Ten Things to Know about AI Data Centers

Dr. Deborah D. Stine

Founder, Science and Technology Policy Academy

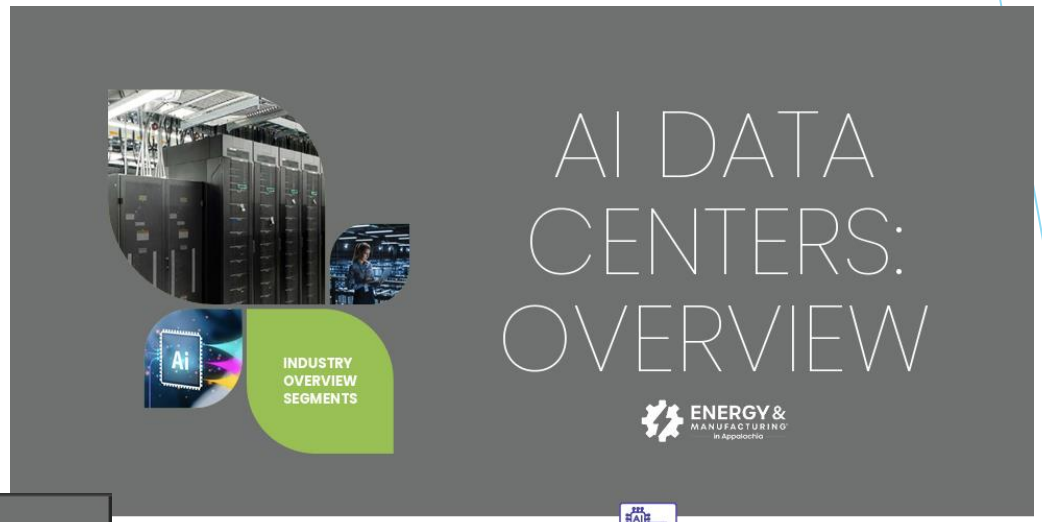
https://scitechpolicyacademy.com/

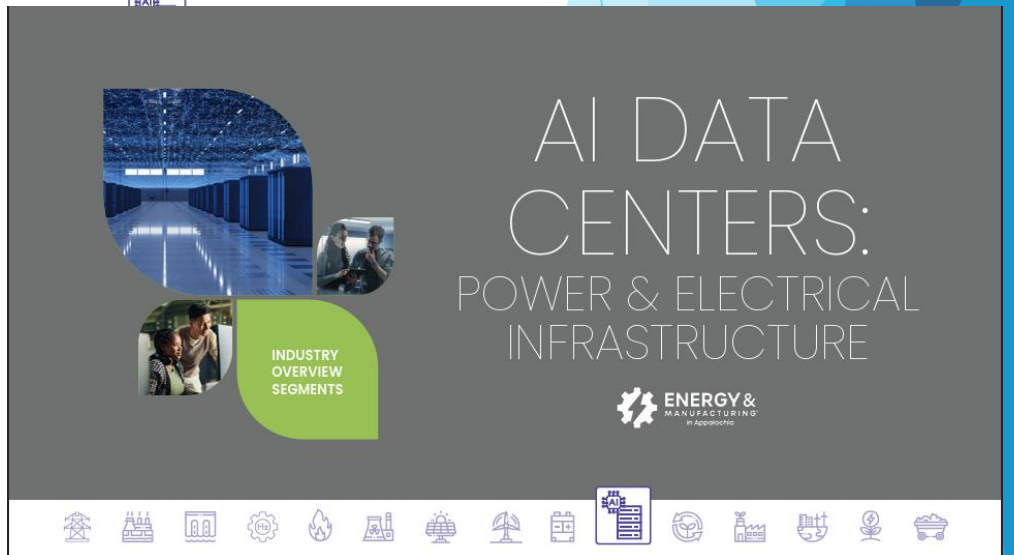
Deborah@scitechpolicyacademy.com

Science and Technology Policy Academy

ENERGY & MANUFACTURING®
in Appalachia

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



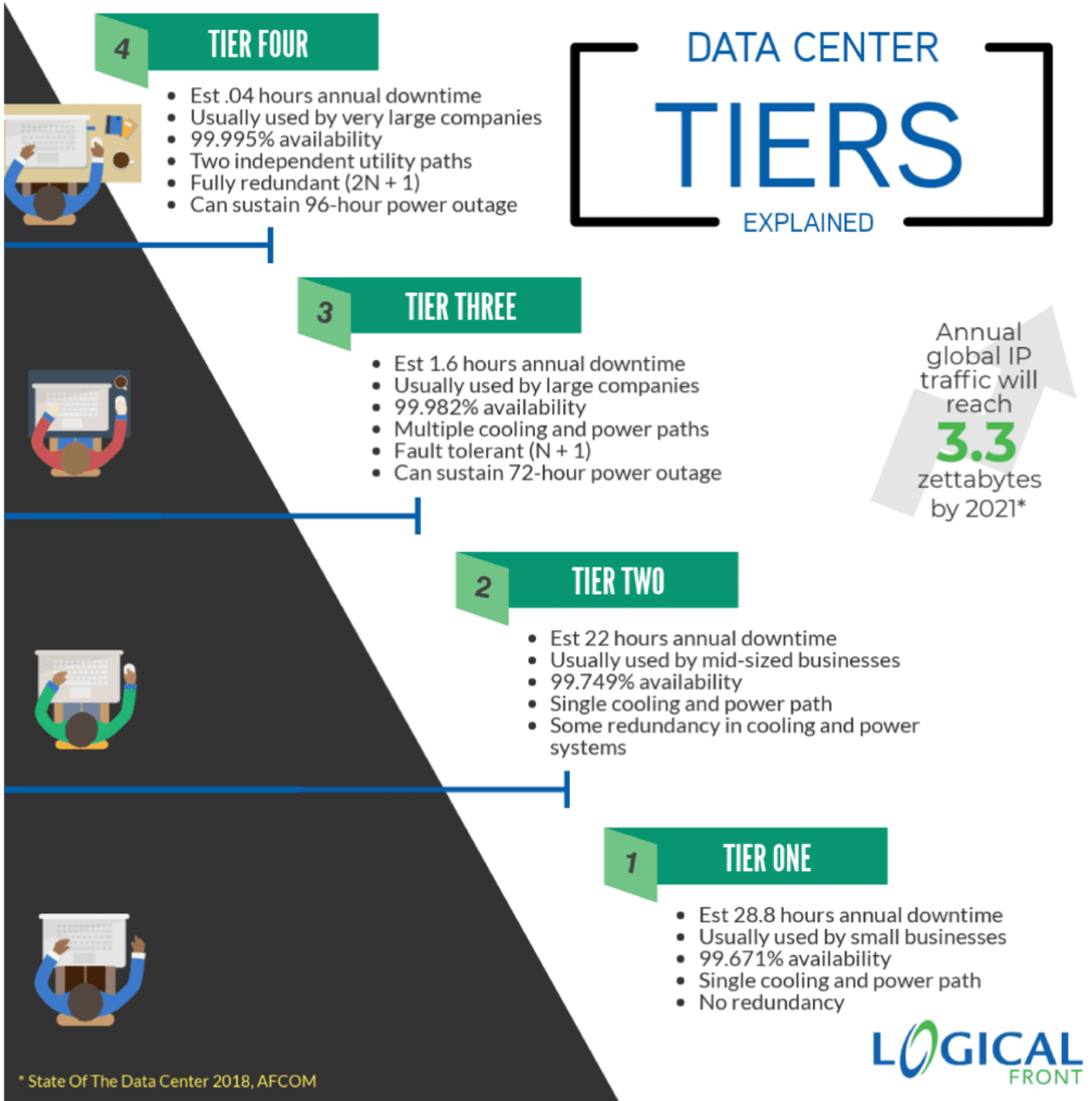


Forthcoming: Structural Steel, Racking, and Enclosures

1. AI Data Centers are specialized facilities designed to support the intensive computing and data storage needs of artificial intelligence applications.

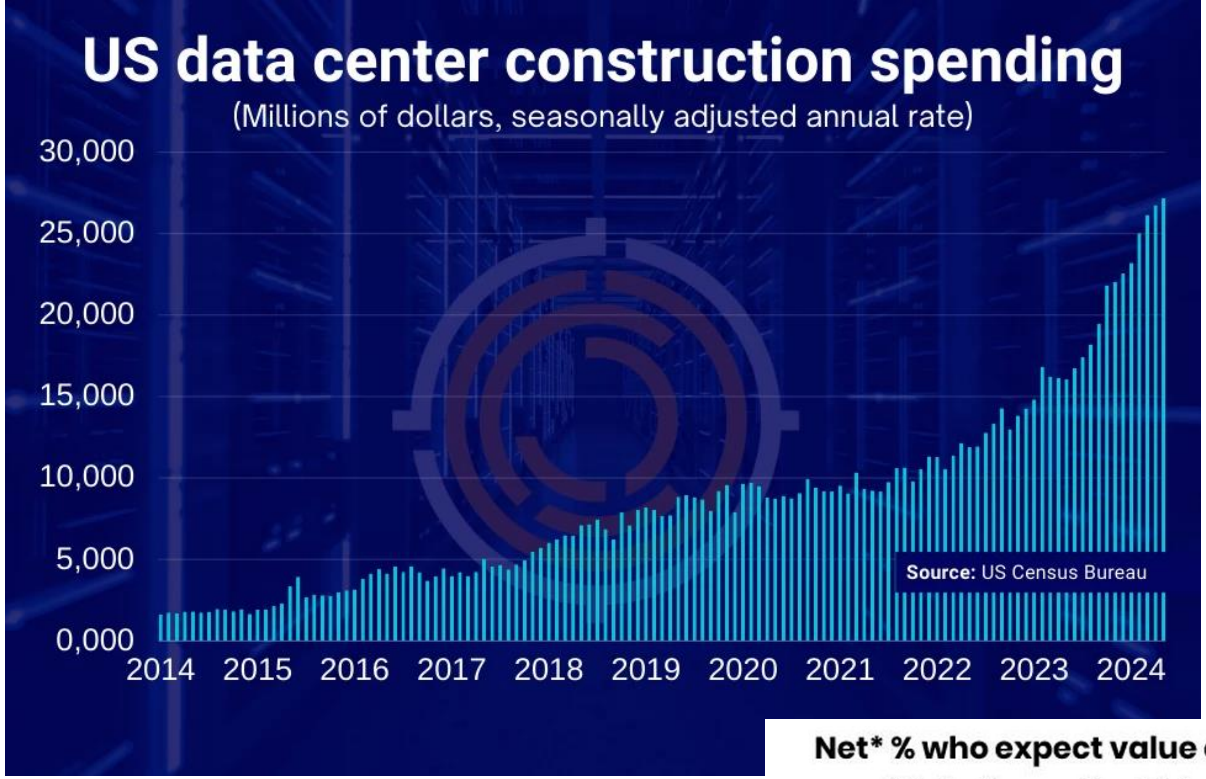
Data Centers vary by scale and function impacting their component needs.

- Hyperscale
- Enterprise
- Colocation
- Edge
- Cloud

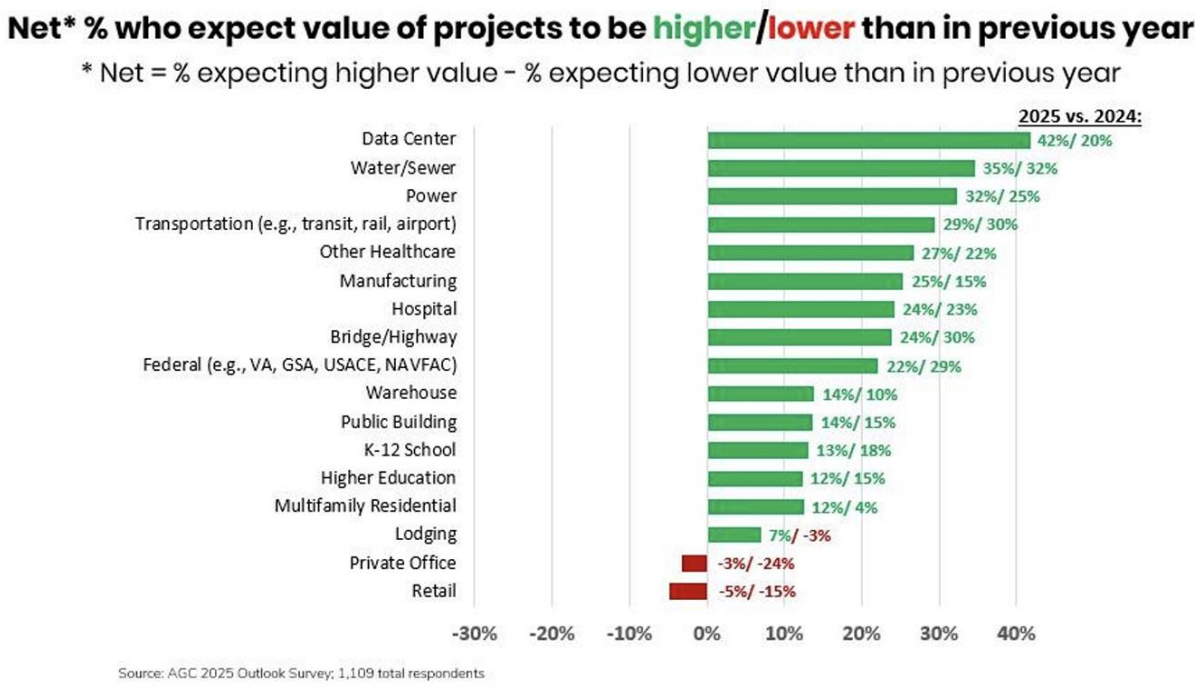


ENERGY & MANUFACTURING in Appalachia

2. Demand for AI Data Centers is Surging.



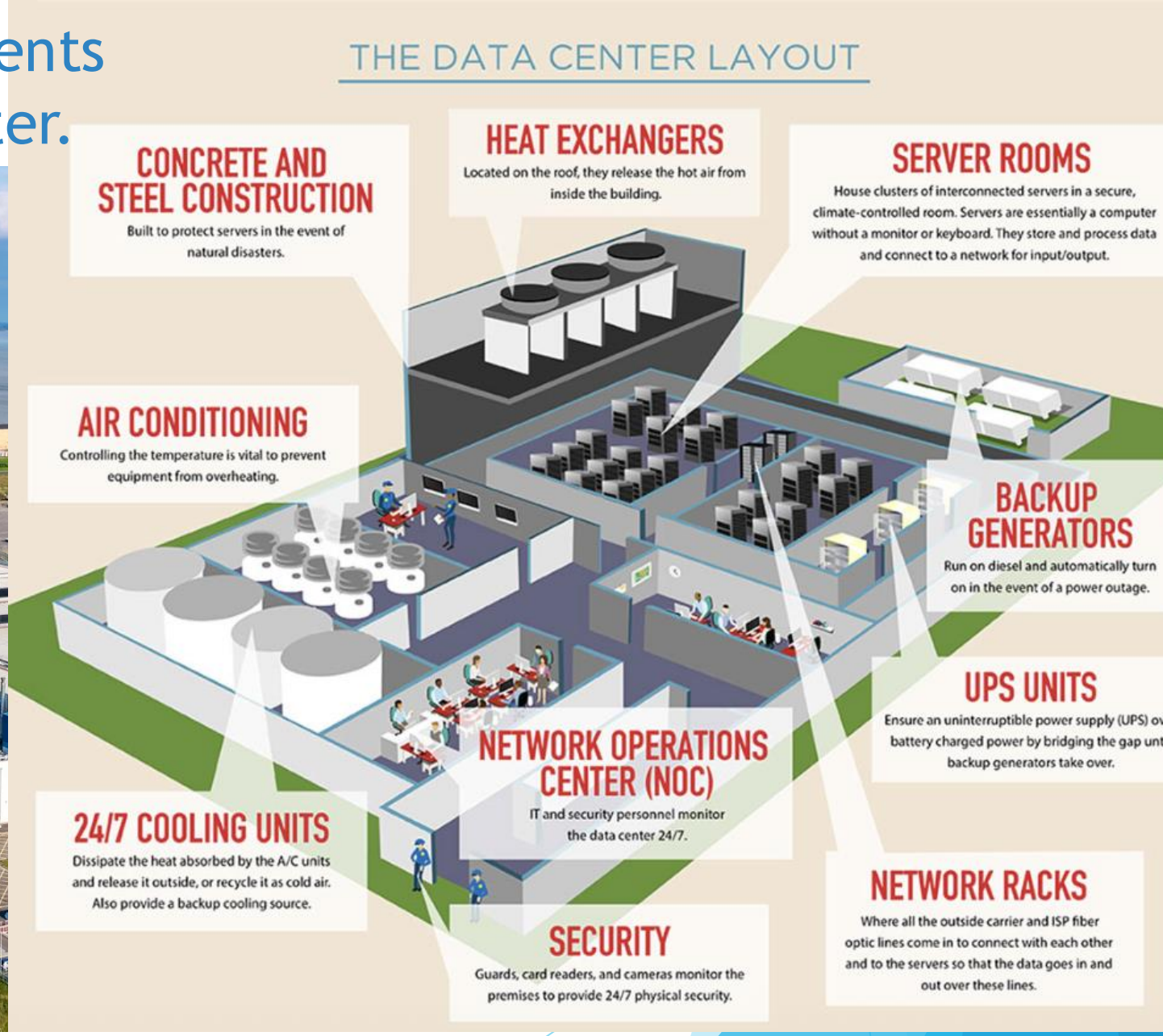
Survey of Contractors



Sources: MEPS International, July 2025; Associated General Contractors of America, 2025

ENERGY & MANUFACTURING in Appalachia

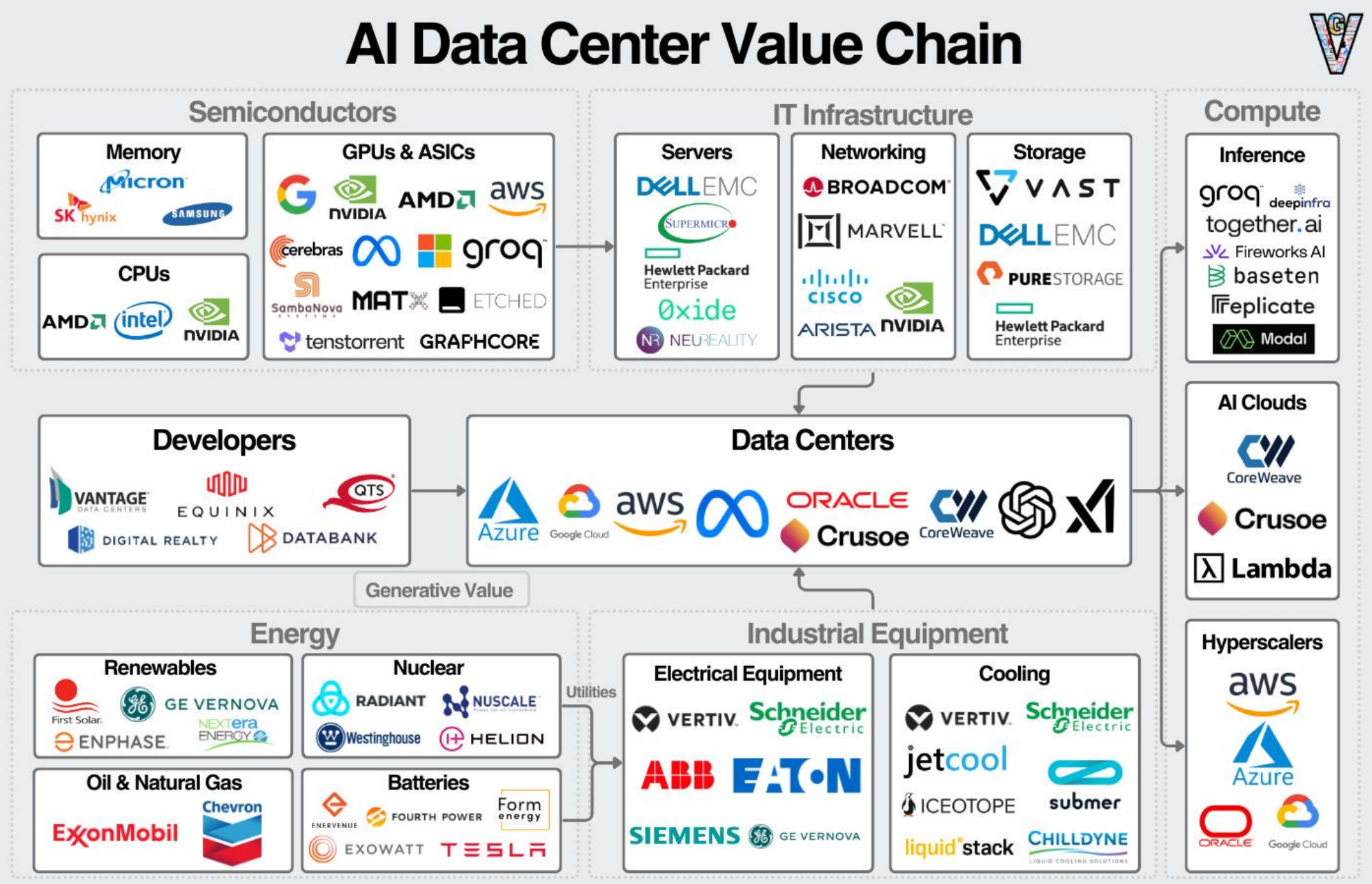
3. AI Data Centers Need Components Inside and Outside the Data Center.



ENERGY & MANUFACTURING in Appalachia

Sources: Google; Infogrades

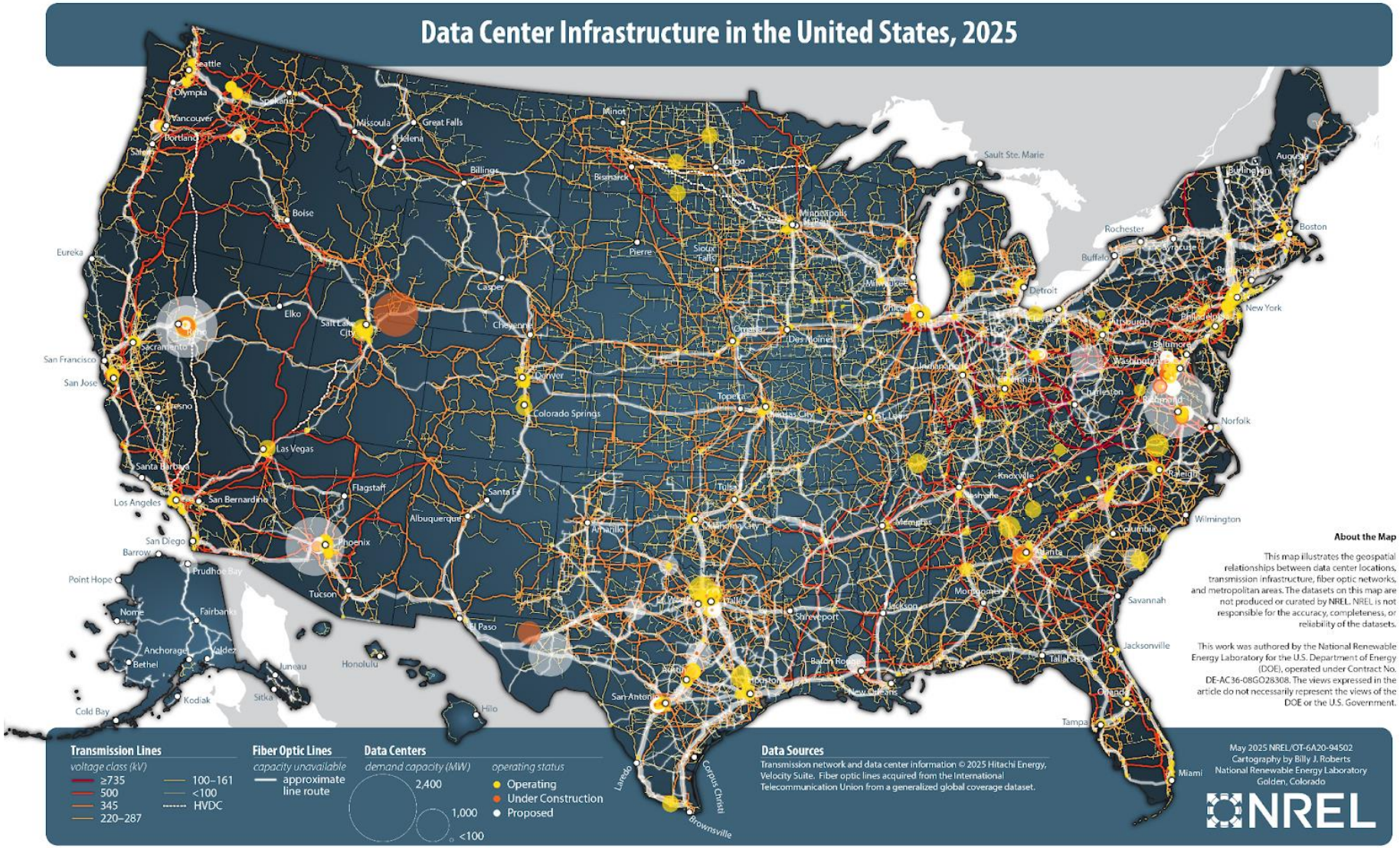
4. AI Data Centers Supply Chain is Multifaceted and Expanding.



Source: Eric Flanagan, October 13, 2024

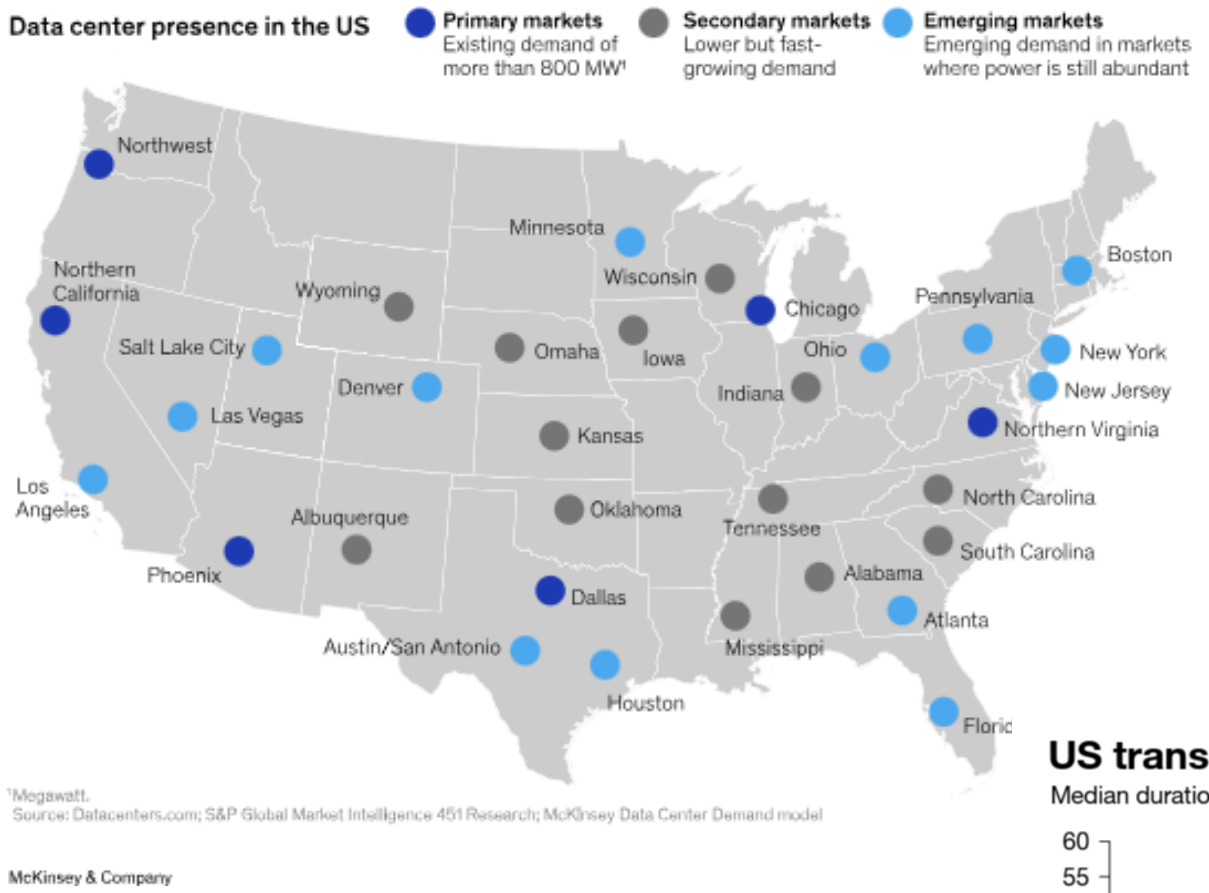
5. New AI Data Center Component shortages:

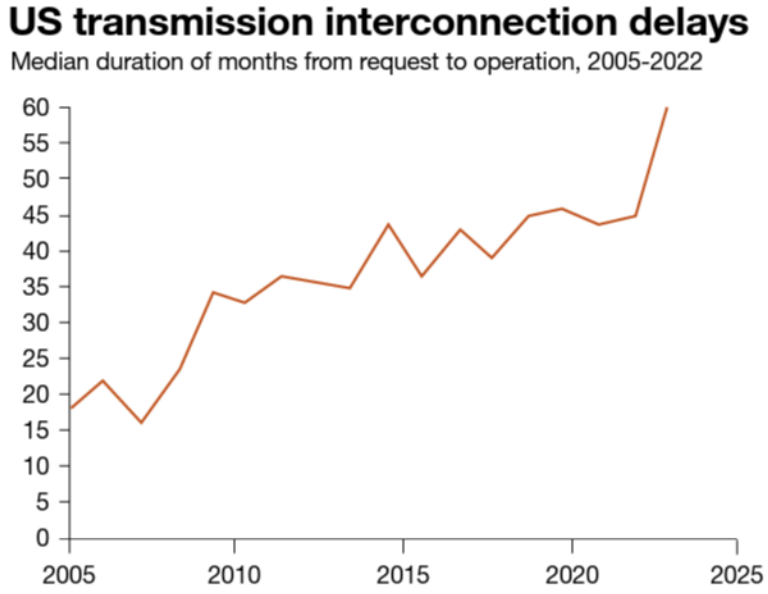
- ❑ Chips
- ❑ Generators
- ❑ Switchgears
- ❑ Transformers
- ❑ High-speed transceivers
- ❑ Concrete
- ❑ Copper



Source: National Renewable Energy Laboratory, 2025

6. AI Data Centers Emerging in Remote Locations due to Energy Demands but Transmission Interconnection Delays are a Barrier.

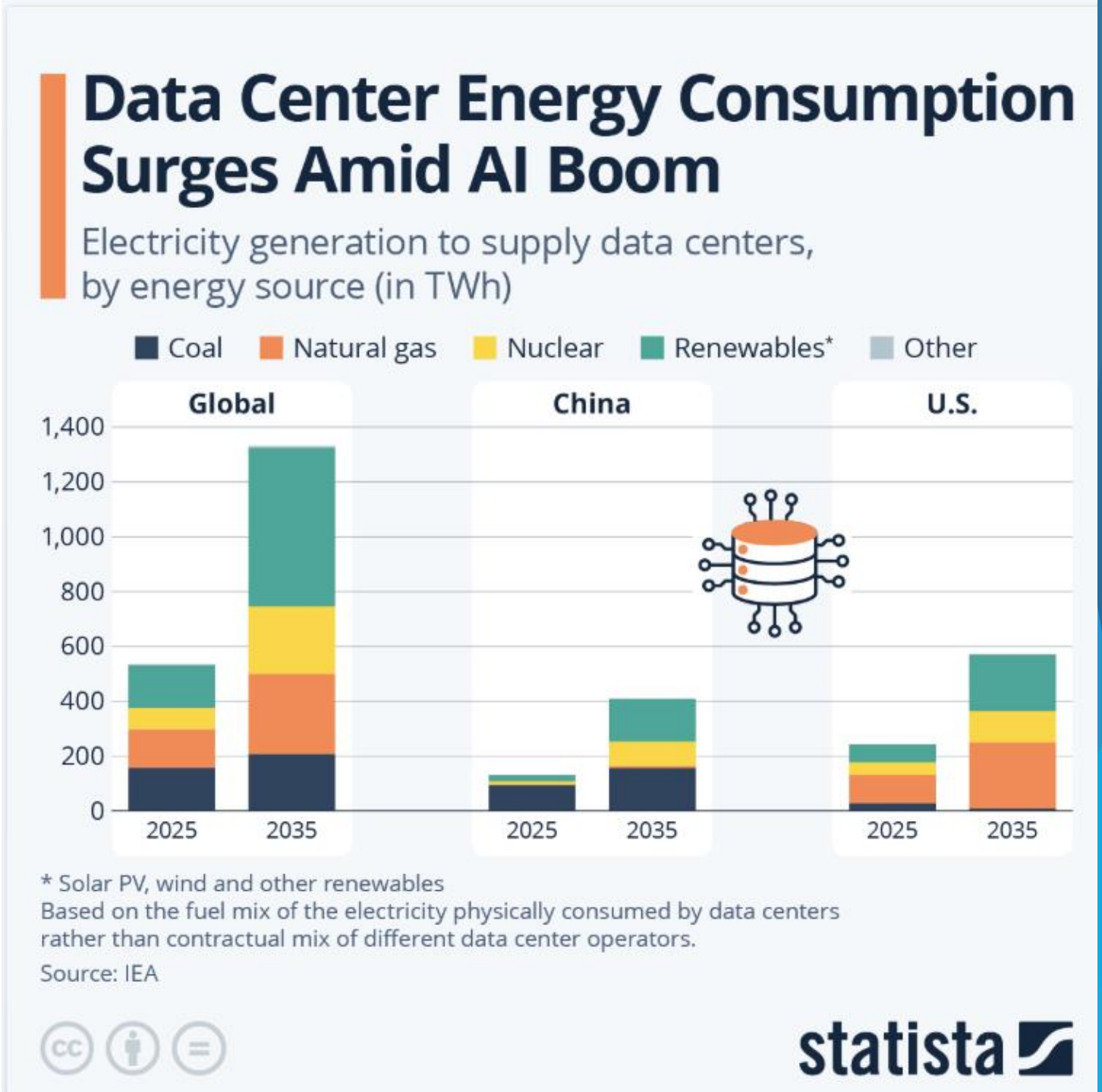




Source: McKinsey, 2025; PwC, 2025

ENERGY & MANUFACTURING in Appalachia

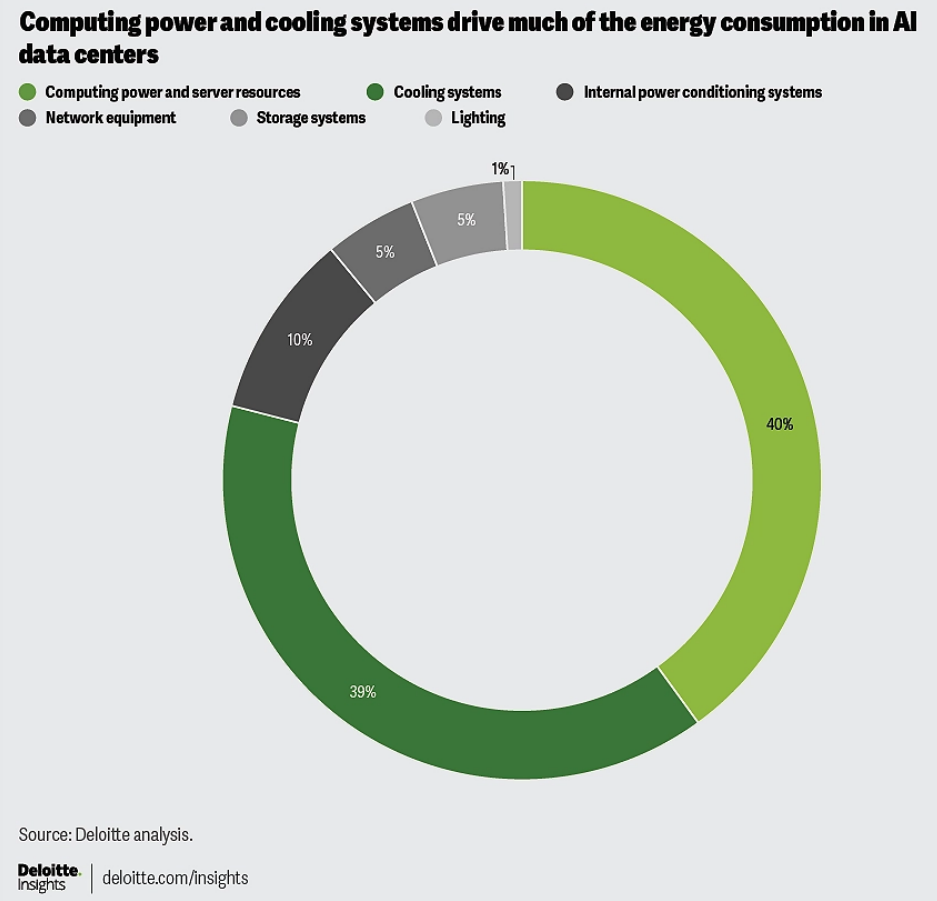
7. Energy Sources Transitioning from Fossil to Renewable and Nuclear Energy from Industry Perspective

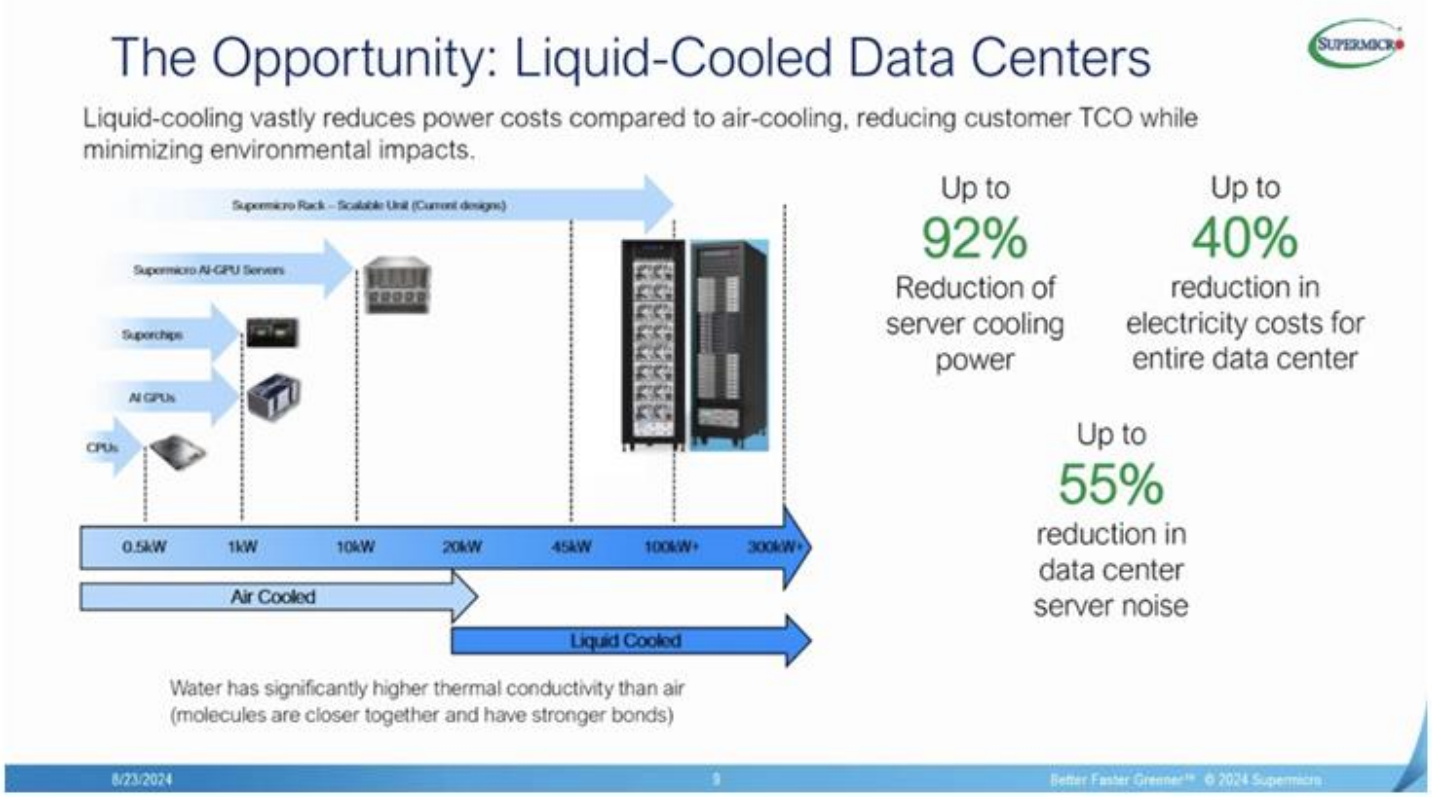


ENERGY & MANUFACTURING in Appalachia

Source: Statista

8. Cooling systems drive much of energy consumption in AI data centers today, but new technologies are emerging.





Source: Semiconductor Engineering, 2024

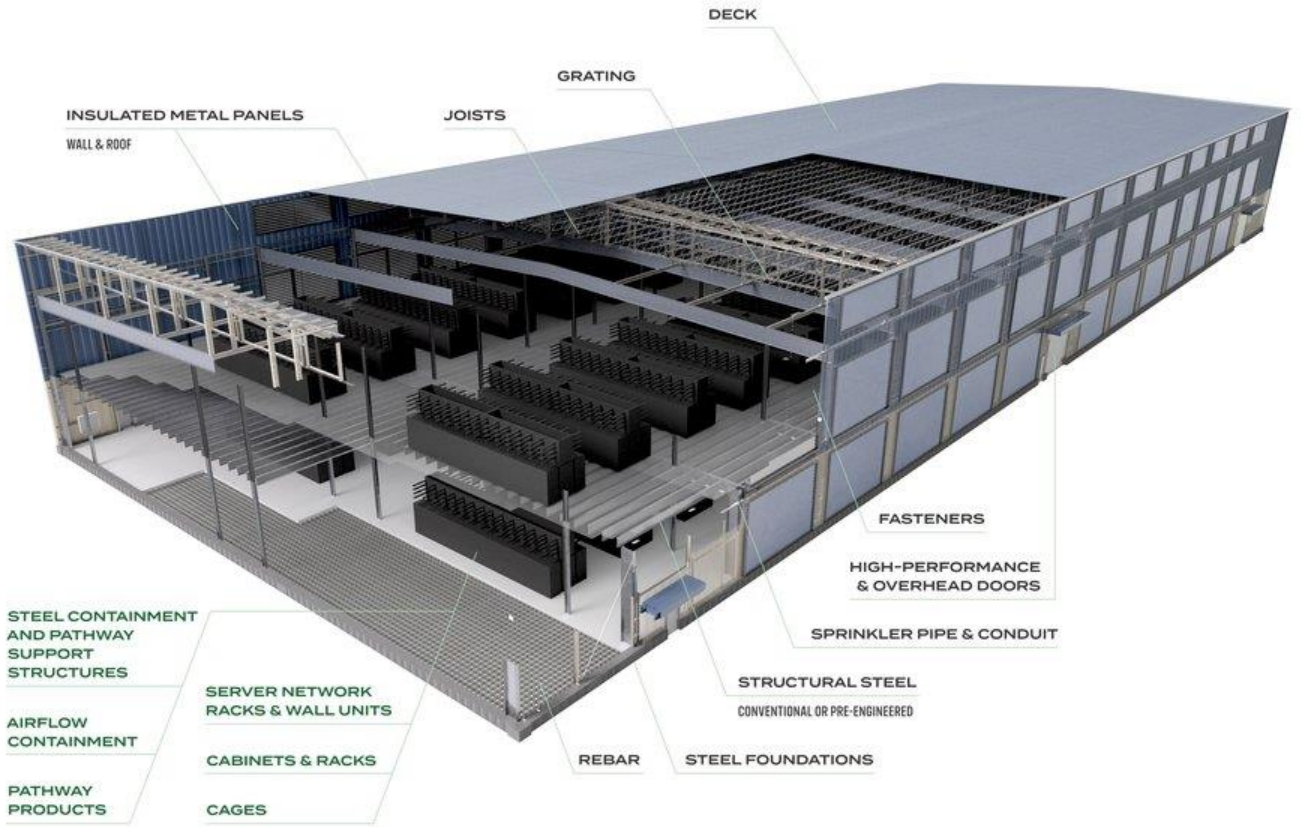
ENERGY & MANUFACTURING in Appalachia

Source: Deloitte, 2024; Semiconductor Engineering, 2024

9. In Steel, the goal to build AI data centers quickly is leading to modular construction, but Environmental Product Declarations are a factor leading to sustainable steel use.

Modular Data Center Under Construction

Source: Equinex

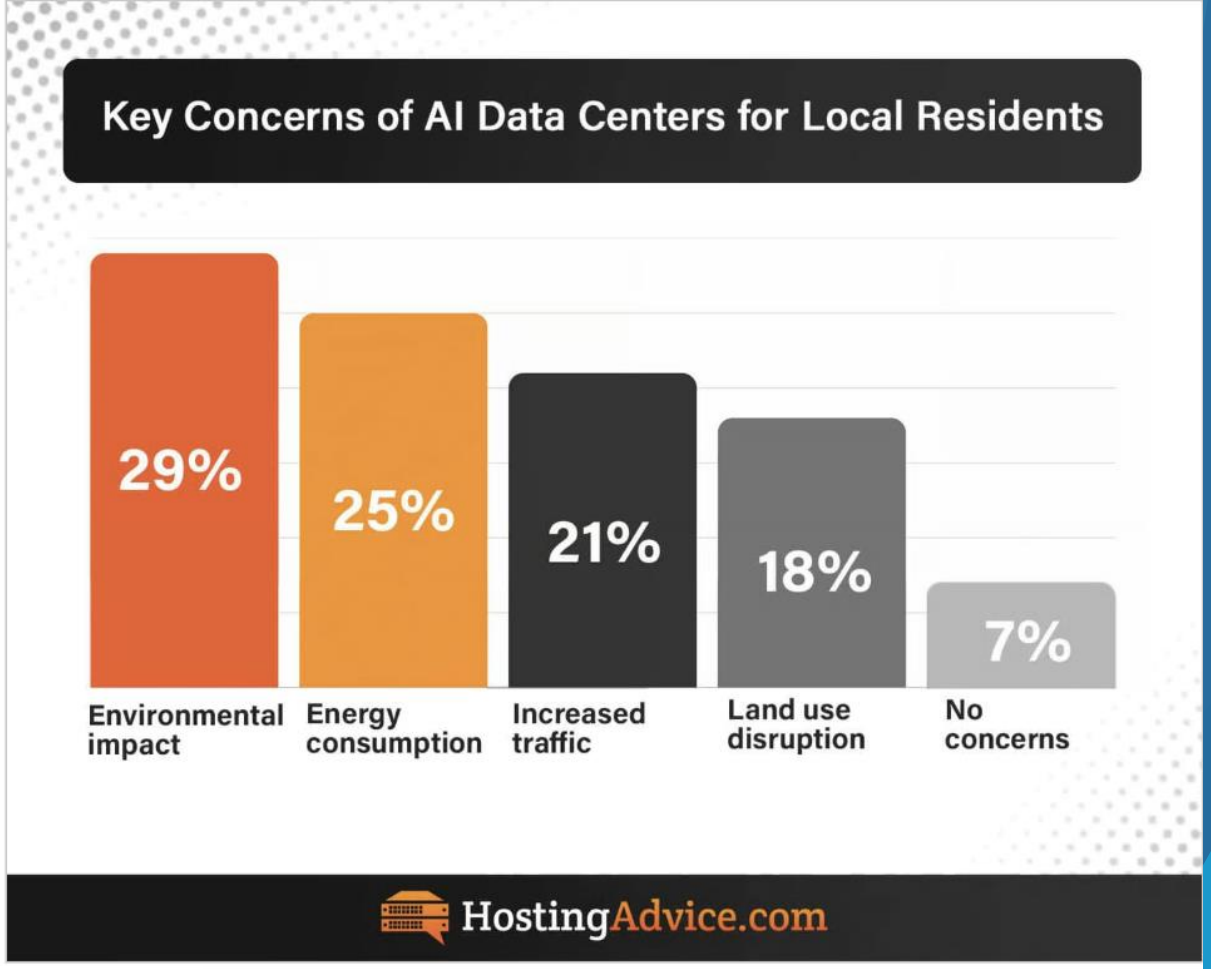


Data Center with Sustainable Steel

Source: l Nucor, Accessed August 2025

ENERGY & MANUFACTURING in Appalachia

10. Public is Concerned About Environmental Impact, Energy Consumption and Electricity Price Impact

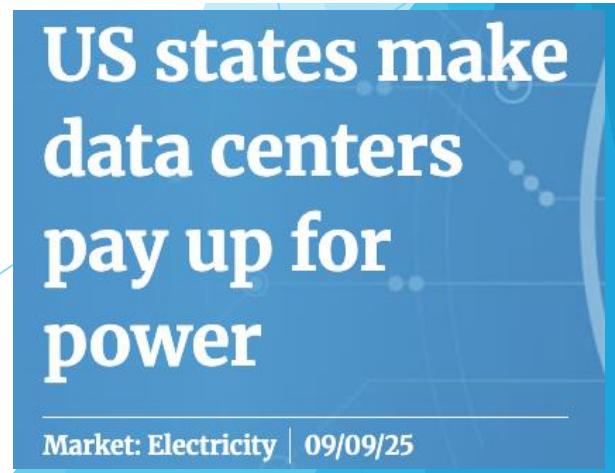


As more data centers connect to Pennsylvania's electric grid, some worry prices will spike

RACHEL MCDEVITT · JULY 15, 2025

Source: HostingAdvice.com, 2025; Allegheny Front, 2025; Argus, 2025

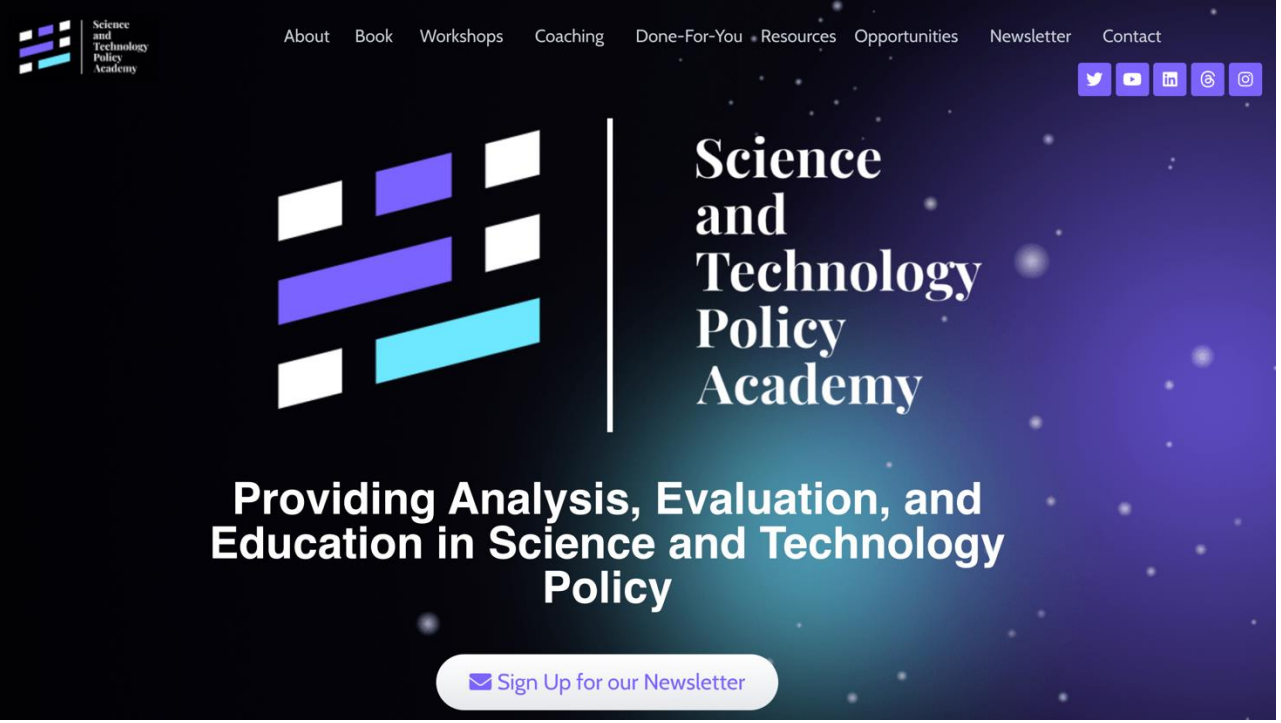
ENERGY & MANUFACTURING in Appalachia



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



CATALYST CONNECTION POWERING POTENTIAL | ENERGY | Digital Bridge | Supply Chain Directory | SMART-PA | RISE PA

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.

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 web

Power & Electrical Infrastructure

- Download the **AI Data Centers: Power & Electrical Infrastruct**
- View the webinar recording of AI Data Centers: Power & Elect
- Click here to view the PowerPoint slides presented in the web

Connect with me on LinkedIn (Deborah D Stine)

Email me at Deborah@scitechpolicyacademy.com

https://scitechpolicyacademy.com/

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

ENERGY & MANUFACTURING in Appalachia