Case Study

Immersion Cooling | **Hyperscale**

Immersion Cooling for Hyperscalers, enabling better sustainability at high densities.

Introduction

This Use Case details how Immersion Cooling can be used to power Hyperscalers and how the technology can help future and existing facilities to have a positive impact on the environment, helping them to reduce their carbon footprint, energy consumption, and costs while also giving back to the community.

The Wyoming Hyperscale and Submer Partnership

Founded in 2020, Wyoming Hyperscale is combining resources to sustainably satisfy the demand for hyperscale data center capacity while implementing best-in-class solutions to directly address global climate change and eliminate the waste inherent in conventional datacenter designs. The company has chosen Submer's SmartPod XL+ to help it achieve its goals.

Rating Index:

Sustainability	★★★★★
Efficiency	★★★★
Cost-saving	★★★
Innovation	★★

Collaboration between:

submer

WYOMING HYPERSCALE WHITE BOX

The Case

While efficiency and sustainability are becoming increasingly important for the industry, the Hyperscale industry is arguably lagging behind. Wyoming Hyperscale is setting the standard for future facilities by utilizing technologies that ensure it minimizes its impact on the environment. Using Submer's Immersion Cooling solutions has allowed Wyoming Hyperscale to:

- Provide high-density compute while having a positive impact on the environment
- Future-proof the project and ensure it meets the most strict rules and regulations
- Achieve huge savings on power consumption
- Consume zero water in cooling operations
- Reuse surplus heat, specifically to benefit the local community
- Lower Scope 3 carbon emissions by selection of greener building materials and attach a carbon-negative enterprise to the data center

Type of Solution

MicroPod + Campus Genius Software

Availability

Wyoming, USA

Highlight

Servers heat will power an indoor farm providing food to local community

Industry

Hyperscale , Cloud, HPC, AI / ML

What is Immersion Cooling?

Also known as liquid submersion cooling, it is the practice of submerging computer components (or full servers) in a thermally, but not electrically, conductive liquid (dielectric coolant).

The challenge

Wyoming Hyperscale has a company philosophy of enabling and building **zero-waste datacenters** that are able to **handle the density and compute power to meet** the needs of today and in the future, while maintaining the family's multi-generational stewardship traditions.

The number of datacenters continues to increase, with datacenter hotspots now part of many landscapes throughout the USA and the rest of the world. At the same time, the number of rules and regulations that Datacenters (new and old) must adhere to is rising.

Arguably the main driver for this is centered around **environmental and sustainability concerns**. The green datacenter market is set to grow from **$50 billion to $143 billion by 2026**.

As both companies and governments pursue their own sustainability goals Datacenters and by and large the tech companies that use them will become increasingly reliant on technologies that help them to become a positive influence on society rather than a burden.

Conclusion? Wyoming Hyperscale wanted to explore what options were available to help them achieve their goal of offering a **high-tech**, **forward-thinking facility** that would be compliant with government regulations and safe for the environment and their employees.

The solution

Wyoming Hyperscale aims to accommodate this need in multiple ways:

The use of Submer's **SmartPod XL+** and **SmartCoolant** technology will offer customers a hyperscale facility that is **low-risk** and **future-proof**.

The heat generated by the datacenter will be used to power an adjacent Indoor Farms operation, which will feed the local community and give them access to fresh produce.

Prior to the installation, the local community did not have access to its own supply of fresh fruit and vegetables. It was reliant on imports from California and Mexico which wasn't of a high quality and often didn't last due to the length of supply chains and distribution transit times.

The **unique location of Wyoming Hyperscale** puts them in a unique position where they are able to **provide private DWDM connections to strategic exchanges across the US** with cutting edge fiber connectivity to the server, diversity of carriers, routes and long-haul fiber networks.

This ensures users are able to meet the needs of their customers without paying over price premiums for fiber cross connects, space, land, electricity and water.

The actions

Wyoming Hyperscale came to Submer to see if their Immersion Cooling solutions could help. The company chose Submer's SmartPod XL+ to kit out its entire Hyperscale facility.

How will the SmartPod XL+ help power high-performance computing?

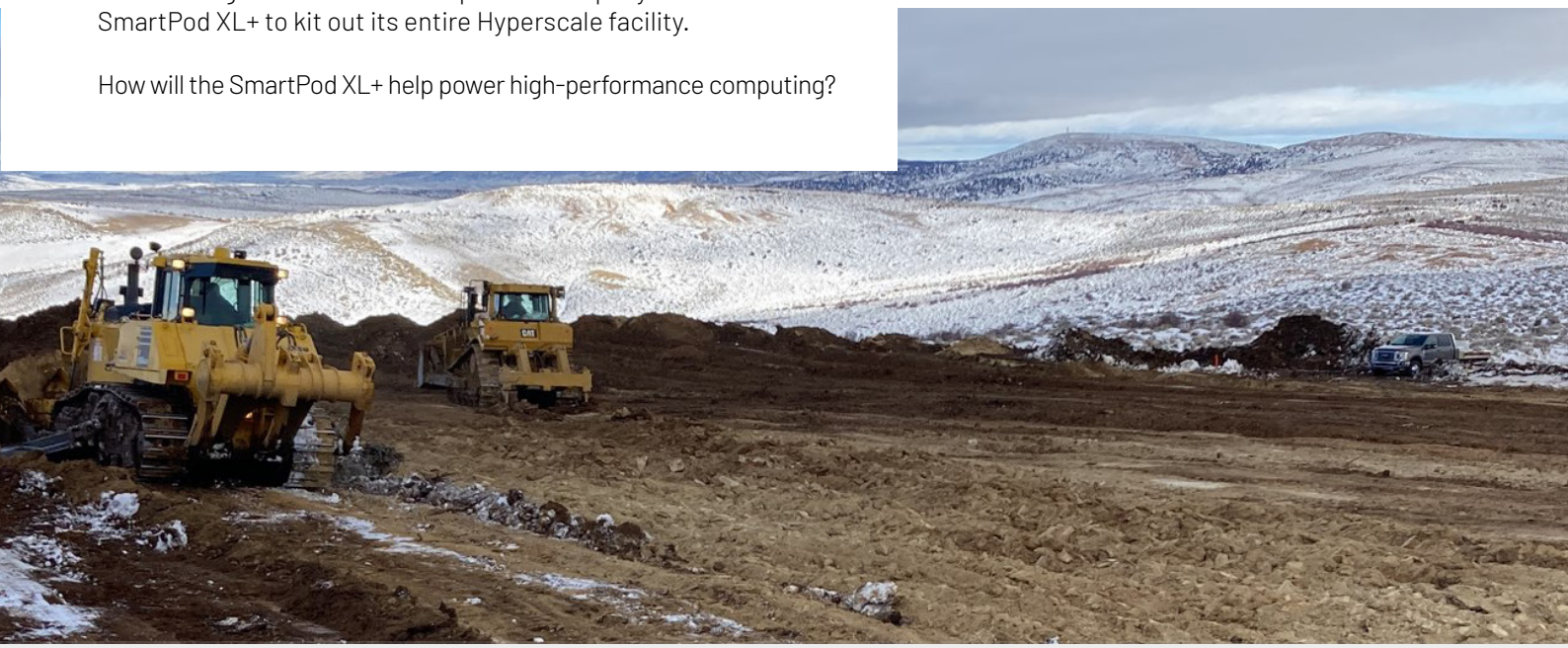
Benefits

Overcome power and density issues
The SmartPod XL+ can hold up to 100kW of compute density using commercially available technology, allowing you to house more compute in a smaller space and meet the density requirements often requested by high-performance computing. Save space while simulataneously increasing compute.

Slash cooling costs
Thanks to Immersion, **reduce cooling costs by up to 95%** in comparison to air cooling techniques.

Protect the environment
The setup of the SmartPod XL + allows users to not only improve its Power Usage Effectiveness (PUE) inside the datacenter and reduce overall energy consumption, users are also able to harness the benefit of zero waste of water and heat reuse.

Simplify and cut building and hardware costs
Immersion does not require a specific environment in order to be successful. SmartPod XL + is a fully modular solution, and unlike its air counterpart, does not require any extra equipment such as chillers or fans. Additionally, the lifespan of hardware increases, and hardware failures decrease, between 30-60%.



What next?

Upon completion of the project, Wyoming Hyperscale will stand at 120 MW, with a phase II project of an additional 90 MW already in the master plan for the site and in its Engineering Services Agreement with Rocky Mountain Power/PacifiCorp, who recently announced that they will host TerraPower's advanced nuclear reactor and liquid sodium energy storage solution in Kemmerer, Wyoming, only 30 miles nort of the switchgear from which Wyoming Hyperscale draws its 138kV primary power.

Wyoming Hyperscale will use the heat generated by the SmartPodXL in Phase I's 30MW to power roughly 30 acres of Indoor Farms. This will benefit users of the datacenter by offering a competitive effective net power cost around 4 cents per kWh.

Wyoming Hyperscale will continue to work with Submer to utilize Immersion cooling in its current and future projects around the globe.

This partnership illustrates how Immersion Cooling can offer sustainable and efficient solutions at scale and empower its users .

Want to know more about how we can help? Visit: submer.com

Want to know more about Wyoming Hyperscale White Box? Visit: wyominghyperscalewhitebox.com

About Wyoming Hyperscale

Founded in 2020 by members of a 6th generation ranching family, Wyoming Hyperscale is combining resources and has assembled a team of preeminent design, engineering and facilities maintenance & operations teams to sustainably satisfy parabolic demand for hyperscale data center capacity while implementing best-in-class solutions to directly address global climate change and eliminate the waste inherent in conventional datacenter designs.

Wyoming Hyperscale decided to change the industry with patented and patent pending technologies that are innovative, efficient, sustainable, and significantly less costly to build and operate.

About Submer

Founded in 2015, Submer provides best-in-class technology that enables data centers around the world to leverage the power of immersion cooling for HPC, hyperscale, data centers, Edge, AI, DL and blockchain applications. Headquartered in Barcelona, with offices in Virginia and Palo Alto, California, Submer consists of an international team of engineering, technological and business experts. For more information, visit submer.com.

> *"Submer has built a strong reputation for building innovative, forward-thinking technology. Thanks to Submer, we have been able to overcome challenges companies face when wishing to build datacenters hardened against all potential natural disasters in the region, while also ensuring we remain sustainable and highly cost efficient."*
>
> **Trenton Thornock**
> Founder of Wyoming Hyperscale

Know more

Want to know more about how we can help? Visit: **submer.com**
Want to know more about Wyoming Hyperscale White Box? Visit: **https://wyominghyperscalewhitebox.com**

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