Boliden is a metals company with a commitment to sustainable development. Our roots are Nordic, our business is global. The company’s core competence is within the fields of exploration, mining, smelting and metals recycling. Boliden has a total of 4,400 employees and an annual turnover of SEK 40 million.

The Rönnskär copper smelter is located outside Skellefteå in northern Sweden. Rönnskär was built between 1928 and 1930 to process the ore found in the Boliden Area in 1924. Nowadays, the plant processes several different types of raw material, ranging from mined concentrate to electronic scrap and other types of recycling materials. The smelter produces over 200,000 tonnes of copper, 13,000 kg of gold and over 400,000 kg of silver every year, and also produces lead, zinc clinker and sulphuric acid. The Rönnskär plant has a total of approximately 860 employees.

Scrap electronic products must be processed and the metals they contain recycled in a way that ensures the minimum possible environmental impact. Boliden’s Rönnskär copper smelter has been processing different types of recycling materials since the 1960s, and it is in-depth experience, coupled with technologies developed in house and extensive capacity for processing these materials, that has won Boliden its position as a world leader in this sector.

Metals for modern life

Electronics for all

Electrical and electronic products are increasingly part of our everyday lives. But at the same time, many countries are introducing legislation requiring the collection of scrap electronics—a trend that is creating both an ever-growing market for recycling materials and a new source of raw materials for metal production. One might say that tomorrow’s mines can be found in our towns and cities.
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Boliden’s use of Kaldo technology is unique. It was initially developed within the steel industry in the 1940s and has since been further developed by Boliden for smelting electronic scrap. The Kaldo furnace is essentially a slightly leaning cylinder which rotates during the smelting process. The material is fed in and tapped out through the mouth of the furnace. There is no need to input any energy into the furnace: the plastic in the input raw material provides sufficient energy for the smelting process. The large amounts of energy released are recycled and converted to electricity or district heating. The smelted electronic scrap, known as black copper, is integrated with the smelter’s main copper flow for further refining and the extraction of copper and precious metals.

Rönnskär’s electronic scrap recycling operations expanded substantially in conjunction with the Recycling materials account for an increasingly large percentage of the smelter’s total metal flow and boost the value of the copper flow. Two thirds of the gold refined at Rönnskär comes from recycled materials. The broad raw materials base also heightens the smelter’s competitiveness. Most of the smelting materials processed at Rönnskär comprise metal concentrates from Boliden’s own mines and mines elsewhere in the world. The smelter has the capacity, however, to handle numerous different types of raw material, including an ever-growing percentage of recycling materials of one kind or another.

Scrapped and collected electronic products have accounted for the biggest increase in material type in recent years, primarily in the form of circuit boards from computers and mobile phones etc. Our suppliers are mainly based in Europe. Rönnskär’s location in northern Sweden demands a high level of logistical efficiency. The smelting materials are delivered by air, sea and road and with our own transport network that encompasses all of Sweden. The “Copper Shuttle” train delivers copper concentrate from our own port and an e-scrap shredder crushes the circuit boards that are loaded aboard at the point of pick-up. The raw materials are then delivered to the Kaldo plant complementing the existing Kaldo plants, yielding a combined annual production capacity of 120,000 tonnes.

Univalue Kaldo technology for electronics
Continuous metal flow
Metals for a modern society

There is hardly a product in today’s society that does not either contain metals or is dependent on metals for its manufacture. The electrical and electronic products released on to the market and subsequently scrapped, are processed and the metals they contain are recovered into valuable products released on to the market and subsequently scrapped. There is hardly a product in today’s society that does not either contain metals or is dependent on metals for its manufacture. The electrical and electronic products released on to the market and subsequently scrapped, are processed and the metals they contain are recovered into valuable products released on to the market and subsequently scrapped.
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Scraped and collected electronic products have accounted for the biggest increase in material type in recent years, primarily in the form of printed circuit boards from computers, mobile phones, etc. These products are processed and the metals they contain are extracted and used in new products.

There is hardly a product in today's society that does not either contain metals or is dependent on metals for its manufacture. The electrical and electronic products released on to the market and subsequently scrapped are processed and the metals they contain are upgraded in a number of stages. The metals are produced in a number of stages:

1. **Investment in the new material processing and smelting facilities that were commissioned in early 2012.** An e-Kaldo plant complements the existing Kaldo plant, yielding a combined annual production capacity of 120,000 tonnes.

2. **Smelted electronic scrap**

3. **Metal concentrate 25%**

4. **Smelting 55%**

5. **Converting 98%**

6. **Anode casting 99%**

7. **Electrolytic Refining 99,99%**

8. **COPPER PRODUCTION**

9. **Where production actually takes place**

10. **Smelting**

11. **Conversion**

12. **Anode casting**

13. **Electrolytic refining**

14. **Continuous metal flow**

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Most of the smelting materials processed at Rönnskär comprise metal concentrates from Boliden’s own mines and mines elsewhere in the world. The smelter has the capacity, however, to handle a wide range of raw materials, including recycling materials of all kinds in metals and non-metals. Smoked and chaffed scrap is usually processed using recycling materials of all kinds in metals and non-metals.

There is hardly a product in today’s society that does not either contain metals or is dependent on metals for its manufacture. Metals can be recycled over and over again without losing any of their quality. The electrical and electronic products released on to the market and subsequently scrapped are processed and the metals they contain are recovered. Smelting and recycling products are released to the market and subsequently recovered and the metals they contain are recovered.

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Rönnskär’s location in northern Sweden demands a high level of logistical efficiency. The smelting materials are delivered by our own mono cars and with trains from the domestic and international supply in containers at our own Berget port. On the return journey, the “Copper Shuttle” train carries containers full of electronic scrap that are loaded on board at the port of Helsingborg. After arriving at Rönnskär, the e-scrap undergoes pre-processing in the form of dismantling and crushing. Glass, a certain amount of plastic, and steel and aluminium are separated out and disposed of in the recycling process. The resulting copper scrap is fed into the Kaldo furnace for further processing. The sampling plant ensures a clean feed for efficient and high-quality processing. From the e-scrap delivered to Rönnskär, the yield of the copper scrap amounts to approximately 50%.

Boliden’s e-Kaldo plant complements the existing Kaldo plant, enabling a combined annual production capacity of 120,000 tonnes.

The metals are produced in a number of separate stages. The raw materials are smelted and refined into products such as copper, gold and silver. The copper production process upgrades the purity of the copper from approximately 25% to 99.99%.
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There is hardly a product in today's society that does not either contain metals or is dependent on metals for its manufacture. E-waste is a resource that can be recovered and converted to energy, with a low environmental impact.

Electronic products have provided us with a new raw materials source that both enhances energy efficiency and helps conserve resources in Boliden’s processes.

Recycling materials account for an increasingly large percentage of the smelter's total metal flow and hence the value of the copper flow. Two thirds of the gold refined at Rönnskär come from recycled materials. The broad raw materials base also heightens the smelter's competitiveness.

Most of the smelting materials processed at Rönnskär comprise metal concentrates from Boliden's own mines and mines elsewhere in the world. The smelter has the capacity, however, to handle a wide range of raw materials from various sources, ensuring that Boliden's production is as sustainable as possible.

Scraped and collected electronic products have accounted for the biggest increase in material type in recent years, primarily in the form of circuit boards from computers, televisions, etc. Boliden has a well-developed recycling system for e-waste, with a 2020 goal of recycling at least 30% of the total smelter’s metal flow.

Electronic products are processed and converted to energy through a three-stage process:

1. Pre-processing: In this stage, the electronic waste is collected, shredded, and separated into metals and non-metals.
2. Smelting: The metals are extracted and refined to produce high-purity copper, gold, silver, and other metals.
3. Conversion: The refined metals are further processed to meet specific customer needs.
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