

Demand for Advanced Cooling Systems Surges in Response to AI Data Center Growth

New report finds Appalachian manufacturers can supply key data center cooling components.

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The global race to build new data centers to power artificial intelligence (AI) applications and cloud computing is driving demand for the advanced cooling systems essential for their operation. A [new report](#) from the [Energy & Manufacturing in Appalachia](#) (EMA) initiative finds that Appalachian

manufacturers are well-positioned to meet the growing need for liquid cooling, heat exchangers, and other high-efficiency components essential to the data center supply chain.



The EMA initiative is led by Catalyst Connection, southwestern Pennsylvania's economic development organization, along with the following regional partners: Alliance for Manufacturing and Technology (AMT), Industrial Modernization Center, Magnet, Manufacturers Resource Center, MANTEC, Maryland MEP, Northeastern PA IRC, Northwestern PA IRC, Reimagine Appalachia, and West Virginia University.

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Petra Mitchell, President and CEO of Catalyst Connection

“The rapid growth in data center building has spurred innovation in advanced cooling systems,” said Petra Mitchell, President and CEO of Catalyst Connection.

“Appalachian manufacturers have the expertise and capacity to supply these essential components that will enable the AI and cloud computing revolution.”

The data center cooling market is projected to grow from around \$20 billion in 2024 to \$56 billion by 2030, according to recent estimates, driven by AI applications, high-performance computing, and hyperscale cloud deployments.

Cooling currently accounts for 30–40% of a data center's total energy consumption, and AI workloads are driving the need for more energy-efficient systems. Hyperscale facilities now rely on advanced liquid-cooling methods that can reduce energy and water use while maintaining the performance AI applications require.

The report profiles the technologies driving this shift:

- Liquid cooling systems – Direct-to-chip, immersion, and rear-door heat exchangers that dramatically improve heat-removal efficiency.
- Hybrid systems – Combining air and liquid cooling to reduce retrofit costs and improve scalability.
- Free and adiabatic cooling – Using ambient air and evaporation to cut mechanical load and energy consumption.
- Heat recovery and reuse – Capturing waste heat for nearby industrial, district-heating, or community applications.

Federal and state programs are also encouraging more energy-efficient and water-conserving cooling technologies. Data center developers are increasingly seeking Environmental Product Declarations (EPDs) and LEED credits that cover refrigerants, water use, and component life cycles. Liquid cooling systems have the potential to reduce water use by up to 90% compared to traditional methods, making them essential to achieving sustainability targets and long-term cost savings.

Appalachian Manufacturers Have the Expertise to Supply Advancing Cooling Systems

EMA's report, *AI Data Centers: Advanced Cooling and Thermal Management for AI Data Centers*, provides a roadmap for Appalachian manufacturers to adapt existing materials capabilities to thrive in a market expected to more than double by the end of the decade. The report identifies significant opportunities for small and medium Appalachian manufacturers to supply:

- Fabricated metal housings, racks, and manifolds for liquid-cooling systems
- Heat exchangers, chillers, and modular cooling units
- Low-global-warming-potential (GWP) refrigerants and coolants
- Sensors, valves, and control systems for precision thermal management

[Read the full report](#)

About Catalyst Connection

Catalyst Connection is a southwestern Pennsylvania economic development organization dedicated to serving manufacturers. For more than 35 years, Catalyst has operated with a focus on powering potential through delivering technical assistance and management consulting

services and developing long-standing partnerships across the region. Catalyst maintains a deeply held commitment to modernizing manufacturing and enabling opportunity across business enterprises, individuals, and throughout communities.

Catalyst Connection is supported, in part, by the Pennsylvania Department of Community and Economic Development and the National Institute of Standards and Technology Manufacturing Extension Partnership (NIST MEP). As such, we are an affiliate of the Pennsylvania Industrial Resource Center (IRC) and the MEP National Network in southwestern Pennsylvania.

About the Energy & Manufacturing in Appalachia initiative

The Energy & Manufacturing in Appalachia (EMA) initiative provides technical assistance and business support to small and medium manufacturers and enterprises in 156 counties of Maryland, New York, Ohio, Pennsylvania, and West Virginia seeking to expand business, production and jobs in the energy supply chains or to be more energy efficient.

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