



Harnessing the power of EnerSys® DataSafe® XE batteries

Customer Case Study



INTRODUCTION

As the world's reliance on digital infrastructure grows, data centers have become essential hubs for managing and storing the vast amounts of data generated by global industries. According to the International Energy Agency (IEA), data centers accounted for around 460 Terawatt-hours (TWh) of electricity consumption in 2022, representing 2% of all global electricity usage¹. As this demand continues to rise, particularly with the growth of AI and cryptocurrency workloads, the need for energy-efficient and sustainable backup power technology has never been more critical.

Such technology was required at a new data center in Northern Italy. As one of Europe's fastest-growing cloud markets, the country has seen a surge of investment in data centers, particularly in hyperscale and colocation facilities. This growth, driven by increased adoption of cloud services domestically and its strategic location at the cross-roads of Europe and the Mediterranean - also sharing connectivity with Northern and Western Europe - has positioned Italy as a key player in Europe's digital landscape. Against this backdrop, the client, operating a high-performance data center, needed to reduce energy consumption, maximize physical space, and align with sustainability goals while maintaining high levels of operational reliability.

The project involved complex challenges, but with EnerSys® as a strategic partner, the client was able to uncover innovative solutions they hadn't initially considered.

Through expert guidance and the implementation of **DataSafe® XE batteries**, utilizing advanced Thin Plate Pure Lead (TPPL) technology, the client achieved significant improvements in energy efficiency and reduced their carbon footprint.

By challenging the client's assumptions and providing new insights, EnerSys® not only addressed immediate operational needs but also positioned the client for future success with a tailored approach that exceeded expectations.





CHALLENGE

The client's data center, located within a multi-building campus just outside of Milan, sits in a prime position offering low-latency connections and high-speed data transmission. With strong links across the region, the facility offers colocation services to hyperscalers and enterprise-level cloud solution providers, making it a key player in Italy's growing cloud market.

The client's data center, located within a multi-building campus just outside of Milan, sits in a prime position offering low-latency connections and high-speed data transmission. With strong links across the region, the facility offers colocation services to hyperscalers and enterprise-level cloud solution providers, making it a key player in Italy's growing cloud market.

However, the rapid growth of digital services has placed significant pressure on data centers to reduce energy consumption while maintaining or increasing operational capacity.

THE CLIENT FACED MULTIPLE CHALLENGES:

SPACE CONSTRAINTS:

With increasing demand for cloud services, the client needed to optimize available space to house more servers. However, traditional Lead Calcium based batteries take up space that could be better used for revenue-generating server installations.

ENERGY EFFICIENCY AND SUSTAINABILITY:

Reducing energy consumption was a priority, especially given the pressure to comply with European sustainability regulations and reduce the overall carbon footprint of the facility. The client needed a solution that would not only be energy efficient but also support long-term sustainability goals.

OPERATIONAL RELIABILITY:

With uptime being the critical factor in the data center industry, the client required reliable backup power technology that could handle short-term power outages and ensure operational continuity.

THE CLIENT'S CHALLENGE: OPTIMIZING ENERGY EFFICIENCY AND SPACE USAGE

ENERSYS® WAS SELECTED TO PROVIDE A SOLUTION THAT ADDRESSED THESE CHALLENGES, FOCUSING ON MAXIMIZING SPACE, REDUCING ENERGY COSTS, AND ALIGNING WITH THE CLIENT'S SUSTAINABILITY OBJECTIVES.



SOLUTION: A NEW PERSPECTIVE ON BATTERY TECHNOLOGY



EnerSys® proposed their DataSafe® XE batteries with Thin Plate Pure Lead (TPPL) technology, which offered a transformative approach to meeting the client's needs.

Compared to traditional Lead Calcium batteries, the TPPL technology in DataSafe® XE batteries provides a range of benefits, including:

SMALLER FOOTPRINT:

The DataSafe® XE batteries offered a **25% reduction in physical size**, freeing up space within the battery room.

This allowed the client to install additional servers, directly increasing their revenue potential by maximizing the use of space within the data center.

ENERGY SAVINGS:

The use of advanced TPPL technology led to a **30% saving on electricity bills** compared to traditional Lead Calcium battery systems. This is achieved through TPPL's significantly lower internal resistance, which reduces the floating current required to charge the batteries. The fine grain structure of the pure lead grid promotes surface area reactions, allowing for more efficient electrochemical activity and lowering overall energy consumption. These savings were crucial in helping the data center meet its sustainability goals under stringent European energy regulations.

LONGER SERVICE LIFE AND RECYCLABILITY:

One of the standout advantages of TPPL technology is its longer service life — **up to 25% longer than conventional lead-acid batteries**. The batteries also offer greatly improved energy density, meaning fewer units are needed to meet capacity requirements. This reduces energy consumption due to lower overcharging needs and contributes to fewer battery replacements over time. In addition, the **99% recyclability of lead in TPPL batteries** makes them an ecologically responsible choice, significantly reducing waste disposal challenges for the data center and supporting the client's commitment to sustainability.

25% REDUCTION

IN PHYSICAL
SIZE

30% SAVING

ON ELECTRICITY
BILLS

UP TO 25% LONGER

THAN CONVENTIONAL
LEAD-ACID BATTERIES



ENERSYS® WENT BEYOND MEETING THE CLIENT'S BASIC REQUIREMENTS, DELIVERING UNEXPECTED BENEFITS THAT FURTHER ENHANCED THE VALUE OF THE INSTALLATION.



UNEXPECTED BENEFITS: ENHANCED SUSTAINABILITY AND LOCAL MANUFACTURING

While the client had anticipated improvements in energy efficiency, the deployment of EnerSys® TPPL technology brought several unexpected advantages:

REDUCED CARBON FOOTPRINT:

Thanks to the extremely low float current (one-third that of standard Lead Calcium batteries), the DataSafe® XE batteries contributed to reducing the data center's carbon footprint. Although the impact on a single installation may be relatively small, when applied across multiple sites, especially for large colocation facilities, the cumulative effect is considerable. This aligns well with the client's objectives of complying with new EU sustainability regulations and achieving carbon reduction targets.

FAST RECHARGE FOR INCREASED RESILIENCE:

The fast recharge capabilities of the DataSafe® XE batteries provided an additional layer of operational resilience. When faced with power instability or outages, the ability to quickly recharge and be ready for the next cycle is critical.

This feature helps mitigate risks associated with grid instability and ensures that the client's data center can maintain high levels of uptime, even in challenging conditions.

LOCAL MANUFACTURING:

The DataSafe® XE battery blocs are made in Europe, with significant production taking place in France and the UK. Both countries have a strong focus on nuclear energy as part of their energy mix, which is less reliant on fossil fuels and produces significantly lower carbon emissions, thereby contributing to a reduced overall environmental impact. By sourcing locally manufactured products, the client is reducing both the carbon footprint of the batteries themselves and the emissions linked to transportation.

99% RECYCLABILITY

OF LEAD IN TPPL
BATTERIES

THESE UNEXPECTED BENEFITS NOT ONLY ADDRESSED THE CLIENT'S IMMEDIATE CONCERNS BUT ALSO POSITIONED THEM FOR LONG-TERM SUCCESS IN MEETING SUSTAINABILITY GOALS AND MAINTAINING OPERATIONAL RESILIENCE.



EnerSys® DataSafe® XE
battery installation
- Milan, Italy

FUTURE-PROOFING THE DATA CENTER: GRID BALANCING, PEAK SHAVING, AND THERMAL MANAGEMENT

Looking forward, EnerSys® batteries with advanced TPPL technology offer the client additional flexibility for future energy-saving and cost-reducing measures:

GRID BALANCING AND PEAK SHAVING POTENTIAL:

Although the client is not currently using their batteries for grid balancing or peak shaving, the potential to do so in the future offers new opportunities. EnerSys® TPPL technology is well-suited for these applications, allowing stored energy to be used during peak demand periods or to help stabilize the grid during supply fluctuations.

FAST FREQUENCY RESPONSE (FFR):

Additionally, the batteries are capable of supporting Fast Frequency Response (FFR), where short bursts of energy are provided for brief intervals (typically 0.5 to 2 minutes), helping balance frequency while minimizing battery wear. This capability adds flexibility and supports broader energy sustainability goals.

THERMAL MANAGEMENT AND REDUCED COOLING COSTS:

Cooling is one of the largest expenses for data centers, with approximately 40% of energy consumption dedicated to keeping servers and equipment at optimal temperatures². The TPPL technology in the DataSafe® XE battery range is designed to operate effectively at higher ambient temperatures, significantly reducing the need for intensive cooling systems.

Studies show that even a 1°C (2.2°F) increase in server inlet temperatures can result in 4% reductions in energy costs³. By safely running their systems at higher temperatures, the client can lower cooling-related energy consumption, further reduce their carbon footprint, and achieve additional cost savings. This thermal management capability positions the client to implement further energy efficiency strategies as the data center grows.

RESULTS: DELIVERING TANGIBLE OUTCOMES

The implementation of EnerSys® DataSafe® XE batteries resulted in significant outcomes for the client:

**25%
SPACE
REDUCTION**

ALLOWING FOR
ADDITIONAL SERVERS
TO BE INSTALLED
AND INCREASING
REVENUE POTENTIAL.

**ENHANCED
OPERATIONAL
RESILIENCE**

THROUGH FASTER
RECHARGE TIMES
AND INCREASED
RELIABILITY DURING
PERIODS OF POWER
INSTABILITY.

**30%
SAVING
ON ELECTRICITY BILLS**

HELPING THE CLIENT
REDUCE OPERATIONAL
COSTS AND ALIGN
WITH SUSTAINABILITY
GOALS.

**REDUCED
CARBON
FOOTPRINT**

THANKS TO LOW FLOAT
CURRENT AND LOCAL
MANUFACTURING
IN LOW-CARBON
ENERGY REGIONS.



CONCLUSION: DELIVERING LONG-TERM EFFICIENCY AND SUSTAINABILITY

EnerSys® didn't just provide battery technology; they challenged the client's assumptions and redefined their approach to energy management.

By delivering a tailored solution that exceeded expectations, EnerSys® helped the client unlock new opportunities for efficiency, sustainability, and resilience.

Looking ahead, the client is well-positioned to explore additional benefits such as grid balancing and peak shaving, ensuring their data center remains competitive and future-proofed in an evolving energy landscape. The successful implementation of DataSafe® XE batteries has transformed the client's operations, delivering long-term value in Italy's fast-growing cloud market.

THESE OUTCOMES
HAVE ENSURED
THAT THE CLIENT'S
DATA CENTER OPERATES MORE
EFFICIENTLY, SUSTAINABLY,
AND PROFITABLY, POSITIONING
IT AS A LEADER IN ITALY'S
GROWING CLOUD
MARKET.

References:

- ¹ International Energy Agency (IEA). Electricity 2024: Analysis and forecast to 2026.
- ² U.S. Department of Energy (DOE). DOE Announces \$40 Million for More Efficient Cooling for Data Centers, May 9, 2023.
- ³ Energy Star - 5 Simple Ways to Avoid Energy Waste in Your Data Center (June 2019).



SCAN ME FOR MORE
INFORMATION ON
HIGH-PERFORMANCE
DATA CENTER
BATTERIES BY ENERSYS





www.enersys.com



World Headquarters

2366 Bernville Road
Reading, PA 19605 USA
+1 610-208-1991 / +1 800-538-3627

EnerSys EMEA

EH Europe GmbH
Baarerstrasse 18
6300 Zug Switzerland

EnerSys APAC

No. 85, Tuas Avenue 1
Singapore 639518
+65 6558 7333



For more information visit www.enersys.com

© 2025 EnerSys. All Rights Reserved. Trademarks and logos are the property of EnerSys and its affiliates unless otherwise noted. Subject to revisions without prior notice. E.&O.E.