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Circular economy

Carbon



We have part of the solution for the raw material crisis. 10 million tons of unused materials have been mapped.

27 Co Cobalt	28 Ni Nickel	12 Mg Magnesium	9 F Fluorine	39 Y Yttrium	3 Li Lithium	13 Al Aluminium	1 H Hydrogen	6 C Carbon	7 N Nitrogen	26 Fe Iron	29 Cu Copper
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Critical and strategic raw materials are crucial for succeeding with the digital and green transition.

Critical raw materials:

Bauxite, Antimony, Arsenic, Baryte, Beryllium, Bismuth, Borax, Cobalt, Coke, Feldspar, Fluorite, Gallium, Germanium, Hafnium, Helium, Lithium, Magnesium, Manganese, Graphite, Niobium, Phosphate, Copper, Phosphorus, Scandium, Silicon, Strontium, Tantalum, Titanium, Tungsten, Vanadium, Nickel

WHAT FUNCTION HAVE THESE RAW MATERIALS?

- The foundation for all renewable technologies (wind, solar)
- The foundation for most energy storage (batteries, electrolysis/hydrogen)
- The foundation for the digitization of society (data storage, infrastructure, IT equipment)

The database contains material side streams from 54 companies. In total, there are 10 million tons of materials annually, distributed across approximately 250 side streams.

About 9 million tons of this is deposited internally on the companies' premises. The remainder is either sold, recycled, or deposited externally.

Little of these materials is currently recycled, and the potential is substantial!

Utilizing available materials will make it possible to avoid deep-sea mining.



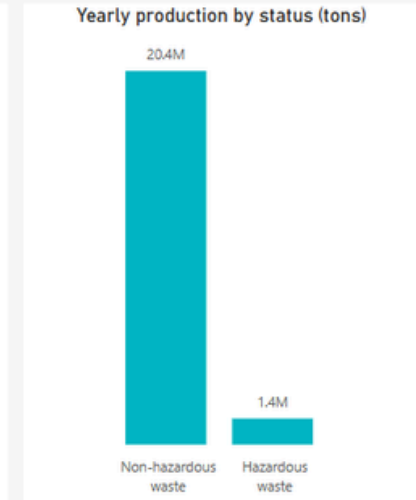
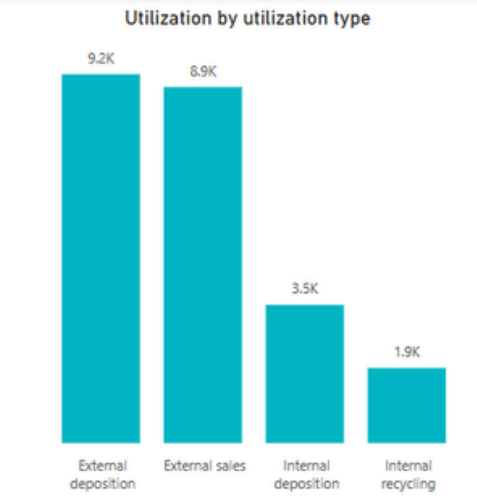
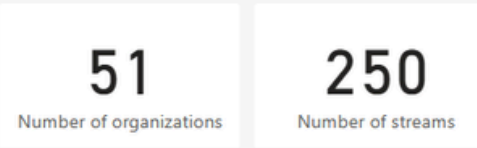
Mapping of material streams

In 2020, the Eyde Cluster was tasked by the Ministry of Climate and Environment to map the national side streams from the process industry.

Some material side streams are currently being utilized with great success, while others show significant potential. Microsilica from Elkem was a major dust problem for Elkem until the 1980s. After many years of thorough R&D work, it has become an important product for Elkem.

The addition of Microsilica makes concrete, among other things, stronger. Silica Greenstone from Eramet has always been used as fill material, but it turns out it may have other applications.

Preliminary R&D work indicates that Silica Greenstone can be used as a soil enhancer in agriculture, as a base layer in roads (including asphalt), and as a raw material in cement and concrete production. Using recycled material in concrete reduces the CO2 footprint of the concrete.

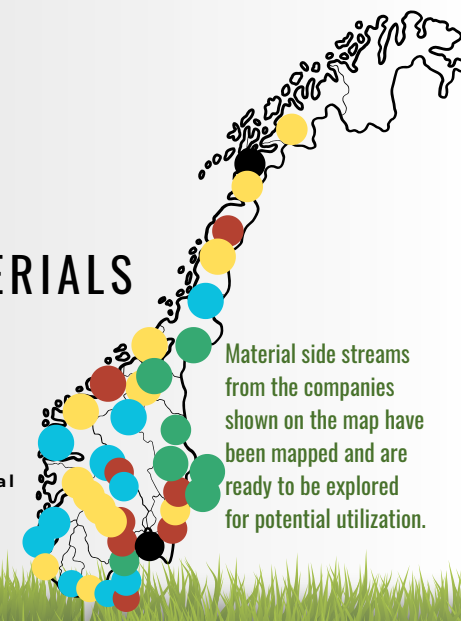


The battery industry is experiencing significant growth, including in Norway. Currently, little material is recycled from batteries, so there is also substantial potential here.

The current collector on the cathode side is made of aluminum. There are around 42,000 tons/year of unused material streams in Norway containing aluminum in various quantities. Manganese is used in the cathode of Li-ion batteries. There are approximately 800,000 tons/year of manganese-containing side streams from the Norwegian process industry.

TYPE OF RAWMATERIALS

- Chemical raw materials
- Primary aluminum
- Other metallurgical
- Pulp and paper industry
- Cement



Material side streams from the companies shown on the map have been mapped and are ready to be explored for potential utilization.