

# Chile Mining Company Improves Operations and Reduces Environmental Impact With Newer Data Center Technologies



A Vertiv Case Study



## Background

Mining is a transcendental activity for the Chilean economy. According to the [Yearbook of Mining of Chile](#), the raw materials that were extracted from the mines represented 12.5% of the Gross Domestic Product (GDP) of 2020. This nation was placed as the largest producer and exporter of copper, producing 5,773 thousand metric tons, a number representing 28% of the world production. A data center in the mining area allows the development of administrative or production systems, having direct influence on the marketing and manufacture of the raw materials that are produced.

Being a natural resource-intensive industry, sustainability is a priority for the mining sector. The use of technologies that provide higher levels of energy efficiency allow the development of rapid incident response schemes. Additionally, improving operational effectiveness has become a fundamental part of the expansion and growth plans of leading mining companies.

One of the most important companies in this sector in Chile, which had previously worked hand in hand with Vertiv in the development of critical infrastructure, had the need to renew its data center equipment that had become obsolete and had two key objectives: implement cutting-edge technologies that allow rapid increases in installed capacity and achieve higher levels of energy efficiency combined with high levels of redundancy and availability.

*"Our mission is to advise clients on the adoption of cutting-edge technologies that fit the reality of each industry and each infrastructure. Our team focuses on understanding the needs in order to implement the right tools that meet the requirements."*

- Gustavo Hilsenrad,  
Enterprise Sales Manager,  
Vertiv LATAM

## In search of new trends

With the obsolescence of its valve-regulated lead-acid (VRLA) batteries, this company saw an opportunity to upgrade the electrical distribution equipment in its data center. Interested in learning about the technologies that are standard today, they contacted Vertiv to learn more.

At that time, a period of study began by the Vertiv team to find the solutions that suited the optimization challenges presented by the mining company.

"We seek to develop a reliable and future-ready infrastructure through disruptive technologies," said José Medina, Enterprise Account Manager at Vertiv. Following the study period, it was determined that the best option to achieve the efficiency levels that the client required was to use a Vertiv™ Liebert® APM uninterruptible power supply (UPS) system because of its capacity to provide high availability, reliability and performance. Thanks to its high-power density, it also reduces the occupied surface area of the system in both row and room applications.

### Challenge

Upgrade the data center's power supply infrastructure with technology that protects critical facilities while achieving higher levels of energy efficiency and implement an adaptable UPS system that meets future growth and power needs.

### UPS Solution Features

A [Liebert APM 50-400 kilowatt \(kW\) UPS](#) system based on lithium-ion batteries. Its features include:

- Compatibility with a wide range of input voltage, i.e. 228~478 Vac
- Double conversion operation with efficiency of up to 96.3% and up to 99% in ECO Mode
- Modular and scalable architecture
- Hot-swappable power modules
- Unitary output power factor and symmetrical power factor diagram
- Integrated input, bypass output, and manual bypass switches
- Built-in parallel and load bus synchronization (LBS) ports
- Touch screen
- Flexible airflow management from front to back or from front to top
- Integrated top and bottom cable input
- Remote diagnosis and monitoring
- Maximum adaptability in terms of occupied surface, power and autonomy
- Works as a UPS with a Redundant Array of Independent/ Inexpensive Disks (RAID) system which, combined with lithium-ion batteries, integrates into a state-of-the-art solution

### Battery Solution Features

- Can/RS485 communication output for monitoring
- Flexibility for up to 32 BMU in cascade communication
- Internal cell equilibrium, passive equalization, maximum equalization current up to 300 milliamps
- High-precision cell voltage and temperature acquisition:  $\pm 3$  millivolts and  $\pm 1$  degree Celsius
- Fan control circuit and interface performs heat dissipation inside the module

### Results

- A modular power supply system with more autonomy, based on lithium-ion batteries that have a useful life of at least 10 years
- A more reliable solution, which allows 24x7 operation
- A data center with higher levels of energy efficiency and lower levels of carbon dioxide (CO<sub>2</sub>) emissions
- Better levels of redundancy and capacity for growth at scale
- Greater return on investment in the long term

## Challenge

### From a necessary change to an opportunity to improve efficiency

The obsolescence of its UPS system was a problem that became an opportunity. Making a change in its first-line protection systems that already had several years of operations and were beginning to generate lower levels of effectiveness allowed the mining company to substantially increase the energy efficiency of its critical operation. It also created a scheme that would facilitate the growth of capacity in the future. However, this change came with the following challenges:

- **Working with space constraints:** The deployed solution had to work in a physical area that was already defined. This space constraint, coupled with the requirements of greater autonomy and load in the data center, meant that traditional batteries were discarded, and a modular and scalable solution was necessary.
- **Being green:** The mining industry, due to its extractive characteristics, has a strong preference for environmentally friendly solutions that can also result in significant improvement in operating costs.
- **Boosting reliability:** Not only did the solution itself need to be highly reliable, but the mining company also needed to minimize downtime with the right power services and support for the data center.

"Innovation is key to making the operation of data centers in the mining sector more sustainable and planet-friendly. At Vertiv, we have a portfolio of products oriented toward energy efficiency that is combined with a service scheme focused on enabling infrastructure to meet the requirements of the future," Medina emphasized.

## Solution

### The most compact and durable option

The analysis by Vertiv experts led to implementation of the [Liebert APM 50-400 kW](#) online modular UPS, which offers the following benefits:

- **Autonomy in limited spaces:** Lithium-ion batteries are up to 60% more compact than lead-acid batteries, thus they allow increased levels of data center autonomy even in small spaces. The type of batteries that were placed can have a lifespan of more than 10 years.
- **Energy efficiency:** The design of this equipment allowed the mining company to operate with maximum levels of energy efficiency and minimum impact on the environment. It has an efficiency level of 96% in online mode and up to 98% in ECO Mode, which allows the customer to reduce CO<sub>2</sub> emissions, have state-of-the-art electronic equipment, and realize less heat loss and energy waste. This efficiency allows savings in operating costs.
- **Optimized operating times:** Liebert® APM has FlexPower™ technology, which incorporates distributed intelligence and scalable power in common assembly. This advanced technology allows the configuration of a completely redundant control and power system, which eliminates the single point of failure, ensuring maximum uptime. It follows an on-demand investment paradigm in which capacity can be added based on requirements without any interruption or downtime.

*"The predictive monitoring service allowed the operating areas of the mine to be much more reliable today and that reduced response and monitoring times."*

- José Medina, Enterprise Account Manager, Vertiv

## Results

### Higher return on investment, less impact on the environment

The result of this implementation was a system with greater capacity for growth, compliance with the highest energy efficiency standards, as well as greater savings on investment in equipment.



Vertiv™ Liebert® APM 50-400 kW

*"The efficiency of this type of solution allows a very high rate of return on investment over time since it generates significant savings and facilitates the growth of capabilities."*

- José Medina, Enterprise Account Manager, Vertiv

With this technology, an increase in autonomy, loads, energy efficiency, and if necessary, the possibility of adding more equipment to continue with the growth was achieved in the same physical space.

"With this project, we managed to demonstrate to auditors, the government, and the country in general that mining production, although it is a process of extraction of raw materials, is capable of using all possible resources to reduce the impact of its operations on the environment," Medina emphasized.

### Installation is just the beginning of the customer relationship

During the installation process, Vertiv was responsible for the installation and startup, assembly of the equipment and boards, communication, and final tests to put the system into production.

The new infrastructure was installed at the end of 2021 and was the beginning of a process that continues. Vertiv's services offered the mining company customized deployment that is accompanied by years of experience and decades of battery and UPS performance data to ensure total power system availability.

## Key Lithium-ion Battery Features

- Multiple chemistries that include lithium cobalt oxide (LCO), lithium ferrophosphate (LFP), lithium manganese oxide (LMO), and lithium nickel manganese cobalt oxide (NMC), among others
- Impressive power density levels, offering the same power in less space
- Last longer, weigh less, recharge faster, and can operate at higher temperatures compared to other battery types
- Manufactured with integrated monitoring capability offering dynamic monitoring of primary operational parameters
- Environmentally friendly