



Eaton enables always-on operations for 100 percent renewable power data center

Location:

Keflavik, Iceland

Challenge:

Establish a fully redundant, highly energy-efficient backup power system to support always-on data center operations within a flexible, scalable and secure infrastructure running entirely on renewable power

Solution:

Eaton onsite engineering support and expertise in critical power system design, Power Xpert™ 9395, Power Xpert 9395P, 9390 and 93PM backup power systems equipped with the Energy Saver System (ESS)

Results:

A comprehensive and highly scalable backup power system supporting a 100 percent uptime guarantee with the ability to lower energy costs, maintain industry-leading levels of power usage efficiency and support an industry-leading commitment to data center sustainability

“Eaton understood our needs from the start and leveraged decades of experience to deliver a solution that was not only right for our customers – but an end result we can all be extremely proud of.”

Jorge Balcells, Director of Technical Services, Verne Global

Background

Verne Global owns and operates a 44-acre data center campus in Keflavik, Iceland. The strategic location provides availability to the world's two largest data center markets, Europe and North America, while also addressing some of the most critical challenges facing today's data center landscape.

Most remarkably, the site offers access to both geothermal and hydroelectric energy resources, enabling a data center capable of running on 100 percent renewable power. Additionally, the ideal climate of the location translates into year-round free cooling capabilities.

By combining the extreme low cost of renewable energy with free cooling, Verne Global was able to establish a secure and predictable data center infrastructure capable of saving customers more than 82 percent on power consumption alone.

Challenge

When constructing the innovative data center, Verne Global needed to extend its commitment to sustainability in the form of highly efficient equipment throughout its entire power system. In addition, the company needed to maintain a flexible, scalable and secure infrastructure capable of supporting customers with optimized solutions for any data center application — and required an enterprise-ready, ultra high-density critical power infrastructure that was still able to help customers lower overall costs.

Most importantly, Verne Global needed to maintain its commitment to providing customers with a guarantee of 100 percent uptime, supported by fully redundant power backup systems and an optimized power system infrastructure that could help reduce total cost of ownership.



Powering Business Worldwide

"Customers don't only come to Verne Global for our industry-leading power savings," explained Jorge Balcells, Director of Technical Services. "They come to us because they know they can achieve the highest levels of data resiliency and power reliability in the world — at a fraction of the costs and environmental impact."

To engineer backup power systems that would support its customers' needs, Verne Global required support from a collaborator that understood its business and challenges and could provide dedicated onsite engineering support and on-time equipment delivery throughout the construction process.

Solution

With a truly global business footprint capable of supporting data center customers wherever they operate, alongside local engineering and service experts available for immediate support, Eaton stood out as the best equipped to help Verne Global establish its critical and mechanical backup power systems.

A key factor in the selection of Eaton's backup power systems was the company's demonstrated track record in solving unique data center challenges.

Across the 44-acre data center campus, Verne Global deployed 24 Eaton uninterruptible power systems (UPSs) specified in three separate models to address the specific needs of each data hall.

For protection of critical information technology (IT) loads, Verne Global applied the Power Xpert™ 9395 backup power system. To increase reliability, all of the 9395's critical components employ redundancy designs, including power supply logic units, operator control panels and cooling fans.

In addition, the 9395s contain digital signal processing (DSP) control technology, advanced battery management, airflow management systems and fans that monitor current conditions and provide advanced warning of potential component failures to reduce unexpected outages.

The 9395P facilitates maximum uptime and is able to operate at up to 96.3 percent efficiency using Eaton's Variable Module Management System (VMMS). UPS units are rarely loaded at full capacity, and at loads less than 40 percent of the full load rating efficiency decreases, increasing the system's overall energy consumption. Eaton's VMMS technology allows UPS units to achieve higher efficiency for lighter loads.

To help reduce demand on cooling equipment, the 9395Ps can reduce the heat emitted from their electrical cables by up to 33 percent, while redundancy in both the power supply logic unit and cooling fans eliminates the need for additional wiring and cooling systems. When compounded, these efficiency gains can greatly help reduce the costs of running a large IT system.

To help Verne Global cost-effectively prepare for the future, the 9395Ps are engineered with inherent, internal scalability. This technology enables the company to adapt to future changes in load demands and meet new requirements for higher reliability without requiring the purchase of additional UPS units.

"It is important that data centers are able to grow alongside the needs of their customers," said Balcells. "A scalable design also empowers data center operators to make continual investment in infrastructure to meet the needs of an evolving industry, which made it critical that the backup power system components could scale and grow while providing additional levels of redundancy and power density."

For robust protection of its mechanical systems across numerous data halls, which includes critical cooling and airflow management equipment, Verne Global applied Eaton's

9390 and 93PM backup power systems.

The energy-efficient 9390 UPS provides backup power and scalable battery runtimes in a small footprint for mid-size data centers, medical equipment and other critical systems.

The innovative 93PM UPS combines unprecedented efficiency with a space-saving, scalable and flexible device that's as easy to deploy as it is to manage. The solution conserves valuable data center floor space with its compact footprint and internal redundancy design. It also reduces cost and unexpected future growth risks with its vertical scalability, enabling data centers to scale as they grow.

With the groundbreaking Energy Saver System (ESS), 9390 and 93PM UPSs can operate at 99 percent efficiency, allowing Verne Global to further reduce power and cooling operating expenses, without sacrificing reliability.



Power Xpert 9395P and batteries

ESS facilitates a dramatic increase in UPS operating efficiency without sacrificing load protection. Market-leading 99 percent efficiency reduces the overall infrastructure energy consumption, resulting in significant operating cost savings.

In ESS mode, the UPS safely provides mains energy directly to load when the input is within the acceptable limits by its voltage and frequency. Superior detection and control algorithms allow the UPS to engage power converters in less than two milliseconds when the utility source goes out of pre-defined limits by its voltage or frequency, always providing secured power to the critical load while maximizing efficiency.

For optimized performance and reliability, Eaton provided dedicated onsite support throughout the entire UPS installation process, with extensive commissioning and power engineering services to ensure all equipment went online without problems.

"Our data center would never have been possible without the countless hours of intricate design and rigorous testing performed by every member of our project team," explained Balcells. "Eaton and its expert technicians played an integral role in this process, remaining onsite for months to satisfy our needs and ensure we achieved our goals without complication."

Results

With a global business footprint and products compliant with global industry standards, Eaton is able to support businesses wherever they operate.

"When engaging in any type of data center expansion or construction process, deadlines can always pose a challenge for equipment suppliers," said Balcells. "However, Eaton's support was always on schedule and at the highest level of professionalism, which provided our team with confidence and continuity throughout the project."

With the help of Eaton, Verne Global was able to establish backup power systems that support its 100 percent uptime guarantee and contribute to its sustainable mission of using

only 100 percent renewable sources of energy and lowering costs for customers while maintaining industry-leading levels of electrical efficiency.

"When we initiated our Iceland data center expansion project, we wanted to do something that had never been done before," Balcells noted. "From ultra-high redundancy to extreme power density and unmatched sustainability, Eaton understood our needs from the start and leveraged decades of experience to deliver a solution that was not only right for our customers — but an end result we can all be extremely proud of."

Eaton's backup power system is also contributing to improved power usage efficiency (PUE) within the data center. PUE is a measurement of how much power is used by computing equipment in contrast to cooling and other overhead; the closer the PUE ratio is to 1.0, the more efficient the data center. Through its collaboration with Eaton, Verne Global was able to achieve a PUE of 1.15 at its Iceland data center.

To summarize, with the Eaton solutions in place, Verne Global is now able to:

- Provide customers with continuous uptime and high availability
- Extend electrical savings with highly efficient UPSs
- Preserve valuable space with the compact footprint of Eaton's solutions
- Quickly and easily expand its power protection solution with inherent UPS scalability
- Maintain the health of each UPS and ensure quick resolution of any issues with Eaton's global footprint of service technicians
- Enhance power usage efficiency to industry-leading levels



93PM and batteries

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