

# **Innovative cooling pushes the boundaries of HPC density without sacrificing efficiency**

**Direct Liquid Cooling technology yields higher rack density, reduced power use, and peak performance with a flexible, modular approach**



## overview

Demands on data centers is intensifying as the need for computing continues to grow. As computing becomes more powerful, components within the data centers start to generate more heat, which can lead to decreased performance and even hardware failure, as well as sustainability and efficiency challenges. For high-performance computing systems, cooling is a core consideration.

It is becoming ever more critical to build sustainable data center operations with energy-efficient cooling, as the power consumption continues to increase, along with the associated heat produced. atNorths SWE01 data center facility in Stockholm, Sweden was specifically designed for high density workloads, such as advanced calculations for AI, simulations, and risk analysis. It has also been architected, designed, and built from the ground up to ensure sustainable operations across the whole of the site, where the selection of the right cooling system was a key component of the design process.

## the solution

To achieve next-level component performance and reliability, while equally improving efficiencies and sustainability, atNorth chose to collaborate with CoolIT Systems. **CoolIT Systems is the most trusted Direct Liquid Cooling (DLC) solution** in the market. Its DLC technology uses the thermal conductivity of liquid to provide dense, concentrated cooling to targeted areas. This combined approach of using DLC and warm water decreases the dependence on fans and expensive air handling systems to cool data center halls, which ultimately results in higher rack density, overall reduced power usage, and significantly advanced performance.

As digitalization increases the world over, we continue to see a lot more demand for HPC across many different industries – from research and simulations to AI and machine learning within aerospace, banking, biomedical, pharmaceutical and beyond. atNorth is a leader in sustainable data center services, and its sites like SWE01 are purpose-built to meet the increasing demands of HPC. They empower their customers with state-of-the-art systems better equipped to facilitate direct liquid cooling. As a trusted leader in data center cooling solutions, we have been very fortunate to partner with atNorth.

**Luc Wagemakers**

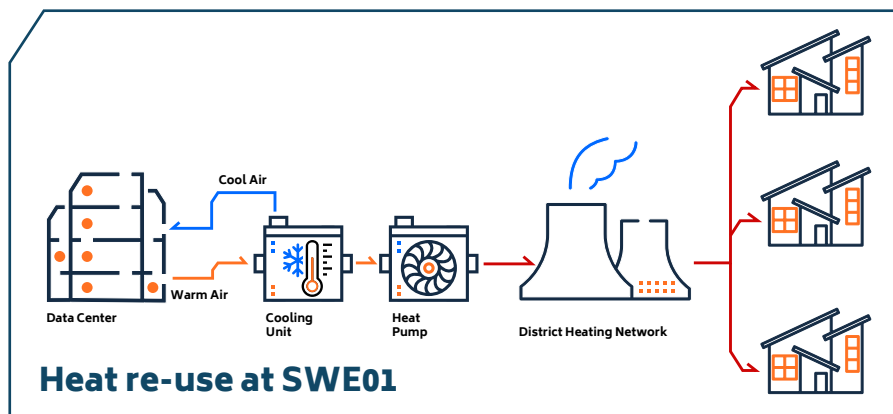
Area Manager of EMEA  
CoolIT Systems

**The growing demand for high-performance computing, artificial intelligence and machine learning applications means a greater need for more efficient cooling solutions.**

## forward thinking design at work

atNorth's data center facilities are designed specifically for high-density workloads and are built with efficiency, performance, and sustainability at the core.

SWE01 is unique in its design, **with a primary cooling system created specifically to maximize heat recovery.** In partnership with Stockholm's energy provider, Stockholm Exergi, the atNorth SWE01 campus captures the heat outputs generated by the site's data halls, recycling all residual heat through Stockholm Exergi's district heating plant to provide heat and hot water for local residents.



The data center cooling systems utilize heat pumps. Warm air exhaust goes into cooling units to heat water. The water then travels into heat pumps which raise the temperature of the water before it is sent into the district heating network. **With CoolIT's DLC technology, the water can be heated inside the server and connected directly to atNorth's cooling system, increasing the efficiency of heat capture in the system.** This approach cools the IT load more efficiently and gives greater control over the heat reuse process, in addition to a superior performance potential, overall reduced power use and a much higher rack density.

## customized approach

The concept can be customized to fit a customer's specific installation, helps reduce rack space, heat outputs and ultimately makes it easier to facilitate sustainability-first practices. This modular approach and level of customization from CoolIT's solution means that SWE01 customers can deploy a considerable amount of IT load in the data center as it is efficiently cooled in a very small area. In turn, this enables the waste heat process to go one step further to ensure the heat from the entire IT load is repurposed, which is unique to most data center sites in Sweden.

Typically, traditional data center providers charge their customers for the unused empty space necessary in setups with inefficient heat exchange. Specialized DLC technology is designed to handle extreme density workloads and by deploying it in its SWE01 facility, atNorth can ensure its customers achieve improved rack densities without having to pay for space that they do not need.

At atNorth, we are always searching for more innovative and sustainable ways to cool our data centers, maximize efficiencies, and save our customers money. At our data center in Sweden, we sought a partner who could help us further enhance our cooling operations in an environmentally focused manner with advanced liquid cooling technology.

CoolIT Systems emerged as a trusted leader in direct liquid cooling (DLC) solution providers, allowing atNorth to serve our customers with additional capabilities in leading-edge data center technology, while boosting energy efficiency to help support sustainability initiatives as well. CoolIT's DLC solutions are perfect for reducing our environmental footprint and work well in our facilities because they are designed with high density in mind.

**Per Lahdet**

Director of Design & Engineering, atNorth

**This process enables 85% of the electricity used in the data center to be captured and passed on as heat to the district heating system. This residual heat can heat up to 20,000 homes.**

## paving the way

CoolIT's patented DLC technology uses warm water rather than cold air to dissipate heat from computer and server components. By capturing component heat in a liquid path, DLC allows for significant component performance and reliability, higher densities, and decreased data center operating expenses through the reduction, or altogether elimination of chillers and computer room air conditioning units (CRACs).

CoolIT Systems' innovative and cutting-edge technology, robust product and service portfolio allows atNorth to offer sophisticated cooling solutions with a flexible, modular approach to customers. With this solution in place, atNorth can better support greater computing densities while reducing its overall data center footprint, leading to better space utilization and more efficiency. This collaboration has been a significant step for atNorth, enabling the data center leader to pave the way for widespread adoption of more efficient, high-density and high-performance computing.

## atNorth can better support greater computing densities while reducing its overall data center footprint



**To find out more, get in touch at:**

atNorth Sales

[sales@atnorth.com](mailto:sales@atnorth.com)

+354 539 3282

[atnorth.com](https://atnorth.com)

