

Copper Scrap Recycling: Surveying Recyclers in NAFTA Countries

*Industry Structure, Yard Management
Practices, and Scrap Inventories*



Organization of presentation

1. Introduction to Nathan Associates Inc.
2. Study design
 - Identify nonferrous metal recyclers in Canada, Mexico, and the United States through Internet research and ISRI contacts
 - Create an electronic directory of recyclers
 - Develop a questionnaire to guide telephone interviews
 - Conduct interviews
3. Preliminary findings
 - Industry structure
 - Concentration
 - Foreign ownership
 - Building capacity through acquisitions
 - Yard management practices
 - Technologies
 - Sources, flow, and amounts of copper scrap recovered
 - Scrap stocks
 - Legislative and regulatory concerns
4. Next steps

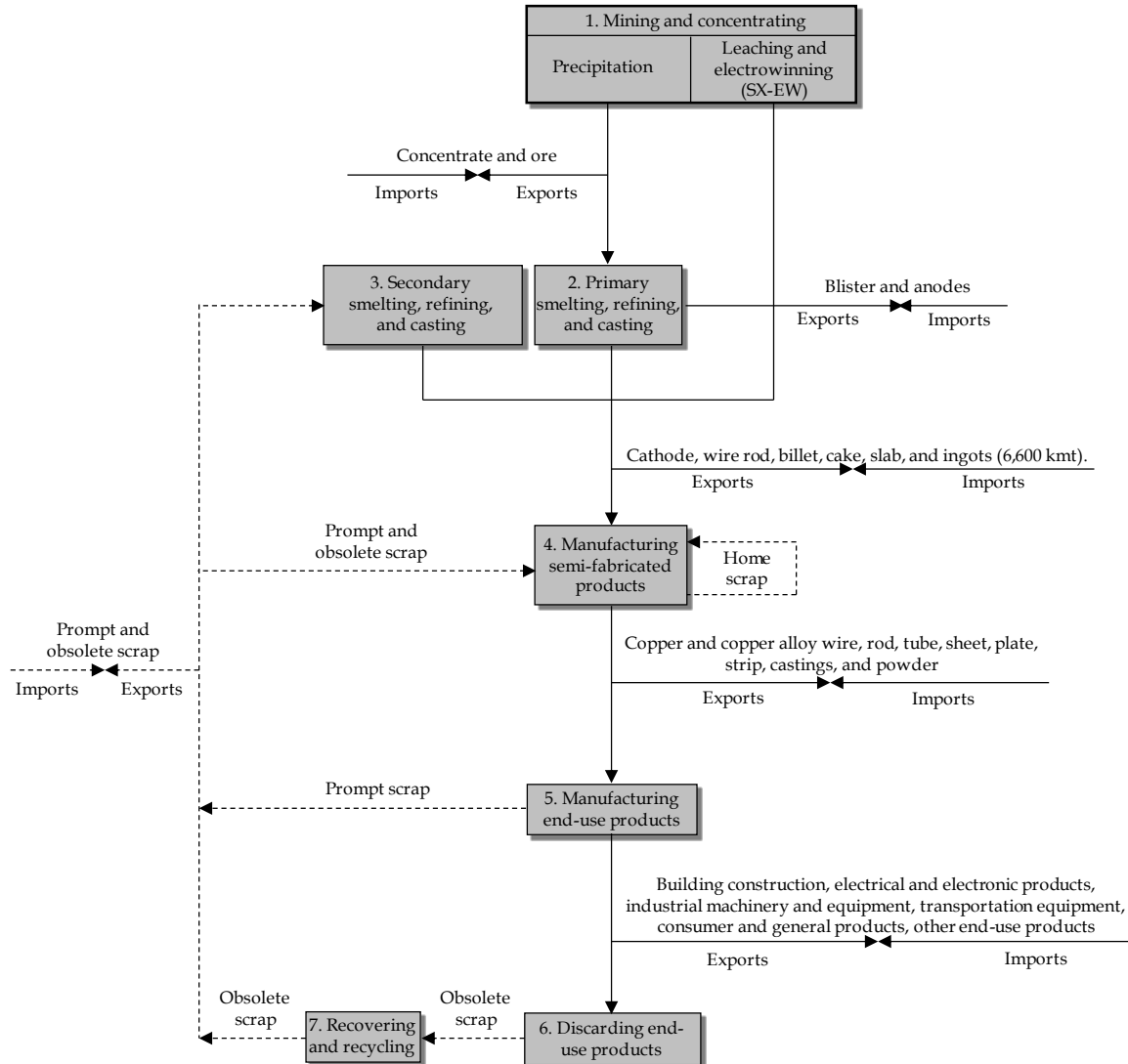


1.1 Who are we?

- Economic consultants founded in 1946 by Robert R. Nathan. We are applied micro-economists with Offices in Washington, Los Angeles, Memphis, London, and Chennai
- Our experience includes estimating U.S. national inventory of obsolete ferrous scrap (1975, 2003, and 2009) and of obsolete copper scrap (2003)
- We also estimated the inventory of obsolete ferrous scrap in Colombia and developed a model to forecast additions to inventory using readily available macro-economic data (completed in January 2009)
- We have also estimated the price elasticity of obsolete ferrous scrap supply (1979 and 2011)



1.3 Copper flow model



1.4 ICSG directory of copper/alloy semis

- Created a template for the ICSG directory of first-use copper and copper alloy semi-fabricators
- Updated the worldwide directory, excluding China
 - Identified and deleted plants in original directory that are no longer operating
 - Identified and included additional operating plants
 - Drilled down on plants in India and the Jamnagar brass parts cluster
 - Drilled down on plants in Russia and Japan to verify operations and identify plants previously not included in the directory
 - Estimated plant capacity
- The ICSG global directory (excluding China) now contains 1,561 plants



2.1 Recyclers and yard locations

More than 500 locations have been identified throughout North America.

- So far, the directory includes 87 locations in Canada where scrap metal is recovered.
- In the United States, we have identified and included 446 locations where scrap metal is recovered.
- To date, we have identified only one scrap metal recycler in Mexico.



2.2 Sample of directory records

Recycler	Address	URL	Contacts	E-mail	Phone	Fax
Camden Iron & Metal, Inc: HQ with a nonferrous materials facility, a frag site, and an export facility all in Camden [Camden Iron & Metal Inc, along with Southern Recycling and Northern Metal Recycling, is a subsidiary of EMR-USA, the American division of European Metal Recycling Ltd.(EMR). EMR is headquartered in the U.K. and is a world-wide leader in metal recycling technology.]	1500 South Sixth Street Camden, NJ 08104	http://www.camdeniron.com/			(856)365-7500	(856) 342-7488
Crash's Scrap Metals [Purchased by Sims Metal Management in early 2011.]	167 West River Road Frankfort, NY 13440	http://www.crashsofutica.com/index.html	Ralph A. Giovinazzo, Non-ferrous Supervisor	ralpha@crashscrapmetals.com	315-735-4451	315-733-8884
Huron Valley Steel Corporation: Headquarters and listed location of Fritz Enterprises Inc (FEI) [HV operates recovery and recycling facilities in Belleville, MI and Anniston, AL]	1650 West Jefferson Suite 100 Trenton, MI 48183	http://www.hvsc.net/index.php			(734) 479-3500	(734) 479-3413
OmniSource Corporation [Acquired by Steel Dynamics, Inc. in 2007 and operates as a wholly owned subsidiary]: Operates 43 collection yards and 20 nonferrous processing facilities located throughout Indiana, Illinois, Michigan, Ohio, Georgia, N. Carolina, S. Carolina, Tennessee, and Virginia	7575 West Jefferson Blvd Fort Wayne, IN 46804	http://www.omnisource.com/about/?p=company_overview	Jason Redden, Head of Nonferrous		800-666-4789 260-422-5541	



2.3 Questionnaire to guide interviews

Draft Questionnaire for Copper and Copper Alloy Scrap Recyclers

1. Company: Triple M Metal LP, Brampton Non-ferrous facility
2. Location address: 900 Intermodal Dr; Brampton, ON L6T 0B5
3. Telephone: 905-494-3999
4. FAX: 905-494-3997
5. URL: www.triplemmetal.com/index.htm
6. Name of respondent and date:
7. Is the company owned by another (Y/N) and if Y, who:
8. Does the company own
a. Dismantling scrap yard (Y/N):
b. Secondary smelter (Y/N):
c. Copper and copper alloy fabricators (Y/N):
9. What recovery technologies are used by the company? 2 shredders and 4 balers; rail siding services at all yards facilitate movement of hundreds of gondolas per month; a fleet of over 70 trucks and 100 trailers; roll off and Luggers operations are supported by a pool of over 1,000 containers; plant handling equipment that captures scrap from source to removal. Trailer services include Dump Trailer, Tin Scow, Flat and Walking Floor.
10. What final copper/copper alloy products are sold by the company? All grades of copper and brass/bronze alloys, including bare bright copper wire, bus bar, #1 copper, #2 copper, light copper, coated or plated copper and CDA alloys such as gilding metal, cartridge brass, red brass, yellow brass, rod brass.

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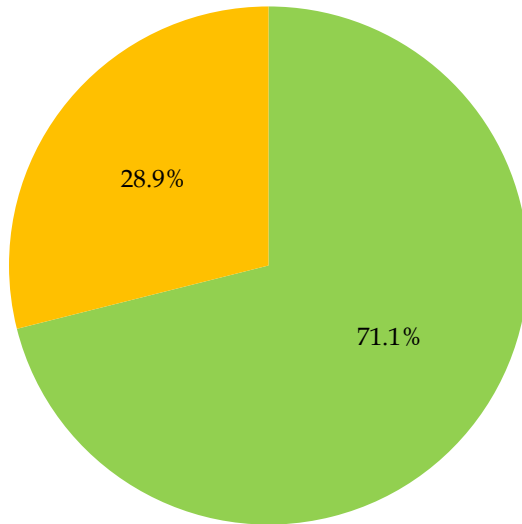
2.3 Questionnaire (continued)

11. Annual recovered scrap volumes:	2007	2008	2009	2010	2011	2012
a. Copper/copper alloy scrap (kt gross weight)						
b. New scrap						
c. Old scrap						
d. Copper content of scrap (tonnes)						
e. Copper content of scrap (%)						
f. Zinc content of scrap (tonnes)						
g. Zinc content of scrap (%)						
h. Nickel content of scrap (tonnes)						
i. Nickel content of scrap (%)						
j. Tin content of scrap (tonnes)						
k. Tin content of scrap (%)						
l. Lead content of scrap (tonnes)						
m. Lead content of scrap (%)						
12. Annual stock of copper/copper alloy (kt gross weight)						
13. Other remarks pertaining to sources, quality, prices, major drivers, trends, etc.:						



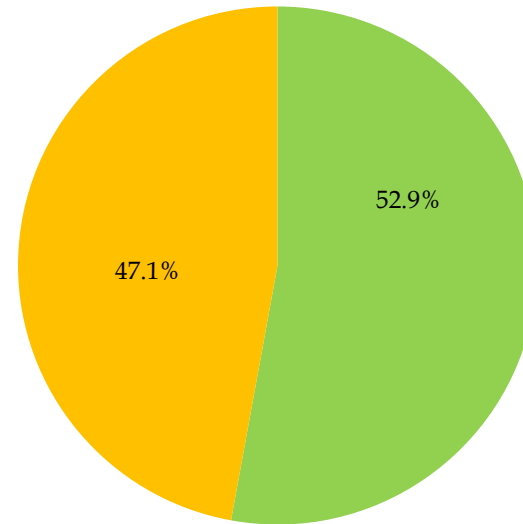
3.1 Ownership is concentrated, especially in the United States

*United States
(446 locations)*



- Locations of top five companies (10.4% of all companies)
- Locations of all other companies

*Canada
(87 locations)*

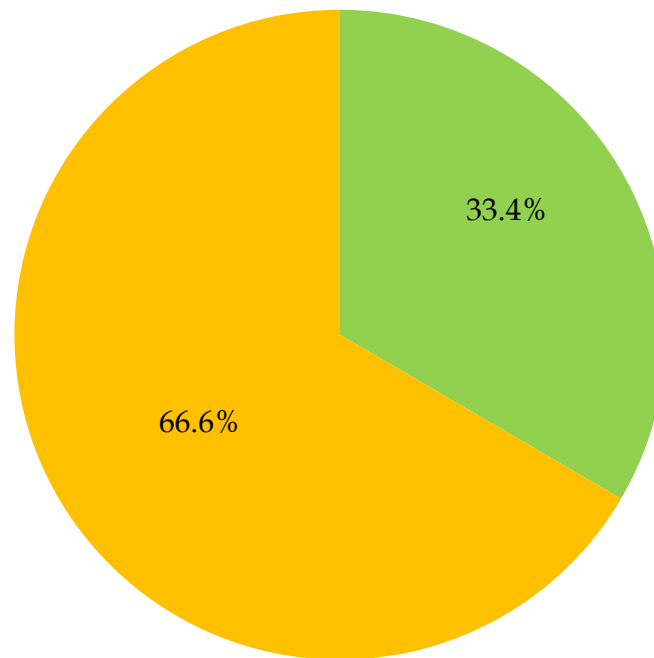


- Locations of top five companies (12.2% of all companies)
- Locations of all other companies



3.1 Significant foreign ownership of industry in United States

*United States
(446 locations)*



- Locations of foreign-owned companies
- Locations of U.S.-owned companies

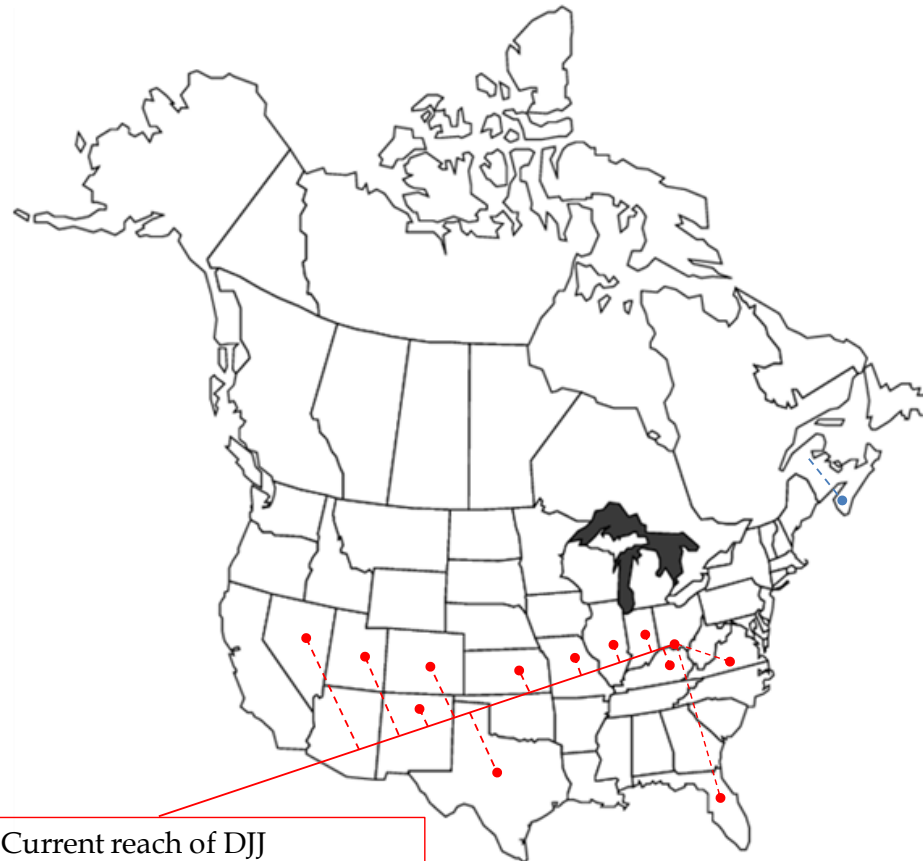


3.1 Leading companies in Canada and U.S. acquiring capacity

- American Iron & Metal Company Inc. (AIM)
- David J. Joseph Company, which is wholly owned by Nucor
 - In 2008, acquired the assets and business of Galamba Metals Group based in Kansas City, Missouri, and Metal Recycling Services Inc based in Monroe, North Carolina.
 - In 2010, acquired Ocala Recycling which operates four facilities in Florida, one with an automobile shredder. Of the approximately 220 auto shredders in North America, DJJ now operates 15.
- Sims Metal Management: In early 2011, acquired Crash's Scrap Metals, a full service metals processing and recycling center located in central upstate New York which had been in business since 1953.
- SA Recycling, which operates the fifth most number of yards in the United States with headquarters in California and facilities throughout the Southwest, recently acquired as many as seven additional yards bringing the total operated by SA to 47.



3.1 Leading companies look to expand geographic coverage



Current reach of DJJ
61 facilities located throughout the United States, including Colorado, Florida, Illinois, Indiana, Kansas, Kentucky, Missouri, Nevada, New Mexico, North Carolina, Ohio, Texas, and Utah



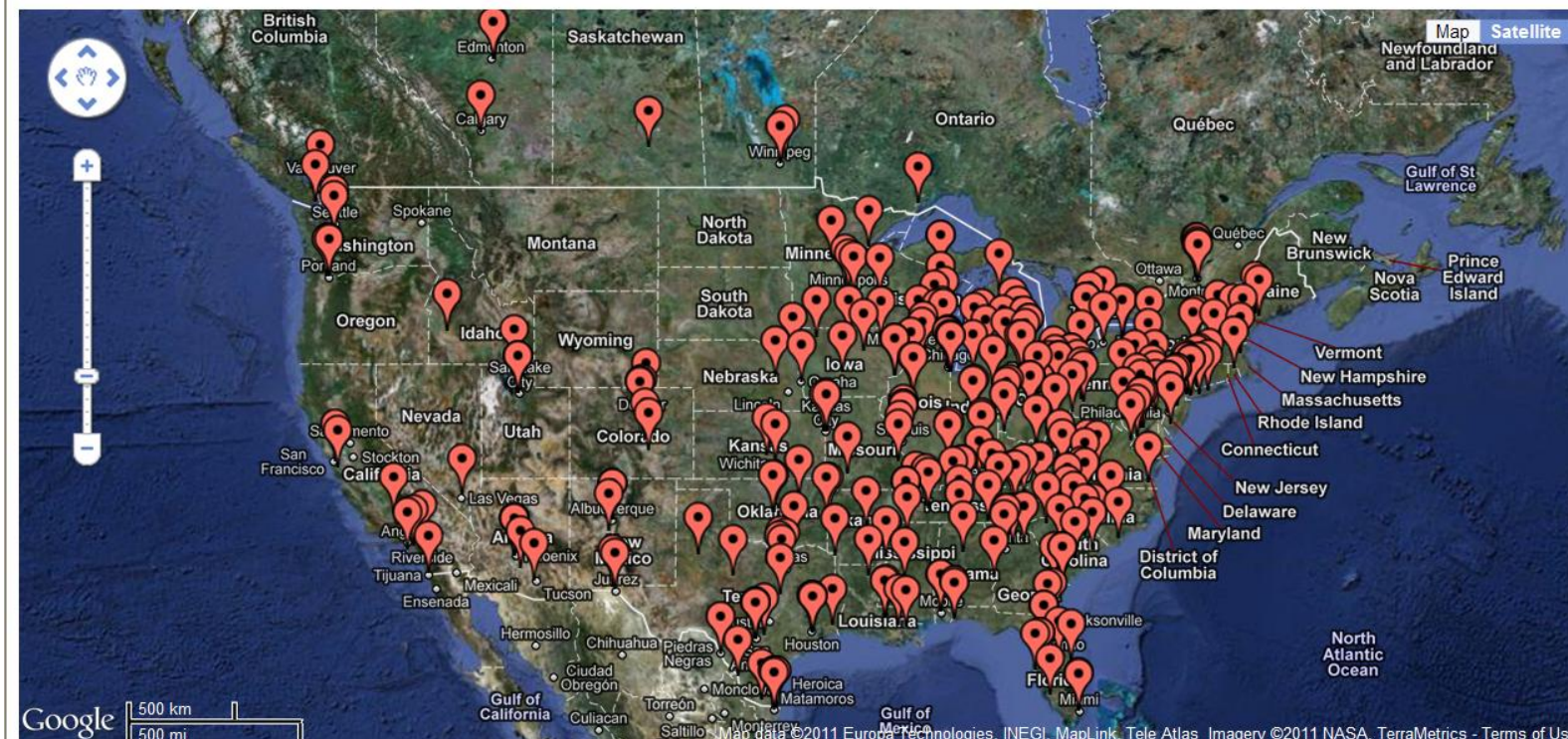
3.2 Technologies used at scrap yards

- Auto and appliance shredders and complementary technologies including magnetic separation, eddy current separation, heavy media separation, color detection, and radiation
- Wire choppers which mechanically process insulated copper and aluminum wire and cable into small nuggets and separates wire from its insulation jacket. Steps include granulation, magnetic separation, sizing, and air separation
- Guillotine and alligator shears which use a downward cutting motion to shear pipes, heavy plates, and beams to specified sizes for better manageability.
- Hydraulic baling presses compress ferrous and nonferrous scrap that requires greater density before shipping, re-melting, or recycling
- Briquetters are similar in function to balers, but compress scrap into briquettes that are different from bales in size, density, and shape
- Torch cutting is sometimes used to reduce scrap pieces into more manageable sizes or separate one metal from another for sorting purposes
- Other technology and equipment includes hydraulic and cable cranes with grapples, clam buckets, and magnets used to handle inbound and outbound scrap; conveyors to move scrap to and from processing equipment; fork lifts; front-end loaders; trucks; and rail cars



3.2 More than 200 auto shredders are found in North America

Map of Shredders in North America



In the United States, 15 million tons of products are shredded annually, 12 million of which are recycled. The remaining 3 million tons of shredder “fluff” is landfilled. Of the recycled shredder output, no more than 3% (360,000 tons) is recovered copper and copper alloy scraps.

3.2 Technologies to recover copper scrap in shredder aggregate

- Magnetic separation isolates shredded ferrous from nonferrous material. The separation is not perfect and often some ferrous pieces are still connected to nonferrous pieces. For example, copper wire from electric motors remains attached to ferrous components in the ferrous stream. The copper material is removed by hand and referred to as “copper pickings,” which typically account for 0.5% of the shredder ferrous scrap stream.
- The nonferrous stream is usually screened into pieces of similar size and eddy current technology, which relies on the principles of electromagnetic induction in conducting materials, is used to further process similarly sized pieces into two separate streams: (1) an aggregate of zinc, brass, copper, and aluminum and (2) an aggregate of stainless steel and all other material. An induction sorting system captures the stainless steel and leaves a residue (the shredder residue or fluff) of plastics, glass, fabric, foam, and a small fraction of metals. Stainless steel accounts for no more than 2% of the nonferrous stream.
- Heavy media separation can be used to isolate aluminum from zinc, brass, and copper. In the heavy media solution, aluminum floats and the heavier metals sink to the bottom. Aluminum accounts of 75% of the nonferrous stream and “heavies” account for the remaining 25%.
- Additional technologies such as color detection and radiation are sometimes employed to separate heavies into components. However, Asian buyers drove up the price of the unsorted stream, and, as a result, most of the mixed metal concentrate is sold to customers in Asia,

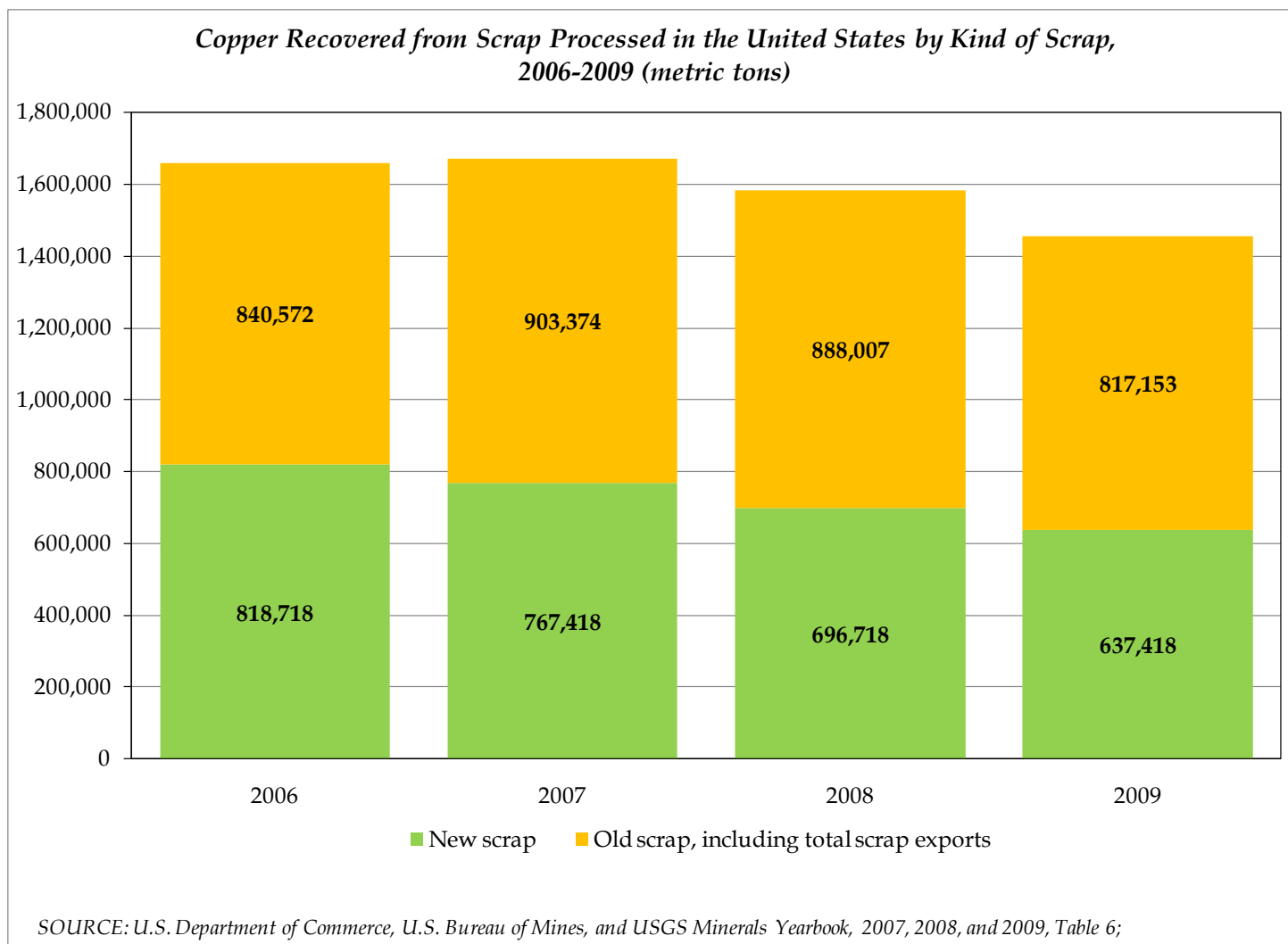


3.2 Scrap sources and flows vary from yard to yard

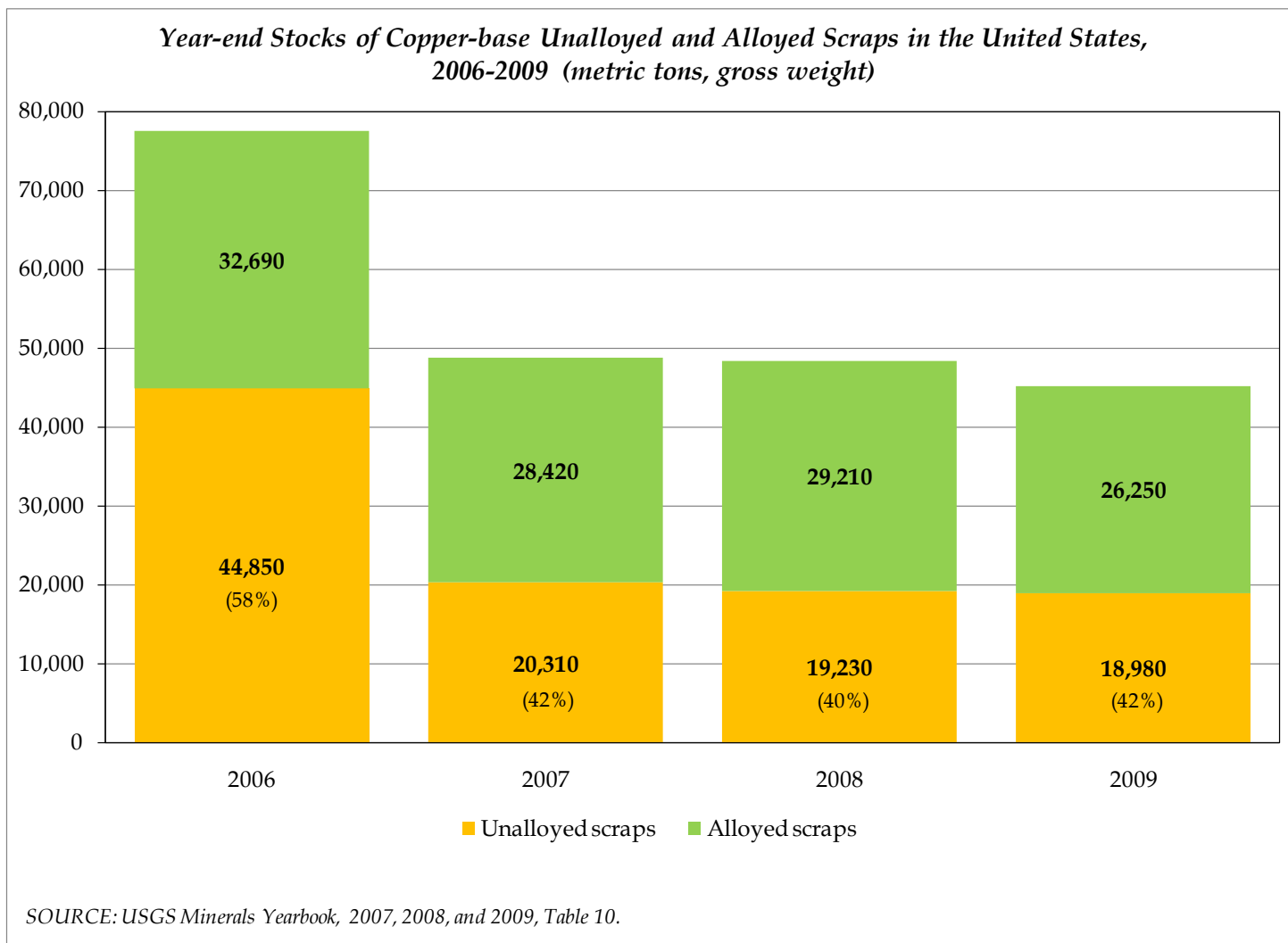
- Sources are yard specific
 - For example, a yard in Florida purchases copper and copper alloy scrap from industrial accounts and peddlers. Approx 30% is from industrial accounts, the rest from peddlers. Of the industrial account purchases, approximately 10% is new scrap. Purchases from peddlers is 100% old scrap.
 - Peddlers are the only source of scrap for a small yard in Colorado that employs small alligator shears to process the material
 - A yard on the Gulf Coast relies exclusively on other scrap processors who are within truck-driving distance
 - Nonferrous scrap processed by Huron Valley Steel is exclusively from shredder yards.
- Practices differ depending on whether focus is on ferrous or nonferrous scrap. For example,
 - At a yard in Texas that focuses on ferrous scrap and operates a mega shredder, copper and alloys are hand picked from the shredder residue and moved to a another yard that focuses on nonferrous scrap where the material is accumulated until volume is adequate for a sale transaction.
 - At a yard in Florida that does not utilize specialized technology, purchased copper and copper alloy scrap is separated into copper 1, copper 2, and copper alloys. ***When approximately 10,000 pounds of material has been accumulated, the material is sold.***



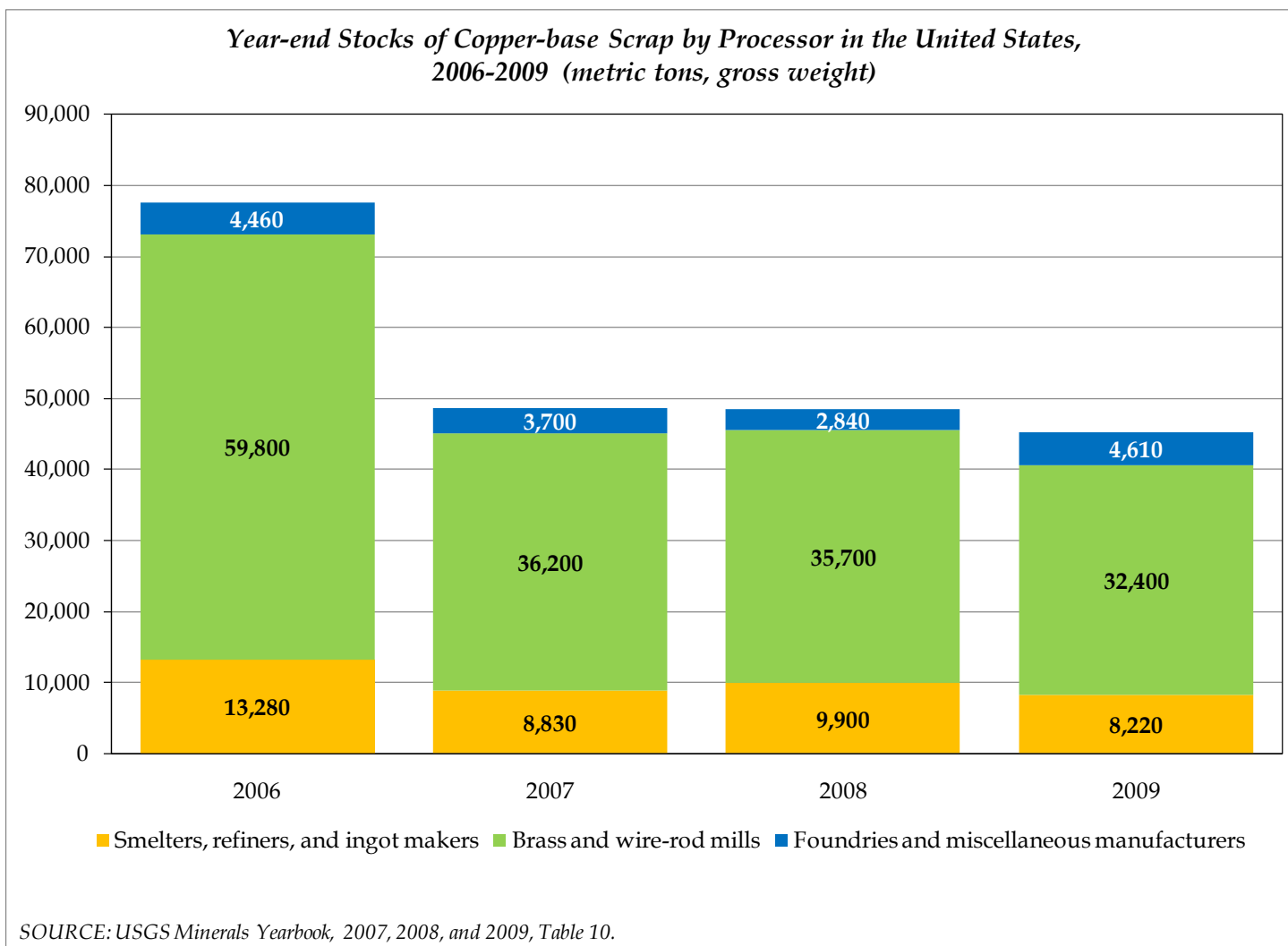
3.2 Interviews revealed no current trend in recovered amounts



3.2 No current trend in total stocks

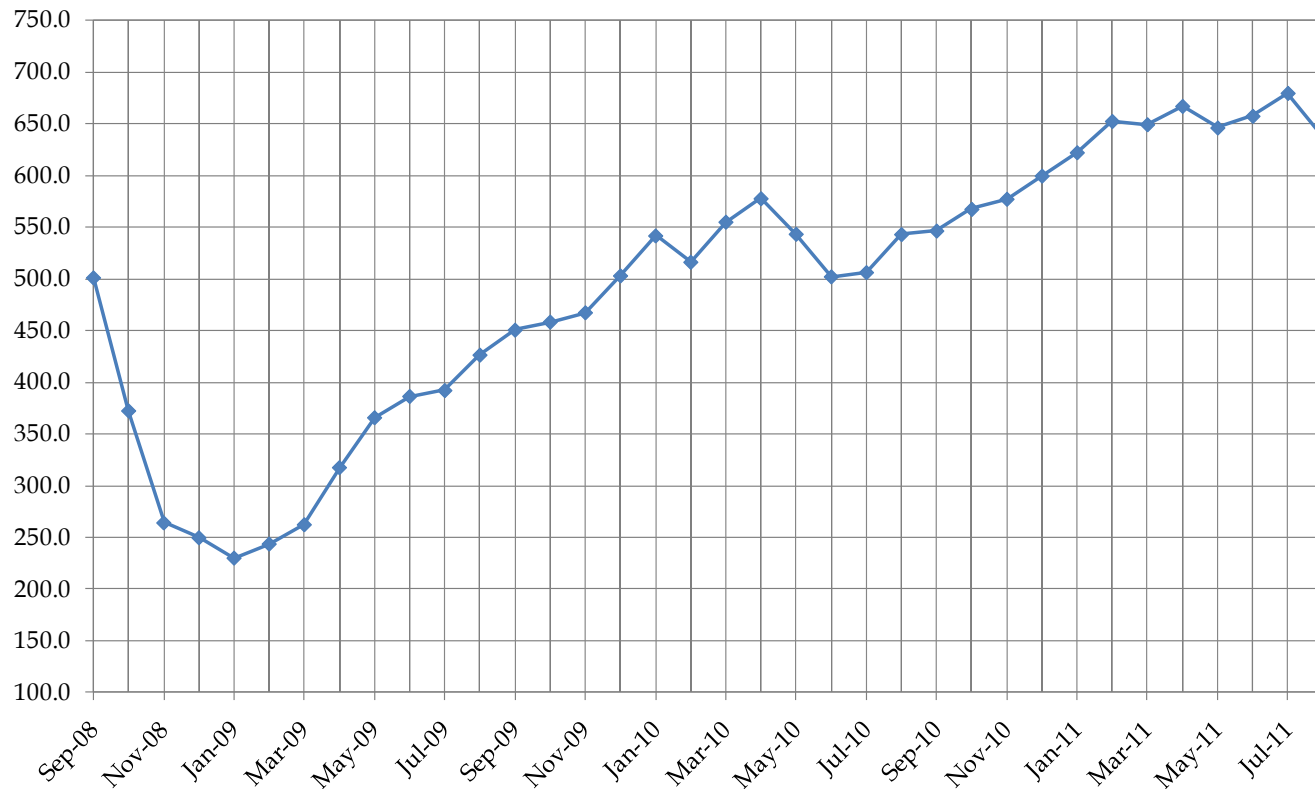


3.2 Copper scrap stocks not held at recyclers' yards



3.2 Little incentive for yards to accumulate stocks

U.S. Producer Price Index for Copper Base Scrap (1982 = 100)

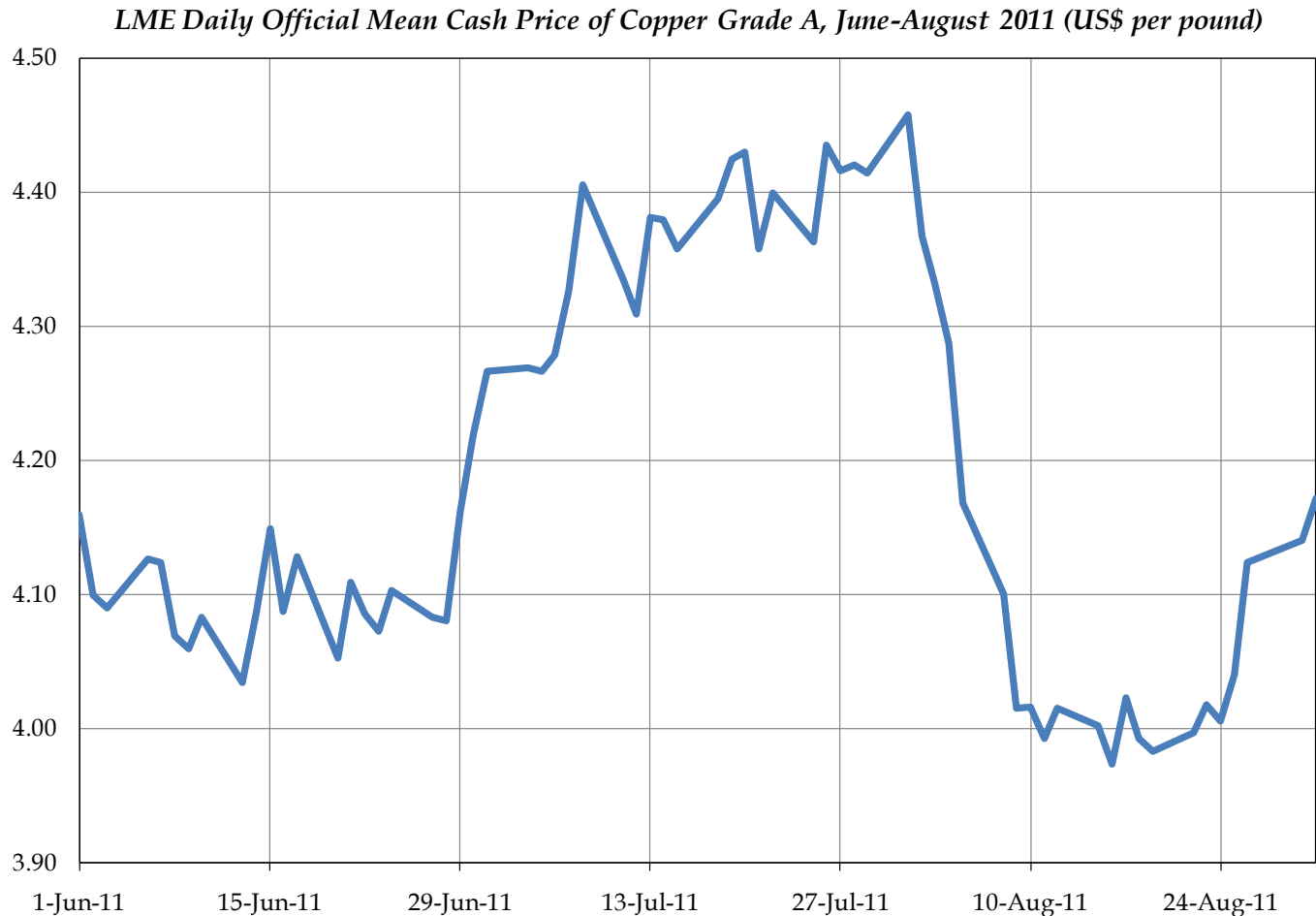


Note: May, June, July, and August 2011 are preliminary.
SOURCE: U.S. Bureau of Labor Statistics.



“No one is inventorying scrap copper at these high and highly volatile prices.”

3.2 Price volatility makes building stocks too risky for yards



“At a price of \$4.00, a 5% swing (\$0.20) could wipe out my margin.”

3.2 Interviews revealed the following...

- “In the past, scrap dealers built and maintained inventories for the purpose of covering sales six months forward. Today, commodity and hedge fund managers make buy and sell decisions based on financial gain only.”
- The nonferrous manager of a yard in Alabama quit holding copper inventory in the late 1980s. “Back then, I got copper prices from my copy of the Wall Street Journal delivered every weekday. Prices might have moved up or down 5% a year. Today, prices move too fast and are too volatile. A 5% swing can occur in a single day or week. And prices are available electronically, 24/7 in real time.”
- Pacific Steel operates 43 recycling branches across nine U.S. state. Thirty of these locations recover nonferrous scrap, including insulated wire, stripped wire, and copper tubes, among other types. They buy and sell copper scrap every day and maintain no scrap inventory. Risk is too high.
- The growth in commodity markets, hedge funds, and global trade, as well as increasing fluctuations in international currency values have resulted in scrap dealers’ decisions to simply buy and sell copper scrap and no longer build and maintain scrap inventories.



3.3 Legislative and Regulatory Concerns

- The U.S. Environmental Protection Agency (EPA) has provided the scrap recovery and recycling industry with exemptions from some of its environmental regulations. Twelve years ago, the industry won an exemption, that, in effect, ruled scrap is not waste. EPA is now considering this and all other scrap industry exemptions. If the “scrap is not waste” exemption were rejected, additional environmental regulations could apply to the copper and copper alloy recycling industry, resulting in more time consuming and costly scrap recovery.
- Metal theft is a problem when prices are high, but the legislative solutions implemented thus far (tag and hold) are ineffective and raise the cost of doing business.
- Threat of export embargoes.



4. Next step recommendations

- To complete this survey, we need to identify additional nonferrous scrap recyclers in Mexico and interview as many as possible and necessary to determine whether yard practices in Mexico are significantly different from those in Canada and the United States.
- Looking ahead, there is additional need for information on old scrap generated in North America annually, amounts recoverable, and the sensitivity of recovered amounts (supply) to changes in scrap prices.
 - ✓ NAFTA copper flow model that can track copper through the entire production, trade, consumption, discard, and recovery cycle
 - ✓ Econometric model of copper scrap supply and demand
- Development of an econometric model relating new scrap and old scrap generation/recovery to explanatory variables and applying the model to generate short-term forecasts of scrap supply.



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Thank you.



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