plastic containers, playground surfaces, and much more. And while overseas markets have been a growing source of demand for U.S. scrap, it's worth remembering that most of the scrap that gets processed in the United States is also consumed domestically.

According to ISRI estimates, more than 70 percent of the approximately 130 million metric tons of recovered paper, plastic, rubber, metal, glass, textiles, and other scrap commodities that were processed in the United States in 2017 was consumed at home.

Evolving Technologies

Today, the scrap recycling industry utilizes a wide range of capital equipment including high-tech shredders, shears and balers, as well as the optical scanners, x-rays, and air jets that are used to separate recycled materials. From tires and rubber to electronics, scrap recyclers are investing in new separation technology and equipment to stay ahead of competitors and gain new revenue channels.

As scrap recyclers strive to meet rising consumer demands and improve their operational, quality, environmental, health and safety, and management systems, the use of third-party certifications has been on the rise. The marketplace is pushing recyclers to become certified through programs like RIOS™ – to improve health and safety, ensure environmental compliance, meet customer demands, and secure a competitive advantage. RIOS™ is a management system certification that is designed specifically for recyclers that deal in any commodity.

How do Scrap Commodity Markets Work?

Scrap prices are subject to many of the same market forces as primary commodities and thus have been experiencing similar price volatility. Scrap is sold by the pound or ton depending on the commodity. For example, copper and plastics are sold by the pound, while steel and paper are sold by the ton. Scrap prices are subject to global market forces and can fluctuate daily, hourly, or even by the minute. Prices are set by the marketplace and reflect domestic and global manufacturing demands, changes in currency markets, transportation disruptions, energy prices, and the comparative cost and availability of virgin commodities.

Scrap has become a key feedstock utilized in manufacturing new products worldwide and supplies a significant amount of global raw material needs. As a world-traded commodity, scrap becomes less dependent on local supplies and markets every day.

Scrap material moves to where demand directs it regardless of its original location. But there is a critical difference between how primary commodity and scrap commodity prices are determined. Unlike primary commodities that can have large inventory swings, the scrap trade is a volume business. Scrap recyclers do not buy scrap inherently expecting to hold it until prices increase. They buy scrap to meet their customers' monthly requirements.

Prices are based on a marketplace made up of consumers who use these recycled materials to manufacture steel, aluminum, copper, paper, electronics, glass, and rubber products, among others. Scrap processors purchase scrap from thousands of sources each day to keep up with expected consumer demand.

After acquiring and then processing scrap into specification-grade material, scrap processors deliver the material based on current market conditions dictated by the customer. Customers have orders to fill and thus buy scrap. Consequently scrap processors are viewed as the price taker, not the price setter, hence the phrase, “Scrap is bought, not sold.”

The **ISRI Index** is a weighted index of ferrous scrap, copper scrap, aluminum scrap, and recovered paper and fiber prices. Scrap prices and supply are closely connected as prices provide the incentive to bring recycled materials to the marketplace. When the ISRI Index fell to the lowest level since the Great Recession in November 2015, supplies were constrained, placing a floor under the market and setting the stage for a price recovery starting in the first half of 2016 and continuing into early 2018. Given the cyclical nature of commodity markets and industrial production, it should come as no surprise that the scrap industry faces similar business cycles.

ISRI Index

ISRI Index: Jan 2012 - Jun 2018 *(Jan 1998 = 100)*

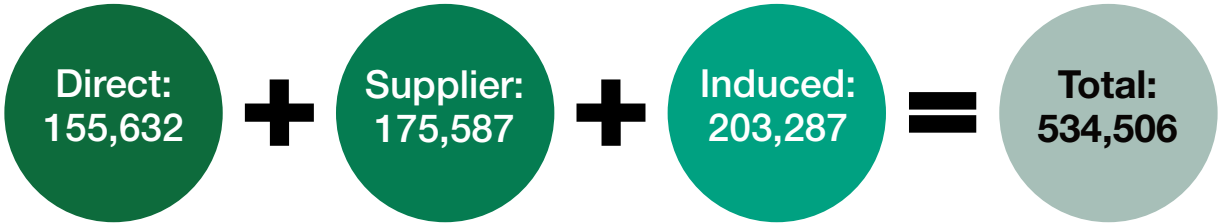
Economic Benefits

Recognized as one of the world's first green industries, the scrap recycling industry creates and supports jobs while also having a positive impact on the environment. In 2017, the independent economic consulting firm of John Dunham and Associates performed an economic impact analysis to document the size and scope of the scrap recycling industry in the United States as well as its significant contribution to the U.S. economy in terms of employment, tax generation, and overall economic benefit.

The U.S. scrap recycling industry is a thriving economic engine and job creator. Specifically, the study found that the people and firms that purchase, process, and broker recycled materials to be manufactured into new products in America support 534,506 well-paying jobs in the United States and generate $117 billion annually in economic activity.

According to the Dunham study, U.S. scrap processors and brokers directly employ more than 155,000 people and indirectly support more than 375,000 other jobs. These workers earn $34.3 billion in wages and benefits, while the industry pays $13.2 billion in direct federal, state, and local taxes, excluding state, and local sales taxes.

The Dunham Study is a snapshot of the industry as of April 2017.



Environmental Benefits

In addition to generating significant economic benefits, the scrap recycling industry is a pivotal player in environmental protection, resource conservation, and sustainable development. The industry recycled approximately 130 million metric tons of materials in 2017, transforming outdated or obsolete scrap into useful raw materials needed to produce a range of new products. In so doing, scrap recycling:

- Reduces the need to mine for new ore, cut down more trees, and otherwise deplete our natural resources;
- Produces significant energy savings as compared to using virgin materials, thereby reducing greenhouse gas emissions; and
- Reduces the amount of material being sent to landfills, saving the land for better uses.

While market forces provide the incentives to recycle and consume scrap material, scrap recycling offers real sustainable solutions for balancing economic growth and environmental stewardship. Not only does recycling conserve our limited natural resources, it also reduces greenhouse gas emissions by significantly saving the amount of energy needed to manufacture the products that we buy, build, and use every day. The energy saved by recycling may then be used for other purposes, such as heating our homes and powering our automobiles.

Energy Savings

Recycling saves impressive amounts of energy which, in turn, reduces greenhouse gas emissions. According to figures from the U.S. EPA's Greenhouse Gas Equivalencies Calculator, the nearly 130 million metric tons of commodities recycled in the U.S. last year saved the CO_2 equivalent of 410 million tons of greenhouse gas emissions, equal to the energy use of more than 43 million homes for one year.

	Reduces Greenhouse Gas Emissions by (CO_2 equivalent)	Which is the Energy Equivalent to?
1 Car	8,811 lbs.	450 gallons of gasoline
1 Refrigerator	566 lbs.	29 gallons of gasoline
1 Computer & CRT Monitor	404 lbs.	21 gallons of gasoline
1 Washing Machine	397 lbs.	20 gallons of gasoline
4 Tires	323 lbs.	17 gallons of gasoline
1 Television	81 lbs.	4 gallons of gasoline
10 lbs. of Corrugated Cardboard	40 lbs.	2 gallons of gasoline
1 Ton of Plastic Bottles	3,380 lbs.	173 gallons of gasoline

Scrap Exports and the U.S. Trade Balance

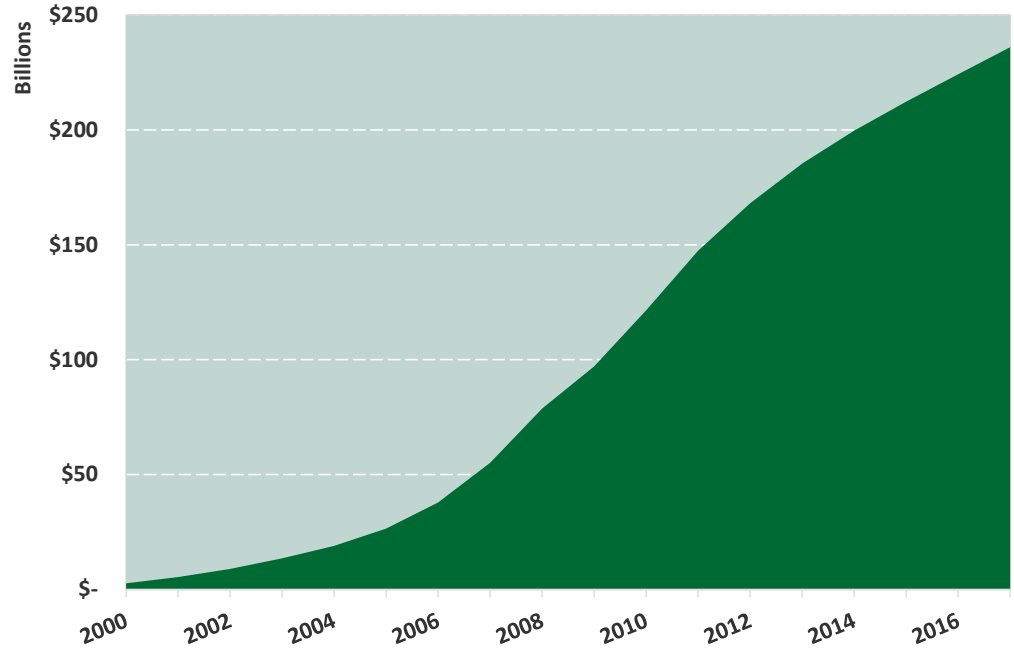
The scrap market has become increasingly global in recent decades. Worldwide, more than 800 million metric tons of scrap commodities are consumed each year. This globalized scrap market is a function of enhanced transportation and technological systems, rising world population with increased urbanization, and greater awareness of the benefits of using scrap commodities in light of the Earth's limited natural resources.

Rising global demand for scrap is good for the environment and, for the U.S. It provides a useful outlet for excess scrap supply. U.S. export sales of scrap also significantly benefit the U.S. trade balance. According to figures from the U.S. Census Bureau and U.S. International Trade Commission, the United States exported nearly 38 million metric tons of scrap commodities valued at $17.9 billion in 2017. Recovered paper and ferrous scrap exports typically represent the bulk of U.S. scrap exports by volume, accounting for more than 32 million metric tons combined last year, while nonferrous and precious metal scrap have some of the highest per-unit scrap values.

Major export destinations for U.S. scrap last year included China ($5.6 billion), Canada ($2.1 billion), Mexico ($1.1 billion), Turkey ($1 billion), India ($923 million), Germany ($910 million), and South Korea ($778 million).

Did you know that since 2000, net exports of U.S. scrap have made a positive contribution to the U.S. balance of trade amounting to more than $235 billion?

Cumulative Impact of U.S. Scrap Exports on the U.S. Trade Balance since 2000 *($ billions)*



CHAPTER IV: Scrap Commodities

Scrap commodities are a special category of raw material commodities because their sources are often times as important as their composition. This added value makes scrap a hybrid of pure raw material and manufactured good. Like a bushel of corn or a bale of cotton, scrap materials are commodities that have a value based on how they may be consumed and what buyers are willing to pay to consume them. Commodities are traded to areas with the technology to consume them. For example, Turkey is a market economy that has the technology and capacity to produce many steel products but does not have sufficient domestic ore or scrap to meet its steelmaking needs. So market participants in Turkey will trade with U.S. scrap yards for the scrap they need to make new steel products. Rather than thinking of a single long chain, the supply chains in the global marketplace weave and interlock together much like the loops of a knitted sweater. The various commodities are like different colors and types of yarn woven together to represent the industry marketplace.

Iron and Steel

Iron and steel scrap, also referred to as ferrous scrap, comes from many consumer and industrial products such as automobiles, steel structures, household appliances, railroad tracks, ships, farm equipment, and other sources. The largest single source of obsolete ferrous scrap in the United States is used vehicle scrappage, which is closely related to new car sales. According to figures from the U.S. Bureau of Economic Analysis, light vehicle sales totaled 17.1 million units in 2017.

In addition to obsolete scrap, prompt scrap, which is generated from the manufacturing process, accounts for approximately half of the ferrous scrap supply. Today, ferrous scrap is the most recycled material in the United States and worldwide. In the United States alone, the U.S. Geological Survey estimates that 66 million metric tons of iron and steel scrap were processed in 2017.

How Is Ferrous Scrap Prepared?

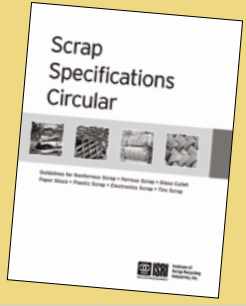
While a small proportion of unprepared obsolete ferrous scrap can be directly used by consumers, the vast majority of purchased iron and steel scrap requires processing by the scrap recycling industry in order to be made into new goods. Scrapyards use a variety of processes including sorting, shearing, shredding, torching, and baling to prepare ferrous scrap according to commodity-grade specifications.

The process of shredding, which was developed in the late 1950s, allows for whole cars, appliances, home fixtures, and other end-of-life products to be quickly shredded into fist-size pieces of metal, greatly increasing scrap processors´ ability to handle large items and to separate nonferrous material. In 2017, *Scrap* magazine reported that more than 350 shredders are installed in North America.

In addition to shredded, ferrous scrap can be grouped by prime scrap (including busheling, bundles, and clips), cut grades such and heavy melting steel, and foundry and miscellaneous grades such as machinery cast.

Ferrous Specifications

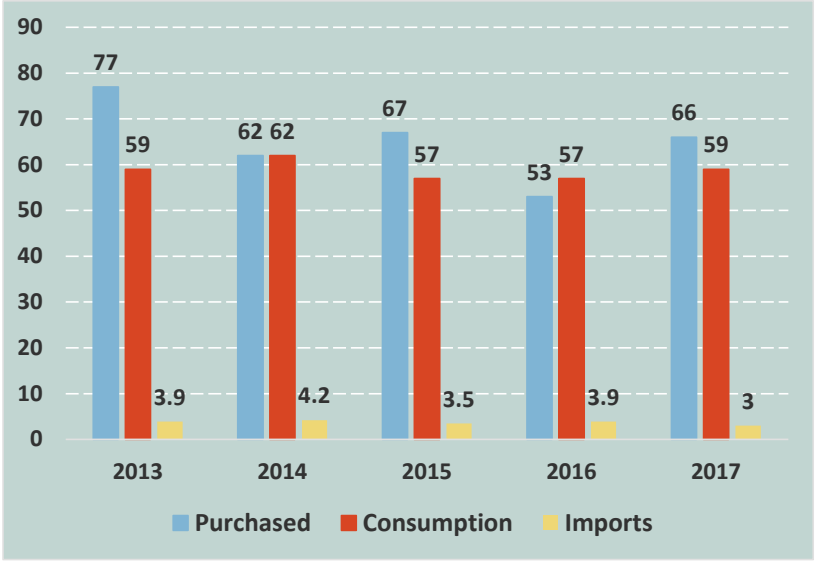
In the 1920s, the U.S. Department of Commerce worked with the Institute of Scrap Iron and Steel and other industry groups to create specifications for ferrous scrap. These specifications helped facilitate ferrous scrap trading to ensure that buyers got what they asked for and sellers could more easily describe the sort of scrap they were trying to sell. Ferrous scrap specifications were codified with a three digit number system. For example, 211 refers to a specific sort of steel, Shredded Steel of an approximate density in this case, that generally comes from discarded automobiles processed through a shredder and magnetically separated from the nonferrous metals.



Stages of Ferrous Scrap Processing

FERROUS SCRAP → Sorting → Shredding → Media Separation → Shearing → Baling

U.S. Ferrous Scrap Purchases, Consumption, and Imports *
2013 - 2017 *(millions of MT)*



Sources: U.S. Geological Survey, U.S. Census Bureau, ISRI estimates
** Data excludes stainless steel and alloy steel scrap*

Old Cars Can Become A New Bridge

The steel in cars can be recycled and used to build other things, like bridges.
Did you know:

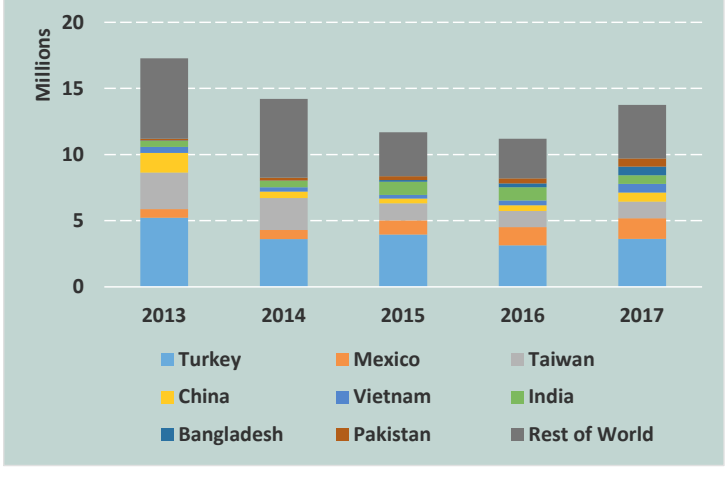
- Recycling one car saves more than 2,500 lbs. of iron ore, 1,400 lbs. of coal, and 120 lbs. of limestone.
- Steel is the most recycled material in the United States. On average, the U.S. processes enough ferrous scrap daily, by weight, to build 25 Eiffel Towers every day of the year.
- Recycling steel requires 60 percent less energy than producing steel from iron ore.
- By using ferrous scrap rather than virgin materials in the production of iron and steel, carbon dioxide emissions are reduced by 58 percent.

Sources: JASON Learning, ISRI

U.S. Ferrous Scrap Exports

Thanks to our large industrial base and existing supply of obsolete scrap, the United States is the world's leading ferrous scrap exporting country. Key export markets for ferrous scrap in recent years have included Turkey, Mexico, Taiwan, India, South Korea, China, and Canada. In 2017, the U.S. exported 13.8 million metric tons of ferrous scrap (excluding stainless and alloy steel scrap) valued at $4.1 billion to 75 countries worldwide. A new wave of infrastructure developments around the world and the volatility of global trade has led to shifts in trade patterns and stockpiling in industrialized and major developing economies. As world markets recognize their need for steel, U.S. ferrous scrap export volumes have rebounded in 2017.

U.S. Ferrous Scrap Exports by Major Destination 2013-2017 *(in metric tons)*



Sources: U.S. Census Bureau, U.S. International Trade Commission

Nonferrous Metal

Nonferrous metals, such as aluminum, copper, lead, nickel, tin, and zinc, do not degrade or lose their chemical properties in the recycling process. As a result, nonferrous metals have the capacity to be recycled an infinite number of times.

Making up less than 10 percent of the total quantity of recycled material in the United States last year, ISRI estimates that nonferrous metal scrap — including highly valued precious metal scrap — accounted for more than half of the total value of U.S. scrap recycling industry earnings in 2017. More than 8.5 million metric tons of nonferrous scrap valued at approximately $30 billion 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, foundries, and other industrial consumers in the United States and more than 70 countries worldwide. These consumers rely on nonferrous scrap as a competitive, environmentally-friendly and energy-efficient input to make brand new products, continuing the nonferrous metal life cycle. The Bureau of International Recycling (BIR) estimates that almost 40 percent of the world's demand for copper is met using recycled material, while more than 80 percent of the zinc available for recycling is eventually recycled.

Stages of Nonferrous Scrap Processing

Nonferrous Specifications

If you talk to anyone in the world who processes metals for a living and mention the word Zorba, Honey, Radio, or Saves, you're talking about nonferrous metals like aluminum, copper, lead, and zinc. You're also talking about combinations, shapes, sources, and chemical compositions to some degree. In 1914, the National Association of Waste Material Dealers began categorizing the different kinds of scrap metals that recyclers were processing to be used by manufacturers. Many of these transactions were made via teletype messages (like SMS text messages of today) and were charged by the letter. In order to keep the costs down, NAWMD used four-or five-letter code names for various types of nonferrous scrap. Berry, for example, means high quality (No. 1) copper wire that is free of virtually any other metals. Twitch refers to aluminum collected from shredding automobiles that went through a specific process of media separation to ensure a certain level of purity.

Aluminum

Aluminum holds the distinction of being both the youngest and the most widely used among all the base nonferrous metals in the United States. Aluminum is a lightweight, ductile, malleable, and corrosion-resistant metal that makes it a popular choice with manufacturers. As with other nonferrous metals, aluminum is also inherently recyclable and recycled aluminum is highly valued as a raw material input for new aluminum production. In 2017, USGS figures show aluminum metal recovered from purchased new and old scrap in the United States totaled about 3.7 million metric tons.

Aluminum can be recycled from a wide range of obsolete products including used beverage containers, aluminum siding, old radiators, used wire and cable, automobile and truck wheels, as well as end-of-life vehicles and airplanes. ISRI estimates that aluminum recovered scrap represented more than 55 percent of total U.S. apparent aluminum consumption.

The U.S. Aluminum Industry

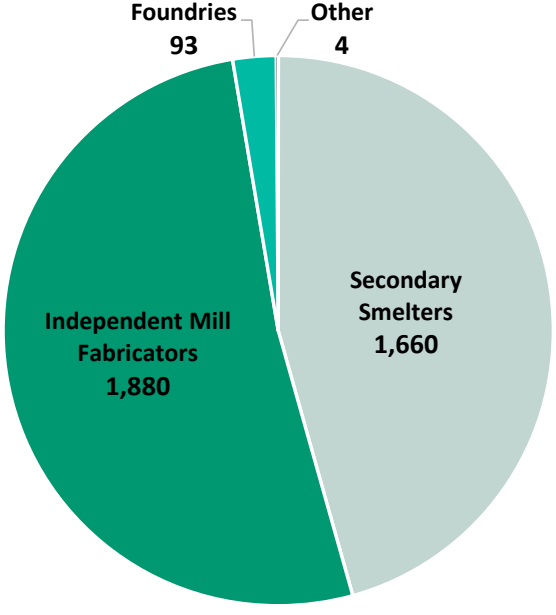
	Aluminum Recovered from Scrap (mt)	Total Aluminum Consumption (mt)	U.S. Aluminum Scrap Exports* (mt)
2017	3,700,000	6,580,000	1,568,000
2016	3,540,000	6,893,000	1,354,000
2015	3,460,000	6,719,000	1,550,000
2014	3,640,000	6,230,000	1,716,000
2013	3,480,000	6,196,000	1,867,000

** Includes UBC's and Remelt Secondary Ingot. Sources: USGS, Census Bureau, ISRI Estimates*

U.S. Aluminum Scrap Consumption

Of the 3.7 million tons of aluminum recovered from purchased scrap in the United States last year, USGS estimates that about 57 percent came from new (manufacturing) scrap and 43 percent from old scrap (discarded aluminum products). The aluminum recovered from old scrap, such as aluminum cans and other obsolete products was equivalent to about 27 percent of total U.S. apparent consumption of aluminum, according to the USGS figures.

U.S. Aluminum Industry Scrap Consumption by Consumer Type, 2017 *(thousand mt, metallic content)*



From One Can to Another

In this process, empty soda pop cans are recycled to make new cans.
Did you know:

- A used aluminum can is recycled and back on the grocery shelf in as little as 60 days.
- If all aluminum scrap processed in the United States were used solely to produce soda cans, the lined-up cans would stretch 25 million miles – the distance from Earth to Venus.
- Each year, United States domestically-recycled aluminum cans save the energy equivalent of 26 million barrels of gasoline – America's entire gas supply for three 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.

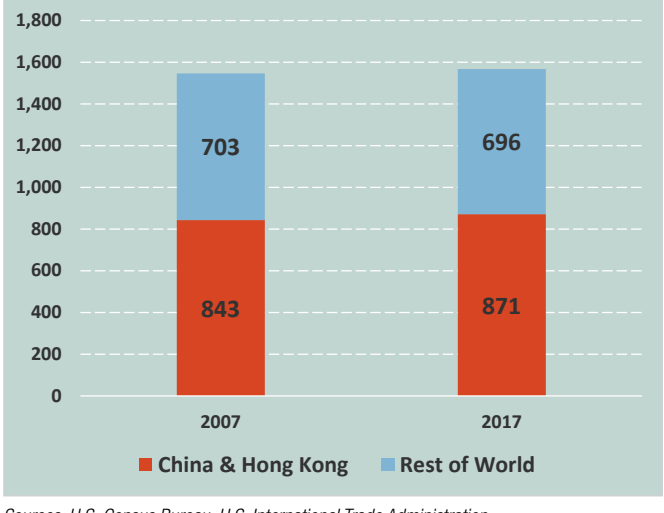
Sources: JASON Learning, ISRI

Aluminum Scrap Exports

Given the tremendous energy savings associated with using aluminum scrap – which can reach up to 95 percent compared with primary metal, global demand for aluminum scrap has rising sharply over the last decade.

China has been a key driver of global demand for aluminum scrap and remains the largest overseas buyer of aluminum scrap. Excluding Hong Kong (which is still treated as a separate export destination in official U.S. trade data), the United States exported more than 830,624 metric tons of aluminum scrap to China in 2017, accounting for 55 percent of total U.S. aluminum scrap exports.

U.S. Aluminum Scrap Exports to China & Hong Kong v. Rest of World, 2007 & 2017 *(in thousands of metric tons)*



Sources: U.S. Census Bureau, U.S. International Trade Administration

Copper

Copper was one of the first metals used by humanity, with archaeological evidence indicating its use more than 10,000 years ago. Today, copper remains a vital commodity used in construction, electrical equipment, transportation, consumer goods, and other products.

Copper scrap is used at smelters and refineries to produce refined copper and is used at the semi-fabrication stage to produce copper rods, bars, wire, and other semi-fabricated shapes, which are transformed into power cables, plumbing tubes, and other end-use products.

According to the U.S. Geological Survey, in 2017 old scrap provided 145,000 metric tons of copper and purchased new scrap – derived from fabricating operations – contributed 715,000 metric tons of contained copper. Major consumers of copper and copper alloy scrap in the United States last year included brass mills (80 percent), smelter, refineries, and ingot makers (15 percent), and chemical plants and miscellaneous manufacturers (5 percent).

The U.S. Copper Industry

	Copper Recovered from Scrap (mt)	Total Copper Usage (mt)	Copper Scrap Exports (mt)
2017	860,000	2,565,000	1,002,000
2016	810,000	2,440,000	943,000
2015	830,000	2,450,000	955,000
2014	820,000	2,380,000	1,044,000
2013	810,000	2,410,000	1,155,000

Sources: USGS, Census Bureau, ISRI Estimates

In 2017, ISRI estimates that copper scrap usage in the United States represented 34 percent of total U.S. apparent consumption of refined copper. Globally, the International Copper Study Group has estimated world copper recycling input rates of between 33-35 percent in recent years, while the overall recycling efficiency rate (the efficiency with which old and new scrap are collected and recycled) has regularly exceeded 60 percent.

Copper and Copper Alloys

There are literally hundreds of different types of copper and copper alloys that use tin, lead, zinc, and other metals to form metal alloys. These metals can be subdivided into several main categories including:

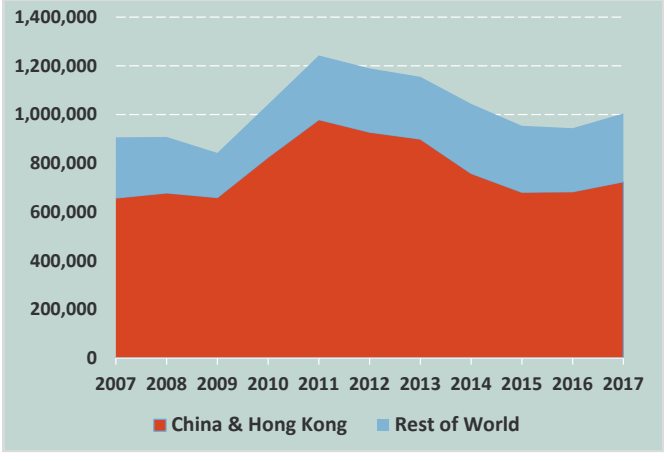
- Coppers
- High-copper alloys
- Brasses
- Bronzes
- Copper nickels
- Copper-nickel-zinc alloys
- Leaded coppers
- Special alloys

Scrap processors have become experts at identifying different types of copper and copper alloy products in order to better ascertain their worth. ISRI specifications with names like Berry, Birch/Cliff, Druid, Honey, Ocean, and Pales cover a wide range of red metal products such as bare and insulated wire, light copper, refinery brass, red brass, yellow brass, brass ammunition, clippings, radiators, tubes, and more. As new products and alloys enter the recycling stream, ISRI specifications are continually being updated to reflect today's marketplace. Some countries, such as India, utilize ISRI specifications in their import/export customs laws.

Copper Scrap Exports

In 2017, the United States exported 724,000 metric tons of copper and copper alloy scrap to mainland China and Hong Kong valued at $1.8 billion. China and Hong Kong accounted for 72 percent of all U.S. copper scrap exports by volume last year. Other important overseas markets for U.S. copper scrap export sales in 2017 included Canada ($284 million, up 48% from 2016), Germany ($143 million up 18% from 2016), South Korea ($130 million, up 19% from 2016), India ($72 million, up 9% from 2016), Japan ($90 million, up 38% from 2016), and Belgium ($57 million, stayed the same).

U.S. Copper Scrap Exports to China & Hong Kong vs. Rest of World 2007 - 2017 *(metric tons)*



Sources: U.S. Census Bureau, U.S. International Trade Commission

Nickel and Stainless Steel

For chemists, designers, and engineers, nickel is a transition element that exhibits a mixture of nonferrous and ferrous metal properties. Among manufacturers who deal with this metal, it's much less common for nickel to be examined on its own than as an element of corrosion-resistant alloys such as austenitic stainless steel. There are plenty of reasons why this difference in thinking occurs. Types of 18-8 stainless steel (named for their 18 percent chromium and 8 percent nickel content) account for large quantities of nickel consumption and also serve as an important scrap source for nickel. USGS figures show that 48 percent of the primary nickel consumed in the United States in 2017 went into stainless and alloy steel production, followed by nonferrous alloys and superalloys (40 percent), electroplating (8 percent), and other uses (4 percent).

Nickel, hi-temp, and stainless steel scrap come in a variety of forms such as wrought solids, clips, and turnings that are covered under ISRI specs from Aroma to Zurik. According to USGS, 90,000 tons of nickel were recovered from purchased scrap in 2017, while 1.33 million metric tons of home and purchased stainless steel scrap were consumed in the United States last year.

The U.S. Nickel Industry

	Nickel Recovered from Scrap (mt)	Total Nickel Usage (mt)	Stainless Steel Scrap Exports (mt)
2017	90,000	231,000	488,000
2016	90,000	210,000	654,000
2015	101,900	210,000	514,000
2014	102,000	238,000	548,000
2013	88,800	199,000	643,000

Sources: USGS, Census Bureau, ISRI Estimates

Global Stainless Steel Production

Stainless and Heat Resisting Steel Meltshop Production *(Ingot/Slab Equivalent)*
Year 2017 *(in thousands of metric tons)*

	Qrt 1	Qrt 2	Qrt 3	Qrt 4	2017
Europe	1,980	1,902	1,665	1,830	7,377
USA	721	699	680	654	2,754
China	6,125	5,920	7,076	6,652	25,774
Asia (w/o China and S. Korea)	1,992	1,958	1,975	2,105	8,030
Others	845	857	1,140	1,304	4,146
World	11,664	11,335	12,536	12,545	48,081

Provided by: International Stainless Steel Forum, Brussels

Lead and Zinc

Lead and zinc are the two most widely used nonferrous metals after aluminum and copper. Lead has been used for centuries as a building material and to produce ceramic glazes, leaded glass and crystal, paints, and other protective coatings. Lead's importance as an industrial metal in the modern ages solidified due to the development of storage battery technology in the mid-19th century. The recycling of automotive-type batteries spawned a viable secondary lead smelting industry in the United States. In 2017, the U.S. Geological Survey reports that lead acid batteries again accounted for about 85 percent of domestic lead use.

Other uses of lead include rolled and extruded products, shot and ammunition, alloys, pigments and compounds, and cable sheathing. USGS figures show that about 1 million metric tons of secondary lead was produced in the United States in 2017 – an amount equivalent to 60 percent of apparent domestic lead consumption, of which nearly all was recovered from postconsumer scrap.

The U.S. Lead Industry

	Lead Recovered from Scrap (mt)	Total Lead Usage (mt)	Lead Scrap Exports (mt)
2017	1,000,000	1,680,000	56,000
2016	1,070,000	1,540,000	45,000
2015	1,120,000	1,540,000	47,000
2014	1,130,000	1,560,000	36,000
2013	1,150,000	1,710,000	34,000

Sources: USGS, Census Bureau, ISRI Estimates

Zinc is mostly used as a mineral additive to protect from corrosion (galvanizing) and create useful metal alloys such as brass and bronze. Its low melting point makes it useful as a die-casting alloy and for rolling applications where more durable dies would be too expensive. Zinc is also consumed by compounding it with rubber, chemical salts, paint, and agricultural products. In the United States, USGS figures show that about 25 percent (or 33,000 metric tons) of the refined zinc produced in the United States was recovered from secondary materials.

Zinc scrap can come from a range of sources including old and new diecast zinc, new zinc clippings, drosses from galvanizing, skimmings, and ashes. Steelmaking dusts and zinc-coated steel scrap also remain rich sources of recoverable zinc. Prices for scrap zinc, such as galvanizing drosses, were frequently quoted as a percentage of the LME price. Other scrap items – such as die cast – are frequently quoted in cents per pound.

The U.S. Zinc Industry

	Zinc Recovered from Scrap (mt)	Total Zinc Usage (mt)	Zinc Scrap Exports (mt)
2017	67,000	870,000	34,000
2016	65,000	780,000	30,000
2015	120,000	960,000	55,000
2014	166,000	965,000	71,000
2013	238,000	935,000	88,000

Sources: USGS, Census Bureau, ISRI Estimates

Precious Metals

Precious metals such as gold, silver, and platinum have long been valued as stores of wealth and for use in producing coinage, jewelry, and decorative arts. Today, precious metals are used in a wide range of applications including electronic and communications equipment, spacecraft, and jet aircraft engines, and can be found in everything from cell phones to catalytic converters.

Given the relative scarcity and high per-unit values of precious metals, they continue to be recycled at a high rate of recovery. The U.S. Geological Survey estimates that 120 tons of new and old gold scrap and 1,150 tons of silver scrap were recycled in the United States in 2017.

In addition, Census Bureau data indicate that more than 15,400 metric tons of precious metal scrap were exported from the United States in 2016 valued at nearly $3.6 billion.

U.S. Secondary Production of Silver & Gold 2013 - 2017 *(metric tons)*

Source: U.S. Geological Survey

Average Annual PGM Prices *($/Troy Ounce)*

Metal	2013	2014	2015	2016	2017
Platinum	$1,490	$1,388	$1,056	$990	$960
Plalladium	$730	$810	$695	$617	$860
Rhodium	$1,069	$1,174	$955	$697	$1,050
Ruthenium	$76	$65	$48	$42	$61
Iridium	$826	$556	$544	$587	$907

Source: U.S. Geological Survey

Recovered Paper and Fiber

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 more than 1.1 billion tons of recovered fiber and the recovery rate for paper and paperboard in the United States increased by more than 30 percent points to reach 65.8 percent in 2017.

The paper recycling segment of the scrap recycling industry collects, sorts, and processes the recovered fiber into specification grade products that were valued at more than $8.1 billion in 2017. These products are sold and transported to paper mills in the United States and worldwide for production into new packaging, office paper, tissue, newsprint, and a multitude of other paper products.

In the United States, more than three-quarters 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 valued at more than $3.2 billion was exported to more than 85 different countries in 2017, generating tremendous environmental benefits and energy savings while significantly helping the U.S. balance of trade.

The U.S. Recovered Paper and Fiber Industry

	New Supply (short tons)	Recovered (short tons)	Recovery Rate
2017	77,269,000	50,822,000	65.8%
2016	77,729,000	52,196,000	67.2%
2015	77,895,000	52,040,000	66.8%
2014	78,504,000	51,171,000	65.2%
2013	78,761,000	50,128,000	63.6%

Source: American Forest and Paper Association

Paper Grades

Recovered paper can be grouped into several main categories including:

OCC: An acronym for old corrugated containers, OCC contains a rippled middle layer that is sandwiched between two layers of linerboard. Mills use old corrugated containers to make new recycled-content shipping boxes, as well as recycled paperboard for product packaging.

News Grades: We don't see newspapers on every doorstep these days. However, paper recyclers get this quality of paper in different ways and it still has quite a useful place in the papermaking industry. Mills primarily use news grades to make new newsprint and in recycled paperboard and tissue, among other grades.

Mixed Paper: Mixed paper is a broad category that often includes items such as discarded mail, telephone books, paperboard, magazines, and catalogs.

High-Grade De-inked Paper: This grade is made of high grade paper such as letterhead, copier paper, envelopes, and printer and converted scrap that has gone through the printing process. It must first be de-inked before it can be reprocessed into high-grade paper products such as printing and writing papers or tissue.

Pulp Substitutes: Also high-grade papers, pulp substitutes are often shavings and clippings from converting operations at paper mills and print shops. Mills can use pulp substitutes in place of virgin materials to make high-grade paper products.

Stages of Recovered Paper and Fiber Processing

Paper Specifications

ISRI's *Scrap Specifications Circular* is used globally as a means of promoting consistency & quality in the trade of scrap – including recovered paper – within the United States and around the world. The terminology and standards contained within the ISRI Specs provide a common language for the global recycling community that allows everyone – regardless of their spoken language or geographical distance from their trading partner - to immediately understand the specific material being shipped, including allowable tolerances for contaminants or prohibitives.

Paper and fiber products are deceptively complicated and depend on rather specific mixtures. These products are also valued for properties such as being lightweight, absorptive, and flexible. The paper specifications that are important information for paper mills when formulating different kinds of paper. Paper specifications are generally referred to by a number such as Sorted Residential Papers & News (56), Hard White Envelope Cuttings (31), or Sorted Office Paper (37). These specifications help processors communicate to paper mill consumers about where the paper was collected from, the fiber content and composition, as well as the potential levels of other material contaminants.

U.S. Recovered Paper Exports

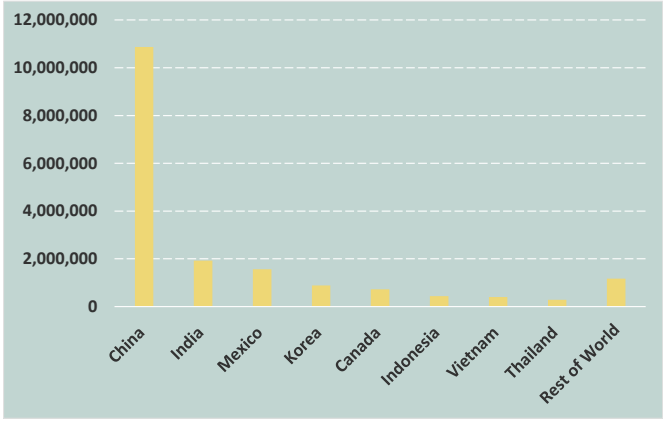
In addition to being consumed by domestic paper mills, the paper and fiber recovered in the United States helps to meet growing export demand as well. In 2017, the United States exported more than 18.3 million tons of recovered paper and fiber valued at more than $3.2 billion. By grade, corrugated exports accounted for 50 percent of all U.S. recovered paper and fiber exports last year, followed by mixed paper exports. China is the largest export market for U.S. recovered paper, with recovered paper export sales to mainland China alone valued at $1.7 billion in 2017.

U.S. Paper Stock Exports *(short tons)*

	Jan-Dec 2017
Corrugated	9,902,914
High Grade De-Inking	996,747
Mixed	3,909,449
Printed News	1,939,987
Pulp Substitutes	833,386
Other	2,623,808

Source – U.S. Census Bureau, U.S. International Trade Commission

2017 U.S. Paper Stock Export Volumes by Major Destination *(metric tons)*



Sources: U.S. Census Bureau, U.S. International Trade Commission

Old Newspapers Can Become New Again!

Newspapers go through a paper recycling process so that trees don't have to be chopped down to make new paper, protecting the environment.

Did you know:

- Since 1990, Americans have recycled more than 1.1 billion tons of recovered paper.
- Nearly 77 percent of all U.S. papermakers use some recovered paper to make everything from newspaper to paper packaging to office paper.
- In 2016, the United States recovered more than 52 million tons of paper; that's 335 lbs. of paper for every person in the country.
- Recycling one ton of paper saves 3.3 cubic yards of landfill space.

Sources: JASON Learning, ISRI

Plastics

The manufacture and distribution of plastics is everywhere. According to PlasticsEurope, the global production of plastics (and related polymer products such as adhesives and coatings) reached 335 million metric tons in 2016. 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. In the U.S. alone, ISRI estimates at least 5 million tons of post-industrial and post-consumer plastics were recycled in 2016. In addition, recycling of engineered and industrial plastics present tremendous opportunities that demonstrate plastics recycling today is "Bigger Than the Bin."

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. 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 material.

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 vital. 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 components 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 25 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. The wide variety and incompatibility of the various polymer blends is a complicating factor in that plastics may look identical but be made of different, incompatible polymers. However, it is incumbent upon 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. These challenges are not insurmountable and plastic recyclers are providing leadership to overcome them.

U.S. Plastic Bottle Recycling

	New Supply (short tons)	Recovered (short tons)	Recovery Rate
2016	1,753	6,172	28.4%
2015	1,797	5,971	30.1%
2014	1,812	5,849	31.0%
2013	1,798	5,764	31.2%
2012	1,718	5,586	30.8%
2011	1,604	5,478	29.3%
2010	1,557	5,350	29.1%
2009	1,444	5,149	28.0%
2008	1,451	5,366	27.0%
2007	1,396	5,683	24.6%
2006	1,272	5,424	23.5%
2005	1,170	5,075	23.1%

Source: Association of Plastic Recyclers, NAPCOR

Stages of Plastic Scrap Processing

Plastic Scrap Specifications

The plastic scrap market has been one of the fastest-developing scrap commodity markets. Plastic has a broad range of uses with new technological advancements happening on almost a yearly basis. ISRI, in partnership with our corporate and association partners, has been updating its plastic scrap specifications to reflect what is being traded in the plastic scrap marketplace. While chemists and plastic product manufacturers may be more concerned with the polymer composition, many incompatible plastic polymers can be used to create similar products. Is the takeout container you just received made from polyethylene, polystyrene, polypropylene, or polyethylene terephthalate? Is the plastic rigid or a flexible film? Was it extruded or thermoformed? Specifications about these various sources and categories help improve the process of recycling plastics that are being consumed everywhere.

Plastic Scrap Exports

Global demand for plastic scrap is impacted by the relative prices of primary resins and plastic scrap, which in turn are influenced by the volatility in natural gas and crude oil markets, among other factors. By volume, plastic scrap has become one of the most important globally-traded scrap commodities. According to figures from the United Nations Comtrade Database, more than 11.7 million tons of plastic scrap valued at nearly $5.2 billion were exported by all reporting countries in 2016. Of that total, the United States exported 1.9 million metric tons of plastic scrap, generating $730 million in export sales. Last year, the United States shipped plastic scrap to more than 80 countries around the world. China and Hong Kong together accounted for more than $320 million, or 49 percent of the total. This was a significant shift from 2016 when China and Hong Kong imported nearly $500 million of U.S. plastic scrap and were the destination of 68 percent of it. Other major export destinations for U.S. plastic scrap last year included Canada ($67 million), India ($58 million), Vietnam ($49 million), and Malaysia ($31 million). This sudden drop in the export sales of plastic scrap was due to the imposition of a trade ban on recyclable plastics by China, the world's largest consumer of plastic scrap recyclables.

U.S. Plastic Scrap Exports by Major Destination in 2017

	Trade Value ($)	Volume (metric tons)
China	$190,710,623	557,820
Hong Kong	$130,662,220	372,904
Canada	$67,454,563	135,795
India	$58,336,236	123,116
Vietnam	$49,389,260	137,042
Malaysia	$31,472,356	121,125
Mexico	$23,390,685	46,375
Thailand	$10,772,518	32,862
Taiwan	$9,299,167	33,976
Indonesia	$8,307,152	29,175
Colombia	$6,322,703	3,126
Australia	$5,647,017	2,036
El Salvador	$5,123,587	5,570
Belgium	$4,268,691	1,254
Spain	$4,178,527	8,594
Rest of the World	$28,098,830	56,966

Sources: U.S. Census Bureau, U.S. International Trade Commission

Household Plastic Can Be Recycled Over and Over Again in Manufacturing

Since 1950, the global production rate of plastic has grown steadily, and all signs point to continued growth. Because of this, there is a need to ensure that plastics are recycled when they reach the end of their useful lives so that we can protect our natural resources. While we are all familiar with the recycling of food, beverage, and other common plastic household containers, plastic recycling goes far beyond that. Engineered and industrial plastics are found in all types of products, from cars to refrigerators, and these plastics are being recycled every day as well.

Sources: JASON Learning, ISRI

Electronics

The U.S. electronics recycling industry has shown tremendous growth over the past decade. This maturing segment of the scrap recycling industry provides a boost of approximately $20.6 billion, including exports of $1.45 billion, to the U.S. economy (up from less than $1 billion in 2002) and employs more than 45,000 full time employees (up from 6,000 in 2002).

A study published by the U.S. International Trade Commission in 2013 found that the U.S. electronics recycling industry processed more than 4.4 million tons of used and end-of-life electronics equipment annually, not including white goods. Of the used electronic products collected, the study found that 83 percent are reused and recycled domestically — including scrap steel, aluminum, copper, lead, circuit boards, plastics, and glass. ISRI estimates that the volume of electronics recycled in the United States now exceeds 5 million tons per year.

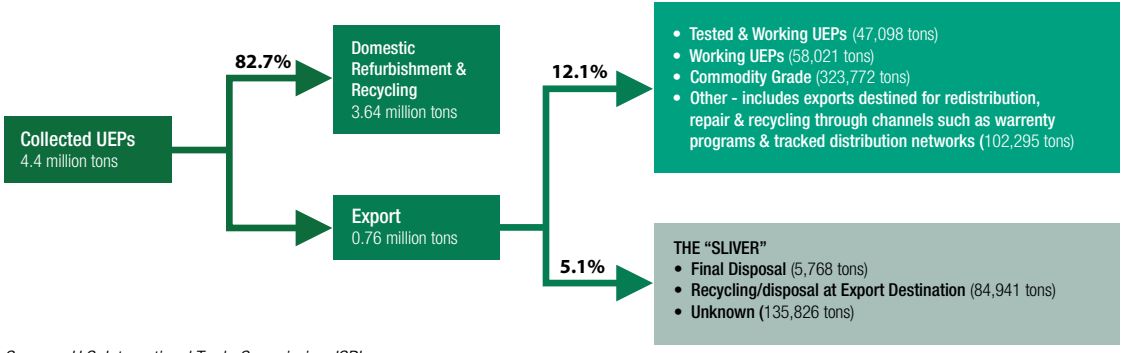
Sophisticated technology has helped electronics recyclers become highly efficient at recycling material into valuable, specification-grade commodities which re-enter the manufacturing stream as the basis for new products. For example - one metric ton of electronic scrap from personal computers contains more gold than that recovered from 17 tons of gold ore.

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 percent 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.

Flow of Used Electronic Products (UEPs)

In February 2013, the U.S. International Trade Commission (USITC) released its study on Used Electronic Products: An Examination of U.S. Exports, the most comprehensive report on the collection and export of UEPs that found more than 80 percent of the UEPs collected in the United States were recycled, reused, or refurbished domestically while only 17 percent of UEPs were being sent for export. A subsequent report released by the Massachusetts Institute of Technology (MIT) Materials Systems Laboratory and the U.S. National Center for Electronics Recycling (NCER) in 2013 indicates that more than 90 percent of used electronics collected for recycling within the United States remain in the United States for processing and are not exported. Taken together, the USITC and MIT/NCER studies provide irrefutable evidence that used electronics products are being reused and recycled in America, not "dumped" into developing countries as proponents of export controls have argued for years.



Sources: U.S. International Trade Commission, ISRI

Your Old Computer Can Become New Again

The U.S. electronics recycling industry annually processes more than 5 million tons of used and end-of-life electronics equipment – cell phones, TVs, computers, copiers, fax machines, music players, copiers, and even iPads! More than 70 percent of the electronics collected and recycled here in the United States can be sorted and used as ingredients in the manufacture of new products. Shredding or otherwise processing the electronics makes available the valuable materials contained within them – including steel, copper, aluminum, plastic, and glass. The rest are refurbished and resold as functioning electronic equipment both here in the United States and internationally.

Sources: JASON Learning, ISRI

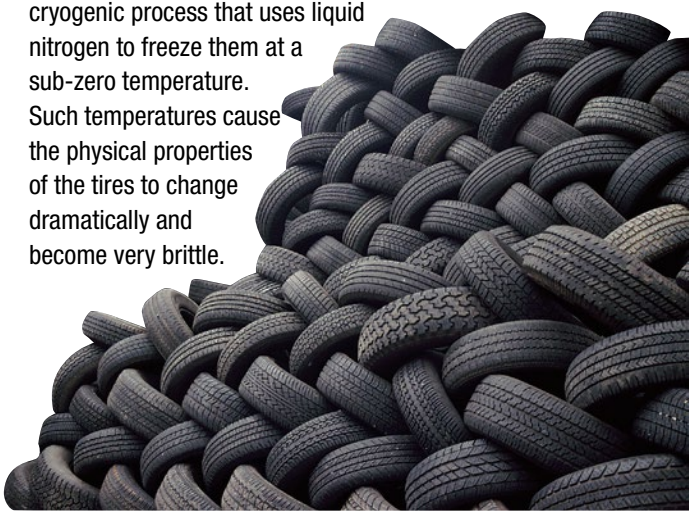
Tires and Rubber

In 2016, 110 million tires were processed by the U.S. recycling industry. 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. The tire and rubber recycling industry supports more than 8,500 jobs and had a total output estimated at $1.8 billion according to John Dunham & Associates. 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, composite product that is virtually indestructible under a variety of conditions. This makes tires difficult to recycle but recyclers have invested millions of dollars in technologies and equipment to recycle tires. Scrap tires now 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.



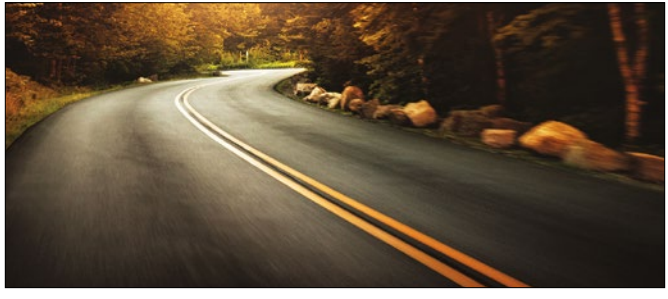
The tire is placed in an enclosure in which powerful hammers smash the tire apart.

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 2016, 1.2 billion pounds of crumb rubber, including 92 million used tires, were 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 rubberized asphalt — have become recognized for their preferable properties and is gaining in prominence and widespread use. 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.

For more information on recycled tires and rubber, visit **RecycledRubberFacts.org**.



Your Old Tires Can Help Build the Newest Highways

Each year, Americans generate 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 manufacture process with more than 90 percent recycled and reused annually. Rubber from scrap tires is used in the manufacture of landscaping mulch; playground mats and athletic surfaces; molded products such as railroad ties, flowerpots, garden hoses, welcome mats; and rubberized asphalt used in the paving of roads. Cutting-edge technologies are even being developed to allow scrap tires to be used in the manufacture of new tires!

Sources: JASON Learning, ISRI

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 2014, (the latest data available), 39.5 percent of beer and soft drink bottles were recovered for recycling, according to the U.S. EPA. Another 31.8 percent of wine and liquor bottles and 14.7 percent of food and other glass jars were recycled. In total, 32.5 percent of all glass containers were recycled, equivalent to taking 210,000 cars off the road each year.

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 percent of raw materials used in making new glass. An estimated 90 percent of recovered glass is used to make new glass bottles. 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 collection programs are also effective at yielding high-quality container glass.

Glass Container Recycling Loop

** A material recovery facility is a specialized plant that receives, separates, and prepares recyclable materials for manufacturers.*

Textiles

Textile recycling is a dynamic sector of the recycling industry that 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.

In recent years, 2 million tons of clothing and textiles have been recovered from individuals (post-consumer) and manufacturers (pre-consumer) in the United States each year that are recycled as new raw materials for the automotive, furniture, mattress, coarse yarn, home furnishings, paper, and other industries. This translates to about 12 lbs. of textiles per person in the Unites States. Demand for used textiles and clothing is growing rapidly overseas as well. According to figures from the Census Bureau, the value of U.S. exports of used textiles and clothing increased from $325 million in 2006 to nearly $667 million in 2017.

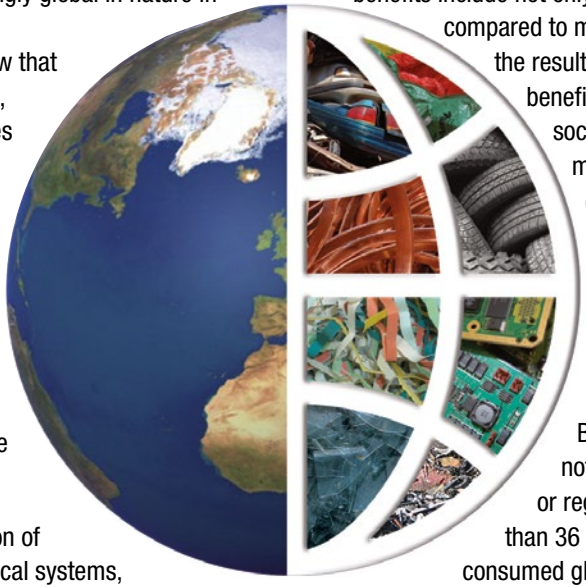
Used clothing collected from households is graded into a number of categories. Garments in good condition are exported for resale in parts of the world where new clothing is not affordable for many. This trade provides employment not only among the exporting nations, but also within the importing countries.

FAS Values of U.S. Used Textile and Clothing Exports, 2007-2017 *($)*

Source – U.S. Census Bureau, U.S. International Trade Commission

The Expanding Scrap Marketplace

The scrap market has become increasingly global in nature in recent decades. Figures from the United Nations Comtrade Database show that in 2017 (as reported through Sep 2018), showed exports of all scrap commodities from around the world were valued at approximately $105 billion. While the United States is the largest exporter of recycled commodities in the world and up until the end of 2017 China has been the world's dominant consumer of commodities (including scrap), the scrap marketplace is far from bilateral, stretching to virtually every corner of the globe.



The globalized scrap market is a function of enhanced transportation and technological systems, the rising world population and increased urbanization, as well as the heightened awareness of the benefits of using scrap commodities given the earth's limited natural resources. Those benefits include not only the relatively lower price of scrap as compared to most other raw material inputs, but also the resulting energy savings and environmental benefits about which manufacturers and society at large are becoming increasingly mindful. As a result, global scrap usage is expected to register continued growth in the decades ahead as the confluence of demographic, climate, sustainable development, market, and technological changes provide even greater incentives to use recycled goods.

But the growth in global scrap usage is not limited to any one commodity, industry, or region. BIR figures also show that more than 36 million tons of nonferrous scrap were consumed globally in 2011 and 233 million tons of recovered paper and fiber worldwide were consumed in 2012.

The following charts provide updated snapshots of where recycled commodities are being shipped and consumed by the major scrap commodities and markets around the globe. Of the 600 million metric tons of ferrous scrap consumed in 2017, the BIR reports that China consumed 148 million metric tons, followed by European Union countries (93 million), the United States (nearly 59 million), and Japan (nearly 36 million).

Ferrous Scrap Use by Major Consumers 2013-2017 *(million metric tons)*

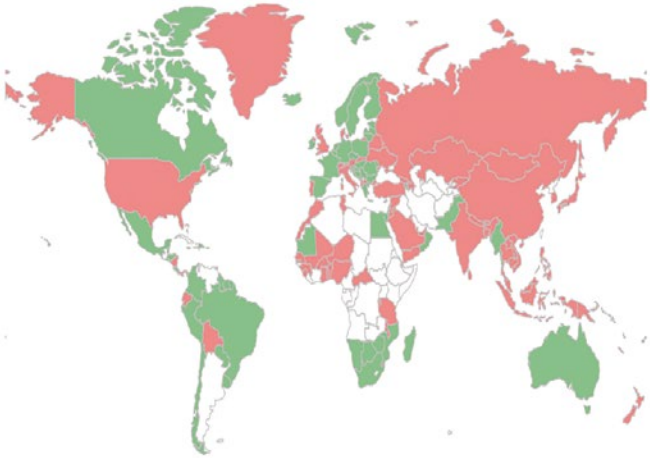
	2013	2014	2015	2016	2017	% 2017/2016
China	85.7	85.5	83.3	90.1	147.9	N.A.*
EU-28	90.3	91.6	90.61	88.4	93.35	+5.6
U.S.A.	59.0	62.0	56.5	56.7	58.8	+3.7
Japan	36.7	36.9	33.53	33.57	35.8	+6.6
Korea Rep.	32.7	32.6	29.85	27.4	30.5	+11.3
Turkey	30.4	28.2	24.1	25.9	30.3	+17.0
Russia	25.9	30.7	27.2	27.8	28.5	+2.5

**No direct comparisons can be made because most of the steel scrap consumed by the outdated induction furnaces was not included in the figures for 2016 and for preceding years. Source: Bureau of International Recycling*

Ferrous Scrap Export Market Development *(Global participation: Green-increased, Red-declined)* 2016 to 2017

	Country	Market Share 2017	Gain in Market Share
1.	South Africa	1.28%	↑ 0.78%
2.	Canada	4.35%	↑ 0.55%
3.	Australia	2.00%	↑ 0.43%
4.	Belgium	3.38%	↑ 0.28%
5.	Poland	1.82%	↑ 0.23%
6.	Singapore	1.45%	↑ 0.18%
7.	Latvia	0.51%	↑ 0.17%
8.	Honduras	0.16%	↑ 0.15%
9.	Czech Republic	1.81%	↑ 0.13%
10.	Romania	0.78%	↑ 0.12%

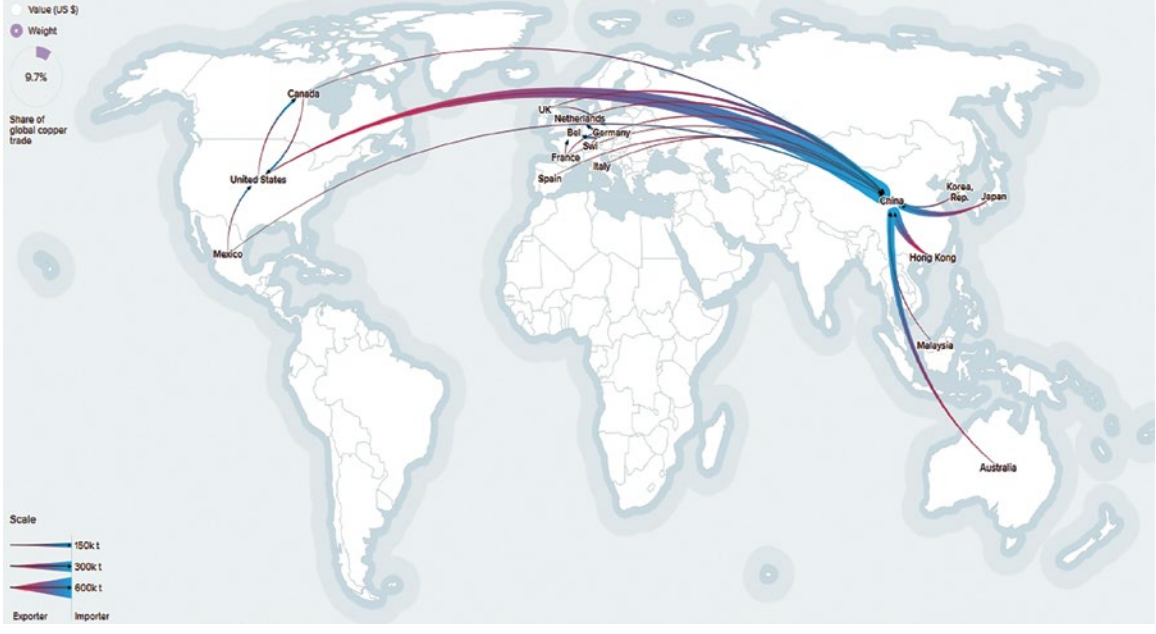
Total export value Year 2016	Total export value Year 2017	World Market
USD 24,752,209,656	USD 31,074,300,860	↑ 25.54%



Country	Export value Year 2016	Export value Year 2017	Own Growth
United States	USD 3,598,623,647	USD 4,451,077,171	↑ 23.69%

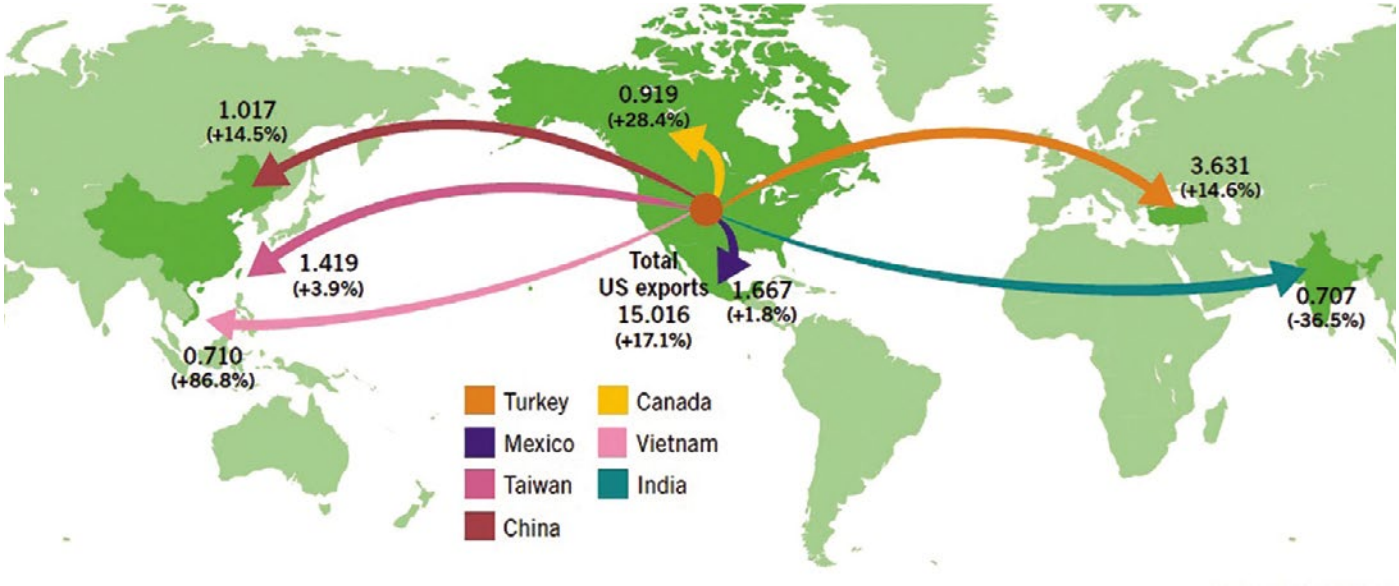
Source: Abrams World Trade Wiki, UN Comtrade Database Labs

Import and Export Flows of Copper Scrap for 2016 *(Red – Export, Blue – Import)*



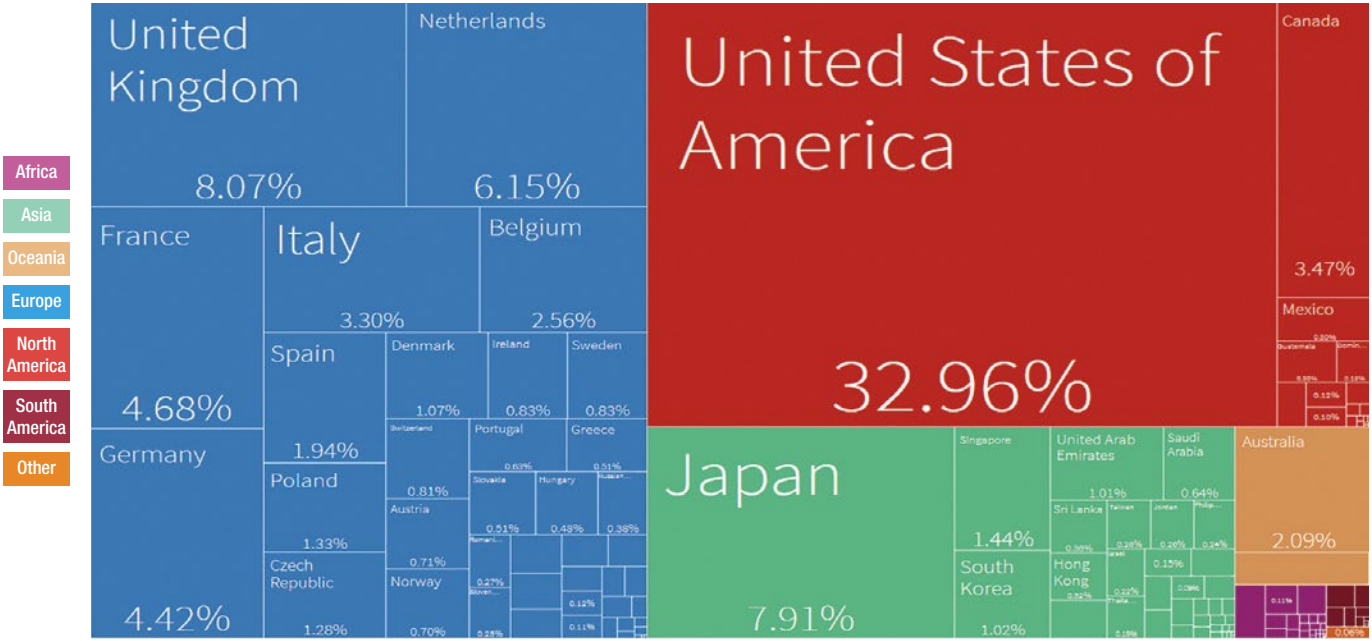
Source: Chatham House's resourcetrade.earth database visualizer

Main Flows of U.S. Steel Scrap Exports 2017 *(million metric tons)*



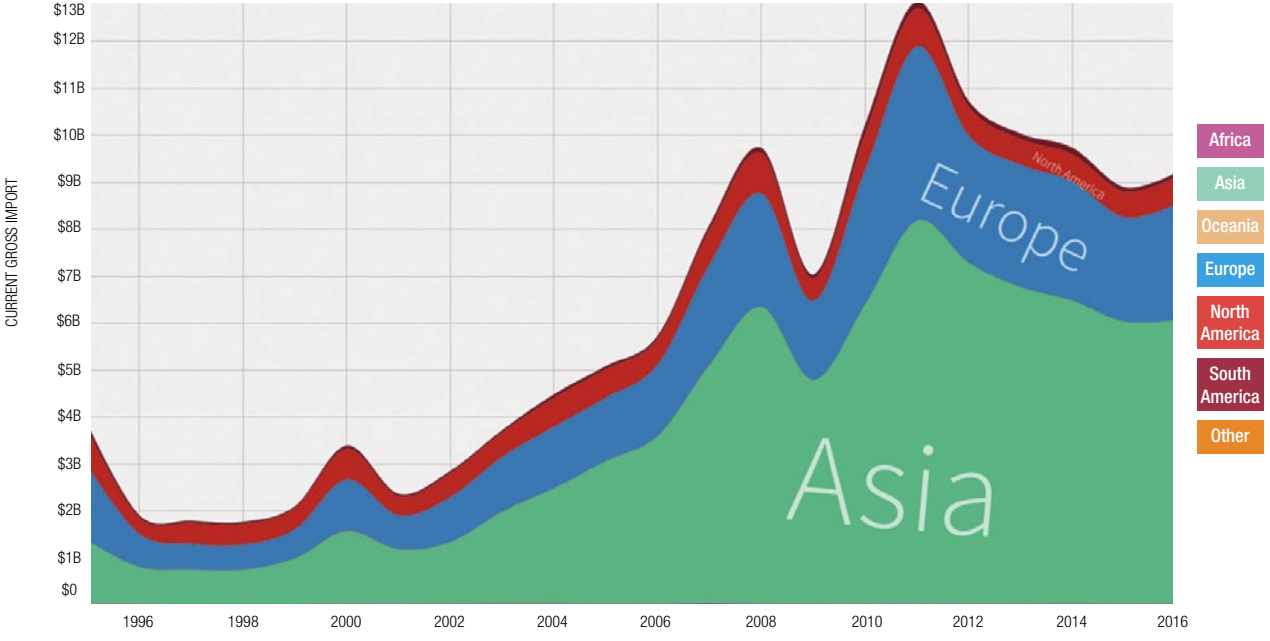
Source: Bureau of International Recycling

Who's Exporting Recovered Paper in 2016



Source: Harvard Center for International Development – Atlas of Economic Complexity

Who's Importing Recovered Paper in 2016



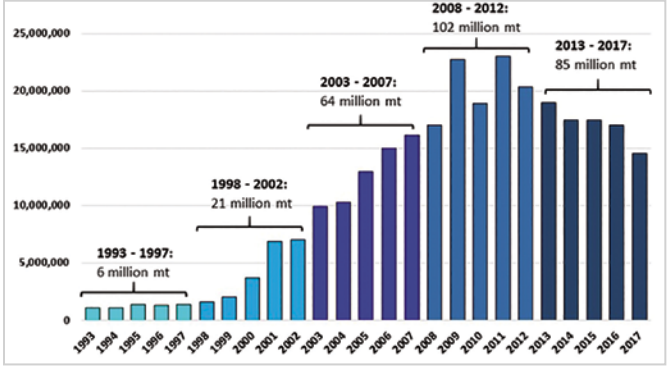
Source: Harvard Center for International Development – Atlas of Economic Complexity

China's Role in the Global Recycling Marketplace

It would be hard to overstate how significantly China's surge in demand for scrap imports impacted the global recycling marketplace. China's rapid economic growth and lack of domestic scrap supply, along with competitive scrap prices and attractive shipping rates, spurred massive demand for imported scrap (see chart).

Today, China's rising domestic supply of scrap, investment in scrap processing, and import restrictions are having an equally significant impact on the global scrap market. Scrap recyclers remain extremely responsive to changing market conditions and are focused on producing consistently high quality scrap commodities to meet consumer demands at home and abroad.

U.S. Exports of All Scrap Commodities to China (incl. Hong Kong) 1993-2017 *(metric tons)*



Sources: Census Bureau, USITC

Appendix A: Historical Production, Recovery, and Consumption Data

U.S. Iron & Steel

U.S. Iron & Steel Scrap Production, Producer Stocks, and Apparent Consumption from Purchased and Home Scrap 1943–2017 *(metric tons)*

Year	Production	Stocks	Apparent Consumption
1943	56,000,000	5,330,000	56,000,000
1944	55,000,000	4,010,000	56,000,000
1945	51,000,000	3,560,000	51,000,000
1946	45,000,000	3,080,000	45,000,000
1947	56,000,000	4,020,000	55,000,000
1948	61,000,000	5,860,000	59,000,000
1949	47,000,000	5,120,000	49,000,000
1950	62,000,000	4,920,000	63,000,000
1951	69,000,000	3,960,000	70,000,000
1952	65,000,000	6,260,000	63,000,000
1953	70,000,000	6,490,000	70,000,000
1954	57,000,000	6,670,000	56,000,000
1955	74,000,000	6,540,000	74,000,000
1956	77,000,000	6,730,000	73,000,000
1957	68,000,000	8,120,000	67,000,000
1958	52,000,000	8,700,000	51,000,000
1959	60,000,000	9,070,000	60,000,000
1960	60,000,000	8,430,000	60,000,000
1961	58,000,000	8,000,000	58,000,000
1962	60,000,000	7,690,000	60,000,000
1963	67,000,000	7,210,000	68,000,000
1964	76,000,000	6,740,000	77,000,000
1965	83,000,000	6,930,000	82,000,000
1966	84,000,000	7,430,000	83,000,000
1967	84,000,000	7,070,000	77,000,000
1968	85,000,000	7,150,000	79,000,000
1969	91,000,000	5,940,000	86,000,000
1970	84,000,000	6,960,000	78,000,000
1971	81,000,000	7,710,000	75,000,000
1972	91,000,000	7,410,000	85,000,000
1973	103,000,000	6,430,000	94,000,000
1974	105,000,000	7,630,000	96,000,000
1975	84,000,000	7,950,000	75,000,000
1976	90,000,000	9,060,000	82,000,000
1977	89,000,000	8,490,000	84,000,000
1978	93,000,000	7,510,000	90,000,000
1979	99,000,000	7,910,000	90,000,000
1980	85,000,000	7,270,000	76,000,000
1981	83,000,000	7,360,000	77,000,000
1982	56,000,000	5,820,000	51,000,000
1983	62,000,000	5,270,000	56,000,000
1984	67,000,000	4,770,000	60,000,000
1985	71,000,000	4,630,000	64,000,000
1986	69,000,000	3,940,000	60,000,000
1987	72,000,000	4,390,000	62,000,000
1988	79,000,000	4,130,000	70,000,000
1989	75,000,000	4,290,000	68,000,000
1990	80,000,000	4,300,000	69,000,000
1991	69,000,000	4,100,000	62,000,000
1992	71,000,000	3,800,000	63,000,000
1993	76,000,000	3,700,000	68,000,000
1994	78,000,000	4,100,000	70,000,000
1995	79,000,000	4,200,000	72,000,000
1996	77,000,000	5,200,000	71,000,000
1997	79,000,000	5,500,000	73,000,000
1998	76,000,000	5,300,000	73,000,000
1999	72,000,000	5,450,000	70,800,000
2000	76,000,000	5,320,000	74,600,000
2001	73,000,000	4,910,000	70,100,000
2002	73,000,000	4,930,000	69,500,000
2003	73,000,000	4,410,000	65,000,000
2004	73,000,000	5,400,000	66,500,000
2005	73,000,000	4,970,000	65,600,000
2006	71,000,000	4,210,000	64,600,000
2007	77,000,000	4,140,000	64,000,000
2008	84,000,000	4,340,000	67,600,000
2009	80,000,000	3,070,000	53,500,000
2010	76,000,000	3,330,000	59,700,000
2011	82,000,000	3,980,000	62,800,000
2012	80,000,000	4,200,000	63,000,000
2013	86,000,000	4,200,000	71,000,000
2014	69,000,000	4,300,000	59,000,000
2015	73,000,000	4,400,000	64,000,000
2016	71,000,000	4,400,000	52,000,000
2017	73,000,000	4,000,000	62,000,000

Source: U.S. Geological Survey

U.S. Primary Refined Copper

U.S. Primary Refined Copper Production, Old, and New Copper Scrap Recovery, 1943–2017 *(metric tons)*

Year	Primary Production	Copper From Old Scrap	Copper From New Scrap
1943	1,250,000	388,000	597,000
1944	1,110,000	414,000	448,000
1945	1,010,000	451,000	462,000
1946	797,000	369,000	360,000
1947	1,050,000	457,000	416,000
1948	1,010,000	459,000	424,000
1949	842,000	348,000	299,000
1950	1,130,000	440,000	446,000
1951	1,100,000	416,000	430,000
1952	1,070,000	376,000	443,000
1953	1,170,000	390,000	480,000
1954	1,100,000	369,000	393,000
1955	1,220,000	467,000	430,000
1956	1,310,000	425,000	419,000
1957	1,320,000	403,000	361,000
1958	1,230,000	373,000	350,000
1959	996,000	429,000	417,000
1960	1,380,000	390,000	401,000
1961	1,410,000	373,000	397,000
1962	1,460,000	377,000	459,000
1963	1,450,000	383,000	501,000
1964	1,500,000	430,000	562,000
1965	1,550,000	466,000	671,000
1966	1,550,000	485,000	725,000
1967	1,030,000	438,000	614,000
1968	1,300,000	472,000	633,000
1969	1,580,000	522,000	726,000
1970	1,600,000	457,000	675,000
1971	1,440,000	404,000	685,000
1972	1,700,000	416,000	765,000
1973	1,700,000	441,000	808,000
1974	1,500,000	439,000	781,000
1975	1,310,000	335,000	547,000
1976	1,400,000	380,000	659,000
1977	1,360,000	410,000	675,000
1978	1,450,000	502,000	746,000
1979	1,520,000	604,000	948,000
1980	1,220,000	613,000	824,000
1981	1,540,000	592,000	816,000
1982	1,230,000	518,000	670,000
1983	1,210,000	449,000	634,000
1984	1,170,000	461,000	659,000
1985	1,060,000	503,000	636,000
1986	1,070,000	477,000	649,000
1987	1,130,000	498,000	716,000
1988	1,410,000	518,000	789,000
1989	1,480,000	548,000	761,000
1990	1,580,000	536,000	775,000
1991	1,580,000	533,000	667,000
1992	1,710,000	554,000	722,000
1993	1,790,000	543,000	748,000
1994	1,840,000	500,000	827,000
1995	1,930,000	443,000	874,000
1996	2,010,000	428,000	891,000
1997	2,070,000	498,000	967,000
1998	2,140,000	466,000	956,000
1999	1,890,000	381,000	949,000
2000	1,580,000	358,000	955,000
2001	1,630,000	316,000	833,000
2002	1,440,000	208,000	842,000
2003	1,250,000	207,000	737,000
2004	1,260,000	191,000	774,000
2005	1,210,000	183,000	769,000
2006	1,210,000	151,000	819,000
2007	1,270,000	162,000	772,000
2008	1,220,000	159,000	700,000
2009	1,110,000	138,000	639,000
2010	1,060,000	143,000	642,000
2011	992,000	153,000	649,000
2012	962,000	160,000	650,000
2013	993,000	166,000	640,000
2014	1,050,000	173,000	640,000
2015	1,090,000	166,000	670,000
2016	1,180,000	150,000	640,000
2017	1,090,000	145,000	715,000

Source: U.S. Geological Survey

U.S. Primary Aluminum

U.S. Primary Aluminum Production and Secondary Production from Old and New Aluminum Scrap, 1943–2017 *(metric tons)*

Year	Primary Production	Secondary Production Old Scrap	Secondary Production New Scrap
1943	834,600	30,000	255,000
1944	704,000	20,800	275,000
1945	449,100	24,800	246,000
1946	371,900	82,100	170,000
1947	518,900	149,000	164,000
1948	565,200	86,800	173,000
1949	547,000	40,500	124,000
1950	651,900	69,000	152,000
1951	759,300	70,000	196,000
1952	850,000	64,000	212,000
1953	1,136,000	72,000	263,000
1954	1,325,000	60,000	224,000
1955	1,421,000	91,000	285,000
1956	1,523,000	88,000	300,000
1957	1,495,000	89,000	315,000
1958	1,421,000	73,000	249,000
1959	1,773,000	94,000	313,000
1960	1,827,000	86,000	311,000
1961	1,727,000	142,000	299,000
1962	1,921,000	152,000	377,000
1963	2,098,000	144,000	449,000
1964	2,316,000	147,000	494,000
1965	2,498,000	186,000	566,000
1966	2,693,000	170,000	635,000
1967	2,966,000	159,000	638,000
1968	2,953,000	164,000	740,000
1969	3,441,000	181,000	862,000
1970	3,607,000	179,000	728,000
1971	3,561,000	196,000	757,000
1972	3,739,000	227,000	795,000
1973	4,109,000	240,000	886,000
1974	4,448,000	276,000	887,000
1975	3,519,000	305,000	816,000
1976	3,856,000	371,000	963,000
1977	4,118,000	482,000	974,000
1978	4,358,000	522,000	996,000
1979	4,557,000	557,000	1,060,000
1980	4,654,000	617,000	960,000
1981	4,489,000	758,000	1,030,000
1982	3,274,000	782,000	884,000
1983	3,353,000	820,000	953,000
1984	4,099,000	825,000	935,000
1985	3,500,000	850,000	912,000
1986	3,037,000	784,000	989,000
1987	3,343,000	852,000	1,130,000
1988	3,944,000	1,050,000	1,080,000
1989	4,030,000	1,010,000	1,040,000
1990	4,048,000	1,360,000	1,030,000
1991	4,121,000	1,320,000	969,000
1992	4,042,000	1,610,000	1,140,000
1993	3,695,000	1,630,000	1,310,000
1994	3,299,000	1,500,000	1,580,000
1995	3,375,000	1,510,000	1,680,000
1996	3,577,000	1,570,000	1,730,000
1997	3,603,000	1,530,000	2,020,000
1998	3,713,000	1,500,000	1,950,000
1999	3,779,000	1,570,000	2,120,000
2000	3,668,000	1,370,000	2,080,000
2001	2,637,000	1,210,000	1,760,000
2002	2,707,000	1,170,000	1,750,000
2003	2,703,000	1,070,000	1,750,000
2004	2,516,000	1,160,000	1,870,000
2005	2,481,000	1,080,000	1,950,000
2006	2,284,000	1,580,000	2,800,000
2007	2,554,000	1,660,000	2,450,000
2008	2,658,000	1,500,000	2,130,000
2009	1,727,000	1,260,000	1,570,000
2010	1,726,000	1,250,000	1,540,000
2011	1,986,000	1,470,000	1,640,000
2012	2,070,000	1,630,000	1,802,000
2013	1,946,000	1,630,000	1,790,000
2014	1,710,000	1,690,000	1,870,000
2015	1,587,000	1,560,000	2,000,000
2016	841,000	1,580,000	2,010,000
2017	740,000	1,600,000	2,100,000

Source: U.S. Geological Survey

U.S. Paper & Paperboard

U.S. Paper and Paperboard Supply, Recovery, and Recovery Rates, 1990–2017 *(1,000 tons)*

Year	Supply	Recovered	Recovery Rate
1990	86,796	29,112	33.50%
1991	85,071	31,201	36.70%
1992	88,273	33,954	38.50%
1993	91,538	35,460	38.70%
1994	95,718	39,691	41.50%
1995	95,971	42,189	44.00%
1996	94,529	43,076	45.60%
1997	99,557	43,989	44.20%
1998	101,183	45,077	44.60%
1999	105,316	46,818	44.50%
2000	102,810	47,311	46.00%
2001	97,395	46,996	48.30%
2002	98,949	47,645	48.20%
2003	98,018	49,255	50.30%
2004	101,884	50,187	49.30%
2005	99,613	51,272	51.50%
2006	100,665	53,314	53.00%
2007	97,007	54,325	56.00%
2008	89,838	51,822	57.70%
2009	78,711	50,036	63.60%
2010	81,784	51,545	63.00%
2011	79,444	52,767	66.40%
2012	78,619	51,092	65.00%
2013	78,761	50,128	63.60%
2014	78,504	51,171	65.20%
2015	77,895	52,040	66.8%
2016	77,729	52,196	67.2%
2017	77,269	50,822	65.80%

Source: U.S. Geological Survey

Appendix B: Global Scrap Exports by Commodity

2016 Global Scrap Trade Export Flow

Commodity	Volume (mt)	Value ($)
Ferrous	76,667,427	$24,337,286,284
Paper	38,334,765	$9,141,209,816
Nonferrous	15,181,962	$29,339,964,521
Copper	*4,586,792*	*$16,127,263,021*
Aluminum	*7,898,106*	*$9,757,112,183*
Nickel	*135,848*	*$498,217,978*
Lead	*1,344,039*	*$453,145,016*
Zinc	*371,163*	*$457,247,699*
Other base metals	*846,014*	*$2,046,978,624*
Plastics	11,743,468	$5,266,362,704
Rubber	1,199,513	$529,722,322
Precious Metals	359,545	$16,127,263,021
Textiles	769,752	$502,145,035
Glass	3,406,545	$366,301,018
World Total	144,256,432	$85,243,953,703

Source: UN Comtrade Database

Appendix C: Global Flows by Country and Year

Global Trade-Ferrous Scrap Exports

Top 20 Exporters	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
USA	14,872,679	16,480,539	21,544,131	22,421,369	20,498,154	24,479,347	21,336,156	18,462,548	15,851,693	12,757,824	12,635,807
Japan	7,653,727	6,447,304	5,437,263	9,397,866	6,463,708	5,442,464	8,585,766	8,149,661	7,338,714	7,838,577	8,706,388
Germany	8,328,422	7,770,488	8,268,658	7,275,297	9,175,797	9,852,132	9,809,707	9,236,668	9,487,994	8,106,175	8,520,295
United Kingdom	7,423,818	6,023,730	6,629,202	6,019,142	7,482,950	7,895,261	7,295,690	6,947,474	6,987,184	7,268,765	8,128,932
Netherlands	4,786,987	4,500,919	4,523,660	4,764,766	5,541,773	5,692,223	5,695,180	5,517,477	5,295,208	4,811,323	5,611,638
Russian Federation	9,633,475	7,915,602	6,035,629	2,386,411	4,031,752	4,377,943	4,557,101	4,542,095	5,765,412	5,580,354	5,572,857
France	6,020,127	6,193,938	5,985,486	5,210,196	6,647,972	6,255,942	6,286,887	6,183,301	6,291,790	5,423,243	5,518,586
Canada	3,927,599	4,738,335	3,705,300	4,794,046	5,190,665	4,845,641	4,551,810	4,537,463	4,510,092	3,420,757	3,634,286
Belgium	2,938,371	2,922,269	2,929,794	3,238,537	3,721,636	3,521,378	3,623,825	3,511,140	3,950,346	3,153,412	3,557,354
Czechia	1,497,647	1,676,692	1,832,764	1,443,888	1,811,045	2,085,362	2,085,809	1,967,522	2,125,940	1,847,040	1,881,439
Australia	1,357,582	1,432,189	1,750,846	1,884,924	1,584,114	1,767,939	2,198,674	2,198,625	2,300,988	1,869,225	1,579,771
Denmark	1,276,516	1,522,778	1,619,517	1,239,493	1,504,705	1,486,127	1,321,972	1,244,207	1,686,253	1,264,293	1,563,818
Sweden	850,105	1,095,063	1,449,321	1,438,647	1,355,138	1,505,398	1,551,724	1,316,710	1,489,924	1,249,784	1,402,797
UAE	529,249	960,516	1,211,409	1,184,145	1,206,860	1,253,063	1,194,263	1,167,376	1,074,126	1,091,532	1,273,830
Poland	1,197,586	1,162,408	1,378,317	959,965	1,396,561	1,889,352	1,930,729	1,972,367	1,986,216	1,368,470	1,267,384
Austria	1,122,616	1,261,105	1,382,962	1,076,351	1,034,399	950,865	1,008,502	963,642	1,055,952	1,071,095	1,123,220
Hong Kong	923,385	1,045,849	1,016,360	865,562	779,399	877,766	804,652	896,714	924,451	868,994	1,048,817
Hungary	954,951	904,287	1,008,287	680,324	1,076,879	1,269,437	1,185,649	1,126,929	1,057,364	862,143	918,105
Singapore	500,382	598,515	623,753	555,924	585,053	605,936	851,953	978,876	909,828	843,716	828,019
Romania	1,862,498	1,963,212	1,985,975	2,565,442	2,519,235	2,348,562	1,908,067	1,947,542	1,430,949	716,646	702,228
Rest of the World	**18,389,867**	**20,476,334**	**19,868,173**	**15,189,164**	**19,257,563**	**24,234,755**	**20,796,725**	**16,071,092**	**16,861,593**	**15,612,367**	**13,818,555**
Grand Total	**96,047,589**	**97,092,074**	**100,186,807**	**94,591,459**	**102,865,357**	**112,636,892**	**108,580,839**	**98,939,429**	**98,382,016**	**87,025,738**	**89,294,125**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Data includes stainless steel (HTS – 7204210000) and alloy steel (HTS – 7204290000)

4) Export data was adjusted for the Netherlands, and Canada

Global Trade-Ferrous Scrap Imports

Top 20 Importers	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Turkey	15,074,009	17,140,855	17,414,983	15,665,319	19,192,350	21,460,461	22,415,029	19,724,892	19,068,156	16,251,308	17,716,247
India	3,418,187	3,051,664	4,603,204	5,136,907	4,676,394	6,265,265	8,179,601	5,636,399	5,699,006	6,710,088	6,380,452
Rep. of Korea	5,616,235	6,880,885	7,313,414	7,800,414	8,089,529	8,626,039	10,125,916	9,261,167	8,001,567	5,745,884	5,842,211
Italy	5,682,247	5,265,184	5,751,165	3,347,489	4,619,195	5,753,381	5,272,709	4,960,353	5,146,318	4,649,968	4,434,285
Belgium	4,206,826	4,344,950	4,143,336	3,643,458	4,626,473	4,563,802	4,284,462	4,595,179	4,785,015	4,171,886	4,304,573
Germany	5,932,605	5,920,071	5,675,167	3,865,111	5,305,194	6,639,700	5,792,845	5,676,700	5,324,260	4,637,419	4,259,242
Spain	7,346,851	6,472,865	6,603,208	4,930,416	5,708,900	4,764,338	4,348,807	4,851,614	4,928,153	5,120,222	4,042,165
Pakistan	1,356,059	2,140,551	1,871,037	2,254,182	1,771,139	1,583,931	1,772,885	1,780,714	2,482,543	3,256,900	4,038,195
Viet Nam	567,209	828,319	1,082,299	2,065,522	2,126,335	3,234,553	3,280,695	3,232,855	3,375,564	3,185,923	3,893,842
Taiwan	4,458,882	5,418,435	5,542,389	3,915,292	5,374,122	5,331,247	4,955,519	4,453,005	4,272	3,373,657	3,154,978
Netherlands	2,321,144	1,669,159	1,842,597	2,846,151	1,988,278	2,188,452	2,378,258	2,290,454	2,359,263	2,233,172	2,471,753
Luxembourg	3,238,139	3,173,113	2,800,650	2,030,226	2,694,245	2,635,424	2,464,483	2,251,732	2,225,575	2,121,316	2,263,786
China	5,383,017	3,365,131	3,516,417	13,620,675	5,766,245	6,692,180	4,934,728	4,439,242	2,524,060	2,283,777	2,160,644
Mexico	1,560,873	1,418,350	1,257,029	849,697	786,362	732,883	946,455	863,775	914,665	1,482,877	1,892,621
Canada	1,870,845	1,667,222	1,689,516	1,416,166	3,024,594	1,861,455	2,656,533	1,753,949	2,918,818	1,717,166	1,844,290
France	3,206,787	3,076,905	3,050,559	2,310,634	2,354,206	2,596,201	2,629,456	2,309,007	2,405,454	2,200,963	1,831,565
Portugal	1,155,846	1,128,685	1,165,430	1,039,658	902,988	1,252,275	1,196,298	1,407,787	1,524,391	1,515,346	1,427,592
Belarus	1,477,413	1,399,415	1,418,570	1,294,326	1,593,836	1,561,015	1,356,745	1,262,243	1,253,909	1,382,061	1,234,730
Austria	1,070,337	1,345,517	1,783,766	1,143,787	991,578	1,016,309	1,007,905	1,168,752	1,270,084	1,215,013	1,042,605
Indonesia	1,001,690	1,259,932	1,898,539	1,484,059	1,642,360	2,156,920	1,943,845	2,398,735	2,136,802	1,019,586	1,019,791
Rest of the World	**21,396,090**	**20,479,454**	**22,656,186**	**13,967,597**	**18,321,558**	**19,965,626**	**17,810,340**	**16,099,780**	**13,649,111**	**14,816,006**	**10,187,742**
Grand Total	**97,341,293**	**97,446,661**	**103,079,461**	**94,627,086**	**101,555,879**	**110,881,457**	**109,753,514**	**100,418,334**	**91,996,985**	**89,090,537**	**85,443,308**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Data includes stainless steel (HTS – 7204210000) and alloy steel (HTS – 7204290000)

4) Import data was adjusted for Viet Nam and the Netherlands

Global Trade-Copper Scrap Exports

Top 20 Exporters	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
USA	803,121	906,511	908,130	842,573	1,041,918	1,242,556	1,189,395	1,154,931	1,043,916	954,167	943,552
Germany	498,916	480,697	478,640	450,012	578,451	584,804	592,067	518,631	530,557	517,706	474,634
United Kingdom	317,073	346,760	358,159	430,373	421,131	514,347	373,751	291,924	295,739	263,912	310,403
France	290,527	281,470	266,214	234,860	290,325	313,464	320,423	299,084	321,116	279,313	289,614
Netherlands	306,132	229,090	241,332	143,329	283,847	315,437	322,592	295,139	326,278	303,598	278,229
Japan	411,734	422,903	395,458	359,535	285,642	287,769	327,930	313,043	294,003	261,100	258,677
Italy	104,310	123,321	151,640	160,106	167,441	174,204	181,890	172,209	173,402	176,256	199,404
Canada	164,638	163,300	101,607	146,569	157,787	178,577	182,792	154,038	161,967	156,990	160,820
Spain	85,454	88,030	84,783	100,498	102,236	87,122	159,419	156,511	150,874	156,617	157,692
Mexico	125,858	122,307	128,715	107,995	125,982	116,266	147,260	144,087	114,051	114,313	123,419
Belgium	161,672	186,795	162,219	111,183	142,841	164,958	168,461	157,204	128,490	105,691	113,018
Saudi Arabia	72,578	96,213	64,827	61,521	90,154	89,716	107,358	110,809	118,991	108,336	91,367
Switzerland	74,079	75,542	82,687	71,204	75,973	84,373	86,964	80,104	82,237	82,921	83,224
Rep. of Korea	201,689	216,151	191,500	186,958	100,090	84,608	119,105	95,652	85,669	71,322	82,296
United Arab Emirates	56,332	47,483	53,969	48,001	71,968	86,160	102,979	102,542	95,713	82,699	78,870
Australia	51,267	48,389	51,267	62,433	73,613	80,381	85,246	104,034	88,052	81,192	76,866
Poland	55,602	62,221	60,838	53,456	71,215	59,537	48,478	58,936	61,677	62,962	74,120
Sweden	45,455	54,760	57,248	55,519	43,318	58,037	58,870	56,470	66,821	65,208	71,823
Thailand	60,327	106,897	76,378	69,669	66,368	74,604	81,413	69,364	69,562	59,260	70,773
Chile	67	100	64	74	120,828	60,638	25,331	52,976	51,704	50,559	65,679
Rest of the World	**1,279,451**	**1,170,400**	**1,102,671**	**1,035,128**	**1,246,076**	**1,330,620**	**1,331,332**	**3,595,315**	**5,530,427**	**2,249,692**	**986,166**
Grand Total	**5,166,282**	**5,229,339**	**5,018,347**	**4,730,997**	**5,557,203**	**5,988,176**	**6,024,926**	**5,589,066**	**5,351,580**	**5,021,164**	**4,990,647**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Export data adjusted for Pakistan, United Arab Emirates, and the United States

Global Trade-Copper Scrap Imports

Top 20 Importers	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	4,942,874	5,584,644	5,576,590	3,997,436	4,363,469	4,685,721	4,858,525	4,371,650	3,873,287	3,656,925	3,348,095
Germany	585,140	595,749	563,559	454,753	626,443	646,282	660,890	619,121	658,986	603,783	606,841
Belgium	295,565	316,297	245,758	212,834	265,228	253,533	303,572	334,658	291,471	234,806	296,845
Rep. of Korea	205,251	221,054	217,008	163,020	202,898	263,182	300,708	291,178	298,548	289,645	273,616
Japan	120,787	135,663	138,729	97,144	159,424	136,881	142,559	127,914	160,128	169,435	228,471
India	108,006	105,210	103,334	78,540	92,399	154,783	203,493	141,417	168,529	174,340	179,375
Netherlands	110,753	117,259	116,503	178,385	144,426	204,327	206,685	166,106	147,516	150,067	150,003
Italy	215,687	180,706	169,257	94,755	129,103	148,430	137,615	151,702	178,161	164,534	144,048
Spain	95,415	57,641	65,109	68,431	82,931	89,499	97,129	104,671	114,867	112,409	128,279
Taiwan	145,904	130,130	106,518	70,266	90,422	89,735	93,867	99,353	95,721	94,597	111,069
USA	117,506	132,915	106,333	71,833	95,895	109,736	104,585	106,331	116,618	111,668	125,293
Hong Kong	146,862	189,576	210,413	190,410	155,271	127,483	105,606	116,032	119,890	128,249	97,581
Austria	88,890	90,398	114,063	134,135	145,902	130,675	127,186	102,554	105,904	88,646	83,968
Sweden	55,756	80,880	91,807	96,739	105,279	120,154	136,653	149,992	101,726	114,664	77,173
Canada	56,139	143,124	51,646	41,036	73,480	65,652	57,825	81,987	67,809	69,803	76,526
Poland	4,902	18,747	19,152	15,467	24,075	26,872	52,632	49,668	63,001	67,297	75,594
France	94,588	87,112	74,817	46,626	66,763	79,085	75,365	61,436	64,726	96,427	63,272
Bulgaria	7,784	12,725	25,330	20,721	35,464	52,461	64,561	56,040	60,453	59,728	49,543
United Kingdom	21,080	21,890	21,611	18,404	28,193	29,292	26,833	25,046	28,226	28,135	35,073
Slovakia	17,959	17,517	30,091	31,622	39,796	30,755	38,481	28,928	34,381	25,669	34,559
Rest of the World	**213,535**	**316,638**	**245,528**	**210,724**	**275,393**	**341,759**	**335,706**	**313,469**	**311,689**	**289,235**	**290,973**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Import data adjusted for the Netherlands and the United States

Global Trade-Aluminum Scrap Exports

Top 20 Exporters	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
USA	1,442,272	1,522,021	1,935,165	1,596,601	1,821,190	2,049,151	1,967,664	1,812,917	1,666,019	1,498,303	1,279,788
Germany	732,938	770,065	702,737	753,216	823,810	945,815	976,412	935,339	1,056,231	1,064,372	1,043,968
Canada	417,369	429,765	403,882	365,356	443,996	473,247	482,748	457,277	493,456	499,982	501,550
France	345,107	379,101	342,467	345,308	403,660	428,246	424,881	448,284	482,768	450,827	454,778
United Kingdom	385,292	848,568	874,909	419,972	454,699	440,726	445,390	402,061	452,606	406,070	439,713
Netherlands	334,426	317,877	264,142	200,650	317,038	322,834	378,652	320,523	349,012	360,748	370,527
Belgium	183,412	185,891	177,550	219,804	274,632	320,103	311,159	313,183	285,677	278,763	274,128
Australia	173,865	178,498	177,078	160,948	196,259	189,361	205,016	207,246	228,379	258,970	266,061
Poland	107,210	113,008	122,681	99,522	123,979	150,581	152,463	154,829	180,076	179,880	215,418
Austria	79,390	90,275	87,952	117,949	122,057	105,137	128,587	151,419	173,159	151,625	199,021
Mexico	163,079	179,260	186,510	162,668	183,932	194,355	234,333	169,557	151,152	156,049	180,629
Japan	103,137	108,933	83,776	147,695	98,621	109,443	146,450	157,903	150,737	150,054	174,115
Saudi Arabia	101,894	131,242	111,569	103,413	137,349	149,895	200,558	176,108	189,858	156,296	170,525
United Arab Emirates	43,291	46,171	53,129	90,278	128,798	112,367	143,071	164,251	162,986	139,675	163,981
Italy	50,536	47,153	66,993	88,702	107,155	103,006	103,667	107,060	111,214	144,319	151,977
Switzerland	140,657	139,599	125,769	116,520	132,086	138,643	141,836	149,337	157,500	139,313	146,205
Sweden	67,871	108,115	106,580	89,939	87,491	95,495	106,761	102,955	112,675	102,166	111,549
Spain	43,191	34,104	110,468	46,974	66,976	51,518	90,881	94,856	80,107	89,263	100,021
Denmark	62,112	52,493	63,813	67,853	67,449	67,131	69,974	71,975	79,029	75,502	80,602
Czechia	54,472	61,078	58,438	49,251	71,398	91,192	87,699	57,714	72,423	81,820	77,986
Rest of the World	**1,160,062**	**1,164,287**	**2,199,497**	**952,681**	**1,337,992**	**2,252,639**	**1,514,186**	**1,364,435**	**1,418,872**	**1,434,042**	**1,496,787**
Grand Total	**6,191,581**	**6,907,503**	**8,255,103**	**6,195,302**	**7,400,567**	**8,790,883**	**8,312,391**	**7,819,230**	**8,053,936**	**7,818,040**	**7,899,327**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Export data was adjusted for the United Arab Emirates

Global Trade-Aluminum Scrap Imports

Top 20 Importers	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	1,765,374	2,090,604	2,154,768	2,626,116	2,854,156	2,685,684	2,592,533	2,504,366	2,305,580	2,086,855	1,917,435
India	247,929	237,194	241,180	297,855	456,333	584,740	709,532	724,101	840,540	882,882	919,376
Germany	597,310	613,081	543,837	362,582	479,416	534,989	577,092	560,691	656,604	790,138	770,140
Rep. of Korea	377,177	467,491	503,154	443,898	545,692	566,953	641,800	711,174	801,211	745,958	715,173
Italy	377,548	448,689	386,459	273,083	376,486	461,302	445,450	456,370	511,986	520,448	517,954
USA	495,527	462,068	476,462	395,212	480,034	545,913	564,447	538,196	536,994	509,848	513,240
Austria	155,586	166,850	170,815	162,155	268,845	282,707	304,271	280,710	285,563	282,557	308,272
Belgium	192,053	192,072	193,475	203,681	221,425	254,967	247,463	219,054	237,096	248,872	275,997
France	206,107	188,814	193,826	215,537	259,420	291,690	266,280	245,937	231,714	215,905	260,759
Poland	52,416	59,519	66,968	66,793	84,850	106,438	107,598	176,509	205,230	238,950	235,391
Spain	107,753	124,093	109,861	67,321	111,942	125,190	155,371	176,445	200,411	205,856	203,673
Netherlands	197,160	204,117	210,203	88,053	184,066	241,081	265,741	220,965	233,610	202,103	185,978
Luxembourg	198,508	196,584	136,806	98,962	128,607	151,237	162,001	165,014	154,961	150,110	142,363
Malaysia	270,015	45,225	56,249	61,754	64,318	79,515	74,988	70,492	88,132	93,747	136,665
Czechia	49,358	63,606	58,686	50,279	61,714	88,951	105,390	83,294	78,491	83,103	125,211
Pakistan	45,969	80,236	59,118	84,872	88,661	90,483	102,437	76,094	105,850	130,775	125,163
United Kingdom	141,469	158,724	149,900	117,673	126,773	110,275	103,224	113,461	168,300	123,124	123,246
Canada	139,489	166,687	163,312	118,266	117,870	121,575	92,098	90,898	102,034	117,890	117,266
Mexico	112,820	112,489	100,475	69,488	126,783	105,363	102,328	89,255	118,549	151,924	113,830
Slovenia	51,596	52,126	51,194	37,315	51,792	52,844	61,462	69,014	77,942	84,186	91,076
Rest of the World	**772,477**	**955,666**	**1,020,837**	**668,410**	**956,239**	**995,670**	**882,814**	**915,381**	**965,009**	**992,748**	**965,013**
Grand Total	**6,553,642**	**7,085,935**	**7,047,583**	**6,509,306**	**8,045,420**	**8,477,565**	**8,564,322**	**8,487,420**	**8,905,809**	**8,857,977**	**8,763,220**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

Global Trade-Nickel Scrap Exports

Top 20 Exporters	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
USA	44,558	76,372	40,090	11,279	22,253	34,301	26,974	26,004	30,758	27,077	17,865
Saudi Arabia	6,423	1,155	3,747	7,202	12,575	10,626	9,919	14,429	17,797	13,224	17,641
United Kingdom	15,841	16,687	18,329	12,310	20,072	17,885	33,477	20,994	15,772	12,015	15,172
Germany	6,354	7,383	5,647	8,227	9,563	8,918	7,727	6,516	9,882	10,866	9,977
United Arab Emirates	449	1,221	85	239	597	1,298	558	453	1,122	2,120	8,428
Belgium	3,488	4,907	2,809	6,813	3,371	7,364	2,418	3,146	11,769	3,477	8,382
France	7,826	7,565	7,507	11,435	30,601	11,634	12,683	9,164	10,253	8,078	7,627
Rep. of Korea	7,879	10,297	10,689	9,241	17,459	6,043	4,440	4,457	7,490	8,429	7,102
Canada	4,258	4,682	6,552	4,857	4,311	5,016	4,935	4,387	7,173	6,972	6,387
Austria	2,342	2,201	1,750	2,098	1,607	2,709	2,633	3,322	5,402	3,659	5,012
Japan	1,406	1,065	1,483	1,100	2,156	2,069	2,994	3,519	5,336	5,527	4,788
Czechia	5,024	1,370	776	2,420	4,358	3,458	6,880	6,608	3,201	3,842	3,700
Mexico	2,404	2,936	2,187	1,990	2,976	3,395	3,241	2,977	3,216	2,930	2,826
Singapore	4,347	3,898	2,892	1,854	2,908	2,611	1,792	1,664	2,073	1,640	2,393
Malaysia	48,090	4,805	3,943	4,026	7,109	6,442	10,633	7,418	9,170	2,186	2,046
Taiwan	1,475	2,548	1,358	1,306	1,421	1,057	1,222	1,421	1,758	1,547	1,788
Switzerland	1,669	1,750	1,603	1,519	1,090	909	1,214	1,069	1,649	992	1,522
Spain	997	221	227	875	366	376	454	339	1,284	384	1,399
Sweden	5,741	5,343	1,517	1,377	1,021	1,137	13,857	1,264	1,397	1,175	1,342
Netherlands	1,740	4,456	4,614	1,711	1,956	1,793	1,336	2,948	3,252	1,529	1,221
Rest of the World	**14,504**	**13,155**	**14,806**	**18,095**	**22,652**	**15,089**	**10,385**	**8,839**	**13,956**	**19,839**	**9,618**
Grand Total	**186,814**	**174,017**	**132,610**	**109,974**	**170,422**	**144,131**	**159,774**	**130,937**	**163,709**	**137,506**	**136,236**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

Global Trade-Nickel Scrap Imports

Top 20 Importers	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Canada	13,100	20,151	18,227	6,311	13,458	18,993	21,108	18,892	21,310	20,079	21,429
USA	13,695	14,817	19,187	16,850	18,271	17,146	21,262	18,692	28,542	25,310	17,453
United Kingdom	8,468	11,882	10,890	9,736	8,783	6,729	8,834	9,887	10,999	9,405	12,325
Sweden	9,176	9,121	12,217	8,708	10,491	10,333	8,801	8,896	9,928	12,283	12,044
Germany	15,507	19,800	18,315	8,259	8,584	12,461	14,209	10,176	12,072	10,515	10,370
Japan	6,702	6,889	5,397	3,919	5,638	5,762	5,342	7,247	10,236	8,392	9,248
Netherlands	9,870	14,008	12,647	4,666	10,872	4,607	2,507	2,803	4,208	4,708	4,732
France	2,387	1,337	2,137	1,265	2,164	2,867	2,713	3,063	3,036	3,229	2,716
India	1,332	2,209	705	836	1,005	1,158	619	2,300	2,481	2,385	2,145
Italy	1,606	1,378	943	765	1,063	656	899	1,330	1,533	1,079	2,117
Singapore	2,856	3,049	3,019	2,466	4,062	2,520	1,432	1,802	2,234	1,135	1,419
Austria	655	2,245	1,165	368	440	527	1,917	4,359	4,376	1,959	1,248
Belgium	492	10,086	559	284	1,315	1,545	1,888	2,448	785	461	1,164
Rep. of Korea	214	492	816	874	433	573	374	313	676	1,358	1,048
Hong Kong	85	290	79	477	40	50	308	252	1,298	213	929
Czechia	152	298	473	1,468	1,257	250	1,442	1,183	755	637	869
Spain	180	274	120	236	151	806	554	386	728	595	653
Taiwan	462	215	220	497	399	469	252	792	357	220	395
Thailand	80	116	131	46	75	115	269	222	306	963	335
Slovenia	18	79	75	5	84	61	8	11	31	129	314
Rest of the World	**3,118**	**10,168**	**6,425**	**3,851**	**1,341**	**1,523**	**849**	**1,318**	**892**	**1,251**	**795**
Grand Total	**90,154**	**128,904**	**113,748**	**71,886**	**89,927**	**89,151**	**95,587**	**96,372**	**116,782**	**106,307**	**103,749**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Import data was adjusted for Slovenia

Global Trade-Lead Scrap Exports

Top 20 Exporters	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
United Kingdom	945	2,795	19,510	30,725	37,782	36,865	21,173	18,684	56,432	42,978	65,232
France	21,857	29,541	15,826	18,439	37,437	20,805	15,939	22,573	25,644	57,659	49,019
Netherlands	16,067	21,822	12,278	13,807	35,168	30,486	22,847	38,896	42,570	52,276	45,785
USA	120,934	128,837	174,795	140,364	28,000	31,449	25,914	34,352	36,344	46,573	39,496
Ireland	142	496	49	114	638	4,144	42,384	30,834	39,979	31,871	31,620
United Arab Emirates	4,726	4,646	5,212	5,967	14,469	13,815	14,867	15,647	19,285	19,498	29,517
Australia	1,559	9,390	15,491	12,831	23,526	24,508	20,786	6,268	21,812	17,388	24,858
Belgium	14,891	19,724	18,105	21,893	21,112	18,789	18,100	18,204	18,420	16,453	15,982
Germany	9,512	17,801	13,133	13,100	9,892	12,898	8,004	12,895	16,250	8,845	11,059
Portugal	14,522	10,443	4,230	2,241	1,811	2,047	1,348	3,522	1,866	1,753	7,854
Italy	3,806	8,513	7,712	9,027	10,896	10,173	14,804	11,681	12,877	7,192	7,018
Sweden	705	734	816	1,044	1,454	1,471	1,458	1,114	9,181	5,570	6,940
Romania	4,389	4,659	2,997	2,526	5,659	6,846	5,419	3,884	11,269	7,557	6,788
Thailand	271	229	314	738	701	1,066	2,048	351	579	256	5,223
Hungary	3,286	2,211	1,414	1,267	1,130	2,428	1,696	3,045	2,987	3,634	5,059
Switzerland	3,124	4,860	3,236	4,748	5,497	5,732	5,301	4,424	4,438	4,053	4,714
Poland	2,041	3,040	960	1,517	1,506	947	1,277	1,046	946	3,776	4,004
Finland	2,421	604	587	357	340	328	1,231	2,130	2,576	3,392	3,837
Austria	3,989	4,616	2,176	775	1,720	4,842	3,175	2,107	2,062	2,182	3,657
Norway	300	6	31	540	41	77	218	136	6,841	3,804	3,593
Rest of the World	**91,018**	**98,950**	**81,980**	**77,907**	**85,425**	**79,794**	**78,743**	**75,956**	**68,090**	**57,159**	**43,815**
Grand Total	**316,530**	**368,681**	**380,229**	**359,925**	**324,119**	**311,552**	**311,514**	**315,553**	**394,817**	**399,174**	**425,094**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018

2) Top 20 determined by latest year of complete data

3) Export data was adjusted for Pakistan, El Salvador, Ghana, and Norway

Global Trade-Lead Scrap Imports

Top 20 Importers	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
India	26,493	15,395	25,212	34,811	57,012	63,067	53,615	59,455	60,386	57,620	64,923
Spain	30,848	45,434	35,556	35,703	43,432	42,236	34,702	35,284	32,249	42,845	43,740
Belgium	40,007	54,388	25,409	34,275	30,693	32,938	25,392	26,501	29,338	26,227	26,308
Poland	1,108	1,256	2,371	2,276	7,164	6,365	4,979	10,370	11,139	14,148	21,527
Bulgaria	1,346	3,548	5,478	12,143	17,461	4,627	1,660	11,050	16,660	16,484	17,827
Germany	21,656	30,314	28,230	40,546	39,652	35,823	28,071	28,412	26,401	15,455	15,355
United Arab Emirates	1,132	856	1,231	1,245	1,682	3,524	11,875	21,092	27,420	21,010	15,250
Ireland	37,664	25,828	17,702	16,689	12,074	12,305	14,089	16,572	16,128	12,435	12,295
Czechia	4,411	6,519	4,773	4,157	2,901	2,932	2,723	4,369	5,232	2,894	10,998
Netherlands	17,508	22,006	11,325	13,593	21,255	16,886	15,138	10,578	8,823	9,607	8,686
Portugal	822	1,056	493	305	822	346	1,019	4,870	961	7,085	7,971
Sweden	3,101	3,770	2,092	4,979	9,464	8,400	9,627	9,282	9,575	11,627	6,323
Greece	138	2,071	2,801	1,753	1,692	2,900	2,182	915	1,032	2,128	6,261
USA	4,365	5,277	5,188	7,160	20,078	25,476	19,955	9,430	12,551	4,932	5,900
South Africa	10,456	10,761	6,947	7,554	9,233	6,829	12,214	6,369	6,569	3,997	5,582
United Kingdom	5,933	17,685	4,535	4,904	9,046	4,839	3,258	4,169	7,236	6,532	5,482
Rep. of Korea	876	1,527	1,749	3,246	4,426	5,132	15,735	10,351	10,238	13,620	5,270
Canada	80,162	64,788	93,314	78,834	8,089	5,038	4,365	6,493	4,268	4,050	5,027
Latvia	13	4	19	24	92	1,221	502	922	3,836	4,271	4,484
Slovenia	2,978	4,995	1,506	1,979	3,807	3,655	3,787	4,117	5,056	3,659	4,406
Rest of the World	**53,048**	**65,329**	**39,239**	**30,458**	**32,049**	**43,861**	**38,934**	**26,596**	**20,997**	**16,004**	**24,166**
Grand Total	**344,064**	**382,806**	**315,171**	**336,636**	**332,125**	**328,399**	**303,824**	**307,197**	**316,093**	**296,630**	**317,782**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018

2) Top 20 determined by latest year of complete data

Global Trade-Zinc Scrap Exports

Top 20 Exporters	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
France	71,223	56,124	43,750	45,976	51,481	45,491	60,946	99,123	118,166	79,287	93,173
Germany	58,008	59,297	51,800	68,648	74,269	74,965	73,263	52,770	53,342	45,865	40,739
Thailand	3,563	5,600	4,153	5,701	12,684	8,323	4,019	1,801	4,472	11,606	30,759
Netherlands	39,073	67,010	19,815	17,399	32,543	25,629	29,417	26,682	31,910	26,101	27,464
USA	83,842	102,305	90,992	47,119	77,934	85,223	90,447	88,047	71,446	55,224	26,567
Belgium	56,015	40,807	15,533	16,627	14,845	11,592	15,048	14,353	15,842	13,646	15,205
Spain	8,542	5,576	6,210	26,675	37,362	15,625	8,283	17,625	8,669	9,171	12,586
Saudi Arabia	3,254	4,128	5,003	2,628	4,603	5,522	6,792	11,045	11,444	10,247	12,405
Canada	18,647	13,359	6,121	5,690	10,770	14,257	15,069	18,127	22,341	17,561	11,704
Austria	4,267	2,141	8,306	6,099	5,757	8,583	8,591	10,440	10,077	7,663	11,424
Italy	12,911	13,067	9,060	12,429	16,452	13,143	7,149	7,024	10,407	9,262	9,160
Romania	228	1,348	442	1,615	711	597	672	592	885	6,753	7,653
Poland	220	425	403	1,593	1,086	1,046	464	570	1,388	2,981	5,740
United Arab Emirates	3,226	3,816	3,240	2,359	3,271	4,880	5,883	4,666	4,369	4,264	5,344
Malaysia	71,828	5,774	6,322	5,767	4,585	5,950	8,442	15,463	12,700	12,589	4,742
Czechia	3,041	2,966	2,885	2,716	4,798	4,474	4,971	3,769	3,539	2,941	3,514
Mexico	11,926	6,364	6,199	6,370	3,146	2,684	2,768	3,288	3,388	3,295	3,507
Japan	3,219	4,238	3,908	3,071	4,472	4,417	3,712	3,924	3,852	3,457	3,315
Denmark	3,879	2,610	2,442	2,704	2,549	2,429	2,557	2,329	2,517	3,023	3,019
United Kingdom	4,571	4,998	3,257	5,135	14,933	11,100	8,356	2,154	4,736	5,310	2,971
Rest of the World	**105,372**	**66,140**	**50,062**	**44,382**	**43,333**	**45,426**	**43,919**	**46,202**	**62,020**	**40,963**	**40,173**
Grand Total	**566,855**	**468,093**	**339,903**	**310,945**	**418,310**	**391,357**	**400,770**	**429,993**	**457,510**	**371,211**	**371,164**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018

2) Top 20 determined by latest year of complete data

Global Trade-Zinc Scrap Imports

Top 20 Importers	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	173,448	174,076	168,742	109,743	158,801	150,440	140,295	122,479	98,892	80,414	63,713
Italy	18,498	19,419	15,156	16,379	24,973	32,789	32,447	36,909	48,094	45,922	53,877
India	119,023	43,549	24,472	44,419	39,533	35,941	49,860	59,546	67,024	44,821	47,803
Belgium	40,500	35,355	25,946	22,456	27,172	31,348	34,756	52,633	68,820	39,227	38,080
Netherlands	14,872	10,439	6,865	22,929	27,727	17,639	29,811	41,486	36,996	25,767	34,468
Germany	37,545	64,897	14,222	27,118	40,332	25,516	24,781	23,261	26,481	25,431	33,624
Rep. of Korea	6,535	2,529	3,995	3,845	5,913	3,289	1,349	5,173	4,967	11,723	29,413
USA	21,416	19,385	12,208	9,179	13,932	16,269	18,143	19,161	23,473	17,815	11,563
France	24,787	6,253	2,300	6,256	17,491	9,771	8,838	7,623	8,129	7,994	8,439
Poland	2,714	3,822	7,812	5,850	10,375	12,002	11,454	12,779	15,366	18,113	7,320
Luxembourg	4,783	4,707	5,322	3,171	3,746	4,735	4,227	3,248	5,628	6,219	5,534
Spain	10,837	9,588	5,165	3,301	2,478	2,407	2,602	2,809	3,587	4,153	4,666
Austria	5,471	4,209	4,244	4,033	4,662	4,562	4,025	3,284	4,460	3,707	4,345
Japan	1,760	2,534	3,617	4,731	5,429	8,982	5,939	7,033	6,306	7,405	4,195
Slovakia	172	123	523	235	462	620	561	849	547	2,344	3,414
United Kingdom	22,866	7,811	5,082	3,237	2,361	1,192	2,346	801	1,172	2,757	2,254
Malaysia	2,860	3,316	2,951	3,452	1,162	961	1,348	1,790	2,830	2,979	2,223
Taiwan	15,318	15,014	6,041	3,869	6,407	10,288	6,337	4,072	4,140	3,208	1,768
Hong Kong	17,402	14,366	4,497	2,768	2,346	2,807	3,491	2,467	3,663	3,777	1,514
United Arab Emirates	1,907	4,098	3,814	1,517	3,590	2,922	2,437	6,165	17,296	1,569	1,361
Rest of the World	**24,140**	**22,602**	**16,925**	**14,146**	**22,910**	**16,043**	**15,723**	**16,448**	**9,637**	**15,866**	**11,589**
Grand Total	**566,855**	**468,093**	**339,903**	**312,633**	**421,800**	**390,525**	**400,770**	**430,013**	**457,510**	**371,211**	**371,164**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data and corrected with export-based reports due to consistency issues

Global Trade-Recovered Paper Exports

Top 20 Exporters	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
USA	15,911,832	18,098,687	18,227,721	19,067,095	18,777,917	21,009,012	20,142,035	18,964,015	18,469,673	19,566,483	19,752,523
United Kingdom	4,012,462	4,744,333	4,916,230	4,463,158	4,397,726	4,490,055	4,475,740	4,266,385	4,514,306	5,045,183	4,964,681
Japan	3,886,905	3,843,980	3,490,838	4,914,185	4,373,578	4,432,132	4,929,315	4,889,715	4,618,628	4,261,372	4,138,080
Netherlands	3,195,798	3,456,154	3,671,452	3,018,050	3,584,906	3,896,997	3,553,697	3,025,029	2,780,061	3,044,991	3,058,185
France	1,986,173	2,113,364	2,171,191	2,739,764	2,623,678	2,924,478	3,052,896	2,895,122	2,855,845	2,868,832	2,858,269
Germany	3,339,543	2,711,573	3,291,667	3,472,987	2,898,459	3,412,633	3,082,461	2,785,491	2,468,553	2,644,858	2,720,539
Canada	1,017,382	1,252,915	1,224,604	1,698,604	1,864,690	2,049,243	2,341,126	2,128,628	2,085,177	2,344,550	2,576,480
Italy	894,496	1,105,497	1,522,216	1,861,347	1,626,848	1,737,597	1,933,141	1,685,179	1,677,646	1,821,317	1,939,935
Australia	998,884	1,232,836	1,281,067	1,392,835	1,467,171	1,406,825	1,603,241	1,479,868	1,469,948	1,564,261	1,469,784
Belgium	2,360,550	2,324,727	2,305,828	2,426,758	2,095,007	2,300,875	2,017,862	1,867,588	1,633,718	1,580,974	1,457,083
Spain	389,155	503,628	732,422	954,049	664,796	782,817	709,901	665,860	891,583	1,013,825	1,152,768
Czechia	260,698	296,882	382,637	409,865	476,420	545,877	642,053	711,857	731,631	795,423	818,204
Hong Kong	934,041	1,101,969	1,091,196	1,027,229	1,194,535	1,278,674	1,162,294	1,032,344	947,859	822,889	805,599
Poland	406,082	410,579	547,874	358,947	398,815	531,215	525,390	593,123	579,044	661,677	688,372
Rep. of Korea	123,592	463,101	292,981	324,226	271,987	323,617	547,378	428,212	482,050	554,553	635,458
Singapore	629,801	666,729	675,415	626,376	739,229	769,089	697,913	681,131	647,437	604,565	610,361
Denmark	711,165	746,662	711,374	727,302	701,627	712,923	686,961	585,989	561,959	587,373	588,206
United Arab Emirates	189,720	252,865	260,682	278,144	280,048	359,092	391,175	438,328	471,462	456,308	521,842
Sweden	198,389	314,655	339,885	318,223	395,164	478,873	431,363	451,439	453,130	466,853	501,829
Switzerland	450,246	518,858	542,404	550,441	589,798	573,381	539,251	520,576	499,651	485,420	477,643
Rest of the World	**3,581,116**	**4,433,579**	**4,503,900**	**5,377,447**	**5,229,244**	**5,929,045**	**6,960,448**	**6,384,169**	**6,491,726**	**6,358,859**	**6,332,863**
Grand Total	**45,478,031**	**50,593,572**	**52,183,585**	**56,007,031**	**54,651,643**	**59,944,450**	**60,425,641**	**56,480,048**	**55,331,087**	**57,550,568**	**58,068,703**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Export data was adjusted for the United Arab Emirates

Global Trade-Recovered Paper Imports

Top 20 Importers	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	19,621,156	22,562,110	24,205,826	27,501,707	24,352,351	27,278,635	30,067,145	29,236,774	27,518,476	29,283,649	28,498,511
Germany	3,113,906	3,025,551	3,164,258	2,860,872	3,624,764	4,108,603	4,021,672	3,907,364	3,954,795	4,001,180	4,285,733
India	1,737,049	1,782,177	1,739,619	2,161,685	1,962,983	2,079,101	2,303,727	2,531,167	3,187,792	3,088,921	3,177,568
Netherlands	2,577,200	2,449,310	2,568,851	1,376,270	2,928,725	3,193,646	2,931,399	2,739,020	2,383,691	2,618,133	2,748,707
Indonesia	2,081,228	2,224,823	2,080,390	2,284,656	2,412,462	2,323,760	2,292,488	2,216,424	2,280,384	1,692,351	2,021,051
Spain	1,125,285	1,277,484	1,170,728	921,186	1,279,188	1,154,169	1,226,263	1,544,586	1,505,165	1,627,547	1,638,323
Rep. of Korea	1,210,907	1,182,108	1,306,820	1,121,827	1,355,990	1,530,872	1,467,150	1,589,486	1,547,289	1,542,292	1,562,258
Mexico	1,443,660	2,065,761	1,429,525	1,408,012	1,478,018	1,414,239	1,304,863	1,259,274	1,407,736	1,384,800	1,531,175
Austria	1,174,401	1,316,447	1,288,989	1,172,977	1,299,671	1,387,955	1,284,855	1,212,240	1,162,476	1,226,687	1,279,027
Thailand	1,049,631	1,015,835	1,217,338	969,850	1,023,857	923,981	999,833	858,301	856,513	1,133,075	1,086,867
Belgium	1,219,998	1,315,999	1,473,890	1,643,748	1,454,905	1,456,191	1,311,531	1,335,797	1,147,548	1,089,102	1,069,313
France	1,036,022	980,719	948,400	787,686	877,312	886,447	749,516	771,529	940,699	1,015,194	977,765
Canada	2,045,287	1,944,475	1,764,051	1,314,241	1,057,584	802,379	1,205,258	721,825	628,656	736,422	762,639
Viet Nam	257,425	404,012	525,867	289,623	591,162	556,700	384,196	450,556	637,453	648,232	712,826
Taiwan	762,968	982,719	834,122	562,640	568,558	596,030	864,889	790,494	845,821	586,012	708,933
Poland	3,894	8,529	14,240	17,843	264,677	306,645	392,984	457,695	518,191	444,857	479,079
Sweden	794,722	777,648	841,728	894,365	1,059,611	976,319	871,241	612,446	618,816	462,590	454,577
Turkey	52,832	28,919	84,827	82,246	115,965	71,922	52,501	80,068	183,834	301,404	450,913
Hungary	28,555	39,498	17,188	103,115	359,743	390,415	415,333	442,558	428,249	398,172	433,586
Switzerland	130,576	131,125	119,819	95,382	139,285	257,718	324,956	351,626	319,471	329,472	379,998
Rest of the World	**3,751,369**	**4,414,568**	**4,024,626**	**3,487,292**	**4,566,107**	**5,701,649**	**4,470,457**	**4,146,438**	**3,712,562**	**4,016,561**	**3,035,154**
Grand Total	**45,218,070**	**49,929,817**	**50,821,102**	**51,057,223**	**52,772,916**	**57,397,376**	**58,942,257**	**57,255,668**	**55,785,619**	**57,626,652**	**57,294,003**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Import data was adjusted for the Vietnam and Taiwan

Global Trade-Plastic Scrap Exports

Top 20 Exporters	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
USA	1,045,848	1,375,681	1,593,703	2,020,770	2,040,483	2,127,877	2,011,095	1,909,335	2,171,691	2,043,124	1,616,967
Japan	1,296,197	1,517,312	1,513,419	1,487,705	1,638,962	1,631,455	1,673,620	1,681,733	1,670,228	1,606,271	1,526,921
Germany	748,603	846,084	774,655	1,445,533	1,418,680	1,462,561	1,511,349	1,324,863	1,453,609	1,376,833	1,445,155
United Kingdom	440,852	548,298	654,393	711,223	838,188	880,577	811,509	648,614	764,404	791,554	805,072
France	379,183	385,592	390,634	447,683	477,954	502,826	508,034	454,119	483,026	468,754	483,957
Netherlands	438,753	412,010	357,819	245,322	361,137	381,131	428,666	464,294	431,322	505,903	481,088
Belgium	382,820	399,629	369,552	453,559	396,963	414,619	456,860	471,666	437,310	430,720	440,849
Mexico	347,875	419,676	435,085	372,442	414,021	442,197	522,143	517,067	862,744	449,974	429,537
Spain	91,944	108,685	112,448	166,850	217,892	192,363	236,880	225,844	333,466	329,937	318,926
Thailand	139,397	183,287	145,309	166,370	205,915	232,170	263,128	317,540	346,912	265,390	306,372
Viet Nam	18,269	19,147	19,342	18,929	39,760	102,059	110,246	223,408	202,021	119,292	276,395
Italy	101,847	113,942	139,913	212,414	263,949	269,601	228,019	191,621	175,859	223,076	234,262
Canada	219,263	199,638	229,263	188,862	190,252	197,638	203,046	170,783	191,778	208,955	213,690
Rep. of Korea	299,078	324,564	285,244	307,717	201,549	161,358	182,975	183,291	192,851	187,609	208,826
Indonesia	36,838	58,167	53,203	53,728	116,354	166,430	204,750	231,747	193,842	148,735	203,586
Australia	99,881	103,540	125,183	204,739	156,388	151,209	193,087	155,085	185,705	206,060	199,743
Poland	50,877	56,911	66,831	97,153	107,541	102,736	101,301	99,431	138,834	166,378	192,224
Slovenia	12,350	14,651	23,641	28,126	35,362	28,177	69,251	71,594	97,581	103,849	180,460
Malaysia	96,789	107,316	114,943	123,627	134,326	153,865	197,598	250,809	247,007	182,271	163,622
Taiwan	187,864	170,590	149,536	166,445	182,693	164,825	157,914	120,210	146,153	145,125	155,244
Rest of the World	**1,860,496**	**2,040,892**	**2,466,761**	**2,551,903**	**3,527,297**	**2,752,215**	**2,218,891**	**2,168,939**	**2,031,824**	**1,909,652**	**1,860,761**
Grand Total	**8,295,026**	**9,405,613**	**10,020,878**	**11,471,102**	**12,965,664**	**12,517,888**	**12,290,363**	**11,881,993**	**12,758,169**	**11,869,461**	**11,743,659**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

3) Export data was adjusted for Vietnam

Global Trade-Plastic Scrap Imports

Top 20 Importers	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
China	5,864,733	6,912,222	7,074,626	7,325,810	8,009,674	8,384,190	8,877,767	7,881,304	8,254,247	7,354,229	7,347,176
Hong Kong	4,421,329	4,145,835	4,503,012	4,752,654	4,795,350	3,962,054	3,200,487	2,506,171	3,080,676	2,864,769	2,877,956
Netherlands	226,692	221,914	238,843	144,459	295,928	374,308	467,433	531,881	622,941	598,127	611,300
Germany	219,474	239,700	227,723	214,448	296,940	302,344	420,106	423,052	501,628	545,607	548,029
USA	557,367	416,683	412,156	356,098	379,490	342,014	361,294	372,705	417,046	393,392	447,945
Belgium	248,563	281,228	294,000	350,481	285,426	322,250	292,285	259,805	226,729	259,728	312,587
Malaysia	73,785	81,900	38,194	92,323	81,885	142,860	176,779	301,435	225,986	249,941	287,673
Austria	69,995	131,224	148,423	106,394	146,137	210,909	218,640	194,626	250,263	245,451	240,589
Italy	190,103	199,010	162,786	116,475	138,291	145,795	138,957	134,360	160,232	153,379	178,631
Taiwan	102,548	122,913	150,203	119,829	148,887	153,084	149,491	201,522	204,365	221,499	177,934
Canada	209,883	187,747	161,881	129,748	148,031	153,294	155,107	146,523	186,390	249,179	171,657
India	94,137	169,909	97,936	478,491	116,252	131,419	195,988	259,614	251,546	185,746	166,859
Turkey	3,516	19,114	10,848	7,169	23,260	55,780	56,497	67,396	105,287	104,031	159,569
Sweden	18,338	79,494	87,251	138,100	300,324	255,449	134,230	213,483	153,842	179,539	139,748
United Kingdom	61,885	97,992	75,784	46,256	53,110	64,237	73,907	93,487	111,097	87,280	130,021
Czechia	28,489	41,874	54,849	48,074	58,555	93,122	111,373	122,698	128,088	131,523	129,925
France	65,222	70,526	81,392	58,708	98,940	109,177	109,822	111,921	110,017	117,055	122,987
Indonesia	7,552	313	8,588	3,175	39,906	90,535	106,994	135,993	107,423	97,146	120,979
Poland	50,143	67,390	42,222	47,907	113,677	113,133	67,305	57,771	62,416	85,814	118,800
Portugal	13,499	12,050	14,876	13,514	21,625	55,617	45,308	51,078	82,725	134,784	107,251
Rest of the World	**603,609**	**649,764**	**768,681**	**784,800**	**889,657**	**1,070,135**	**1,045,232**	**1,202,175**	**1,138,664**	**1,118,591**	**1,087,326**
Grand Total	**13,130,863**	**14,148,804**	**14,654,275**	**15,334,914**	**16,441,343**	**16,531,706**	**16,405,000**	**15,268,998**	**16,381,608**	**15,376,810**	**15,484,941**

**Notes*

1) Data tables were derived from the UN Comtrade Database (last downloaded on March 23, 2018)

2) Top 20 determined by latest year of complete data

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