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# ABB solutions power Europe's greenest data center in Norway

With ABB technology the Lefdal Mine Datacenter plans to become Europe's biggest, with the smallest environmental footprint.

As Norway aims to become a superpower for green data centers, the Lefdal Mine Datacenter has called on the expertise of ABB to supply the critical power infrastructure to provide clean energy for this 120,000 m<sup>2</sup> facility.

Powered exclusively by four glacial hydropower stations and two wind farms, with a combined capacity in excess of 300 MW, Lefdal Mine Datacenter plans to become Europe's largest and greenest.

ABB has been an integral partner from the beginning, working alongside Rittal to provide tailored power supply solutions and extensive knowledge and expertise for such a challenging engineering project. Providing a powering system that can remain reliable as the center grows—to 200 MW from the current 10 MW in phases over the next three years—was of particular importance.

To meet such challenges, ABB has built a medium-voltage backbone for the entire facility. To meet any emergency situation, ABB also provides a decentralized UPS (uninterruptible power supply) system, which means that each section inside the data center has its own UPS installation. If there is a problem with the grid, the UPS kicks in within a couple of milliseconds and ensures reliable power supply until the backup generators come online.

About 120,000 m<sup>2</sup> (1.3 million square feet) of white space is currently available in the data center, much of it in containers shipped by Rittal and parked in the former underground mine passages. "ABB was one of the first to be involved in the project, because everything starts with power," explains Andreas Keiger, Executive Vice President, Rittal. "You need transformers, you need generators. So, based on the good relations we have, we started to discuss how to get ABB on board."

Data centers are the backbone of our daily life, storing all the data generated by smart devices, businesses and social media. Reliability and the maintenance of secure operations 24 hours a day is therefore crucial, with redundant systems in place to ensure the data center is always operational.

Consequently, data centers are among the biggest consumers of energy. Yet Lefdal Mine is remarkably energy efficient. In addition to its sustainable power supplies, it uses cold water from a nearby 565-meter-deep fjord as a coolant. The data center is located below sea level, eliminating the need for expensive high-capacity pumps to lift the fjord's water to the cooling system's heat exchangers. The result is that the data center's cooling solution will have power usage effectiveness (PUE) – the industry standard for energy efficiency - of between 1.08 and 1.15 for 5 kW rack, making it among the greenest data centers in the world with 30-40 percent energy savings over traditional facilities.

"Cooling is crucial, because these servers generate huge amounts of heat. Because water cooling is so efficient, these server containers can run up to 50 kW of power, where you would normally expect just 7-8 kW with traditional air cooling," said Mats Andersson, Marketing Director, Lefdal Mine Datacenter.

Ciaran Flanagan, Global Segment Leader Data Centers at ABB adds: “At ABB we are very proud of our participation in this truly innovative project. The quest for energy efficiency never ends and is not just a desire, it’s now a responsibility and one we take seriously at ABB. We are truly delighted to be part of the team.”

The Lefdal Mine Datacenter has been operational since May 2017 and is built 150 meters into a mountain in what was formerly an underground mine for excavating olivine - also known as the gemstone peridot - a green, high density-mineral used in steel production. Located on Norway’s west coast, between Måløy and Nordfjordeid, the six-story mountain hall facility sets a new standard for the data center industry.

In February 2018, the Norwegian government released its data center strategy ‘Powered by Nature,’ which stressed that attracting data centers and international investments is an important part of their industrial policy. With such incentives and a fast-growing need for more data centers powered by renewable energy, Lefdal Mine will have an edge with its unique location and engineering. As more of the world becomes digital, ABB will be powering Lefdal and Norway for the demands of tomorrow.

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