Expansion of e-scrap capacity at Rönnskär

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Expansion in brief

- Capacity for recycling of electronic scrap from 45,000 to 120,000 tonnes/year
- New Kaldo plant – Capex SEK 1.3 billion
- Start end 2011/beginning 2012
- Increased production
  - Gold + 2 tonnes
  - Silver + 32 tonnes
  - Copper + 14,500 tonnes
Rationale for expansion

- Increased profitability
- Lower volatility
- Increased availability of e-scrap
- Availability for copper concentrate expected to be low for several years
- Maintain position as world leader
- Contribute to a sustainable society
Competitive position in e-recycling

- Proven technology
- Skilled personnel
- Best Available Technology for environment, health and safety
- Established market relations
- Excellent logistics (own harbour and the Copper shuttle)
- Synergies with existing production
E-scrap recycling within EU – legislation will drive e-scrap volumes

WEEE-directive from 2005
Target to collect 4 kg per person and year = 90,000 tonnes/y

WEEE-directive 2016 (not yet decided)
Target to collect 13 kg per person and year = 270,000 tonnes/y

Collected in Sweden 2008
16 kg per person and year

WEEE = Waste from electrical and electronic equipment

=main source of supply
Electronic scrap within EU
Supply and demand

- Smelter capacity
- Scrap availability
- Net import/export
Supply of e-scrap to Rönnskär

Europe: 70% of e-scrap volume
Scandinavia: 20% of e-scrap volume
North America: 5% of e-scrap volume
Others: 5% of e-scrap volume
The value chain for electrical and electronic waste

Collection of e-waste from industry and households

Inspection/Cleaning

Partition/Fragmentation

Separation

E-scrap*

BOLIDEN

* Types of e-scrap
  - WEEE-scrap (e.g. low-grade circuit boards)
  - Granules
  - High grade circuit board scrap
  - Alloyed scrap with precious metals
  - Production waste from manufacturing of electronics
  - Telecom scrap

Plastic

Glass

Aluminium

Iron

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Competitors

- **Europe**
  - Aurubis, Hamburg
  - Aurubis, Lünen
  - Umicore, Hoboken

- **Rest of the world**
  - Xstrata, Canada
  - Dowa, Japan

- **Alternatives**
  - Exports to China and Africa
  - Waste deposit instead of recycling
Existing Kaldo

- Start-up 1976
- Treatment of electronic scrap since 1980
- Flexible unit, altering campaigns e-scrap and lead smelting
- Superior capacity compared to competing technologies
- World class environmental performance
- Continuous improvements
More than 30 years of experience in e-scrap smelting and recycling

E-scrap processed at Rönnskär

Tonnes

New Kaldo Plant

- Indoor storage
- Kaldo furnace
- Boiler
- Gas cleaning equipment
- Granulation plant
Shredder for pre-treatment

Sampling

Logistics for unloading
Environmental Performance

- Increased energy recycling
  - excess heat from scrap smelting transformed into electricity or district heating
- Decreased fugitive emissions of dust
  - increased storage capacity for electronic scrap
  - enclosed conveyor system to kaldo furnace
- Transportation
  - less internal transportation
  - future supply mainly with ship or train
- CO$_2$-emissions
  - raw material related emissions are not included in the European trading with allowances (ETS)
- Permit from County Administrative Board 26/06/2008
120,000 tonnes per year