![CyrusOne]

Conserving a Billion Gallons of Water Per Year

CyrusOne Waterless Cooling: More Than Just Reducing Environmental Impact

Eliminating Costs, Reducing Risk, Accelerating Speed to Market – All While Saving a Billion Gallons of Water per Year

CyrusOne builds large-scale data centers to operate with industry-leading power utilization effectiveness (PUE), positioning the company as a leader in energy efficiency and resulting in CyrusOne customers saving tens of millions of dollars in power costs annually in comparison with the historic norms of data centers.

A favorable combination of environmental responsibility and financial savings has been driving an improvement in energy conservation across the data center industry. The United States Data Center Energy Usage Report, released in June, 2016 by the Lawrence Berkeley National Laboratory, concluded that despite explosive growth, data centers were consuming 1.8% of the nation's energy, less than the 2.0% utilized by data centers four years earlier.

Water Challenges the Data Center Sector

With power efficiency largely under control, the next issue facing the data center industry is the enormous amounts of water required to cool most data centers. The United States is getting drier. As population expands, particularly in the West, Southwest, and South, water resources are being strained in regions experiencing rapid data center growth.

More Frequent Drought Conditions: At the start of 2017 over 50% of the contiguous United States was labeled at some level of water depletion between "abnormally dry" to "extreme drought" according to the weekly U.S. Drought Monitor report. Frequently, the water situation is more even dire. September, 2012 saw over 78% of the country within that same range, including a record 65.5% of the United States suffering from drought.

Drought conditions have been occurring more frequently over the years. As recently as June, 1993 there were no drought conditions at all in the United States according to the Palmer Drought Severity Index, the monthly precursor to the weekly U.S. Drought Monitor reports.

Climate Patterns + Population Growth = Strained Water Resources: As climate patterns change many states west of the Mississippi River, particularly Texas, Arizona, and Nevada, are consistently leading the nation in economic growth and job creation. The population growth that accompanies a thriving economy results in more people creating higher demand on a limited water supply, and resources are being strained. Water issues are taking up more of the mindshare of public officials from coast-to-coast, and the high consumption of water by the data center industry is not going unnoticed.

CyrusOne's Superior Approach Improves upon Inefficient, Wasteful Data Center Cooling

Traditional data center cooling methods utilized by nearly all operators require tens of millions of gallons per year in water for a single major data center. This strains local resources, frequently requiring significant water and sewer construction projects that can be timely and costly. Traditional methods require large pumping and storage systems to be built on site. Water that is deposited in the sewer system is loaded with solids, and can be toxic enough to kill grass and other vegetation. Dealing with these harmful byproducts of data center cooling is a major water management issue for many municipalities.

CyrusOne Responds with Waterless Innovation: Understanding that water sustainability is a critical issue, water conservation has been a significant factor in data center design for CyrusOne. The company's hyperscale, purpose-built data centers utilize an air-cooled chiller technology with an integrated compressor and condenser that cool the closed loop of water. Filling the pipe with water just a single time is the only water consumption. There is no evaporative cooling, no blowdown, no new water usage, and no release into the sewer system. Little maintenance is required, simply the occasional addition of water treatment biocides to control oxidation and bacteria growth in the closed loop system.

Limited Water Necessary: The chilled water loop for a 4.5 MW data center is filled once with less than 8,000 gallons, the permanent water supply can be provided by a single tanker truck. No new water or sewer lines need to be run out to the data center. Local officials do not need to plan for the byproducts of a massive release of toxic water into their sewer system.

Saving A Billion Gallons a Year:

In 2018, CyrusOne anticipates saving a billion gallons in water and sewer usage combined, with a system that does not adversely affect the highly-competitive PUE numbers earned by CyrusOne data centers. In CyrusOne's large-scale data centers power efficiency and water conservation meet.

A billion gallons would fill two 8 oz. servings of water for every person on earth.

![CyrusOne logo]

 CyrusOne Enterprise Data Centers

The Business Advantages of Waterless Cooling

In addition to the conservation introduced by CyrusOne's water-free cooling system there are significant business advantages as well. When you don't need millions of gallons of water to run your data center, the following benefits are introduced:

Speed to Market Advantage: For some hyperscale data center users, speed-to-market is THE most important factor in a data center project. Getting a municipality to green-light a data center project is a lot easier when there is no great strain being placed on their water and sewer resources. Additional water and sewer services do not need to be approved and constructed. Construction of a water-free data center is significantly faster.

Financial Advantage: Constructing data center water infrastructure is costly. Avoiding those capital expenditures, as well as future operating expenses, without significantly impacting PUE (power usage effectiveness) is a winning scenario for all involved.

Reliability Advantage: Water is an enemy of technology infrastructure. There is danger and complexity added when massive amounts of water are stored in or adjacent to a data center. An intricate water system provides another element that can go wrong. Limiting the number of utilities that need to be relied upon and backed up is a winning proposition for any data center operator.

A Superior Methodology: Other limited-water or no-water usage cooling systems being experimented with in the data center sector require large up-front capital costs and a significant time frame to build. CyrusOne's solution is the only no-water use solution that combines a proven technology without requiring costly and timely capital projects, providing significant speed-to-market and financial advantages.

Beneficial for All: CyrusOne's continuing commitment to water sustainability is right for the environment, beneficial to our customers, and welcomed by the municipalities where CyrusOne data centers are built. CyrusOne's water strategy simply achieves very desirable results for all involved.

About CyrusOne

CyrusOne specializes in providing highly reliable, flexible and scalable enterprise data center colocation that meets the specific needs of customers across its broad portfolio of carrier-neutral data center facilities in the United States, Europe and Asia. CyrusOne employs its Massively Modular® engineering and design approach to optimize design and construction materials sourcing and enable just-in-time data hall inventory to meet customer demand. The company engineers its facilities with redundant power technology, including an available 2N architecture.

CyrusOne customers can mix and match data centers to create their own production and/or disaster recovery platforms by combining facilities via the low-cost, robust interconnectivity provided by the CyrusOne National Internet Exchange (IX).