



Free cooling technology from Eaton-Williams helps Verne Global's data centre reduce its cooling costs



Case Study

With the price of fossil fuels rising relentlessly, the data centre community is under huge pressure to reduce power consumption and look for alternative solutions preferably from renewable resources with low or no carbon emissions.

One company, Verne Global is doing exactly that. The company is tapping into the vast natural resources at its disposal and using Eaton-Williams® to supply an energy efficient cooling solution for what is the world's first dual-sourced 100% renewably powered scalable data centre in Iceland.

HVAC temperature controlled environment

- Primary cooling – direct free cooling
- Secondary cooling – indirect free cooling with glycol heat exchanger
- Cooling method – raised floor, cold aisle containment
- Cooling suitable for 4kW-20kW, customised density available at higher levels
- ASHRAE TC 9.9 compliant

Working in partnership with Colt Data Centre Services, the Eaton-Williams team has designed and commissioned a unique fresh air free cooling system that provides year round precision control

with no mechanical cooling and no chillers.

The system was designed for Verne Global's a co-location data centre in Keflavik and constructed using Colt's established modular data centre design. The location offers many benefits; the climate ranges from around freezing to 56°F (13.3°C). The average lows and average highs range from around freezing to 14°C.

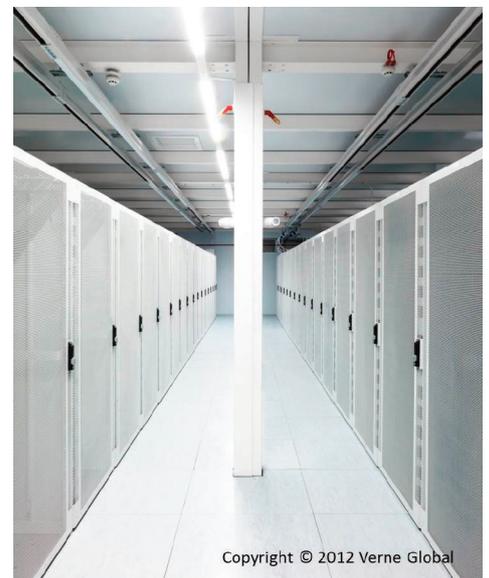
"The temperate climate of Iceland provides a great opportunity for 100% free cooling, without the need for chillers or compressors and cuts the amount of electricity required to cool the data centre which has financial and environmental implications," says Jeff Monroe, CEO Verne Global.

Eaton-Williams designed the HVAC system for the Tier-3 (2N UPS for critical systems) data centre, which provides more than 23000m² of technical space and offering a range of density options, from 4kW to 16+kW racks, with connectivity options that include VPN, MPLS and GigE and connected via subsea fibre lines to Europe and the U.S.

The location offers many benefits; the climate ranges from around freezing to 56°F (13.3°C), enabling Verne Global to substantially reduce the amount of electricity used to cool its data centre - the computers are cooled by circulating only natural air.

This eliminates the need for refrigeration systems that can account for over 50% of a data centre's power usage and which could have a significant impact on carbon footprints and PUEs (Power Usage Effectiveness). The benefits are financial as well as environmental.

Designing a robust and efficient cooling system that took into account coastal conditions and met Verne Global's environmental commitments was not unusual for the Eaton-Williams engineering team, who's solution incorporated complex algorithms and exploited natural resources to provide the correct levels of cooling without using DX.



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Jeff Muir, Eaton-Williams Head of Engineering comments: "It was a mammoth task that involved taking full advantage of the ambient air conditions and designing in the required parameters."

The result was an N+1 HVAC air conditioning based around 12 'CTF' cooling modules, based on systems previously designed for Colt's own modular data centre in North London. The units were customised further with primary cooling being supplied by direct free cooling from the outside air. Each unit has multiple variable speed Electronically Commutated (EC) fans to precisely match to the cooling demand to minimise energy use and provide N+1 resilience.

The systems ensure that temperature levels in the data centre are maintained at 18°C - 27°C with humidity between 30% and 70% RH. Secondary cooling is via indirect free air with glycol heat exchanger. The HEVAC system contributes to the data centre's impressive overall PUE of 1.21.

Benefits

- Year round free cooling
- No mechanical chillers
- 80% reduction in cooling costs
- Lower PUE
- Reduced carbon footprint

"This highly customised and innovative solution was designed, tested and manufactured within 16 weeks to meet Verne Global's operational schedule. By using only renewable green energy sources Eaton-Williams has achieved considerable energy savings enabling Verne Global to offer probably one of the most attractive power profile of any data centre facility," adds Jeff Muir.

Verne Global now boasts a zero carbon data centre that offers extensive facilities for its customers with reduced cooling costs of 80% or more and with an infrastructure built with steel the facility is 100% recyclable at the end of its life.

With businesses under pressure to seek out and use renewable in their business activities, Eaton-Williams is leading the way by developing innovative solutions that enable data centres to deploy cooling strategies that make a significant environmental contribution.



Two years on...

The world's first 100% renewably powered data centre is performing more efficiently than initial expectations, thanks to the capacity and cost savings resulting from Eaton-Williams innovative free cooling system

"After two years of operation, the actual efficiency of our data centre in Keflavik, Iceland, has exceeded expectations," said Tate Cantrell, Chief Technology Officer for Verne Global. "Our initial expectations were high with efficiency estimated to be 80% savings in electrical energy costs of the cooling system, which uses 100 percent outdoor air to cool the servers. Not only did the data centre meet those efficiency goals, it surpassed them.

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