Scrap is not Waste and Recycling is not Disposal

Zero Waste and Recycling Interim Study Committee
State Capital Building, Denver, Colorado

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Vice Chair, Institute Scrap Recycling Industries

ISRI Institute of Scrap Recycling Industries, Inc.
Voice of the Recycling Industry™

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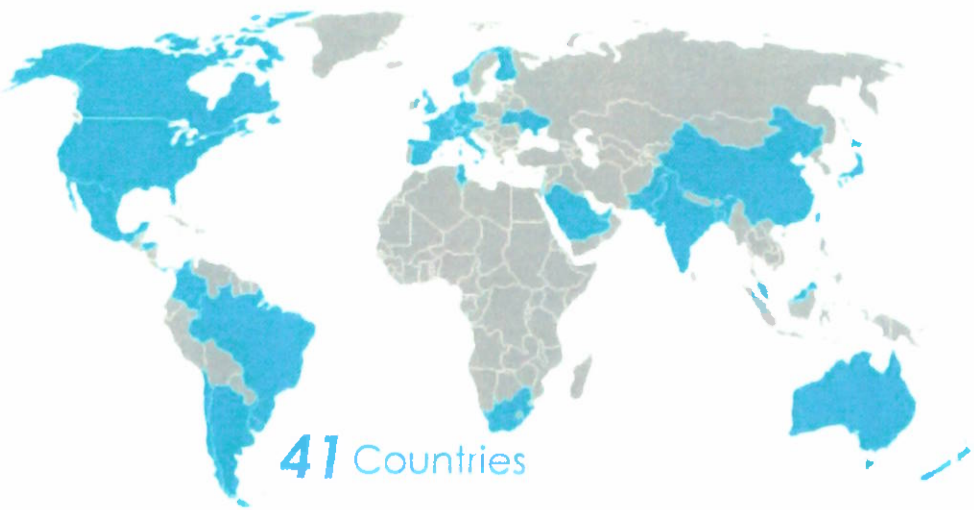

1,300+ Members

4,000+ Locations

Manufacturers, Processors Industrial Consumers, Brokers, Traders, Equipment/Service Providers

Ferrous & non-ferrous metals | **Paper** | **Plastics** | **Tire & Rubber** | **Electronics**

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OUR MISSION

To promote safe, economically sustainable & environmentally responsible recycling through networking, advocacy & education.

Workplace Safety

Responsible Recycling

RIOS

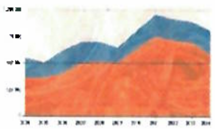
Recycling at its best™

Education, Training & Networking

Specifications

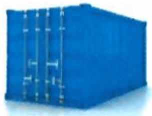
Design for Recycling™

Market Intelligence



Awareness

Free & Fair Trade



U.S. Recycling Industry: A Snapshot

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125,000,000+ Tons processed annually

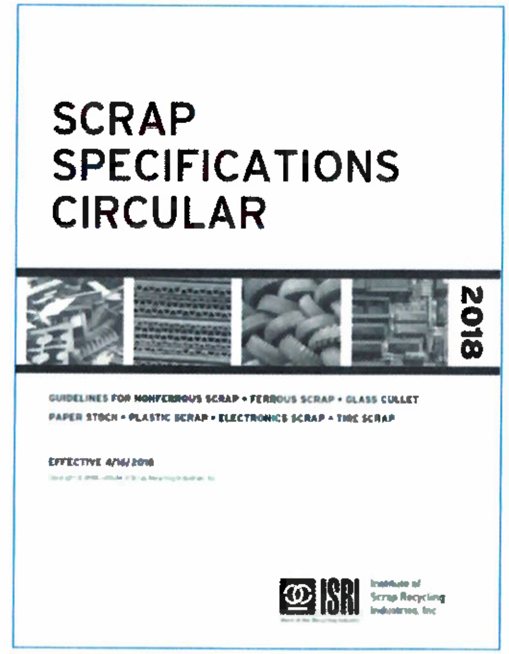
Iron/Steel	66.0	Copper	1.9	Plastics (bottles)	0.8
Paper	46.1	Lead	1.1	Electronics	5.0+
Aluminum	5.3	Zinc	0.07	Tire (#)	110

In millions of tons (or other unit shown). 2017 Data (except Plastics and Tires, 2016)

$117B Economic activity **$13.2B** federal, state & local tax revenue

1. Recycling is a Commodities Business Driven by Demand

- ISRI's Scrap Specifications play a key role
  - Provide the global standard for consistency & quality
  - Reflect tolerances allowed by materials manufacturers
  - Common language
  - Inbound MRF Specifications Expected in 2019



3. Recycling is a Global Business.

- Total Global Scrap Consumption = 800 million metric tons
- Total Global Scrap Trade = 180 million metric tons
- The U.S. and China are/were key players in the global scrap market.

  - Total Exports from U.S. to 155 Countries = 37 million metric tons
  - Total Imports into China from World = 43 million metric tons

ISRI Definitions

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- **<u>Recycling</u>** is the series of activities during which obsolete, previously used, off-specification, surplus, or incidentally produced materials are processed into specification-grade commodities, and consumed as raw-material feedstock, in lieu of virgin materials, in the manufacture of new products. The series of activities that make up recycling may include collection, processing, and/or brokering, and shall result in subsequent consumption by a materials manufacturer.

- A **<u>"Recyclable"</u>** material is an obsolete, previously used, off-subscription, surplus, or incidentally produced material for processing into a specification grade commodity for which a market exists.

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- **Recycled Material** is material that was initially obsolete, previously used, off-specification, surplus, or incidentally produced and that has been processed into a specification-grade commodity for use in materials manufacturing.

- **Processing** is any mechanical, manual, or other method that transforms a recyclable material into a specification-grade commodity. Processing is often multi-step, with different steps at different locations.

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- **Materials Recovery Facility (MRF)** is a recycling facility where primarily residential recyclables, diverted from disposal by the generator and which are collected separately from municipal solid waste are mechanically and/or manually sorted into commodities for further processing into specification-grade commodities and/or sales to end users. A solid waste management facility which may process municipal solid waste to remove recyclable materials is not a materials recovery facility.

ISRI's Initiatives and Partnerships

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- Trade missions to China, India, and Southeast Asia
- Leadership role in U.S. EPA's "America Recycles Dialogue" and America Recycles Week activities (Nov. 11-15, 2019)
- Design for Recycling®
- The REMADE Institute, Founding Member

Design for Recycling®: Key ISRI Concept

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Since ~1990, ISRI's Design for Recycling® principles seek to increase sustainability of consumer durables:

- Eliminating or reducing use of hazardous substances and material impediments to the recycling process
- Maximizing use of recycled materials
- Maximizing yield of recyclable materials at end of life
- Working with stakeholders to achieve above goals

An ISIS issue paper dealing with potential hazardous wastes and potentially nonrecyclable materials.

Design for Recycling

Hazardous Materials

Institute of Scrap Iron and Steel. *Phoenix Quarterly*. **1986**, *18(1)*, 8-10.

Design for Recycling® Award

2019 Awardee: Nestlé Waters NA
Pure Life® 100% rPET 700 mL Bottle

The REMADE Institute

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- **R**educed **EM**bodied-Energy **A**nd **D**ecreased **E**missions Institute for Sustainable Materials Manufacturing
  - A Manufacturing USA® Institute funded by DOE
  - $140M/5-Year Public-Private Partnership in 1:1 Match
- Goal: To drive down the cost of technologies essential to reuse, recycle and remanufacture materials
- 4 Material Types: Metals; Used Electronics; **Polymers; and Fibers**
- 5 Focus Nodes
  - Systems Analysis & Integration
  - **Design for Re-X**
  - Materials Optimization
  - Remanufacturing
  - **Recycling/Recovery**
- ISRI has been involved in REMADE and its development since 2013.

REMADE Projects Involving Paper or Plastics

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- New Approaches to Improve Deinking Flotation to Increase the Availability of High-Quality, Low-Cost Recycle Paper Fibers - Virginia Tech
- Assessment of the Impact of Single Stream Recycling on Paper Contamination in Recovery Facilities and Paper Mills – University of Miami
- A Dynamic Techno-economic Systems Modeling Framework for U.S. Fiber Recycling - Northwestern U, Yale U, ISRI
- Identifying strategies to maximize benefit of fiber recovery through systems quantification - MIT, AF&PA, WestRock, Graphic Packaging
- Reinforced Recycled Polymer Composites - Oklahoma State University, Niagara Bottling LLC, Shaw Industries
- Scalable High Shear Catalyzed Depolymerization of Multilayer Plastic Packaging – University of Massachusetts-Lowell, Michigan State, Unilever, ACC, National Renewable Energy Laboratory
- Systems Analysis for PET and Olefin Polymers in a Global Circular Economy – Michigan Technological University, American Chemistry Council, Idaho National Laboratory
- Mapping the Material Base for REMADE –Yale University, Unilever, International Zinc Association, Massachusetts Institute of Technology