

**INDUSTRY  
OVERVIEW  
SEGMENTS**

# AI DATA CENTERS: STRUCTURAL STEEL, RACKING & ENCLOSURES





# ENERGY & MANUFACTURING®

— in Appalachia —

Provide support for small and medium-sized manufacturers interested in providing components for the potential market opportunity presented by AI data centers.

AI DATA CENTERS: OVERVIEW

INDUSTRY OVERVIEW SEGMENTS

ENERGY & MANUFACTURING®  
in Appalachia

AI DATA

This slide thumbnail features a dark grey background. On the left, there is a circular image of server racks in a data center, with a smaller inset image of a person working at a computer. Below the main image is a green semi-circular graphic containing the text 'INDUSTRY OVERVIEW SEGMENTS' and a small 'AI' icon. The title 'AI DATA CENTERS: OVERVIEW' is written in large, white, sans-serif font on the right. The Energy & Manufacturing logo is at the bottom right, and 'AI DATA' is written in small letters at the bottom left.

AI DATA CENTERS:  
ADVANCED COOLING &  
THERMAL MANAGEMENT FOR AI  
DATA CENTERS

INDUSTRY OVERVIEW SEGMENTS

ENERGY & MANUFACTURING®  
in Appalachia

This slide thumbnail has a dark grey background. On the left, there is a circular image of a data center interior with blue lighting, and a smaller inset image of a glowing blue sphere. Below the main image is a green semi-circular graphic with the text 'INDUSTRY OVERVIEW SEGMENTS'. The title 'AI DATA CENTERS: ADVANCED COOLING & THERMAL MANAGEMENT FOR AI DATA CENTERS' is centered in white. The Energy & Manufacturing logo is at the bottom right.



AI DATA CENTERS:  
POWER & ELECTRICAL  
INFRASTRUCTURE

INDUSTRY OVERVIEW SEGMENTS

ENERGY & MANUFACTURING®  
in Appalachia

AI DATA

This slide thumbnail has a dark grey background. On the left, there is a circular image of a data center aisle with blue lighting, and a smaller inset image of two people talking. Below the main image is a green semi-circular graphic with the text 'INDUSTRY OVERVIEW SEGMENTS'. The title 'AI DATA CENTERS: POWER & ELECTRICAL INFRASTRUCTURE' is centered in white. The Energy & Manufacturing logo is at the bottom right, and 'AI DATA' is written in small letters at the bottom left.



# AI Data Centers, Structural Steel, Racking & Enclosures: In the News

Article • [Data Centres](#)

# The Role of Steel in Today's Data Centre Industry

By [Amber Jackson](#)

July 04, 2025 • 8 mins

“It is likely that these moves made by the US and UK governments will encourage companies to begin pivoting investment in local steel production and manufacturing, so they aren't heavily reliant on international suppliers,” he says. “This could help protect such companies from future global disruptions or price spikes.”

For the data centre industry, developers will be able to better focus on building facilities that are closer to where materials and critical equipment are made. This approach, known as ‘regional capacity’ makes supply chains shorter and that much more reliable.

Over time, these moves could lead to faster construction timelines, more stable prices

# AI Infrastructure Investment: The Hidden Boom in Construction Materials



By David Engle

Published September 23, 2025 | Updated October 2, 2025

**Steel:** One hyperscale AI data center requires up to 20,000 tons of steel to support the enormous structural load a hyperscale AI data center requires. With more than 500 of these hyperscale centers existing worldwide – and with several more to come – the need for steel is obvious. Even standard AI data centers are built with 1,500 to 2,000 tons of steel.

## **ESG mandates shaping material choices:**

Environmental rules are shaping material choices. Builders are being pushed to use sustainable materials, reduce carbon emissions, and adopt circular economy practices.

# Microsoft signs green steel supply deal with Stegra in Sweden for use in data centers

Also agrees to purchase environmental attribute certificates tied to Stegra's green steel plant in Sweden

September 25, 2025 By: Zachary Skidmore [Have your say](#)

Microsoft is not the first hyperscaler to commit to using green steel within its data centers. Last [November](#), Amazon Web Services signed a deal with SSAB to pilot the use of green steel to construct the roof and wall structures at the AWS Västerås data center.

Microsoft, AWS, [Google](#), and Meta are all part of the Sustainable Steel Buyers Platform (SSBP), a nonprofit organization that aims to bring together ambitious corporations in sectors with high steel usage, such as technology, construction, and manufacturing, and facilitate low-emission steel procurement in North America.

Steel is a crucial material in the construction of data centers. In addition to its traditional role in the foundations and shell of the building, it is also used in the racking, service enclosures, cooling systems, piping, and power generation equipment.

Article • [Data Centres](#)

## Why has Vertiv Acquired Great Lakes Data Racks & Cabinets?

By [Ben Craske](#)

August 21, 2025 • 4 mins

## Will Vertiv Transform Scalable Prefab Data Centre Solutions?

By [Ben Craske](#)

August 06, 2025 • 3 mins

The company expects the integration to deliver several advantages for its customers:

- **Streamlined infrastructure sourcing** through a single, expanded portfolio
- **Faster deployment** with pre-engineered cabinet and rack solutions
- **Operational efficiency** from factory integration of Vertiv power and cooling technologies
- **Improved scalability** for AI and edge computing applications
- **Global service support** through Vertiv's [established international network](#).

These elements align with the growing need for rapid deployment of high-density infrastructure to support data-intensive applications.

By combining Great Lakes' enclosure expertise with Vertiv's power and cooling systems, the company is positioning itself to address both current and future demand from hyperscale, colocation and enterprise operators.

<https://datacentremagazine.com/news/vertiv-launch-onecore-for-rapid-scalable-prefab-data-centres>

<https://datacentremagazine.com/news/why-has-vertiv-acquired-great-lakes-data-racks-cabinets>

# Today's Agenda

How Does Structural Steel, Racking, and Enclosures Support Data Centers?

What to Know About Structural Steel, Racking, and Enclosures

AI Data Center Structural Steel, Racking, and Enclosures Related Components

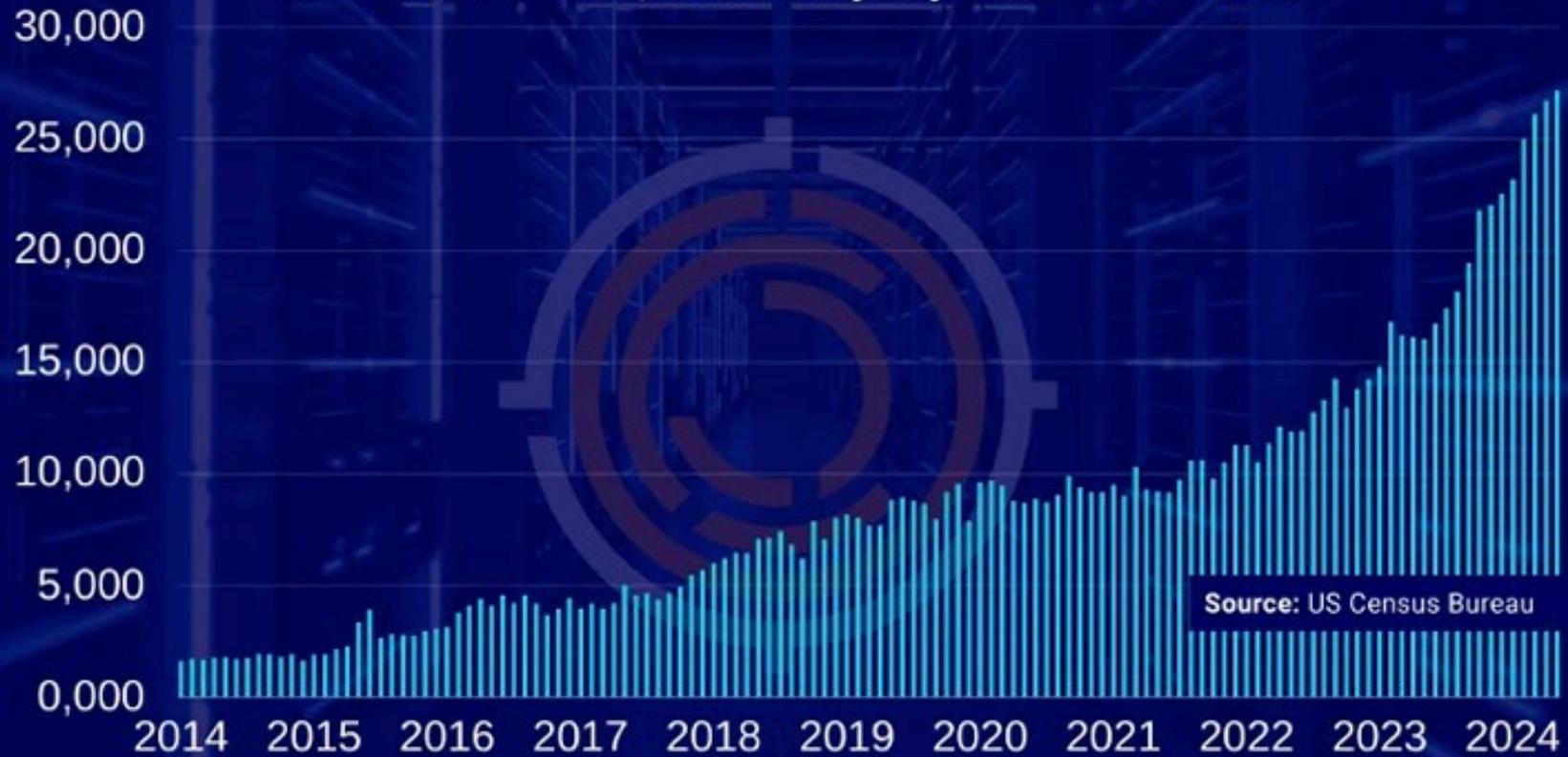
Industry Resources

Questions & Answers

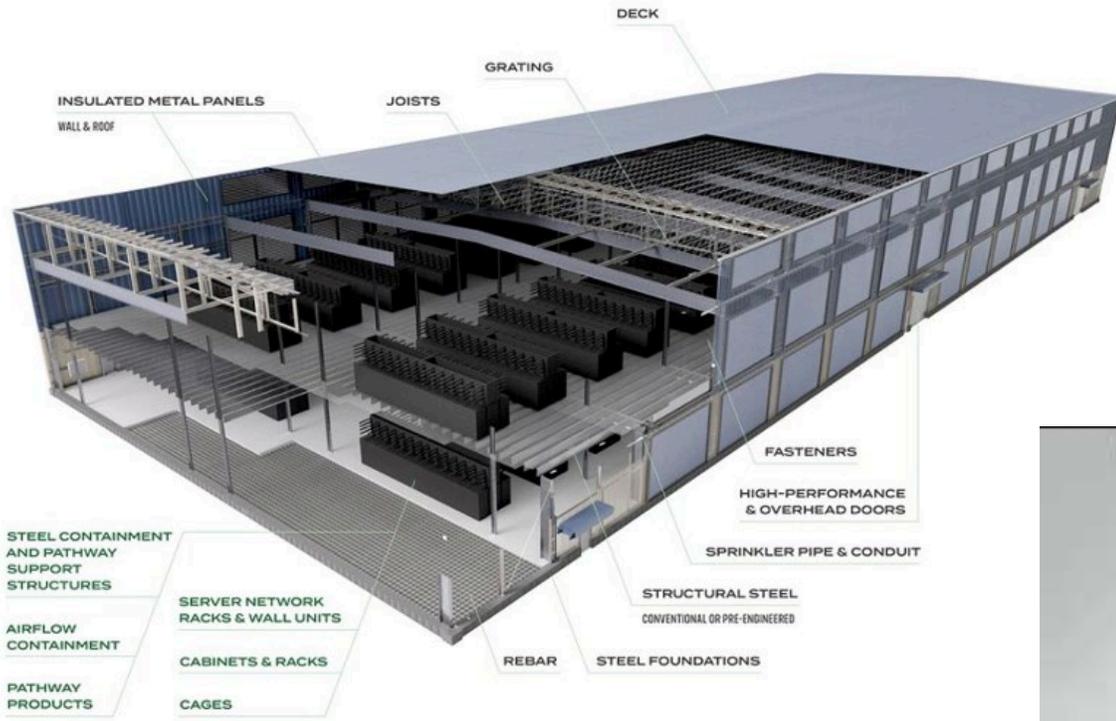
# How Does Does Structural Steel, Racking, and Enclosures Support Data Centers?

# US data center construction spending

(Millions of dollars, seasonally adjusted annual rate)



Source: MEPS International, July 2025



Data Center with Sustainable Steel  
 Source: [NUCOR](https://nucor.com), Accessed August 2025



# What to Know About Structural Steel, Racking, and Enclosures

# Government Support



An official website of New York State [Here's how you know](#) ▾

## Department of Taxation and Finance

## Internet Data Centers

Tax Bulletin ST-405 (TB-ST-405)

### Exemption for tangible personal property

An operator of an Internet data center doesn't have to pay sales tax on the purchase or use of machinery, equipment, and certain other tangible personal property.

Property eligible for the exemption includes:

- computer system hardware, such as servers and routers;
- pre-written computer software;
- storage racks and cages for computer equipment;
- property necessary to maintain the appropriate climate-controlled environment, such as air-filtration equipment, air-conditioning equipment, and vapor barriers;
- power generators and power conditioners;
- property that will constitute raised flooring when installed; and
- other similar equipment.



# Data Center Tax Exemption

A tax credit for eligible data center equipment



## DATA CENTER TAX EXEMPTION DETAILS

The **Data Center Tax Exemption** provides a sales-tax exemption rate and term that allow for partial or full sales tax exemption on the purchase of eligible data center equipment. Projects must meet minimum investment and payroll thresholds to be eligible. Final approval of the tax exemption is contingent upon the approval of the Ohio Tax Credit Authority.

<https://www.jobsohio.com/incentives-programs/data-center-tax-exemption>



Commonwealth of Pennsylvania

## Department of Revenue

# Computer Data Center Equipment Exemption Program

Program Guidelines

September 2025

<https://www.pa.gov/agencies/revenue/incentives-credits-and-programs/computer-data-center-equipment-program>

[https://www.pa.gov/content/dam/copapwp-pagov/en/revenue/documents/incentivescreditsprograms/computerdatacenterequipprog/documents/computer\\_data\\_center equip\\_exemption\\_program\\_guidelines.pdf](https://www.pa.gov/content/dam/copapwp-pagov/en/revenue/documents/incentivescreditsprograms/computerdatacenterequipprog/documents/computer_data_center equip_exemption_program_guidelines.pdf)

# Environmental Goals

To sign up for news alerts from Amazon, click here and choose "Allow" for notifications.



News ▾

About Us ▾

Our Impact ▾

Subscribe

News / Sustainability

## How AWS is using more lower-carbon materials to build data centers

We're using lower-carbon concrete and steel to build data centers and aiming to help make these materials available across the construction industry.

### 1. "Designing-out" the overall amount of steel and concrete we use

We continuously evaluate the design criteria for everything from server racks to office spaces and storage rooms. Doing so allows us to find opportunities to reduce the total amount of materials, like steel and cement, needed to support our buildings. We recently identified an opportunity to change the air system in our data center designs to reduce the amount of materials we use in new building structures. By removing the concrete topping from a mezzanine floor and only using steel beams, we save roughly 115 metric tons of carbon dioxide equivalent per data center.

# 43 data centers

constructed with lower-carbon concrete and steel

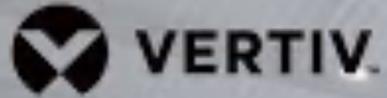


### 3. Encouraging our suppliers to incorporate lower-carbon steel into their supply chains

### 4. Investing in innovative technologies to drive carbon reductions in the future



<https://www.aboutamazon.com/news/sustainability/aws-decarbonizing-construction-data-centers>



# Modular data center tour | Vertiv SmartMod™ Max

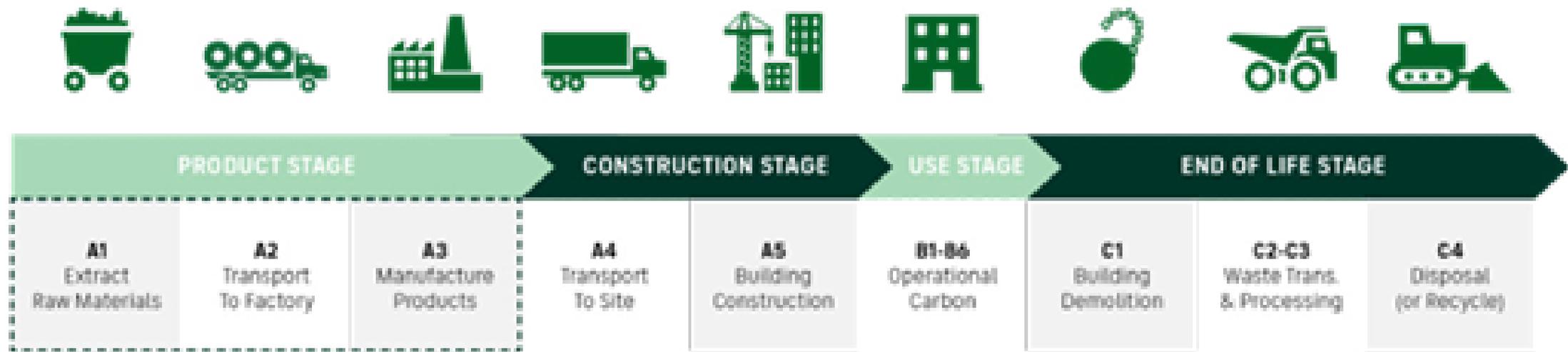


# WHAT IS AN ENVIRONMENTAL PRODUCT DECLARATION?

An environmental product declaration (EPD) is a document that provides transparent information about a product's environmental impact throughout its lifecycle.

An EPD is like a nutrition label, outlining a product's impact on the environment — it requires one year of production data to be used within a life-cycle assessment (LCA), ultimately creating the product's environmental impacts in six categories.

EPDs are based on international standards and product-specific guidance to ensure consistent and transparent environmental data based on a framework that makes it possible for readers to understand the results in the report.



Stages Within A Lifecycle Assessment Enable Steel Industry Professionals To Calculate Environmental Product Declarations (EPDs)

Source: [Nucor](https://nucor.com), 2020

# AI Data Center Structural Steel, Racking, and Enclosures Related Components

## AI Data Center Structural Steel, Racking & Enclosure Components

### BUILDING SHELL & STRUCTURAL STEEL

COMPONENT	NAICS NUMBERS	NAICS NAME	DESCRIPTION	USE
Blast and Fire-Resistant Panels	332311	Prefabricated Metal Building and Component Mfg	Panels/barriers for enhanced envelope safety	Safety in mission-critical environments
Exterior Cladding/Wall Panels	332311	Prefabricated Metal Building and Component Mfg	Prefab metal or composite wall systems	Weather protection & insulation
Raised Floor Structures	238330	Flooring Contractors	Modular, steel-supported floors with airflow panels	Underfloor cable/cooling passage
Roof Trusses and Decking	332312/238160	Fabricated Structural Metal/ Roofing Contractors	Steel roof/decking structures with insulation	Roof support and weather resistance
Seismic Bracing/Anchoring Systems	332312/332999	Fabricated Structural Metal/ Misc. Fabricated Wire Product Mfg	Steel bracing and anchor hardware	Seismic resilience, heavy load safety
Structural Steel Frames	332312	Fabricated Structural Metal Manufacturing	Main load-bearing support columns, beams, and joists	Building shell, room expansions
Utility Raceways	332999	Misc. Fabricated Wire Product Manufacturing	Segregated routing raceways for MEP (power, cable, etc.)	Organized distribution of infrastructure

### RACKING SYSTEMS

COMPONENT	NAICS NUMBERS	NAICS NAME	DESCRIPTION	USE
Cable Management Accessories	332999	Misc. Fabricated Wire Product Manufacturing	Horizontal/vertical managers, lacing bars, blanking panels	Cable airflow management
Earthquake-Proof/Specialized Mounts	332312	Fabricated Structural Metal Manufacturing	Locking hardware/mounting feet for seismic safety	Equipment protection
Modular Rack Frames	333318	Other Commercial Service Industry Machinery	Tool-less, expandable frames	Quick deployment/upgrades
Rack-Mounted Cooling Modules	333415	Commercial & Industrial Machinery Mfg	Integrated air or liquid cooling units in racks	Local/server cooling
Server/Network Racks	333415	Commercial & Industrial Machinery Mfg	Open/enclosed steel racks, 19'/23' sizes	Equipment mounting, density opt.
Smart Racks	333999	Miscellaneous Machinery Manufacturing	Embedded sensor racks for monitoring	Thermal control, asset, security

### ENCLOSURES

COMPONENT	NAICS NUMBERS	NAICS NAME	DESCRIPTION	USE
Aisle Containment Doors	332321	Metal Door & Frame Manufacturing	Sliding/swinging doors for aisle containment	Thermal isolation, access control
Custom/Edge Enclosures	332710	Machine Shops	Special enclosure fabrication	Modular/edge deployments
Environmental Sensor Housings	334513	Instruments & Related Products Mfg	Protective enclosures for sensors	Environmental monitoring

## AI Data Center Structural Steel, Racking & Enclosure Developers and Manufacturers

The construction of most U.S. AI data center projects is by experienced firms that provide preconstruction, engineering integration, and critical infrastructure commissioning. These firms rely on manufacturers of structural steel, racks, and enclosures to provide some of the numerous components that make up today's data centers.

Structural steel developers and fabricators deliver robust, scalable structural steel frames, trusses, and seismic/thermal supports critical for the reliable physical foundation of AI data centers, enabling large vertical and horizontal expansions, long-span floor plates, and resilient, compliant building shells for extreme compute densities.

Manufacturers and integrators of data center enclosures and racking systems typically design, engineer, and fabricate both advanced racks and secure enclosures as part of an integrated product suite. Their solutions are critical to safely and efficiently housing, cooling, and powering extremely dense AI server and GPU deployments.

A list of some of the leading companies is provided below.

### DATA CENTER CONSTRUCTION

- **AECOM:** With a strong presence in project management, engineering, and large integrated builds, AECOM is frequently selected for complex, multi-phase data center developments alongside or in partnership with top GCs.
- **DPR Construction:** One of the largest and most experienced builders of data centers nationwide, DPR Construction is known for advanced project delivery and sustainable construction practices.
- **Holder Construction:** Holder is recognized as one of the top data center contractors by volume and revenue and is frequently chosen for speed, technical quality, and massive multi-hall developments.

- **Jacobs Solutions:** A global leader in engineering, design, and construction for digital infrastructure, Jacobs executes integrated planning, project management, and engineering for many of the largest campuses in the U.S. and worldwide, including complete turnkey services from site prep to commissioning.
- **Skanska USA:** Skanska engages in major, sustainable, and high-volume digital infrastructure projects, with a strong focus on environmental performance and efficient delivery.
- **Turner Construction Company:** A leading general contractor in both domestic and international projects, Turner routinely handles major data center campuses for the world's largest tech firms, utilizing advanced techniques such as BIM and prefabrication for speed and reliability.
- **Whiting-Turner Contracting Company:** Whiting-Turner delivers robust construction solutions and is a consistent player in the U.S. for large-scale data centers, executing complex projects across regions.

### STRUCTURAL STEEL

- **Allied Steel Buildings:** Well-known for modular, pre-engineered steel building systems, delivering shells and framing for rapid data center construction and AI facility expansion.
- **Banker Steel:** Headquartered in Virginia with multiple regional plants, Banker Steel provides fabrication and erection for high-security, mission-critical, and hyperscale data center buildings across the Eastern and Midwestern U.S.
- **Basden Steel:** A leading Texas-based fabricator and erector of structural steel, Basden Steel supports industrial, commercial, and data center projects, with capacity for both traditional and modular approaches.

## AI Data Center Structural Steel, Racking & Enclosure Developers and Manufacturers

- **Lexicon:** National structural steel fabrication and erection contractor experienced in data center shells and fast-track, high-security projects.
- **Nucor:** The largest U.S. steel producer, Nucor supplies beams, columns, plate, and custom-fabricated modules using sustainable electric arc furnace technology, widely utilized in data center construction.
- **Schuff Steel:** Among the largest steel fabricators and erectors in the country, Schuff Steel frequently supplies large-scale data centers, complex commercial structures, and projects with high capacity and precision needs.
- **U.S. Steel:** Major integrated U.S. steelmaker providing beams, columns, and plate for infrastructure, commercial, and data center projects, especially those requiring domestic sourcing or large volumes.

### RACKING SYSTEMS AND ENCLOSURES

- **AMCO Enclosures:** Amco provides custom and standard server racks, seismic racks, cabinets, cold aisle containment, and modular enclosures manufactured in the U.S.
- **Black Box Corporation:** Black box produces modular racks, cabinets, and fully integrated IT enclosure solutions for data centers and network operations.
- **Chatsworth Products:** Chatsworth designs and manufactures cabinets, racks (including seismic and high-density), and integrated infrastructure solutions for mission-critical and edge environments.

- **Eaton:** Eaton supplies both racks and highly-engineered cabinet enclosures supporting advanced airflow, monitoring, and security features for AI data centers.
- **Hammond Manufacturing:** Hammond provides electrical and electronic enclosures and rack mounting solutions.
- **IMH Products:** IMH provides custom machining, sheet metal fabrication, and assembly for server racks, cabinets, airflow panels, mounting, and power distribution custom enclosures.
- **Legrand:** Legrand manufactures server racks and cabinet lines, along with extensive cable management and enclosure accessories.
- **Maysteel Industries:** Maysteel offers precision sheet metal enclosures, OEM custom server racks, aisle containment structures, and modular cabinet solutions.
- **nVent Hoffman:** nVent manufactures racks and cabinets, cable management and pathway solutions, and networking accessories.
- **Rackmount Solutions:** Rackmount provides a wide range of customizable rack enclosures, wall mount cabinets, and mobile racks designed for small to large-scale IT/data center deployments.
- **Saginaw Control & Engineering:** Saginaw manufactures standard and custom-designed enclosures made from various materials like steel, stainless steel, and non-metallic options, and meeting different NEMA ratings for environmental protection.

# Industry Resources

## AI Data Center Structural Steel, Racking & Enclosure Trade Associations & Resources

### TRADE ASSOCIATIONS

**Association for Computer Operations Management**: AFCOM serves as a leading professional organization for individuals engaged in data center and IT infrastructure management.

**Associated General Contractors of America**: AGC represents a broad range of construction firms, including those specializing in data center construction.

**American Institute of Steel Construction**: AISC develops and maintains standards for the design, fabrication, and erection of structural steel buildings. The institute provides education, technical resources, and certification programs to promote safety, innovation, and best practices for steel construction across a range of building types, including mission-critical facilities such as data centers.

**Data Center Coalition**: DCC serves as the membership association for the data center industry, advocating for favorable business climates, policies, and investments that support the sector's growth and success. DCC engages in public policy advocacy, thought leadership, and community outreach to promote the economic and community-building impacts of data centers.

**Metal Building Manufacturers Association**: MBMA serves as the leading advocate for the metal building systems industry, offering research, technical guidance, and education on the use of modular steel solutions. The association works closely with manufacturers, architects, and contractors to promote efficient, cost-effective, and high-performance metal buildings for industrial, commercial, and technology infrastructure applications.

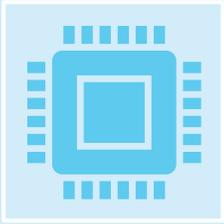


U.S. DEPARTMENT  
of ENERGY

## Office of Manufacturing and Energy Supply Chains

The frontline of America's energy manufacturing and supply chain security

<https://www.energy.gov/mesc/office-manufacturing-and-energy-supply-chains>



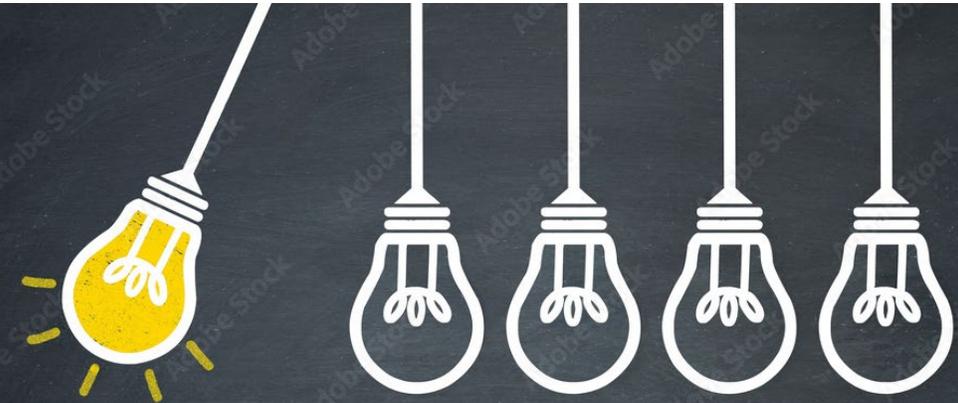
AI Data Centers are a potential major emerging market for small and medium-sized energy and electrical equipment manufacturers



AI company sustainability policies will likely drive new equipment purchases, though Trump Administration fossil fuel policies may counteract.



Sprint is needed to capture market opportunity at the regional, national, and global level



**FINAL THOUGHTS**



Connect with me on [LinkedIn](#) (Deborah D Stine)

Email me at

[Deborah@scitechpolicyacademy.com](mailto:Deborah@scitechpolicyacademy.com)

<https://scitechpolicyacademy.com/>

## AI Data Centers

AI Data Centers, specialized facilities designed to support the intensive computing and data storage needs of artificial intelligence applications, are rapidly becoming critical infrastructure as demand for high-performance computing continues to soar. As a result, they are a potential market opportunity for small and medium-sized manufacturers interested in providing components for AI data centers. The opportunity lies in agility: understanding specialized demand, aligning with environmental and regulatory shifts, and moving quickly to deliver next-generation components.

[Click here](#) to learn the **Ten Things to Know About AI Data Centers**

### AI Data Center Overview

- [Download](#) the free **AI Data Centers: Overview** report that identifies:
  - Market Size & Growth Forecasts
  - Market Drivers, Challenges & Concerns
  - The Data Center Layout
  - AI Data Center Components and NAICS Codes of Suppliers
  - Contact – Developers, Manufacturers, & Trade Associations
  - Map of where Data Centers are emerging
- [View the webinar](#) recording of AI Data Centers.
- [Click here](#) to view the PowerPoint slides presented in the webinar.



### AI Data Centers: Power & Electrical Infrastructure

Explore the rapidly growing power demands of AI-focused data centers and the infrastructure needed to meet them. With computing loads increasing dramatically, facilities must provide reliable high-density power delivery, robust grid interconnection, and backup systems to support round-the-clock operation.

- [Download](#) the **AI Data Centers: Power & Electrical Infrastructure** Report.
- [View the webinar](#) recording of AI Data Centers: Power & Electrical Infrastructure
- [Click here](#) to view the PowerPoint slides presented in the webinar.

<https://www.wemakeithere.org/ai-data-centers-supply-chain/>



### AI Data Centers: Advanced Cooling

As AI workloads push hardware to higher densities and power levels, thermal management becomes a critical bottleneck. This overview details how advanced cooling technologies—such as direct-to-chip liquid cooling, microchannel cold plate two-phase pumped systems, and high-efficiency rack-level cooling—are enabling efficient and reliable data center operation.

- Download the **AI Data Centers: Advanced Cooling** Report.
- [View the webinar](#) recording of AI Data Centers: Advanced Cooling
- [Click here](#) to view the PowerPoint slides presented in the webinar.
- [View](#) the AI Data Centers: Advanced Cooling Press Release

### AI Data Centers: Structural Steel, Racking & Enclosures

AI data centers rely on large volumes of structural steel, precision racking, and secure enclosures to support high-density computing environments. These components form the core physical framework of each facility—enabling fast construction, heavy load capacity, efficient airflow, and secure equipment housing. Hyperscale sites now use **around 20,000 metric tons of steel**, and AI servers can add **1,000 pounds more per rack** compared to traditional deployments.

Demand is rising for modular steel systems, prefabricated structures, high-density racking, and enclosure designs built for advanced cooling and cable management. The global rack and enclosure market is expected to grow from **\$5.2 billion in 2025 to \$9.4 billion by 2030**, driven by rapid AI expansion and the need for scalable, reliable infrastructure.

Sustainability is also influencing procurement, with many operators seeking low-embodied-carbon steel and Environmental Product Declarations (EPDs). For small and mid-sized manufacturers, steel fabrication, machining, metalworking, and enclosure production represent strong entry points into the AI data center supply chain.

- Download the **Structural Steel, Racking & Enclosures** Report.