

Ways the Internet of Things is Transforming the Data Center Industry

The Internet of Things (IoT) pushes far more data than ever into the data center industry, requiring more efficient cooling but aiding automation.

Cloud Computing: A More Effective Way of Curbing Energy Consumption?

The advantages of cloud computing apply to users, data centers, and the environment. Cloud data centers cut emissions by using liquid immersion cooling.

Immersion Cooling: The Answer to Sustainable Big Data Centers

Liquid immersion cooling makes data centers sustainable by drastically cutting power use. This technology also cuts costs and increases performance.

Is the Metaverse a Growing Threat to the Environment?

The metaverse is a new technology that merges the virtual and the real. It offers plentiful opportunities but threatens the environment.

The Best Way to Reduce Water Waste: Immersion Cooling

Data centers have long faced the challenge of implementing a more economical, yet higher-performing cooling system. As consumer demand for companies to [reduce their carbon footprint](#) is at an all-time high, that system must now also be environmentally conscious. Water consumption, e-waste, greenhouse gases, carbon footprints, and sustainability have all become central concerns of the data center industry. Promisingly enough, a concept known as immersion cooling offers the most efficient way to reduce water waste and other environmental tolls – while enhancing performance and reducing costs!



In the US alone, [data centers use well over a billion liters of water per day](#). Not the American people, not huge corporations, *data centers*. Even more jarringly, over half of that water is potable despite it only being used for things like cooling. Older cooling technologies waste huge amounts of this water, while immersion cooling minimizes waste and more.

Data centers need to remove the excess heat produced by increasingly powerful processors. Cooling equipment can singlehandedly account for a substantial portion of the facility's water, as well as [nearly half its electricity](#). With these resources at risk, it's imperative for data centers to utilize forward-thinking solutions immediately.

Immersion Cooling vs “Water Cooling”: Are They the Same?

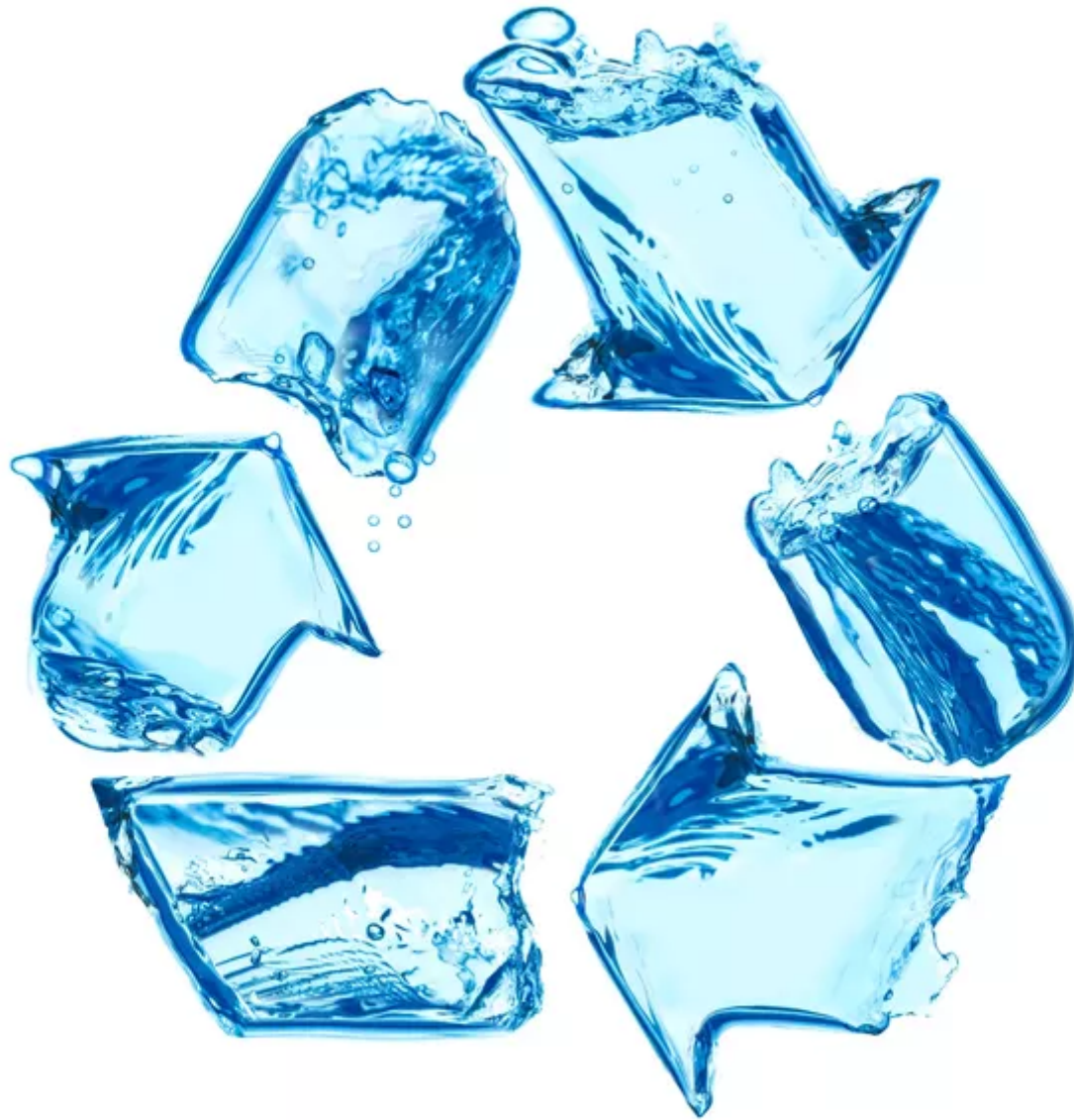
Though both immersion and water cooling are types of liquid cooling systems (as opposed to the traditional air approach), they fundamentally differ in their mechanisms and resource use. Above all else, immersion cooling reigns far supreme in water waste reduction efforts.

With immersion cooling, as the name implies, you surround the entire computer system in a liquid (*not* water! Dunking a server in water would fry it; [immersion cooling uses a safe dielectric fluid](#)). Contrastingly, water cooling involves piping water through additional tubing to cool the servers. This technique endangers the technology and requires substantial volumes of water.

Liquid immersion cooling systems – [like GRC's](#) – enable high-performance computing operations without wasting water, overheating servers, or losing profit to electricity bills. Immersion cooling also takes less real estate and produces less noise, making this a win-win solution. GRC's immersion tanks take all of these benefits a step further, effectively slashing cooling energy use by 95%! Their smart design allows technicians to install and service their hardware easily. A healthier planet *and* bottom line sounds like a no-brainer to us.

Immersion Cooling: The Answer to the Question

of Sustainability



As a massive user of water and electricity and a producer of toxic emissions, data centers *must* work to become greener. Several different avenues have already begun merging to steer data centers towards a solution. Sustainable energy sources, like hydro and solar, join sustainable on-premise equipment to do more for less. Immersion cooling lies at the intersection of these strategies to drastically decrease energy and water use, emissions, and e-waste.

How does immersion cooling accomplish all of this? It uses a liquid that's more than a thousand times more effective than traditional data center air cooling. This [eliminates much of the resource demand](#). Additionally, data centers draw far less power from the grid and require less of their electrical infrastructure for cooling. The servers no longer need fans, further decreasing electricity use.

By minimizing the loss of heat, electricity, real estate, money, and water, immersion effectively poses a near-perfect answer to the question of data center sustainability.

The Challenges of Immersion Cooling

While immersion cooling is an incredible technology already revolutionizing the data center landscape, it has encountered challenges. Certain environmental, technical, and even legal considerations affect [where it can be deployed](#).

While immersion cooling offers substantial TCO savings, it does require a financial investment from the data center. As a new technology, many people remain apprehensive about its capabilities.

Additionally, data centers that have relatively modest needs may not reap as many benefits from taking the plunge. Immersion cooling offers more bang for the buck in data centers that require excessive power, space, water, and other resources. Thus it may pose a challenge for smaller data centers to justify the switch. It is, however, worth noting that, regardless of size, all data centers can save resources with this technology.

Additional challenges facing immersion cooling include ensuring the compatibility and safety of materials in the tanks. The designers at GRC have directly addressed these challenges and produced a system that is safe for humans and the environment.

Among the design challenges, the central issue is engineering the system to transfer heat from the servers to the liquid. There are [single-phase and two-phase systems](#), and GRC's single-phase system decreases the complexity and costs while increasing reliability and limiting the risks of global warming. Fortunately, the difficulties in implementing liquid immersion cooling have now become manageable.

The Future of Immersion Cooling

The undeniable upsides of immersion cooling pose the question: how will this technology evolve in the coming years?

We should expect to see immersion cooling become far more widespread. Environmental sustainability efforts are pressuring hyperscalers to go green, and liquid immersion helps data centers fulfill these commitments.

Computer processors, including specialized devices for high-performance computing, are becoming dramatically more power-hungry. [Immersion cooling feeds these processors](#) to keep our world spinning.

Through the work of GRC, immersion cooling has become a commercially viable technology. Now data centers are rapidly upgrading to reap the financial, technical, and environmental benefits. The growing awareness of water as a sensitive resource will push even more organizations to take the plunge to reap these benefits, too.

Final Thoughts

Liquid immersion cooling has fast become a key data center upgrade, as more businesses learn about this remarkable new technology. It's come along just as customers and governments are pressuring the industry to clean up its act (and the earth!).

Wasting immense quantities of water that could better serve humanity elsewhere – as well as burning excessive fossil fuels – is no longer acceptable. Thankfully, immersion cooling rectifies the water waste crisis in data centers. It even incidentally saves money and space while reducing noise and simplifying maintenance!

If all of these advantages entice you to transition your data center to a liquid immersion cooling system, separate yourself from your competitors with GRC. You'll see lower TCO, and your servers will run faster and last longer. Save, well, *everything* by going with the smartest cooling system on the market. [Go green with GRC today!](#)

4 Creative Ways Rejected Heat Can Be Utilized

While data center heat has traditionally been seen as a problem, creative organizations are making it into a valuable resource thanks to liquid cooling.

3 Ways to Manage E-Waste from Data Centers

Data centers produce a measurable percentage of global e-waste. They can manage electronic waste with liquid immersion cooling and sustainable policies.

Can Data Centers Benefit from Recycling Waste Heat?

Data centers produce damaging waste heat as a byproduct of operations. This heat can be made from a liability into an asset with liquid immersion cooling.

E-Waste: Addressing a Growing Problem for Data Centers in 2022

Electronic waste, or e-waste, has become a problem for data centers. Remedies include recycling and repairing hardware, and using liquid immersion cooling.

Is It Possible for Green Energy and Blockchain Technology to Coexist?

Blockchain has become a huge part of the [global economy](#). It fuels billions and billions of dollars of transactions around the world. The technology underlying blockchain however has a relatively high energy-use profile, drawing attention to another new technology: environmentally responsible immersion cooling techniques like [GRC's liquid cooling tanks](#).

In many people's minds, blockchain is associated with digital asset mining and cryptocurrencies. That may have been the case, but now, there are several other applications. International payments have become the number one use case, with around [16% of the blockchain market](#). Other key use cases include provenance or lineage at nearly 11% – the tracing and authentication of components for products.

Of the organizations making use of blockchain, [45% are developing secure information exchange](#). Additionally, many are using currencies like Bitcoin (the initial blockchain use case) and Ethereum. There are now around [10,000 different cryptocurrencies!](#) This represents a massive increase over the last few years, as blockchain technology has gone mainstream. This rapidly increasing use, however, poses a problem for energy management.



The Issue with Blockchain and Crypto Mining

The issue with blockchain, including its most prevalent use in mining cryptocurrencies, is its immense energy consumption. Bitcoin and other applications conduct processor-intensive, hash calculations to enable people and institutions to make transactions autonomously. [The entire network uses several gigawatts, or billions of watts](#) of electricity to power this functionality – more than some countries!

If you add up all of that power use over the year, it totals [122.87 terawatt-hours for Bitcoin alone](#). That's billions of dollars of electricity, and since over 60% of the world's electricity is still produced using fossil fuels that electricity consumption means a tremendous amount of toxic fumes and greenhouse gases. And that's just Bitcoin. Other cryptocurrencies and blockchain applications use comparable amounts.

While [efforts towards more efficient blockchain technologies are underway](#), for now, they remain among the more prevailing polluters of these new processes. The energy use of Bitcoin and other blockchain technologies is only increasing, as these become ever more prevalent in society. As people become responsive to green issues like sustainability and greenhouse gas emissions, it's critically important to consider the indirect environmental cost of blockchain.



Is the Promise of Green Energy the Silver Lining?

Green energy, the carefully-considered production of power to protect the environment offers an exciting prospect for the world of crypto. Clean electricity from solar or hydro cuts emissions on the production side. On the consumption side, clean tech like [GRC's liquid immersion systems](#) makes blockchain more environmentally friendly.

For example, you can run the processor-intensive calculations for blockchain in a [GRC HashRaQ](#) that cuts energy requirements by as much as 90%! How? By deploying liquid immersion cooling technology that is [1,200 times more efficient](#) than traditional air cooling. The same technique also enables the GRC HashTank to perform even more efficiently at 95% energy reduction in a shipping container!

Back on the green energy production side, [startups are working to enable people to select renewable electricity sources on the grid through blockchain](#). In Estonia, people can already access real-time data on power production sources. Green power will likely soon make electricity more affordable and resilient, not to mention sustainable, through the intelligence of blockchain smart contracts.



Bringing together the generation and use of electricity, blockchain can enable

people to see instantly how much we are using and where. Leveraging real data, blockchain enhances reliability to enable renewable energy producers and users to make more efficient use of resources.

You can see with confidence that you're using clean electricity. The blockchain networks allow the electricity market to function transparently, allocating production and use to make the most of green sources like biomass. This completes the circle, from production with green energy to use with smart tools like immersion cooling.

Immersion Cooling Techniques: What You Should Know

[GRC's immersion cooling techniques work smoothly with blockchain.](#) As blockchain continues its formidable march into more corners of the economy, data centers need to respond with effective cooling techniques to handle the heat.

The intense computational requirements of blockchain push servers to the max. This imposes a price constraint as cooling comprises one of the main costs of a data center. Air-cooled data centers, quite simply, cost too much for crypto mining to be profitable.

Liquid immersion cooling offers superior performance at a far lower cost. Upfront data center costs can be cut in half while [eliminating 95% of cooling costs!](#) This technology works efficiently anywhere, unlike older air-cooling methods.

Whether you're building a new data center or have a spare piece of land, you can easily deploy immersion cooling to slash costs. The [HashTank](#) portable data center and the [HashRaQ](#) rack system both provide industry-leading green cooling for your blockchain applications.

For the most intensive workloads out there, even at well over 100 kilowatts per rack, immersion cooling effortlessly dissipates heat. Liquid is the ideal environment for removing waste heat. This approach also simplifies site requirements to save even more money. You'll be amazed at how clean, quiet, and efficient the immersion cooling systems are.

In addition to the lower costs and greater cooling capacity, immersion cooling techniques offer protection against environmental contaminants such as dust and corrosion. Furthermore, this approach does not require fans or many other moving parts from traditional cooling, thus extending the life of your expensive hardware.

Immersion cooling will take literally billions of tons of pollutants out of the environment by displacing messy [air cooling](#) while enabling the spread of blockchain. All things considered, liquid immersion cooling is a win-win solution. From day one through the total cost of ownership, you'll see a handsome ROI and a more rewarding outcome for the environment.

Get The "Greener" Cooling Solution With GRC

While blockchain applications like cryptocurrencies and digital asset mining have increased the demands on data centers and the power supply, GRC now offers the technology along with the expertise to manage these cooling demands effectively.

GRC's modular cooling systems are cost-effective to install and operate. They produce a deeper cooling of your crypto rigs or other data-intensive IT infrastructure. You can upgrade to liquid anywhere, from a state-of-the-art data center to an unused area in a brewery!

Join the green revolution. Get the cost savings while doing your bit for the long-term sustainability of our environment. [Learn how GRC's liquid immersion cooling](#)

[tech can make your data center smarter and greener while keeping revenues in the black.](#)