

# DLC adoption remains slow and steady

UII DATA REPORT 181 | JULY 2025

## SUMMARY

Direct liquid cooling (DLC) adoption in data centers remains gradual, with most operators still relying on traditional air cooling methods for their IT equipment. However, this may shift in the future as server rack densities increase and the cost of maintaining air cooling systems becomes unsustainable.

Results from the Uptime Institute Cooling Systems Survey 2025 reveal that high rack densities remain the top driver for utilizing DLC with environmental sustainability another driving factor for adoption.

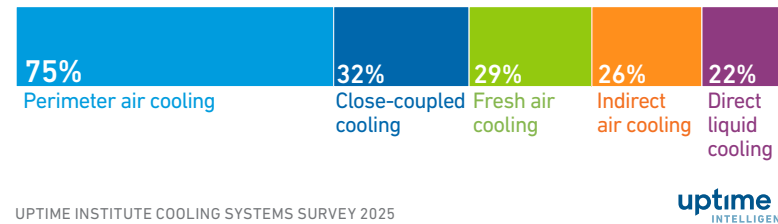
Operators are most likely to assess the viability of a liquid cooling system based on how readily it integrates into existing infrastructure. However, many cite a lack of industry standards around liquid cooling systems as a major barrier to implementation; others are dissuaded by the high costs and the potential risks of system failure.

### ABOUT THIS SURVEY

The Uptime Institute Cooling Systems Survey 2025 was conducted online from April 2025 to June 2025, and had 1,033 respondents. This report highlights some of the findings.

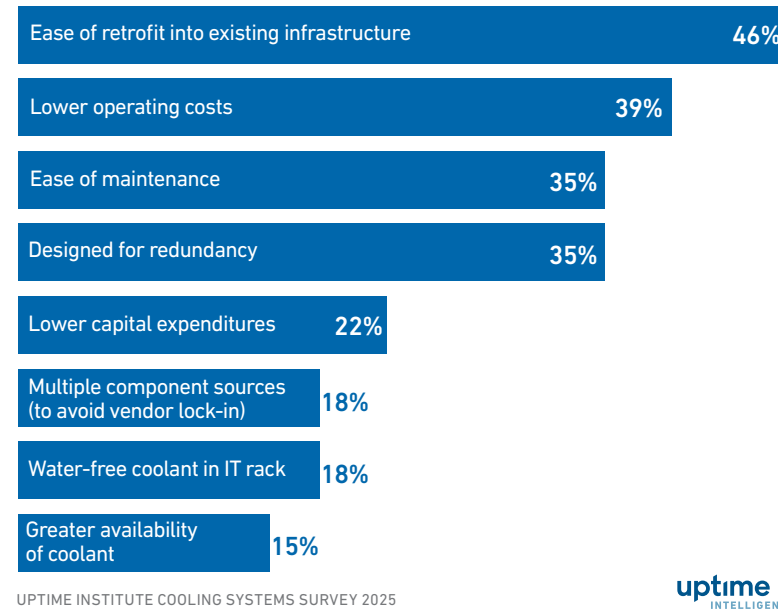
## Perimeter air cooling remains most popular option

Which types of IT cooling does your organization use in its data centers? Choose all that apply. (n=512)



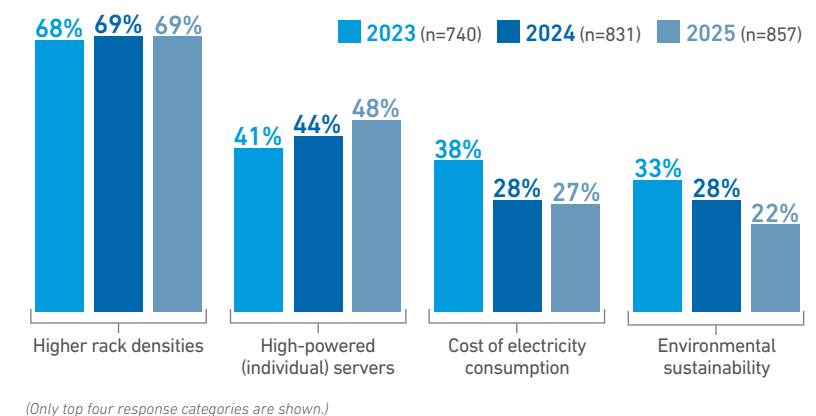
## Most operators say retrofit ease determines DLC system viability

Which of the following factors do you consider to be most important for determining whether a direct liquid cooling system is viable? Choose no more than two. (n=905)



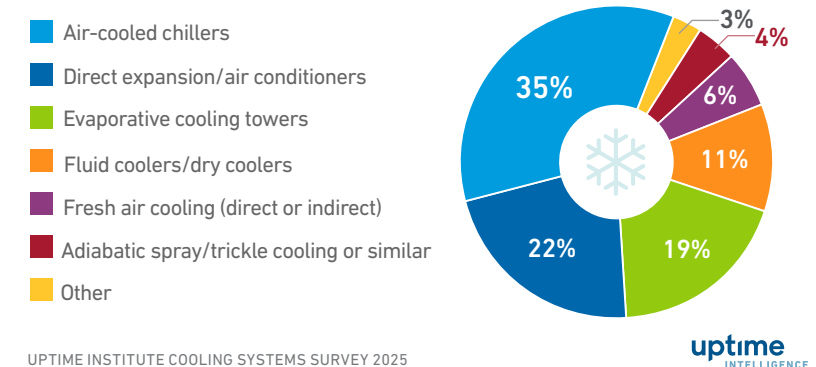
## Higher rack densities still drive DLC adoption

Which of these factors are the primary drivers for direct liquid cooling adoption? Choose no more than two.



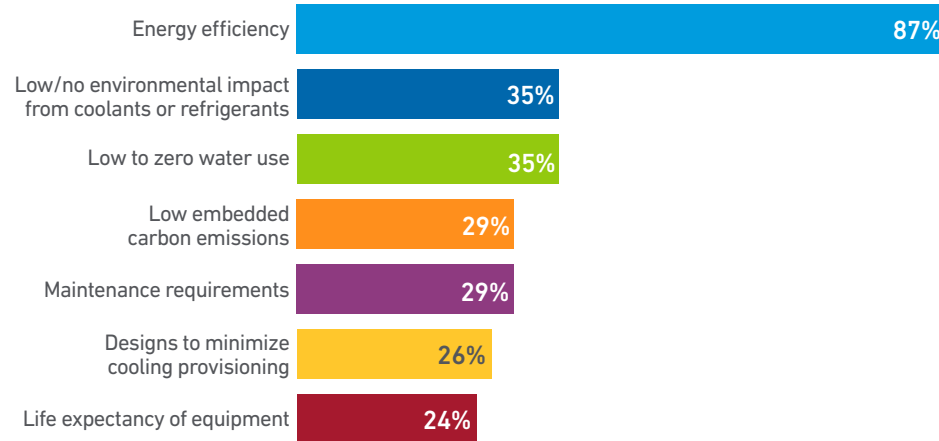
## Air-cooled chillers are most common heat rejection system

What type of systems does your data center primarily use to dissipate heat outside the data center? (n=400)



## Operators favor efficiency over sustainability

Which of the following factors do you consider to be most important in determining whether a cooling system is environmentally sustainable? Choose no more than two. (n=466)

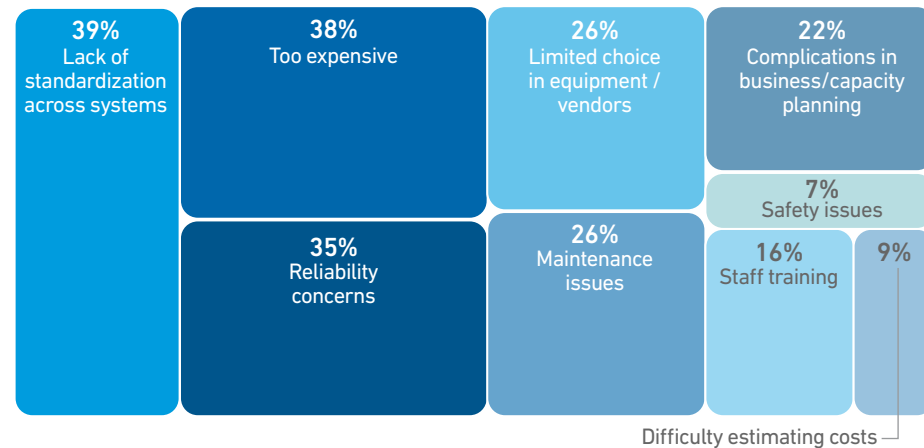


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## Lack of system standards is the top barrier to direct liquid cooling

Which of the following factors are the biggest barriers to adopting direct liquid cooling in data centers? Choose no more than two. (n=861)

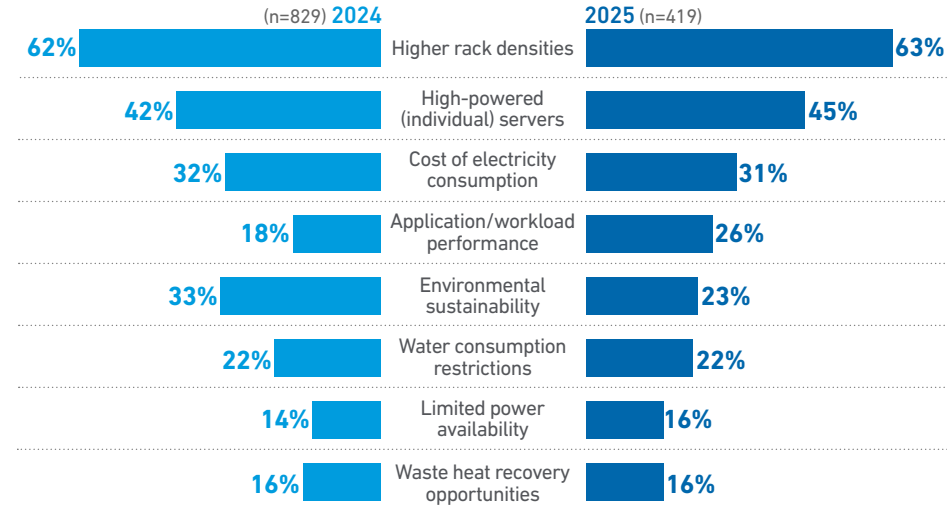


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## Fewer predict environmental concerns will drive DLC adoption

Which of these factors do you think will be the primary drivers for direct liquid cooling adoption three years from now? Choose no more than two.

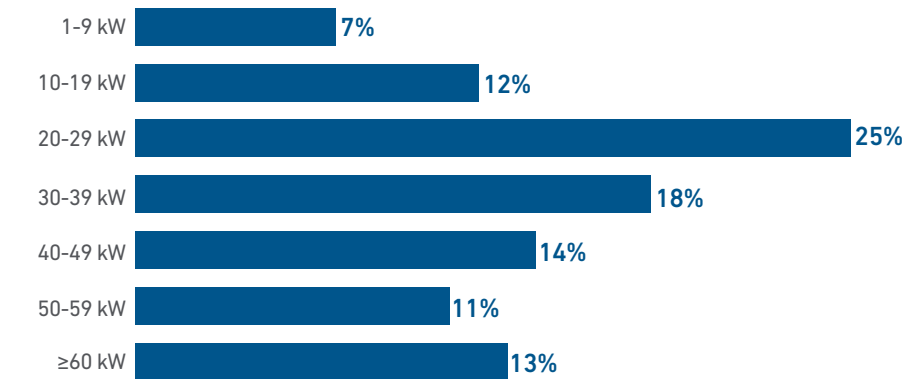


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## Most believe DLC necessary at rack densities greater than 20 kW

At what IT rack power density do you think air cooling becomes too costly or inefficient, making the use of direct liquid cooling necessary? (n=786)



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## Demographics: Uptime Institute Cooling Systems Survey 2025

### Verticals (n=823)

Design and engineering

25%

Colocation/multi-tenant data centers

15%

Data center equipment supplier

10%

Technology

9%

Telecommunications

8%

Financial

7%

Government

5%

Utilities/energy

4%

Manufacturing

4%

Education

4%

Software and/or cloud services

4%

Other

2% Healthcare/pharmaceutical

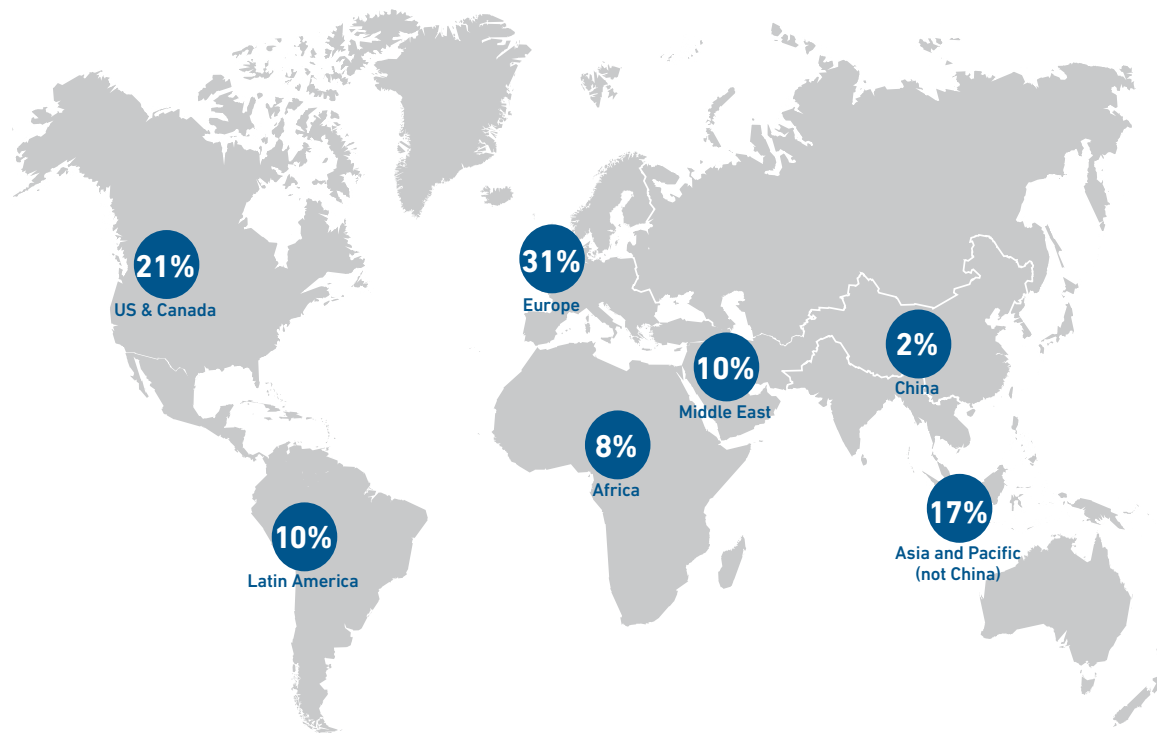
1% Media

1% Retail/wholesale/distribution

1% Insurance

0% Transportation

### Company location (n=1033)



### Digital infrastructure environment (n=1033)

29%

Enterprise data center owner/operator

21%

Data center design or engineering firm

13%

Vendor/product supplier

9%

Colocation provider

3%

Cloud/hosting provider

13%

Consultant/advisory firm

11%

Other

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### About Uptime Institute

Uptime Institute is the Global Digital Infrastructure Authority. Its Tier Standard is the IT industry's most trusted and adopted global standard for the proper design, construction, and operation of data centers – the backbone of the digital economy. For over 25 years, the company has served as the standard for data center reliability, sustainability, and efficiency, providing customers assurance that their digital infrastructure can perform at a level that is consistent with their business needs across a wide array of operating conditions.

With its data center Tier Standard & Certifications, Management & Operations reviews, broad range of related risk and performance assessments, and accredited educational curriculum completed by over 10,000 data center professionals, Uptime Institute has helped thousands of companies, in over 100 countries to optimize critical IT assets while managing costs, resources, and efficiency.

Uptime Institute is headquartered in New York, NY, with offices in Seattle, London, Sao Paulo, Dubai, Singapore, and Taipei. For more information, please visit [www.uptimeinstitute.com](http://www.uptimeinstitute.com)

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