Riders in the Sky: Transforming Communication Paths from Rail Tunnels to Data Centers

October 14, 2021

Trenton Thornock, founder of Wyoming Hyperscale White Box near Aspen, Wyoming, one of the highest elevations on the Union Pacific Railroad, is reinventing the data center. By using sustainable, power saving next-generation geothermal and liquid cooling technology – this data center developer is taking land stewardship to whole a new level.

"One of the most important aspects of the Wyoming Hyperscale project is the focus on its implementation of cutting-edge technology to make it the most efficient with the smallest footprint environmentally," said Brady Thornock, operating partner of Wyoming Hyperscale White Box. "This aligns with our mission as land stewards to have healthy soils, healthy livestock and wildlife with clean water and air," Brady Thornock said.

Valuable Communications Assets and Sustainable Resources

After embarking on their journey to become a data center developer in 2017, Trenton and his brother Brady Thornock, realized they had access to valuable communication assets and the opportunity to leverage sustainable design. One of the greatest assets they had access to? The ranch they grew up on, located in the mountains of Wyoming. The brothers saw an opportunity to use the privately-owned portion of the 12,000-acres inside the fence line for something new.

"I grew up on the family ranch, and my brother is a 6th-generation rancher," said Trenton Thornock, founder of Wyoming Hyperscale. "One of the things we aimed to do is repurpose a large accumulation of rock on the property; it was created when the Union Pacific blasted a rail tunnel through the mountain."

Transforming From One Communication Mode to Another

Data is hot--in more ways than one. Lumen is providing networking and security solutions Wyoming Hyperscale needs to build one of the most sustainable and eco-friendly data centers in the world. **https://t.co/VsSUlGYMgA** **pic.twitter.com/HXZH9hpq**

— Lumen (@lumentechco) **October 18, 2021**

Committed to creating a better, cleaner and greener world for all, Lumen is supporting Desert Color to bring sustainable homes and nature living powered by CenturyLink into fruition. Learn more: **https://t.co/AOycTLuwe5** **pic.twitter.com/8RuOqsn9**

— Lumen (@lumentechco) **October 21, 2021**

The Union Pacific Railroad began construction in the 1860s and this route was part of the first transcontinental railroad. This venture was groundbreaking, integral to the formation of communication between the East and West – across deserts, mountains, rivers, and plains.

Today, fiber optic communications networks tracing the rail line running through the Thornock's property will be repurposed for a new venture in communication: sustainable data centers.

A Sustainable Partnership

In July 2020, the Thornock brothers seized their opportunity to create something new and formed Wyoming Hyperscale White Box LLC. The brothers built a unique vision for otherwise unusable land.

The Thornock's vision for this data center was built around the use of liquid cooling, an energy-saving alternative to necessary data-center cooling, traditionally accomplished with fans. What makes this approach to cooling so unique is that it does not use water, instead opting for a geothermal coupling and indoor farms to increase natural resource efficiency.

"It increases our cooling efficiency on the inside of the data center by 95 percent," Trenton Thornock said. "This method of cooling also takes our water usage to zero, which is very unusual for large data centers."

How exactly does this translate to a sustainable project? Liquid and geothermal cooling strategies directly impact a datacenter's Power Usage Effectiveness (PUE). PUE measures the ratio of total power used by a computer data center facility in relation to its power delivered to computing equipment. Studies report a range of PUE scores for data centers, but the average of older data centers tends to be around 1.8. Data centers that prioritize air-cooled efficiency tend to produce values closer to 1.25 or slightly less.

Scoring low, near 1.0, technically perfect efficiency, is considered standout. Wyoming Hyperscale's total effective (PUE) score is less than one when the sale of computing heat resource is factored in. Christi Thornock, Brady's wife, and co-steward of the operating partner of Wyoming Hyperscale, is the majority owner and operator of indoor farming operations on the Wyoming ranch that will connect to the data center heat stream.

Lumen Technologies is honored to support Wyoming Hyperscale White Box with security and networking services, bridging natural resources and tech, to create sustainable and energy-conscious solutions together.

"We know as we focus on taking care of the land, it will take care of us," Brady Thornock states. "We are working together to provide the opportunity for the next generation to continue ranching."

For more information see the press release here: **Lumen Technologies supports Wyoming**

[Hyperscale's vision for "sustainable" datacenters](#).

https://news.lumen.com/riders-in-the-sky-transforming-communication-paths-from-rail-tunnels-to-data-centers