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Scaling AI Sustainably: Next-Gen Thermal Management Technologies for Data Centers

February 2026

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Chemours at a Glance

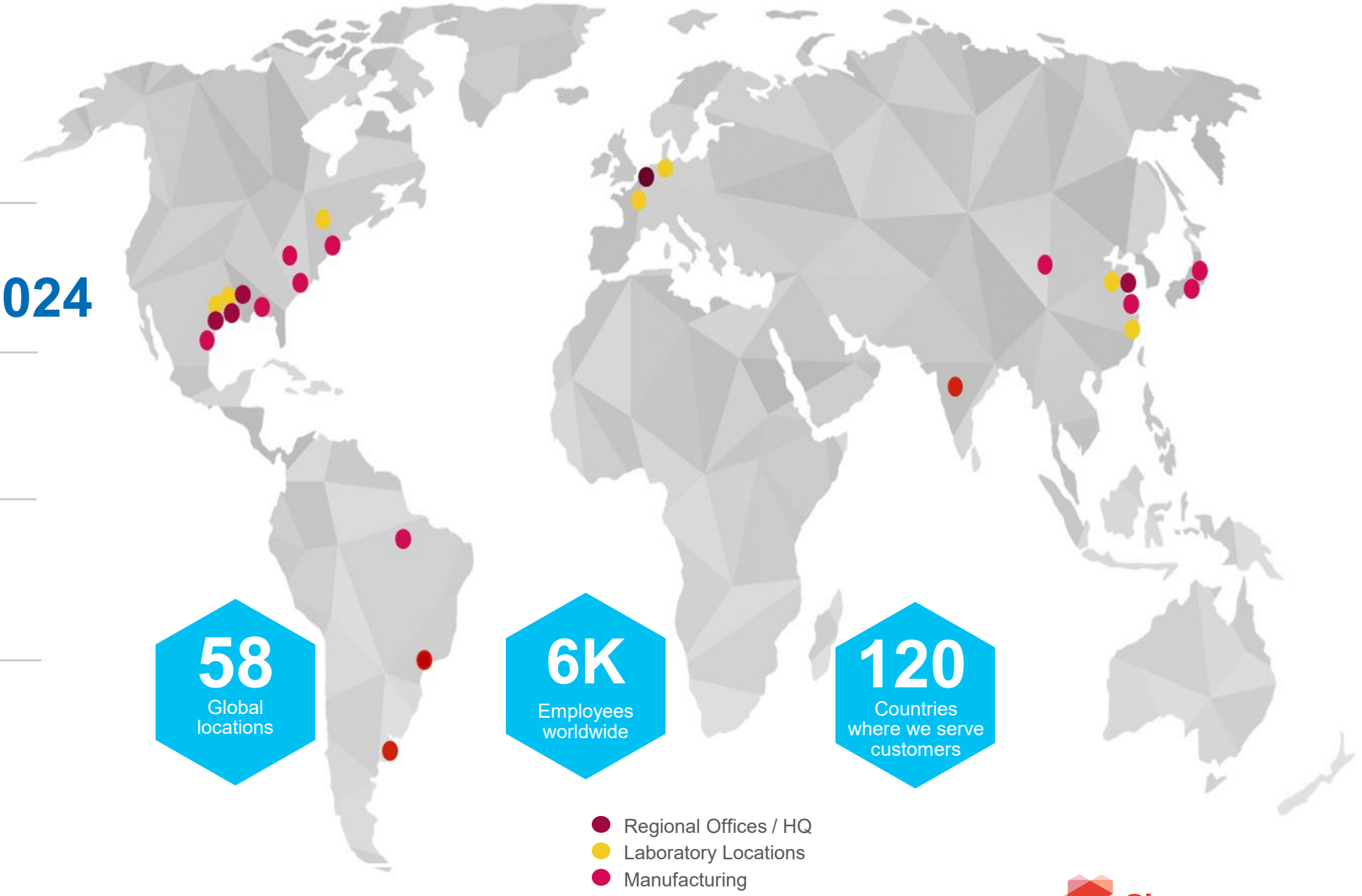
Founded
2015

Sales
$5.8 Billion in 2024

Employees
6,000

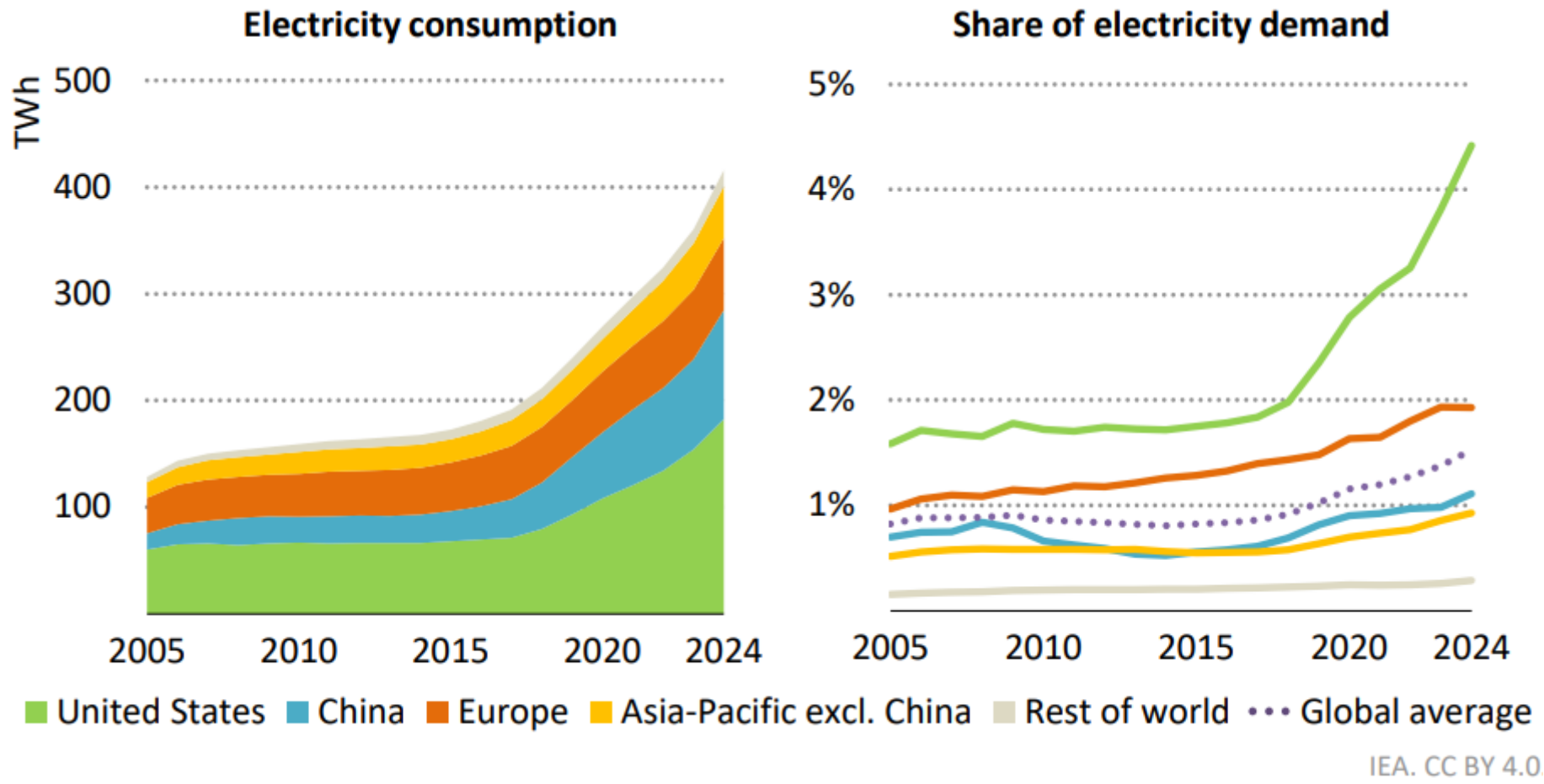
HQs
Delaware

NYSE
CC



1:Not an exhaustive representation. For more details on Chemours footprint visit: Chemours' Global Expansion and Global Footprint

Electricity consumption of data centers

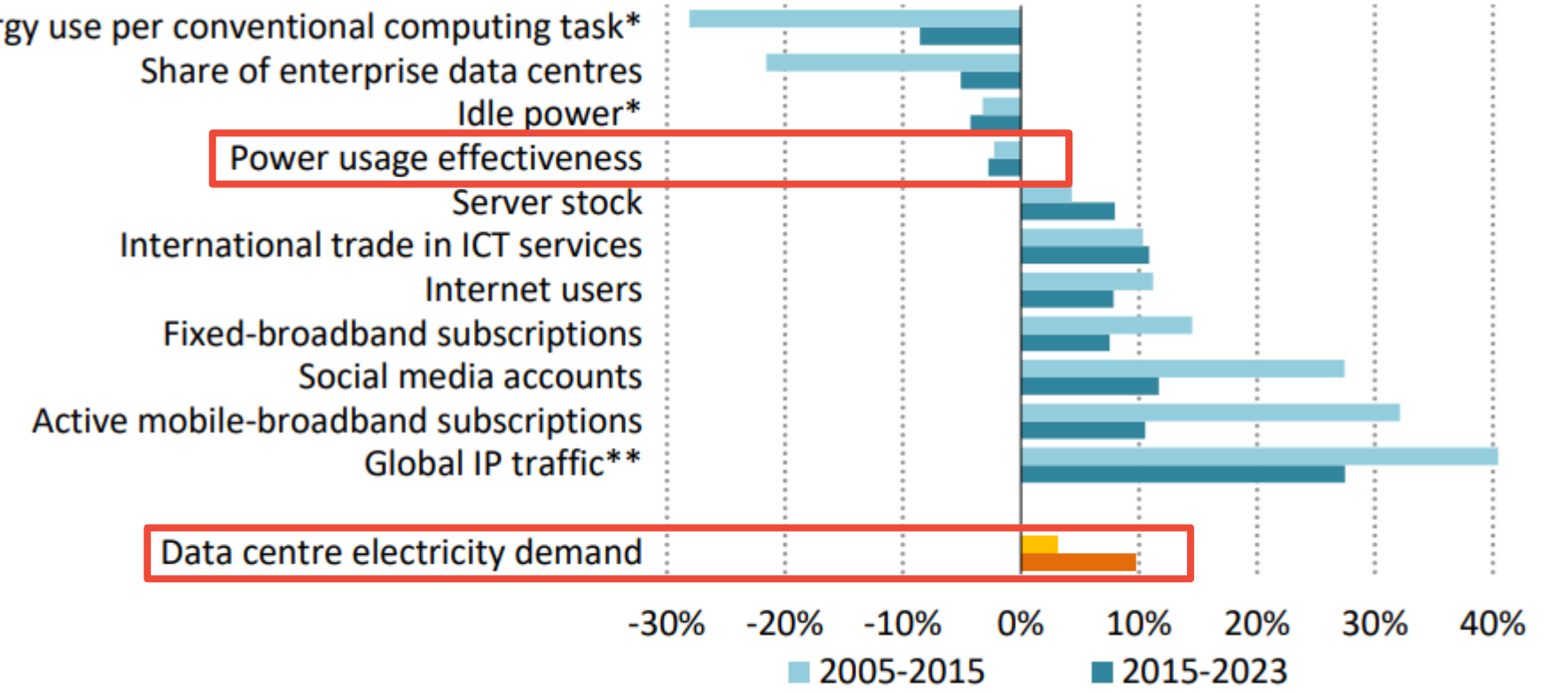


AI training and AI inferencing will increase the share of electric demand related to data centers

Source: Energy and AI report by IEA, April 2025

Energy Efficiency and Electricity Demand for Data Centers

Average **annual change** in key drivers of data center electricity consumption globally, 2005-2015 and 2015-2023



Source: Energy and AI report by IEA, April 2025 IEA. CC BY 4.0.

PUE improvements for Data Centers are very limited

Data Centers' Electric Demand is accelerating

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Solving the Data Center Thermal, Energy, Land & Water Crisis

Data Center Challenges

Significant grid constraints, water permitting issues, land permits, and the capability of current cooling systems are contributing to industry growth limitations, regulations, and community objections

Contribution to global energy consumption is expected to increase from 1% to 3%-4% by 2030

Existing energy efficiency improvement methods are no longer enough–16% /yr. improvement projected to drop to 2% /yr.

Billions of gallons of fresh water consumed annually to support cooling

Next generation IT infrastructure will generate too much heat for traditional AC systems alone

Global land usage for data centers is expected to increase from 43MM to 64MM by 2030

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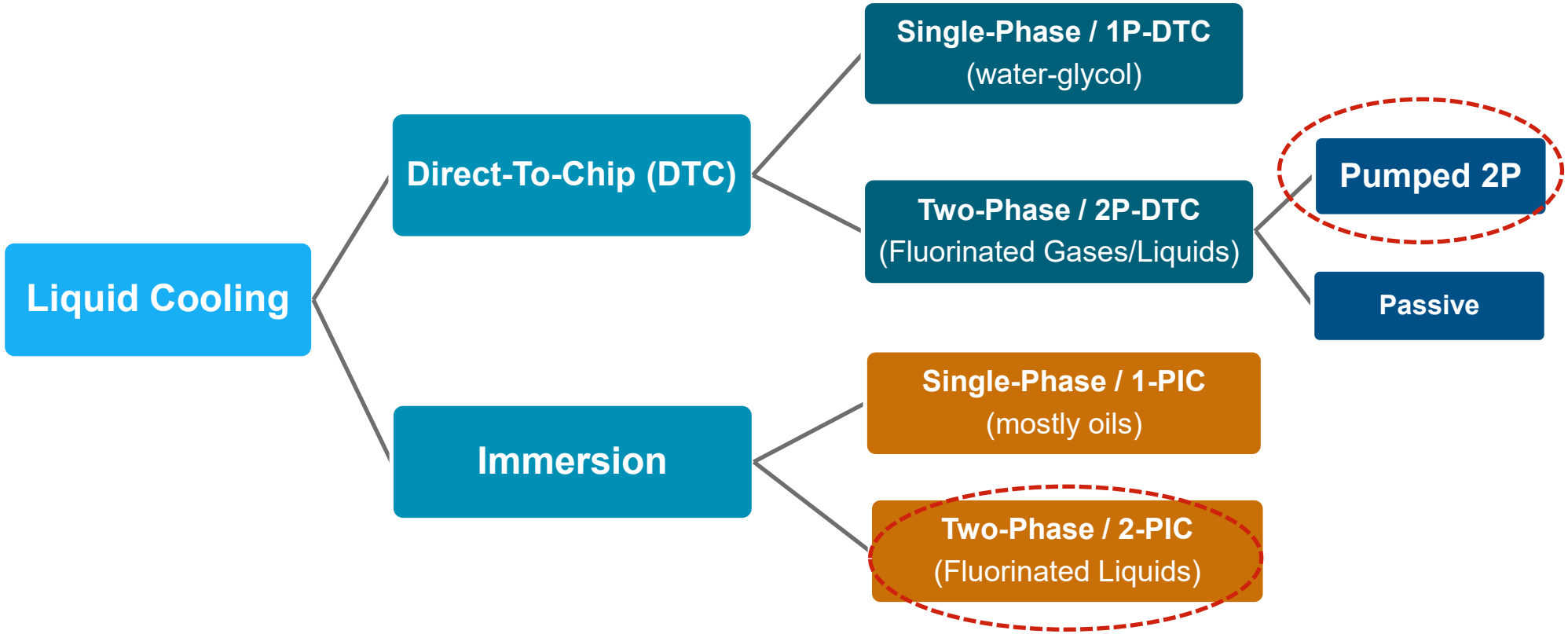
Liquid Cooling Technologies for Data Centers



- Why Liquid Cooling?
  1) Performance: Air cooling is no longer economical nor feasible for high-density workloads
  2) Energy/Water efficiency: Liquid cooling enables significant reduction in PUE and WUE

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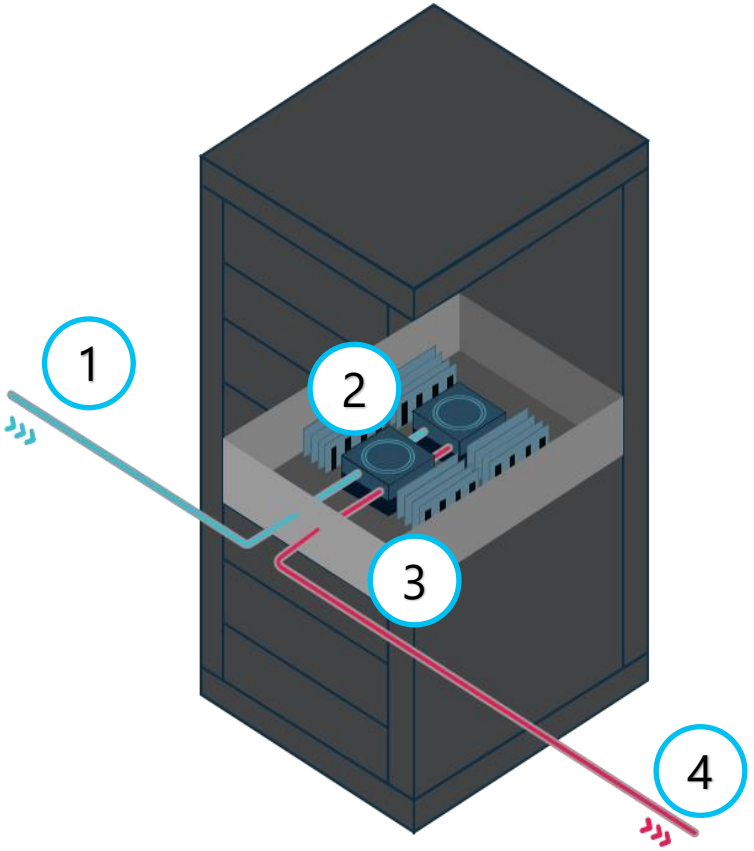
Two-Phase Direct to Chip Cooling in Data Centers



How Two-Phase Direct to Chip Cooling Works:

1. Chilled Opteon™ thermal management fluid circulates into the server rack
2. A specialized cold plate located directly on top of the chip is used to transfer heat to the fluid
3. The fluid boils, exiting the heat exchanger as a vapor
4. The vapor returns to a chiller directly or by a secondary fluid loop to be condensed back to a liquid and recirculated back to the chip

The Power of Latent Heat of Evaporation:

When a liquid transforms into vapor, it releases latent heat—an essential physical property that our products leverage to dramatically enhance cooling performance.

This latent heat vaporization allows our solutions to **absorb 10 to 100 times more heat** than traditional single-phase fluids.

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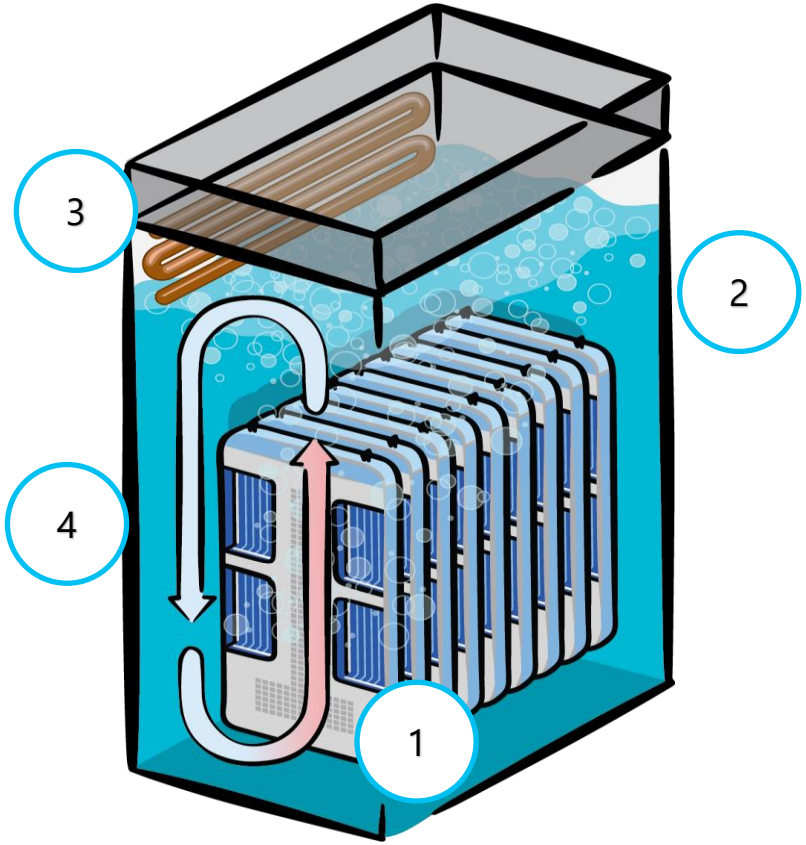
Two-Phase Immersion Cooling in Data Centers



How Two-Phase Immersion Cooling Works:

1. Electronic equipment is placed inside a semi hermetic tank filled with Opteon™ 2P50
2. The heat from the electronic equipment causes the fluid to boil
3. Vapor rises and condenses back to a liquid when it makes contact with the condenser coil
4. The fluid returns to the pool in a passive cycle

Advancing next-generation computing speeds

Two-phase immersion cooling offers the most efficient heat-transfer capability, which will enable high-powered computing and ever-faster processing speeds

[Check out our explainer video]

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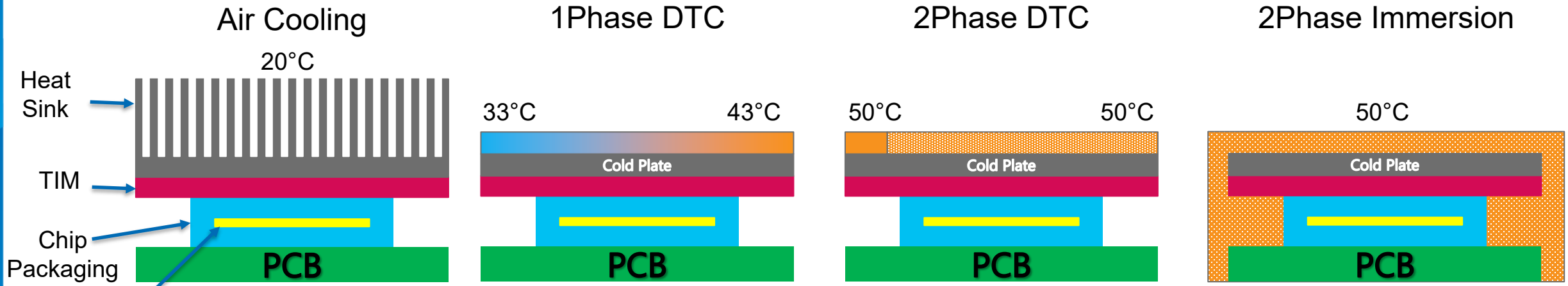
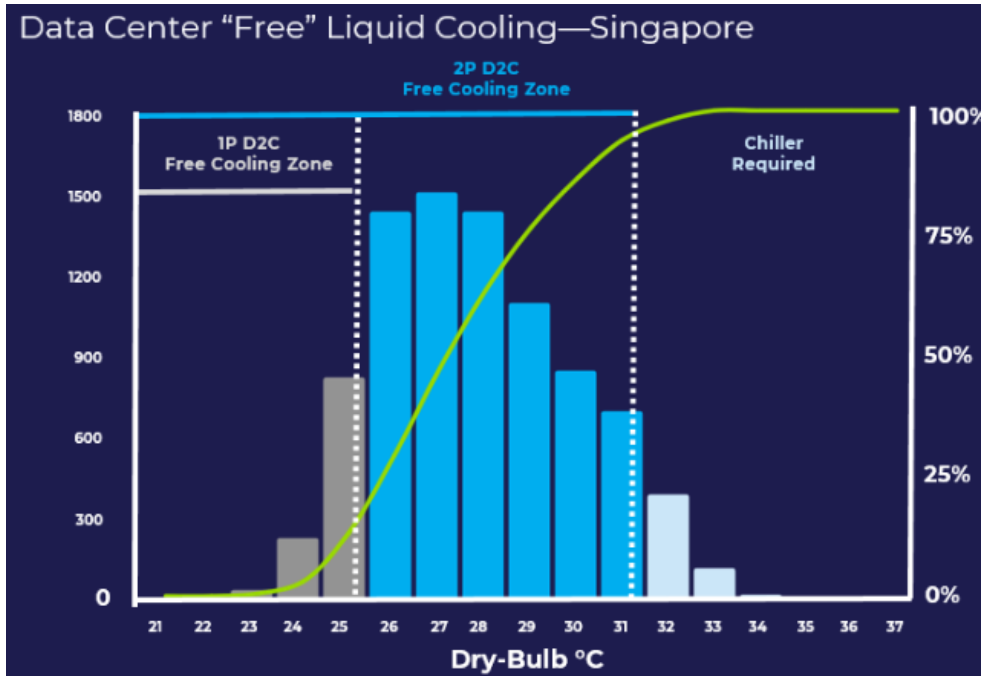
Why Advanced Liquid Cooling is more Efficient?



$$R_{J-f} = \frac{T_{Junction} - T_f}{\dot{Q}_{total}} = R_{TIM} + R_{HS\ or\ CP} + R_{fluid}$$



Source: [2025 OCP Southeast Asia Tech Day - From Analyst to Innovator-Why Liquid Cooling Is the Future of AI Factories](#) by Accelsius

Free Cooling Enabled with Advanced Two-Phase Liquid Technologies

To achieve the same Junction temperature, Advanced Two-Phase liquid cooling operates at a higher temperature, allowing more frequent free cooling

Temperatures represented are orders of magnitude and will vary depending on the system design and components efficiency

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Chemours' Two-Phase Liquid Cooling Advantages for Data Centers

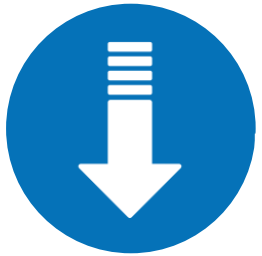
Two-Phase Liquid Cooling when compared to Air Cooling in data centers can lead up to*

40%

Lower Energy Consumption per MW

Near Zero

Water consumption vs. 8.23 MGal per year per data center

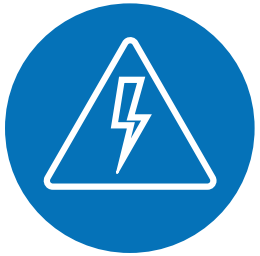


60%

Reduction in Data Center footprint

35%

Lower Construction Cost ($/MW)



7.5kW+ per chip

Enabling next generation chip cooling**

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*https://liquidstack.com/content/uploads/2022/05/2022-Case-Study.pdf

** ACT Demonstrates Breakthrough in High-Power Direct-to-Chip Liquid Cooling Technology - Advanced Cooling Technologies

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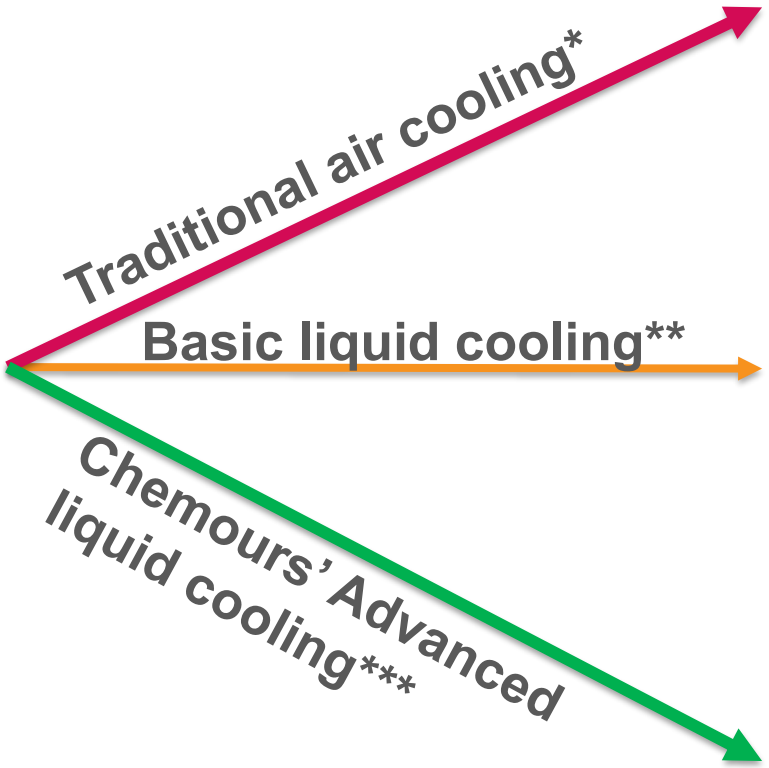
How Advanced Liquid Cooling Solves Power Challenges?

100 MW power on site



67 MW computational
33 MW for cooling

80 MW computational
20 MW for cooling

95 MW computational
5 MW for cooling

* PUE for Traditional air cooling is assumed at 1.5
** PUE for Basic liquid cooling (1PDTC) assumed 1.25
*** PUE for advanced liquid cooling is assumed at 1.05

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Thank you and Come Collaborate with Us!

Samer Saab, PhD

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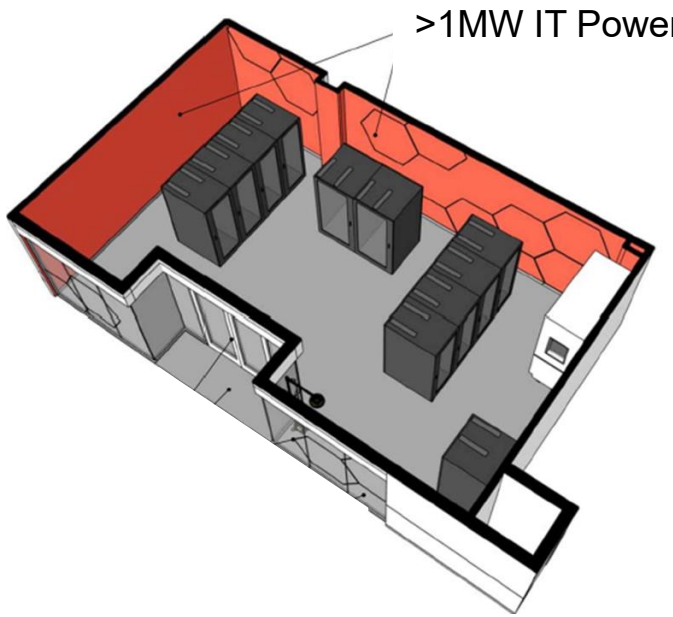
Chemours Data Center Cooling Testing Facilities (Newark, DE)

Two-Phase Immersion Cooling

Two-Phase Direct-to-Chip



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