



2025-26 Better Buildings & Better Plants WINTER WEBINARS

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Better Buildings™

Better Plants

U.S. DEPARTMENT OF ENERGY

From the Ground Up: Geothermal Heating and Cooling Solutions

January 22, 2026

11:00am – 12:00pm ET



U.S. DEPARTMENT
of ENERGY



Nina Wuerch
DOE

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Polls 1-3

We want to learn more about you.

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Today's Presenters



Richie Stever
University of Maryland Medical
System



Jim Henry
Iron Mountain Data Centers



Richie Stever

University of Maryland Medical System

Better Buildings & Better Plants Webinar

From the Ground Up: Geothermal Heating and Cooling Solutions

January 22, 2026

Prepared by: Richie Stever

compassion | **discovery** | **excellence** | **diversity** | **integrity**





About University of Maryland Medical System

University of Maryland Medical System (UMMS)

- Maryland-based academic health system anchored by the University of Maryland Medical Center
- 12 hospitals and 150+ care locations serving urban, suburban, and rural communities
- 29,000+ employees delivering advanced, patient-centered care





Project Overview: Shore Regional Medical Center Replacement Hospital

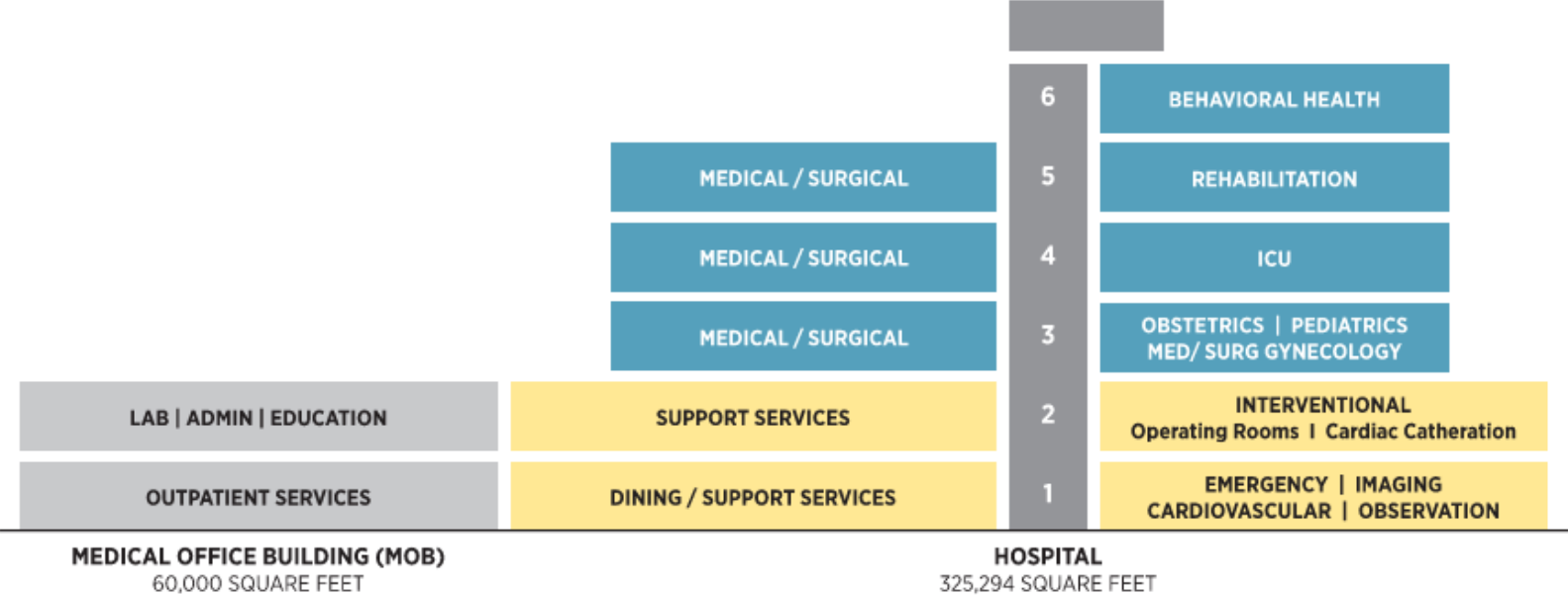


Greenfield Site: 250 Acres
Construction Start: July 2024
Planned Completion: Spring 2028

compassion | discovery | excellence | diversity | integrity



SRMC Elevation Schematic Plan

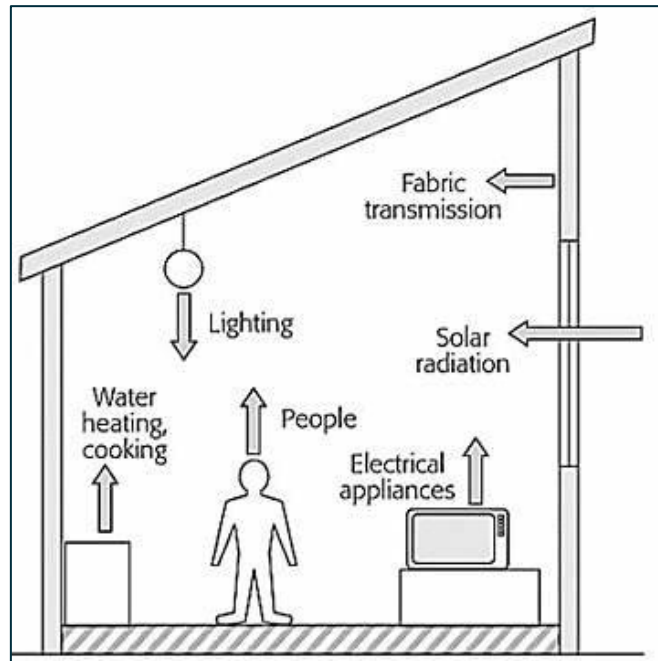




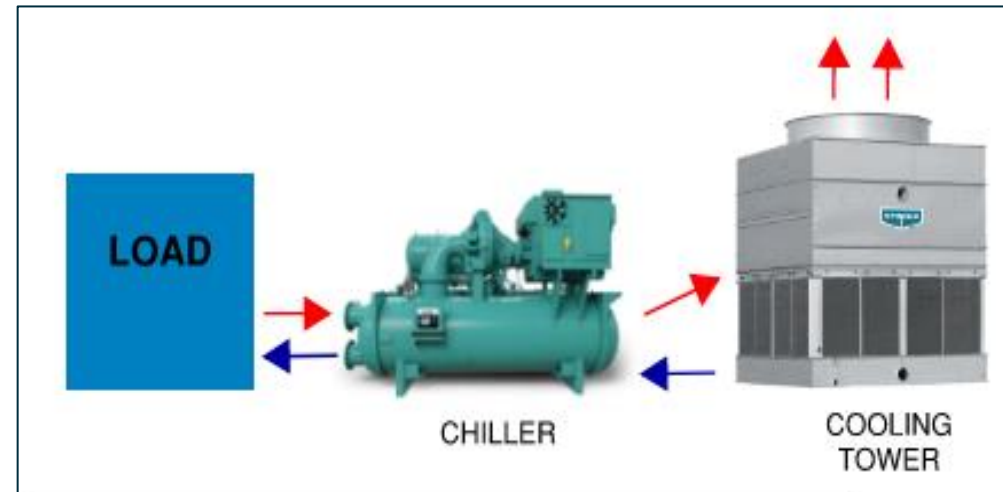
How does a traditional building work?

HVAC is simply moving heat around!

Where does heat come from (load)?



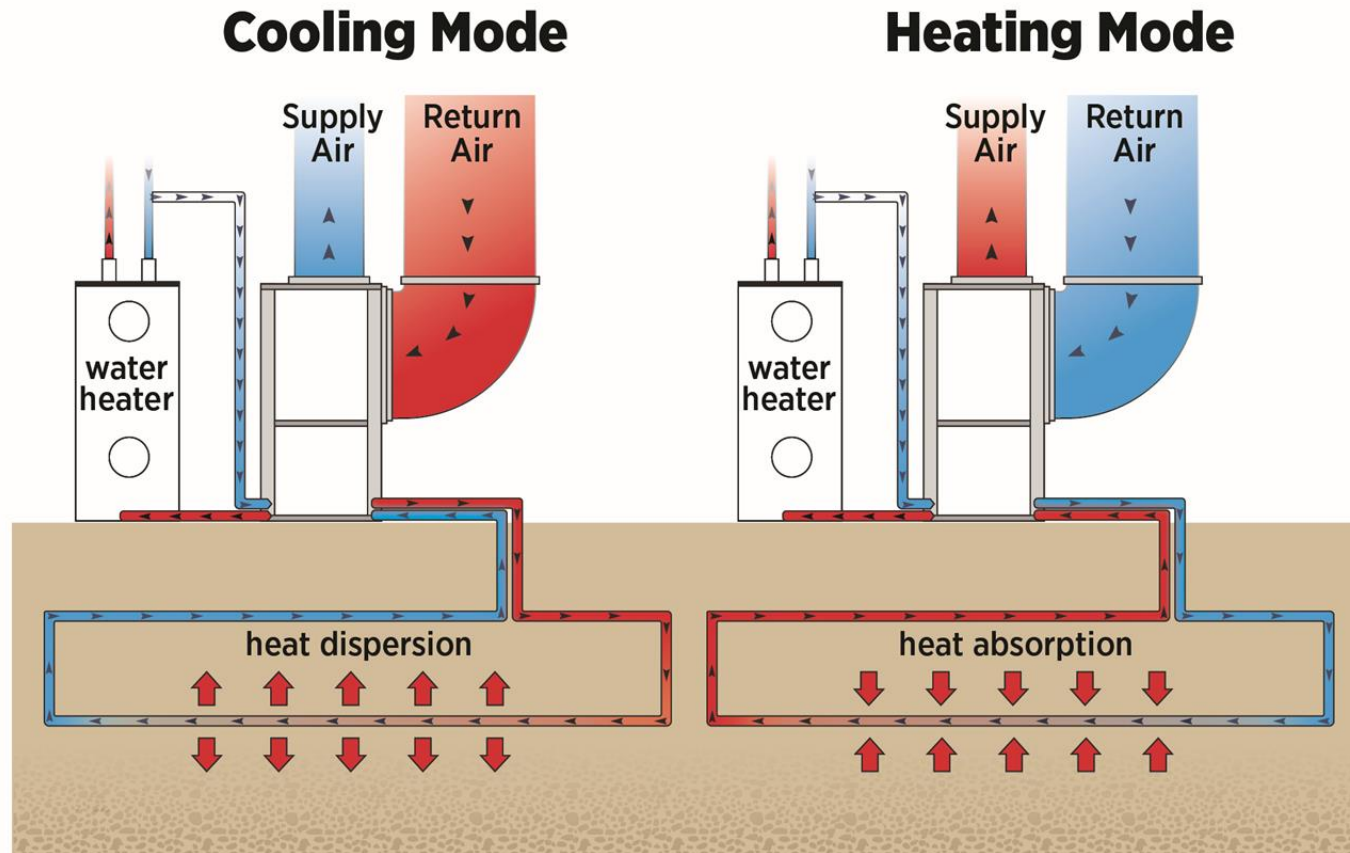
Where does the heat go?





How does geothermal work?

Uses the earth as a natural thermal battery
Transfers heat between the building and the ground for cooling and heating
No on-site fuel combustion





Capital Cost Reconciliation: Traditional Plant vs Geothermal

- ▼ **Capital Offsets (avoided scope)**
 - Cooling towers & associated infrastructure
 - Co-gen plant equipment + integration
 - Smaller plant footprint
 - Reduced piping/ductwork
 - Reduced structural & foundation requirements
 - Natural gas line
- ▲ **Capital Adds (new scope)**
 - Ground loop + geothermal distribution
 - Heat pump plant equipment
 - Electrical capacity & distribution adjustments

SRMC = Net Neutral!!



SRMC System Details

1,728 vertical wells

400 feet deep

Closed Loop

2,600 miles of pipe

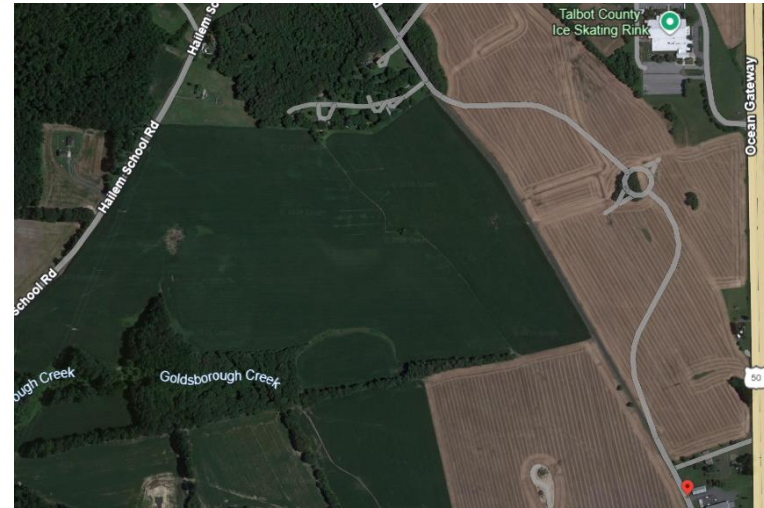


System Output & Efficiency

Captures ~29 billion
BTUs annually
(= *energy use of ~800
Maryland homes*)

Annual heating
demand: ~12 billion
BTUs

Highly efficient,
stable, predictable
performance



July 1, 2024



November 12, 2025

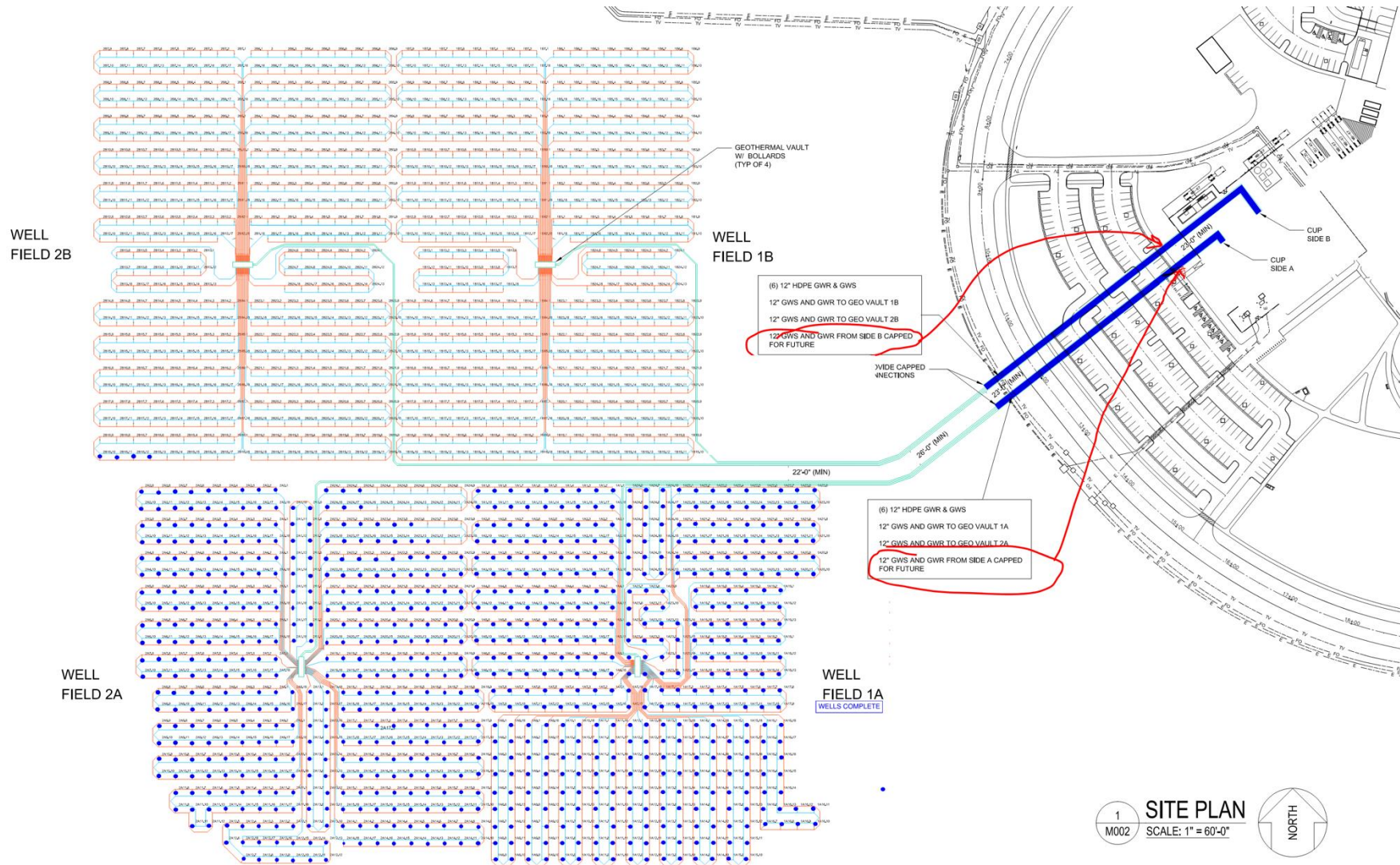


Proximity of geothermal to SRMC





Status of Installation as of 1/13/26



851 WELLS DRILLED AS OF 1/13/26



Show and Tell





Economic Impact

- First-cost neutral to a conventional central utility plant
- Delivers ~\$1.2M per year in operating cost savings
- Generates SRECs / renewable attributes
- Reduces exposure to fuel price volatility and future carbon regulation
- Incentives that can improve the business case
 - Federal assistance
 - Utility rebates / demand response
 - State programs





Scale and Market Context

- Largest geothermal system being built for a U.S. hospital to date
- Largest single-building geothermal well system in the Mid-Atlantic & Northeast
- Among the largest non-residential well systems nationally
 - Epic Systems (WI): ~6,100 wells (corporate campus)
 - Ball State University (IN): ~3,600 wells (district system)
 - Fort Knox (KY): large ground-source system with geothermal pond



UMMS Mission Alignment

Compassion: Healthier air and quieter systems for patients and neighbors

Discovery: First all-electric and geothermal hospital in Maryland

Excellence: High-efficiency, resilient infrastructure with lower operating costs

Diversity: Benefits shared across all communities we serve

Integrity: Long-term environmental and financial stewardship





Key Implications for Owners

Better strategy: turns waste heat into a usable asset

Better risk profile: less fuel volatility and fewer combustion dependencies

Better resilience: stable performance across seasons and grid conditions

Better scalability: repeatable model for new builds and retrofits

Better lifecycle: long-life infrastructure with predictable performance

Polls 4-6

We want to learn more about your experience with data centers.

Please go to www.slido.com and enter code **#DOE** to respond



Jim Henry

Iron Mountain Data Centers

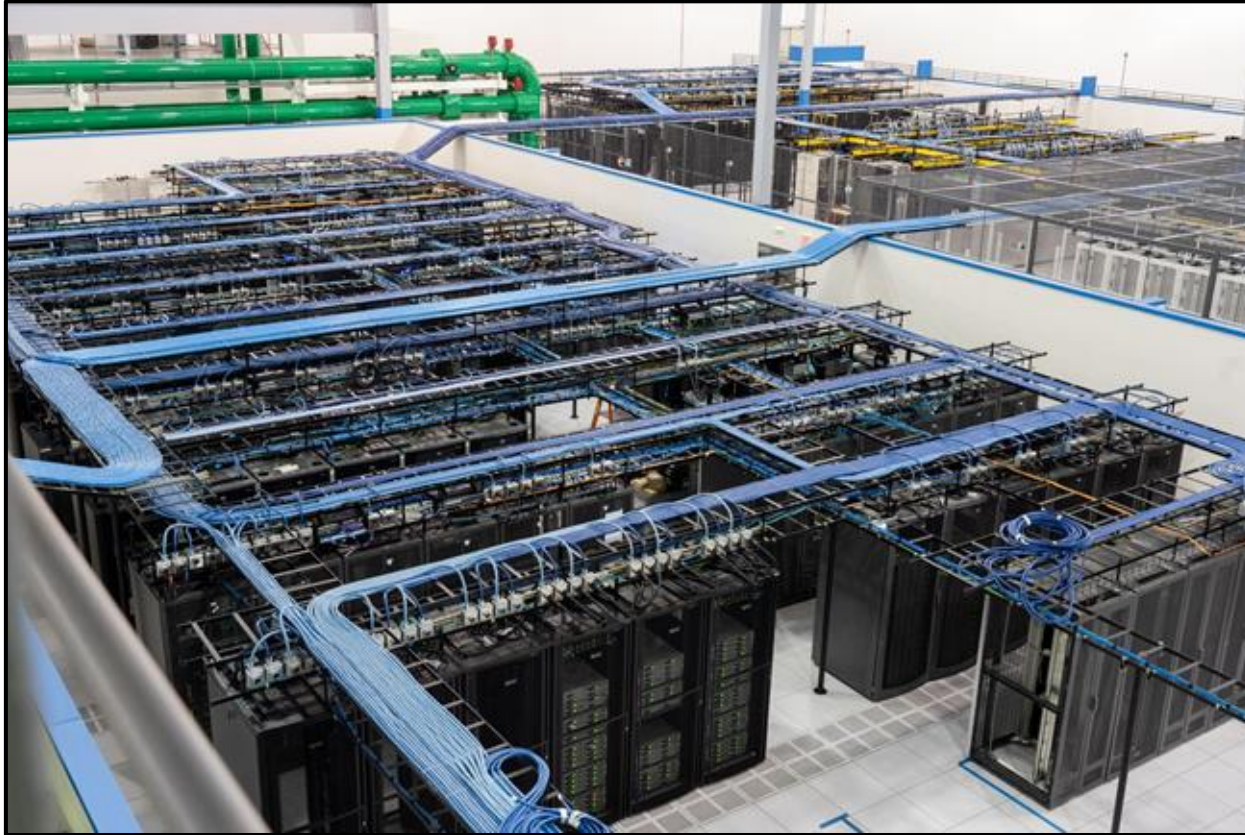
What is a colocation data center?

Gemini tells us....*“a facility where companies rent space, power, cooling, and network connectivity to house their own servers and IT equipment, instead of building and managing a dedicated data center themselves.”*

I personally call it.... *“A geographically-diverse global technology ecosystem.”*

Catchy - eh?

What is a data center?



What is a data center?



Data Center Fast Facts

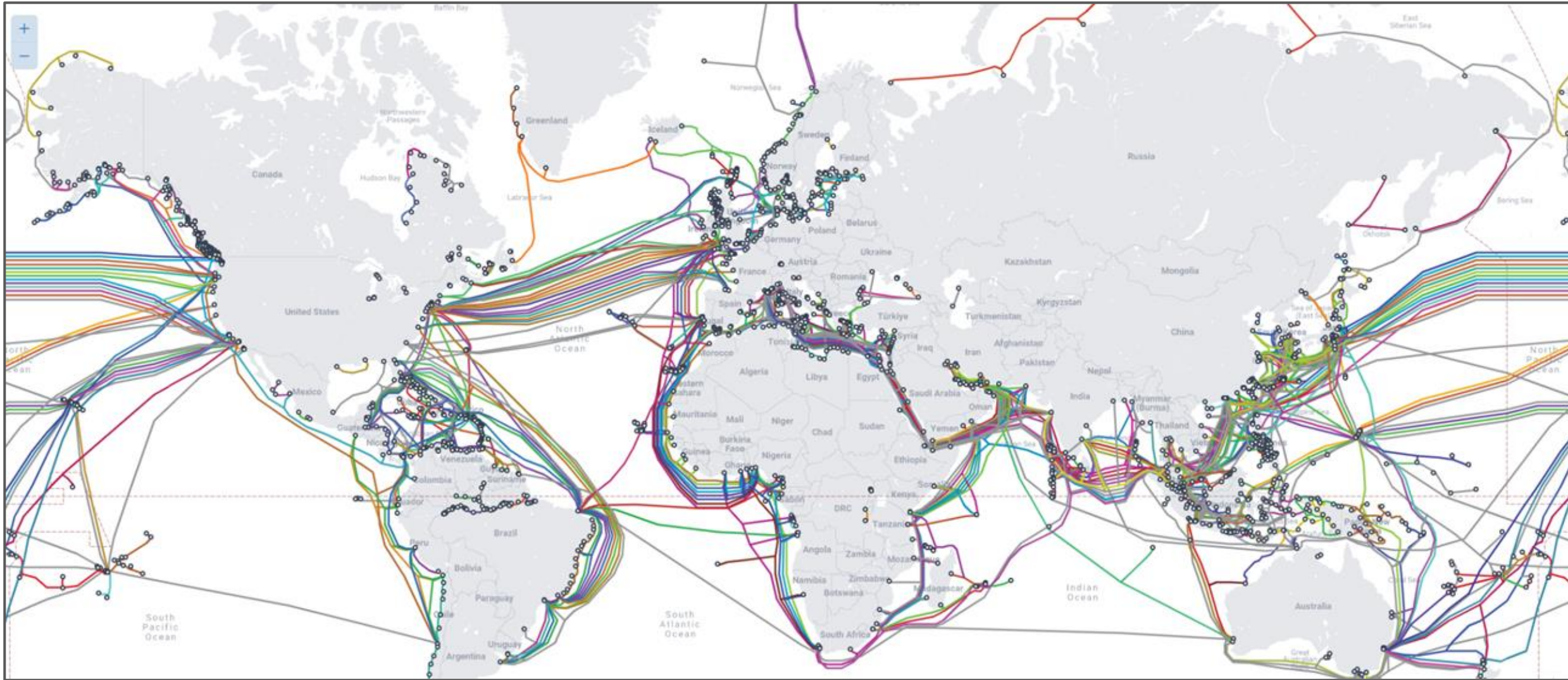
- We are the cloud
- Everybody “has” a data center
- Technology cannot scale or evolve without data centers
- AI is dependent on the existence of not only data centers, but more importantly, high performance data centers
- “Old school” data centers are more important now than ever.



- Sustainability (for the sake of environmental responsibility) has morphed into Compliance within the industry - particularly in Europe
- Energy use, clean energy, water use, and overall resource utilization are hot topics in data center development
- Data residency, sovereign clouds, and geopolitical risk challenge the industry with regard to development in key markets



We're all interconnected!



What do data centers need to run?

- Power
- Cooling
- Network connectivity
- IT Infrastructure
- Building Management Systems
- Physical and Cyber Security



Key Data Center Sustainability Challenges

- With the current AI boom, information on the resource use of data centers is often mischaracterized
- Energy and water use are key drivers from an efficiency perspective - accelerating regulation in many markets
- With such tremendous amounts of energy that are needed to run data centers, new means of accommodating this are critically important
- The “greenest” kilowatts are the ones that you don’t use...



The Underground

- Vast former limestone mine turned underground storage facility in Western Pennsylvania - 220+ feet underground
- Houses and serves many of the Iron Mountain business lines, including records storage, digital studios, hard copy and scanning, shred, and data centers
- Key data center offering for business continuity and disaster recovery of critical IT systems
- Physically sound and protected from natural disasters such as major storms, earthquakes, floods, etc...
- First underground facility ever certified by EPA ENERGY STAR®
- ISO 14001 and ISO 50001 certified







The Lake

- 35 acre reservoir - naturally occurring aquifer with isolation to maintain water level
- Alkaline water with no life - no fish, no bugs!
- Stays at a consistent ~57 F temperature year-round due to ambient temperature in the mine
- Does have a supplementary surface-mounted free-cooling chiller plant - the lake has a cooling capacity!
- Major design components consist of – reservoir pumps, heat exchangers, and building loop data center pumps all of which are concurrently maintainable
- Pumps lift the water into a heat exchanger where it receives the heat from the data center and rejects it when the warm water from the heat exchanger returns to the reservoir







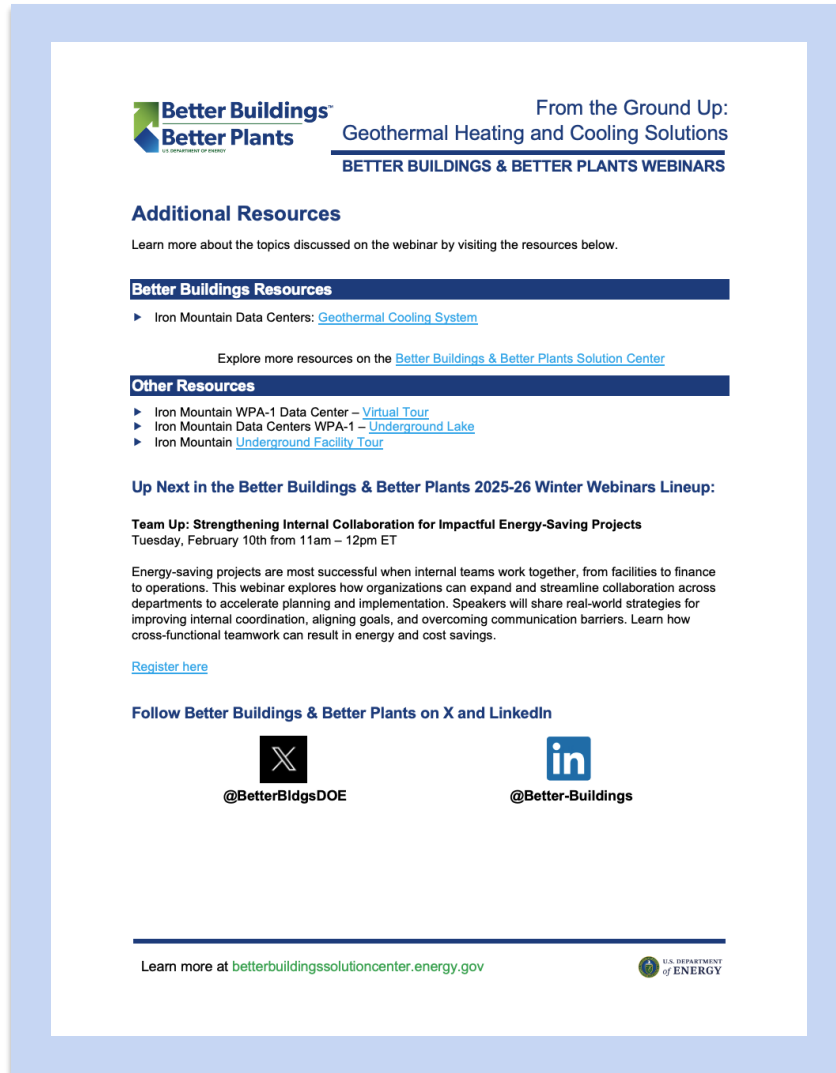








Interested in Learning More?



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From the Ground Up:
Geothermal Heating and Cooling Solutions
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Additional Resources

Learn more about the topics discussed on the webinar by visiting the resources below.

Better Buildings Resources

- ▶ Iron Mountain Data Centers: [Geothermal Cooling System](#)

Explore more resources on the [Better Buildings & Better Plants Solution Center](#)

Other Resources

- ▶ Iron Mountain WPA-1 Data Center – [Virtual Tour](#)
- ▶ Iron Mountain Data Centers WPA-1 – [Underground Lake](#)
- ▶ Iron Mountain [Underground Facility Tour](#)


Up Next in the Better Buildings & Better Plants 2025-26 Winter Webinars Lineup:


Team Up: Strengthening Internal Collaboration for Impactful Energy-Saving Projects
Tuesday, February 10th from 11am – 12pm ET

Energy-saving projects are most successful when internal teams work together, from facilities to finance to operations. This webinar explores how organizations can expand and streamline collaboration across departments to accelerate planning and implementation. Speakers will share real-world strategies for improving internal coordination, aligning goals, and overcoming communication barriers. Learn how cross-functional teamwork can result in energy and cost savings.

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- Better Buildings & Better Plants Solution Center Resources
- Speaker-chosen content
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Q & A

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Team Up: Strengthening Internal Collaboration for Impactful Energy-Saving Projects

Tuesday, February 10, 2026
11:00am – 12:00pm ET

[REGISTER TODAY >](#)

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MAY
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