COPPER AND COPPER ALLOYS SCRAP SUPPLY SURVEY IN THE EUROPEAN UNION

APRIL, 2013

PRESENTATION
Survey Focuses On Industry Structure and Copper Scrap Flow

**SOURCE**
- End of Life Vehicles
- Construction and Demolition
- Industrial Waste
- WEEE
- Solid Municipal Waste

**SCRAP MARKET (SUPPLY)**
- Direct collection
- Small/medium sized traders
- Scrap recyclers
- Big traders

**DEMAND**
- Smelters, semi- and final production

**PART ONE – INDUSTRY STRUCTURE**
Sample of interview partners, segments of Trading Companies, main characteristics

**PART TWO – COPPER SCRAP FLOW**
Copper scrap flow (exports and imports) incl. data consistency, estimated copper content
We Have Used Both Primary and Secondary Data

**SOURCE**
- End of Life Vehicles
- Construction and Demolition
- Industrial Waste
- WEEE
- Solid Municipal Waste

**SCRAP MARKET (SUPPLY)**
- Direct collection
- Small/medium sized traders
- Scrap recyclers
- Big traders

**DEMAND**
- Smelters, semi- and final production

**SECONDARY DATA**
- EUROSTAT, COMTRADE
- ORBIS Database
- Various papers, websites

**PRIMARY DATA**
- Standardized phone interviews (49)
- Expert phone interviews (9)
AGENDA

➔ Part One: Industry Structure
  Sample of Interview Partners
    Segments of Trading Companies
    Main Characteristics of Trading Companies
  ➔ Part Two: Copper Scrap Flow
    Exports and Imports
    Estimated Copper Content
Primary Research Has Focused on 10 Key EU27 Countries

**AVAILABLE ADDRESSES OF DIRECT COLLECTORS, SCRAP RECYCLERS AND TRADERS**
TOTAL: 740

- United Kingdom: 42%
- Germany: 13%
- Italy: 7%
- Spain: 5%
- Belgium: 5%
- Netherlands: 5%
- France: 5%
- Austria: 2%
- Sweden: 2%
- Denmark: 1%

**Languages Applied**
Interviews were conducted in English, German, French and partly Spanish.

**Success Ratio**
Success Ratios were extremely high in Austria, Belgium and partly in Denmark.

**Number of Addresses**
UK and Germany made up for more than half of available addresses.

**Percentage of EU27 Exports**
UK, Germany and the Netherlands export 67% of total copper scrap volumes to extra-EU countries.

Quelle: Eurostat Data Explorer
Selected 10 Countries Made Up 90 % of Extra EU27 Scrap Exports

EU COUNTRIES RANKED BY TONNAGE COPPER AND COPPER ALLOYS EXPORTS: TOTAL 2011: 1.352.931 TONS

Source: EUROSTAT Data Explorer (EXTRA EU TRADE EU27 7–11.xls)
We Contacted 137 Copper Trading Companies – 53 Were Willing to Participate

TOTAL NUMBERS
53 COMPANIES INTERVIEWED
84 NO INTERVIEW POSSIBLE

EXAMPLE GERMANY
20 German companies interviewed
21 German companies not willing to participate
49% RESPONSE RATE
AGENDA

➔ Part One: Industry Structure
  Sample of Interview Partners
  Segments of Trading Companies
    Main Characteristics of Trading Companies
  Part Two: Copper Scrap Flow
  Exports and Imports
  Estimated Copper Content
8 of 41 Trading Companies Sell More Than or Equal To 20,000 Tons of Copper Content

COMPANIES INTERVIEWED
TOTAL: 53

41, 77%
12, 23%

PROVIDING VOLUME
NOT PROVIDING VOLUME

SCRAP (COPPER CONTENT) TRADED
IN TONS PER ANNUM

250,000
200,000
150,000
100,000
50,000
0

8 LARGE TRADERS

33 SMALL AND MEDIUM-SIZED TRADERS
Direct Collectors With Direct Access to Scrap Sources Made Up 70% of Our Sample

SCRAP MARKET (SUPPLY) (3 roles – collectors, recyclers, traders – NOT mutually exclusive)

**DIRECT COLLECTORS**
- Small & medium traders: < 20.000 tons p.a.
- Scrap Recyclers
- Large traders >= 20.000 tons p.a.

**Number:** 39 (out of 53)  
**Share:** 74%

**Number:** 33 (out of 53)  
**Share:** 65%

**Number:** 30 (out of 53)  
**Share:** 57%

**Number:** 8 (out of 53)  
**Share:** 16%

**Ownership: AURUBIS**
- Cablo Metall (DE)
- CMR International (BE)
- Electro Recycling Nord (DE)

**Ownership: SCHOLZ RECYCLING**
- Scholz Recycling (DE)
- Fritz Kutting (AT)
- Uniscrap (DK)

**Ownership: GALLOO GROUP**
- Galloo NV (BE)
- Belgomet (BE)
- Motormetal (BE)
- Retra NV (BE)
- Van Heygen (BE)
AGENDA

Part One: Industry Structure
- Sample of Interview Partners
- Segments of Trading Companies
- Main Characteristics of Trading Companies

Part Two: Copper Scrap Flow
- Exports and Imports
- Estimated Copper Content
## Relationships to Supply - Demand AND Economies of Scale: Perfect Strategic Position

### Scrap Market (Supply) (1)

<table>
<thead>
<tr>
<th>Type</th>
<th>Number (out of 53)</th>
<th>Share</th>
<th>Main Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct collectors</td>
<td>39</td>
<td>71%</td>
<td>- Relationships to clients</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Logistics and substantial scrap yards to absorb scrap from various sources</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Sell to small &amp; medium sized traders</td>
</tr>
<tr>
<td>Small &amp; medium traders</td>
<td>33</td>
<td>65%</td>
<td>- Relationships to big traders and/or smelters</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Trade within EU</td>
</tr>
<tr>
<td>Scrap Recyclers</td>
<td>30</td>
<td>57%</td>
<td>- Relationships to smelters and/or large traders</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Tend to specialize on certain products (e.g., cars, cables etc.)</td>
</tr>
<tr>
<td>Large traders</td>
<td>8</td>
<td>16%</td>
<td>- Relationships to foreign large traders or smelters</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Trade outside EU (due to scale and negotiation power)</td>
</tr>
</tbody>
</table>

#### Main Characteristics
- Relationships are key
- Defined by local communities

#### Industry Scrap
- Main Asset: Machines for dismantling (need for economies of scale!)

#### Private Households
- Main Asset: size, access to shipping
Yard Size Does Not Always Correlate with Volume Due to Different Business Models

VOLUME SCRAP COPPER CONTENT AND SCRAP YARD SIZES
in TONS / SQUARE METERS

29 interviewees provided both volume AND scrap yard size

*: One outlier with 300,000 square meters removed from sample, companies that either not provide scrap yard or volume are not included
E-Motors Are the Only Product For Which Size of Business Plays a Key Role

**SCRAP MARKET (SUPPLY)**

<table>
<thead>
<tr>
<th>Products</th>
<th>Direct Collectors</th>
<th>Small &amp; medium traders: &lt; 20,000 tons p.a.</th>
<th>Scrap Recyclers</th>
<th>Large traders &gt;= 20,000 tons p.a.</th>
<th>AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Grade Cable</strong></td>
<td>Number: 39 of 53 Share: 71%</td>
<td>Number: 33 of 53 Share: 65%</td>
<td>Number: 30 of 53 Share: 57%</td>
<td>Number: 8 of 53 Share: 16%</td>
<td><strong>AVERAGE</strong></td>
</tr>
<tr>
<td>% = Number / interviewees in segment</td>
<td>32 of 39 82%</td>
<td>32 of 33 97%</td>
<td>25 of 30 83%</td>
<td>7 of 8 88%</td>
<td><strong>87%</strong></td>
</tr>
<tr>
<td><strong>Low Grade Cable</strong></td>
<td>Number: 28 of 39 Share: 72%</td>
<td>Number: 26 of 33 Share: 79%</td>
<td>Number: 23 of 30 Share: 77%</td>
<td>Number: 5 of 8 Share: 63%</td>
<td><strong>72%</strong></td>
</tr>
<tr>
<td>% = Number / interviewees in segment</td>
<td>28 72%</td>
<td>26 79%</td>
<td>23 77%</td>
<td>5 63%</td>
<td><strong>72%</strong></td>
</tr>
<tr>
<td><strong>E-Motors</strong></td>
<td>Number: 25 of 39 Share: 64%</td>
<td>Number: 22 of 33 Share: 67%</td>
<td>Number: 21 of 30 Share: 70%</td>
<td>Number: 8 of 8 Share: 100%</td>
<td><strong>75%</strong></td>
</tr>
<tr>
<td>% = Number / interviewees in segment</td>
<td>25 64%</td>
<td>22 67%</td>
<td>21 70%</td>
<td>8 100%</td>
<td><strong>75%</strong></td>
</tr>
<tr>
<td><strong>Brass</strong></td>
<td>Number: 20 of 39 Share: 51%</td>
<td>Number: 18 of 33 Share: 55%</td>
<td>Number: 15 of 30 Share: 50%</td>
<td>Number: 4 of 8 Share: 50%</td>
<td><strong>51%</strong></td>
</tr>
<tr>
<td>% = Number / interviewees in segment</td>
<td>20 51%</td>
<td>18 55%</td>
<td>15 50%</td>
<td>4 50%</td>
<td><strong>51%</strong></td>
</tr>
<tr>
<td><strong>Radiators</strong></td>
<td>Number: 24 of 39 Share: 62%</td>
<td>Number: 22 of 33 Share: 67%</td>
<td>Number: 16 of 30 Share: 53%</td>
<td>Number: 3 of 8 Share: 38%</td>
<td><strong>55%</strong></td>
</tr>
<tr>
<td>% = Number / interviewees in segment</td>
<td>24 62%</td>
<td>22 67%</td>
<td>16 53%</td>
<td>3 38%</td>
<td><strong>55%</strong></td>
</tr>
</tbody>
</table>
Recyclers Use Their Sizes and Export Options to Strengthen Their Negotiation Power

### TOP RECYCLING COMPANIES IN EU 27 (NACE CODE 3832 RECOVERY OF SORTED MATERIALS*) BY THEIR TOTAL REVENUE IN 1,000 US DOLLARS

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Revenue (1,000 US Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Metal Recycling</td>
<td>3,500,000</td>
</tr>
<tr>
<td>Scholz Recycling AG</td>
<td>3,000,000</td>
</tr>
<tr>
<td>TSR Recycling</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Ecore B.V.</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Interseroh Management</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Van Gansewinkel Groep</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Stena Recycling AB</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Guy Dauphin Environment</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Der Grüne Punkt</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Kuusakoski</td>
<td>1,000,000</td>
</tr>
<tr>
<td>SIMS Group UK Limited</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Consorzio Nationale Servizi Societa</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Nord-Schrott GmbH</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Reukema Metal Group</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Johnson Controls Recycling</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Purfer</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Veolia Proprete</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Stena Metall A/S</td>
<td>1,000,000</td>
</tr>
<tr>
<td>AFM Recyclage</td>
<td>500,000</td>
</tr>
<tr>
<td>Bicomet S.P.A.</td>
<td>500,000</td>
</tr>
<tr>
<td>Paprec France (Prevost)</td>
<td>500,000</td>
</tr>
<tr>
<td>Sims M+R GmbH</td>
<td>500,000</td>
</tr>
<tr>
<td>Duesmann &amp; Hensel</td>
<td>500,000</td>
</tr>
<tr>
<td>Stena Recycling A/S</td>
<td>500,000</td>
</tr>
<tr>
<td>H.J. Hansen</td>
<td>500,000</td>
</tr>
<tr>
<td>Dansk Retursystem</td>
<td>500,000</td>
</tr>
</tbody>
</table>

Source: Websites of companies, ORBIS database  *Scholz, TSR and Interseroh not included

Evidence of copper recycling activity: Green bar
No evidence of copper recycling activity: Clear bar

### INDUSTRY STRUCTURE - CHARACTERISTICS

<table>
<thead>
<tr>
<th>Evidence of Copper Recycling Activity</th>
<th>No Evidence of Copper Recycling Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Metal Recycling</td>
<td>Scholz Recycling AG</td>
</tr>
<tr>
<td>Scholz Recycling AG</td>
<td>TSR Recycling</td>
</tr>
<tr>
<td>TSR Recycling</td>
<td>Ecore B.V.</td>
</tr>
<tr>
<td>Interseroh Management</td>
<td>Van Gansewinkel Groep</td>
</tr>
<tr>
<td>Van Gansewinkel Groep</td>
<td>Stena Recycling AB</td>
</tr>
<tr>
<td>Stena Recycling AB</td>
<td>Guy Dauphin Environment</td>
</tr>
<tr>
<td>Guy Dauphin Environment</td>
<td>Der Grüne Punkt</td>
</tr>
<tr>
<td>Der Grüne Punkt</td>
<td>Kuusakoski</td>
</tr>
<tr>
<td>Kuusakoski</td>
<td>SIMS Group UK Limited</td>
</tr>
<tr>
<td>SIMS Group UK Limited</td>
<td>Consorzio Nationale Servizi Societa</td>
</tr>
<tr>
<td>Consorzio Nationale Servizi Societa</td>
<td>Nord-Schrott GmbH</td>
</tr>
<tr>
<td>Nord-Schrott GmbH</td>
<td>Reukema Metal Group</td>
</tr>
<tr>
<td>Reukema Metal Group</td>
<td>Johnson Controls Recycling</td>
</tr>
<tr>
<td>Johnson Controls Recycling</td>
<td>Purfer</td>
</tr>
<tr>
<td>Purfer</td>
<td>Veolia Proprete</td>
</tr>
<tr>
<td>Veolia Proprete</td>
<td>Stena Metall A/S</td>
</tr>
<tr>
<td>Stena Metall A/S</td>
<td>AFM Recyclage</td>
</tr>
<tr>
<td>AFM Recyclage</td>
<td>Bicomet S.P.A.</td>
</tr>
<tr>
<td>Bicomet S.P.A.</td>
<td>Paprec France (Prevost)</td>
</tr>
<tr>
<td>Paprec France (Prevost)</td>
<td>Sims M+R GmbH</td>
</tr>
<tr>
<td>Sims M+R GmbH</td>
<td>Duesmann &amp; Hensel</td>
</tr>
<tr>
<td>Duesmann &amp; Hensel</td>
<td>Stena Recycling A/S</td>
</tr>
<tr>
<td>Stena Recycling A/S</td>
<td>H.J. Hansen</td>
</tr>
<tr>
<td>H.J. Hansen</td>
<td>Dansk Retursystem</td>
</tr>
</tbody>
</table>
Recyclers, Traders and Collectors Face Highly Consolidated EU Smelter Industry*


* semis-fabricators are potential clients in addition to smelter industry
AGENDA

Part One: Industry Structure
- Sample of Interview Partners
- Segments of Trading Companies
- Main Characteristics of Trading Companies

Part Two: Copper Scrap Flow
- Exports and Imports
- Estimated Copper Content
China Gets 75% of Total EU-27 Copper Scrap Exports

COPPER SCRAP GROSS EXPORTS FROM EU-27 TO WORLD 2011
TOTAL: 1,352,931 TONS

COPPER SCRAP GROSS IMPORTS TO EU-27 FROM WORLD 2011
TOTAL: 491,290 TONS*

Source: EUROSTAT (HS Code 7404 Copper waste and scrap), all countries contributing more than 1% to either export or import volume.
UK Is the Only Big Exporter Country Not Only Relying on China as Major Partner

EU COUNTRIES RANKED BY ANNUAL TONNAGE COPPER AND COPPER ALLOYS EXPORTS: TOTAL 2011: 1,352,931 TONS

Source: EUROSTAT Data Explorer (EXTRA EU TRADE_EU27 7–11.xls)
Differences in Export and Import Reports Lead to Inconsistent Picture

COPPER SCRAP GROSS EXPORTS VS. IMPORTS 2011
(TOTAL EU27, TONS)

GROSS EXPORTS FROM GERMANY 2011
(GERMANY, TONS)

Source: EUROSTAT (HS Code 7404 Copper waste and scrap)
Interviews and Eurostat Information Shed Some Light on Origin of Inconsistencies

We found four basic explanations for deviating export/import figures in the EU:

- Exporting shipper (in country of origin) does not know ultimate country of destination and fills in country where copper scrap is stored. Importer however, fills in country of origin and NOT country of storage. (This argument is not officially confirmed by EUROSTAT but data structure shows some evidence of this happening).

- The importing country reports less systematically than the exporting country and vice versa. (Respective hints were given in some interviews)

- When company is below report limit the country would estimate their volumes. Approach to these estimates differs from country to country. (Argument officially by EUROSTAT)

- The definition of copper scrap (HS code 7404) may differ from country to country. (Argument confirmed by EUROSTAT)
AGENDA

Part One: Industry Structure
  Sample of Interview Partners
  Segments of Trading Companies
  Main Characteristics of Trading Companies

Part Two: Copper Scrap Flow
  Exports and Imports
  Estimated Copper Content
2 Sources We Used for Estimates Hint at Approx. 30% Copper Content in Exports

*EUROSTAT (HS Code 7404 Copper waste and scrap), Prices: 8000 US $ per ton copper (http://www.indexmundi.com/commodities/?commodity=copper&months=300), steel: 800 US $/ton for carbon steel (http://www.worldsteelprices.com)