



Photo: TRIMET

SUPRAL

SANDBOX LABORATORY FOR THE ENERGY TRANSITION

PIONEERS IN ELECTRIC POWER


General Contractor

Supported by:



Federal Ministry
for Economic Affairs
and Energy

on the basis of a decision
by the German Bundestag



Karlsruher Institut für Technologie



Photo: TRIMET

THE CHALLENGE

Aluminum is a critical material **essential to key industries worldwide**.

Primary aluminum production is energy intensive, and the Hall-Héroult process poses **inherent limits** to reducing energy use and emissions.

THE SOLUTION

High-current applications are where superconductors deliver **maximum efficiency**.

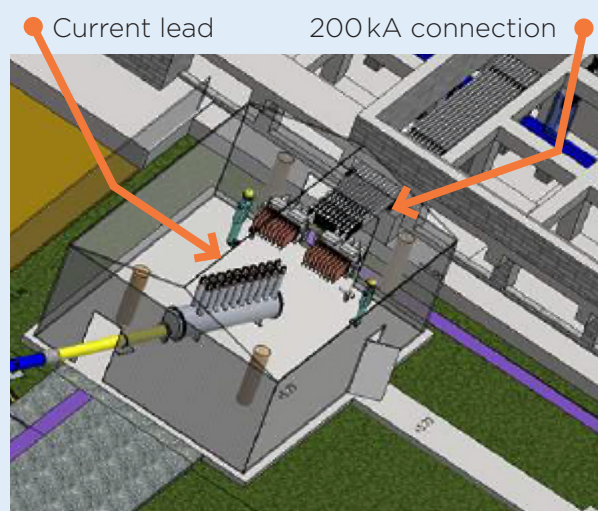
Superconductors have **zero DC resistance** and support extremely high current densities, enabling **highly efficient systems** that require significantly less material.

SUPERCONDUCTORS SAVE ENERGY AND COSTS

Superconductors conduct currents **without electrical losses**.

This property allows the design and construction of highly efficient, ultra compact and lightweight energy transmission systems.

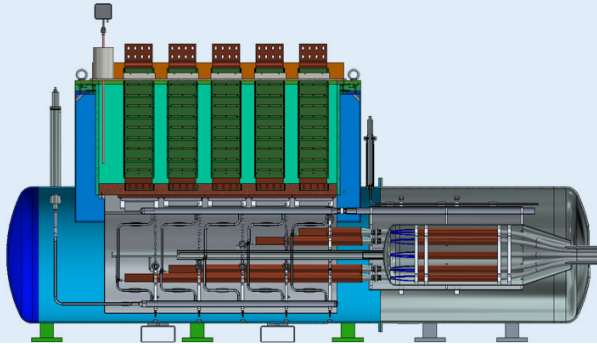
Save **up to 90%** of the energy needed by conventional systems through a superconductive system and reduce your operational expenses.



THE TECHNOLOGY

Proven in aluminum and chlorine electrolysis, superconductors are **ready for deployment** in high-current **industrial applications**.

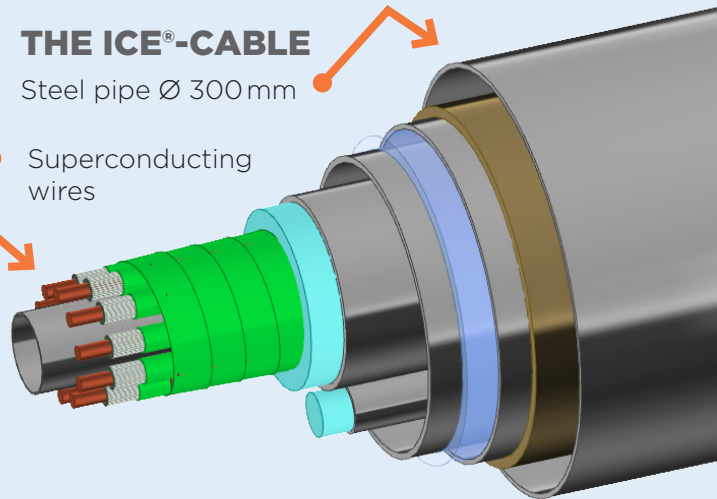
By utilizing a licensed composite conductor developed by the Karlsruhe Institute of Technology, **VESC create superconducting systems with exceptional efficiency**.



THE ICE®-CABLE

Steel pipe Ø 300 mm

Superconducting wires



GAS-COOLED CURRENT LEAD

200 kA connection



THE PROJECT

600 METERS OF HIGHLY EFFICIENT POWER TRANSMISSION

Vision Electric Superconductors and its partners are building the **world's first 600 meter, 200 kA** high-temperature superconducting (HTS) busbar.

POWER SAVINGS

Over this distance, the system saves **2 megawatts** of power compared to conventional aluminum busbars.

COOLING STATIONS SECURE OPERATION

State-of-the-art cooling systems ensure smooth and reliable operation. **Cooling to 20 K** significantly increases the current carrying capacity of the superconductors.

REDUCED SYSTEM WEIGHT AND SIZE

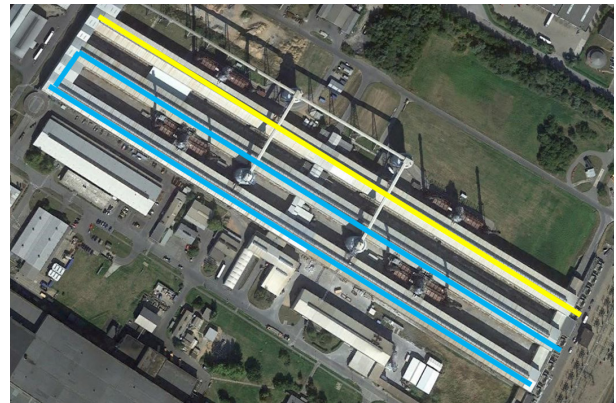
90 aluminum pots are supplied by the HTS-busbar, using only **10% of the weight** compared to conventional busbars.

REDUCING THE CARBON FOOTPRINT OF ALUMINUM

Thanks to superconducting technology, the new system saves approximately **8,000 tons of CO₂** annually.

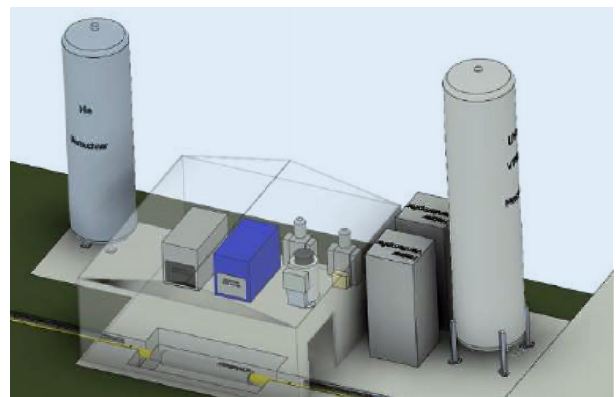
CURRENT STATUS 2025

Under construction, **completion in 2027**.



INSTALLATION WITHOUT INTERRUPTING OPERATIONS

Installation of the high-temperature superconductor busbar will take place without interrupting plant operations.



THE COLD BOX

Located in the middle of the busbar, the cold box manages the cooling of the superconductors.

VESC ACQUIRED THE FOLLOWING PARTNERS FOR THE IMPLEMENTATION OF SUPRAL



BUTTING

Specifically tailored cryostats that secure efficient operation.



Tailor-made copper and aluminum busbars.



Delivering quality high-temperature superconductor tapes.



Cooling infrastructure to support the step to liquid nitrogen level.



Cooling machines that allow the superconductors to reach incredible current densities.

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ABOUT VISION ELECTRIC SUPER CONDUCTORS

We are pioneers in the field of efficient power transmission.

VISION ELECTRIC SUPER CONDUCTORS is a frontrunner in the development of industrial and energy applications based on superconductor technology.

We have **decades of experience** in high-power engineering. We deliver the best quality – made in Germany.

OUR VALUE TO YOU

- Fast development cycles reduce time-to-market
- Reduce material costs and scope 3 emissions
- Increase efficiency and decrease CO₂ footprint
- Reduce operating costs and lower total cost of ownership



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