



The U.S. Nonferrous Metals Recycling Industry: Short-Term Challenges and Longer-Term Outlook

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Study Groups' Seminar "Role of Recycling in Meeting Future Demand for Metals"

Lisbon, Portugal
4 October 2023

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Presentation Outline

- About ISRI and the Recycled Materials Industry
- U.S. Nonferrous Market Trends and Industry Drivers
 - U.S. Manufacturing
 - Light Vehicle Sales and the UAW Strike
 - The Resilient U.S. Labor Market
 - Housing Market Developments
 - Rising Interest Rates and Dollar Appreciation
- International Trade Developments
 - Export Demand for U.S. Recycled Copper and China
 - Export Demand for U.S. Recycled Aluminum
 - Trade Issues
 - ISRI Specifications
- Outlook and Opportunities
 - Latest Fed Projections
 - Federal Investments and Grant Opportunities
 - Capital Investment in U.S. Metal Production

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The Institute of Scrap Recycling Industries, Inc. (ISRI)

U.S. based trade association representing processors, brokers, industrial consumers, equipment manufacturers & service providers

+1,500 Members

+40 Countries **+5,000** Locations



Ferrous and non-ferrous metals



Paper



Plastics



Tires



Textiles



Electronics



Our Mission:

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

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About the Recycled Materials Industry

WHO WE ARE

- We are the recycled materials industry.

WHAT WE DO

- We provide the **high-quality raw materials** needed to make both **everyday items and the essential infrastructure** people depend on.

WHY IT MATTERS

- We make the supply chain more sustainable, resilient, and secure.
- We protect natural resources.
- We reduce carbon emissions.
- We reduce waste.

WHERE WE'RE GOING

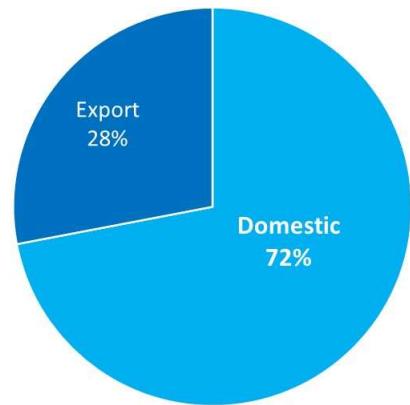
- We're **continuously innovating** to recycle more **material, more efficiently**.
- We're **one part of the solution** and we're **working with individuals and communities** to help them sort and recycle more.
- Because consumer brands and big companies have a role to play, we **partner with them to help them recycle more, use more recycled materials in their products, and design their products to be recycled more easily**.

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Big Picture: What We Process and Where it Goes

Estimated Tonnage of Recycled Commodities Processed in the United States, 2021	
Metric tons and %	2021
Iron and Steel	71.9 million
Nonferrous	
Aluminum	5.3 million
Copper	1.8 million
Lead	1.0 million
Nickel	123,000
Zinc	194,000
Recovered Paper and Fiber	45.5 million
Post-Consumer Plastic	2.2 million (2020)
Electronics	+6 million
Other (includes tire & rubber, textiles, glass, etc.)	7.5 million
TOTAL	140 million
U.S. Recycled Commodity Exports	38.5 million
Export share	28%

Sources: U.S. Geological Survey, U.S. Census Bureau, U.S. International Trade Commission, American Forest & Paper Association, Stina, Inc., Scrap Tire News, ISRI.

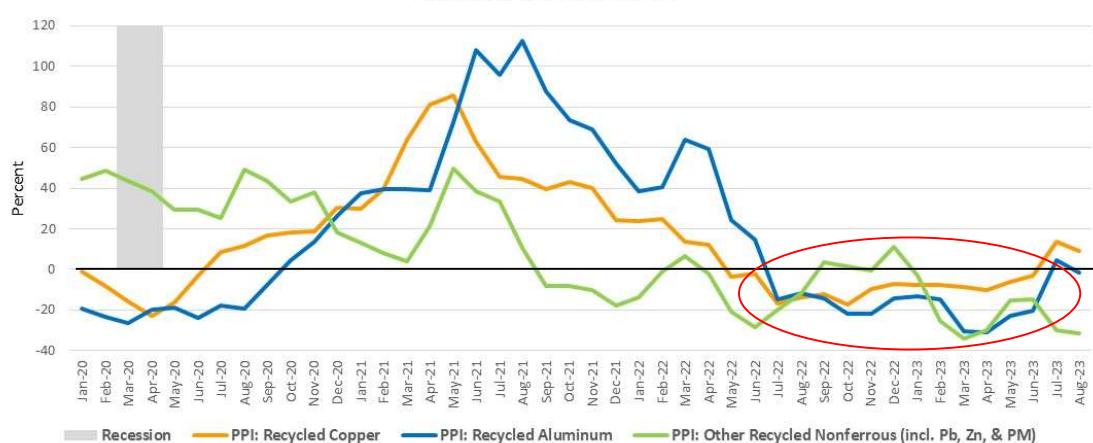


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U.S. Recycled Nonferrous Metal Market Conditions

Year-on-Year % CHG in U.S. Recycled Nonferrous Metal Producer Price Indexes
2020-2023

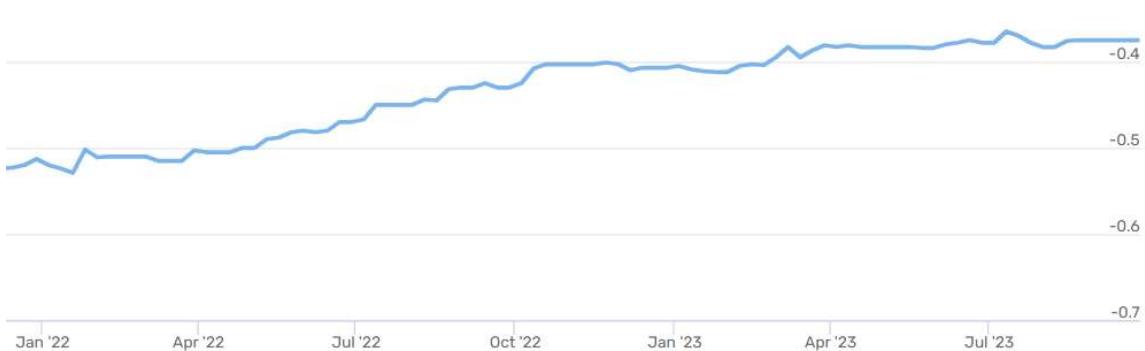
Source: Bureau of Labor Statistics



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U.S. Recycled Copper Spreads Held Relatively Steady

#2 copper cash spread del US consumer



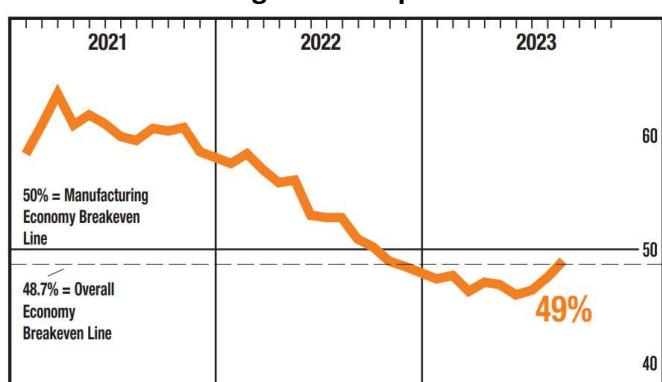
Source: Davis Index.

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Key Drivers: Manufacturing Downturn

- “Overall, things continue to be very steady: Sales and revenue are as expected, and the supply environment has stabilized greatly versus 2021-22. Some things to watch include the Panama Canal (drought), U.S.-China relations, and the impact the UAW (United Auto Workers) strike could have on suppliers of ours who support automotive production. But overall conditions feel stable.” **[Miscellaneous Manufacturing]**
- “Orders and production remain steady, and we are maintaining a healthy backlog. Continued inflation and wage adjustments continue to drive prices up, although we should get some relief from the markets stabilizing.” **[Transportation Equipment]**
- “A recession feels imminent. Money continues to be pushed into the bank markets, driving inflation rates really high. Most plants are buying less material or reducing consumption in the name of sustainability, as well as running at 80 percent of capacity. Prices of some products may increase for the upcoming winter weather.” **[Petroleum & Coal Products]**
- “Business conditions and market demand remain strong. We are projected to be at capacity in the next 12 months.” **[Primary Metals]**

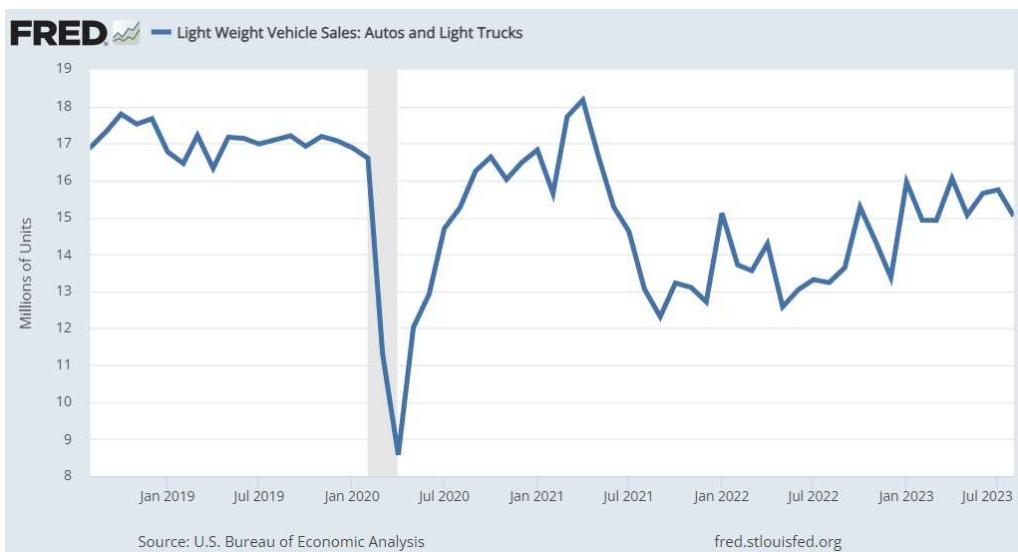
U.S. Manufacturing PMI in Sep: 49.0



Source: Institute for Supply Management.

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Key Driver: U.S. Light Vehicle Sales

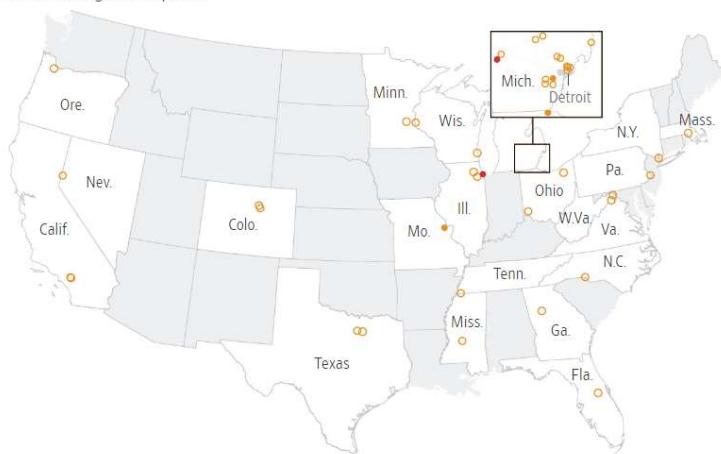


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United Auto Workers Strike

UAW strike locations

- Plants targeted Sept. 14
- Parts distribution centers targeted Sept. 22
- Plants targeted Sept. 29



September 14, 2023:
3 assembly plants (GM, Ford, Stellantis)

September 22, 2023:
38 parts distribution centers (GM, Stellantis)

September 29, 2023:
2 additional plants (Ford, GM)

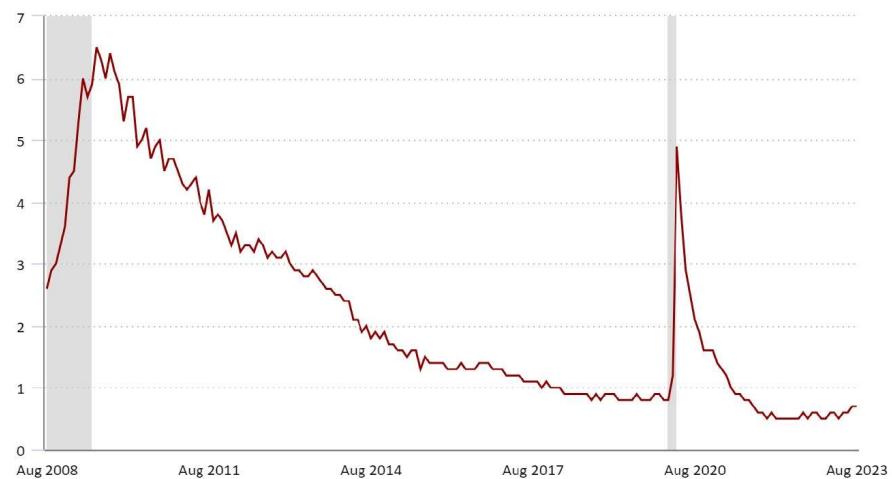
Source: United Auto Workers

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Key Driver: Resilient U.S. Labor Market

Number of unemployed persons per job opening, seasonally adjusted

Click and drag within the chart to zoom in on time periods



There are still more job openings in the United States than unemployed persons. In August 2023, there were 0.7 unemployed persons for every 1 job opening.

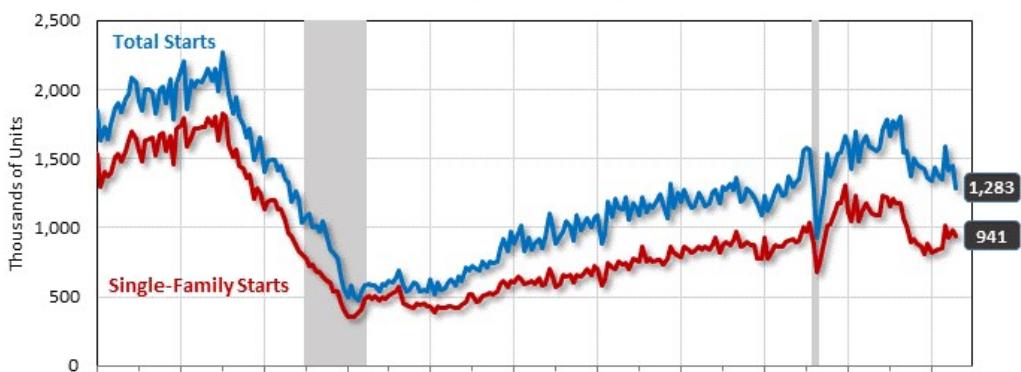
Hiring and retaining new employees remains a major challenge for U.S. recyclers.

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Key Driver: U.S. Housing Market

Aug 2023

New Housing Units Started in the United States
Seasonally Adjusted Annual Rate



Source: U.S. Census Bureau and HUD, New Residential Construction report, September 19, 2023
Shaded areas represent recessions as defined by the NBER's Business Cycle Dating Committee

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Key Drivers: Rising Interest Rates and Dollar Appreciation



Demand for U.S. Exports: Recycled Copper

U.S. Exports of Recycled Copper and Copper Alloys by Major Destination

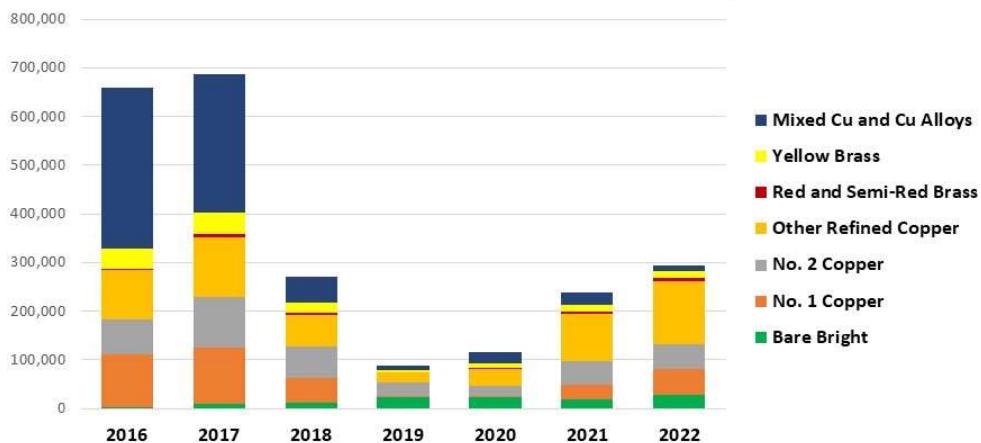
Metric tons
Sources: Census Bureau/U.S. International Trade Commission; ISRI.

Country	Year 2021	Year 2022	Jan-Jul 2022	Jan-Jul 2023	YTD % CHG
China	237,891	291,516	172,837	169,553	-1.9%
Canada	114,968	107,086	64,482	58,911	-8.6%
India	52,390	85,600	46,855	42,094	-10.2%
Malaysia	152,043	66,426	39,049	40,052	2.6%
Thailand	45,663	63,416	38,946	35,460	-9.0%
South Korea	64,301	53,529	33,361	21,762	-34.8%
Belgium	29,219	42,097	25,965	20,323	-21.7%
Germany	34,369	30,728	18,296	17,683	-3.3%
Japan	27,310	32,411	19,308	16,155	-16.3%
Pakistan	24,875	27,332	16,748	11,475	-31.5%
Hong Kong	30,666	20,518	15,224	11,034	-27.5%
Poland	13,628	16,777	9,235	9,604	4.0%
Taiwan	20,120	17,566	11,426	6,938	-39.3%
United Arab Em	5,088	6,557	4,158	5,795	39.4%
All Others	63,895	64,845	36,710	24,562	-33.1%
Total:	916,426	926,401	552,600	491,400	-11.1%

Composition of U.S. Recycled Copper Exports to China

Composition of U.S. Recycled Copper and Copper Alloy Exports to Mainland China, 2016-2022 (metric tons)

Sources: Census Bureau/U.S. International Trade Commission; ISRI.



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Demand for U.S. Exports: Recycled Aluminum

U.S. Exports of Recycled Aluminum (including UBCs and RSI)

Metric tons

Sources: Census Bureau/U.S. International Trade Commission; ISRI.

Country	Year 2020	Year 2021	Year 2022	Jan-Jul 2022	Jan-Jul 2023	YTD % CHG
India	307,607	441,650	460,086	269,326	274,065	1.8%
Malaysia	416,982	518,931	391,376	204,465	217,148	6.2%
South Korea	286,182	283,472	294,998	175,171	161,740	-7.7%
Thailand	73,210	74,998	115,501	59,830	119,487	99.7%
Mexico	151,912	167,400	194,922	123,689	104,067	-15.9%
Hong Kong	69,016	200,109	133,474	95,867	99,516	3.8%
Canada	72,255	99,777	122,901	69,623	70,895	1.8%
China	154,469	18,288	17,565	10,481	29,316	179.7%
Taiwan	42,879	34,667	42,144	20,199	28,396	40.6%
Indonesia	97,196	71,016	60,934	36,477	22,476	-38.4%
Japan	19,840	29,477	29,370	16,973	20,439	20.4%
Vietnam	17,185	11,934	13,917	7,388	12,524	69.5%
Pakistan	13,793	17,807	17,377	9,736	9,449	-2.9%
All Others	120,117	125,408	103,768	68,461	42,622	-37.7%
Total:	1,842,644	2,094,934	1,998,333	1,167,687	1,212,141	3.8%

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Trade Issues

- **BASEL CONVENTION:**

Potential changes to the list of constituents & categories of waste (Annex I) under consideration, including adding:

- aluminum compounds;
- nickel and nickel compounds;
- cobalt and cobalt compounds;
- lithium and lithium inorganic compounds;
- silver compounds.

- **REVISED EUROPEAN WASTE SHIPMENT REGULATIONS**

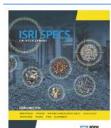
- **GLOBAL ARRANGEMENT ON STEEL & ALUMINUM**

- **NATIONAL RESTRICTIONS ON RECYCLED MATERIAL IMPORTS & EXPORTS**

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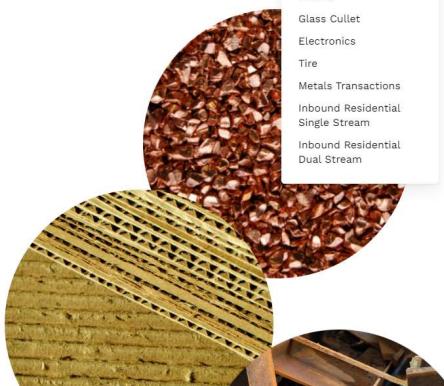
Nonferrous
Ferrous
Paper Stock
Plastic
Glass Cullet
Electronics
Tire
Metals Transactions
Inbound Residential Single Stream
Inbound Residential Dual Stream

ISRI SPECIFICATIONS

ISRI Specifications are designed to facilitate the trading and use of the entire range of recycled materials including recycled ferrous and nonferrous metals, paper, plastics, electronics, glass, tire and rubber, and residential recyclables. By providing a common language for buyers and sellers of recycled commodities around the world, the Specifications also play a key role in market development and realizing the full economic and environmental benefits generated by recycling.

The Specifications are reviewed on an ongoing basis to ensure they meet the demands of the global marketplace. Any individual, company, or organization can **propose** additions, modifications, or deletions to the Specifications. As the flow of recyclable materials continues to evolve with the introduction of new products into the supply stream, ISRI will continue to update the Specifications.

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U.S. Economic Outlook: Latest Fed Projections

Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy, September 2023

Variable	Median				
	2023	2024	2025	2026	Longer run
Change in real GDP	2.1	1.5	1.8	1.8	1.8
<i>June projection</i>	1.0	1.1	1.8		1.8
Unemployment rate	3.8	4.1	4.1	4.0	4.0
<i>June projection</i>	4.1	4.5	4.5		4.0
PCE inflation	3.3	2.5	2.2	2.0	2.0
<i>June projection</i>	3.2	2.5	2.1		2.0
Core PCE inflation	3.7	2.6	2.3	2.0	
<i>June projection</i>	3.9	2.6	2.2		
Federal funds rate	5.6	5.1	3.9	2.9	2.5
<i>June projection</i>	5.6	4.6	3.4		2.5

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Outlook: Recycled Material Investments and Opportunities

U.S. Infrastructure Investment

In 2023 and beyond, the U.S. Recycled Materials Industry will be essential towards meeting sustainability goals and investments mandated by the historic \$1.3 trillion infrastructure law



Electric Vehicles (EVs)

Recyclers within the US and throughout the world will be a key part of the development of the transformation from combustion engine vehicle systems to EVs



- US Grants and new innovations like Electric Vehicles and their battery systems
- Public-private partnerships
- Policies governing critical minerals & securing the supply chain
- New safety concerns
- ISRI EV Working Group
- On June 12, 2023, the U.S. Department of Energy (DOE) announced more than \$192 million in new funding for recycling batteries from consumer products, launching an advanced battery research and development (R&D) consortium, and the continuation of the Lithium-Ion Battery Recycling Prize, which began in 2019.

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Opportunities for Federal Funding and Tax Credits

MESC-10 Facility and Workforce Assistance

- FY23 Industrial Assment Ctrs \$15M
- BIL 40523 IAC Expansions \$150M
- BIL 40521 IAC Imp. Grants \$400M
- **BIL 40209 Manufacturing/ Recycling Grants in Energy Communities \$750M**
- BIL 40534 State Manufacturing Leadership \$50M

MESC-20 Battery and Critical Materials

- **BIL 40207 Battery Material Processing \$3B**
- **BIL 40207 Battery Manf. \$3B**
- BIL 40207(f3) Battery Recycling: State/Local Programs \$50M
- BIL 40207(f4) Battery & Crit. Mineral Recycling: Retailer Collection \$15M
- **BIL 40205 Rare Earth Demo \$160M (with FECM)**

MESC-30 Energy Sector Industrial Base

- BIL 40555 Rebate Program \$20M
- IRA 50143. Manufacturing Conversion Grants \$2.0B
- DPA (IRA) \$250M
- **48C Tax Credits (IRA) \$10B**



MESC

OFFICE OF MANUFACTURING AND EXPORTS



Examples

**\$15 Billion of
awards and
conditional
commitments
announced by
LPO since 2021**

- **Ultium Cells** was awarded a \$2.5B loan for three domestic battery cell manufacturing facilities in Ohio, Tennessee, and Michigan
- **BlueOval SK LLC (BOSK)** awarded a \$9.2 billion conditional commitment to construct of three manufacturing plants to produce batteries for Ford Motor Company in Tennessee and Kentucky
- **Syrah Technologies** was awarded a \$102.1M loan or the expansion of its Syrah Vidalia Facility to produce graphite-based active anode material
- **Ioneer Rhyolite Ridge, LLC** awarded a \$700M conditional commitment to develop supply of lithium carbonate in Esmeralda County, Nevada.
- **Redwood Materials** was offered a \$2 billion conditional commitment to construct and expand battery materials campus in McCarran, Nevada to support production of anode copper foil and cathode active materials from recycled batteries and production scrap
- **Li-Cycle** awarded a \$350M conditional commitment to construction of a lithium-ion battery resource recovery facility



U.S. Capacity Expansions: Copper and Aluminum

- **Aurubis** announced it plans to invest a total of 640 million euros (\$707 million) to build the secondary copper smelter in Augusta, Ga. After deciding to add a second recycling module, the plant will now have a throughput capacity of 180,000 tons per year.
- **Wieland North America**, the North American division of Germany-based Wieland Group, announced its plans to invest approximately \$100 million to open a recycling and refining facility in Shelbyville, Kentucky.
- **Prime Materials Recovery together with the Spanish company Cunext** began production at Ames Copper Group, Shelby, North Carolina, in 2022 which produces 50,000 tons of 99.7 percent pure copper anode using scrap that contains as little as 93 percent copper. The recycled anode is supplied to another company that uses it to produce cathode.
- **Spectro Alloys** announced a \$77 million investment to expand its aluminum recycling facility in Rosemount, IL.
- **MetalX** announced a \$200 million investment to build a greenfield aluminum rolling slab facility in the Midwest. The plant is expected to become fully operational in the first half of 2026 and will employ approximately 100 people.
- **Hydro** announced a \$50 million investment in its extrusion plant in Cressona, Pennsylvania. The investment will expand the site's recycling capabilities, which include remelt and extrusion billet casting, producing low-carbon aluminum products.
- **Aluminum Dynamics** - owned by Steel Dynamics - announced a \$2.2 billion investment to build a low-carbon, recycled aluminum flat rolled mill, with two supporting satellite recycled aluminum slab centers in Columbus, MS.
- **Novelis** announced a \$2.5 billion investment to build a fully integrated aluminum manufacturing facility including recycling/casting, hot rolling and finishing for beverage can and automotive markets in Bay Minette, AL. The facility will be powered by renewable energy, use recycled water and operate as a zero-waste facility.

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U.S. Capacity Expansions: Steel

Company	Location	Product	Capacity (st/yr)	Start-up
SDI	Sinton, Texas	Sheet	3 million	Ramping Up
Nucor	Gallatin, Kentucky	Sheet	1.4 million	Ramping Up
Northstar BlueScope	Delta, Ohio	Sheet	850,000	Ramping Up
Nucor	Brandenburg, Kentucky	Plate	1.2 million	Ramping Up
CMC	Mesa, Arizona	MBQ	500,000	Ramping Up
ArcelorMittal/Nippon	Calvert, Alabama	Sheet	1.6 million	2H 2024
US Steel (Big River)	Osceola, Arkansas	Sheet	3 million	2024
Nucor	Mason County, WV	Sheet	3 million	2024
Nucor	Kingman, Arizona	Bar	600,000	2024
Nucor	Lexington, NC	Bar	430,000	2024
CMC	Berkeley County, WV	Bar	500,000	2025
Hybar	Osceola, Arkansas	Bar	600,000	2025
Pacific Steel	Mojave, CA	Bar	380,000	2025

Source: Argus Media.

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Thank you!

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 ISRI Recycled materials are what we're made of.

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