



Liquid Cooling AI

Next-generation cooling systems for high-performance computing and AI from Chip to Chiller

Life Is On

Schneider
Electric

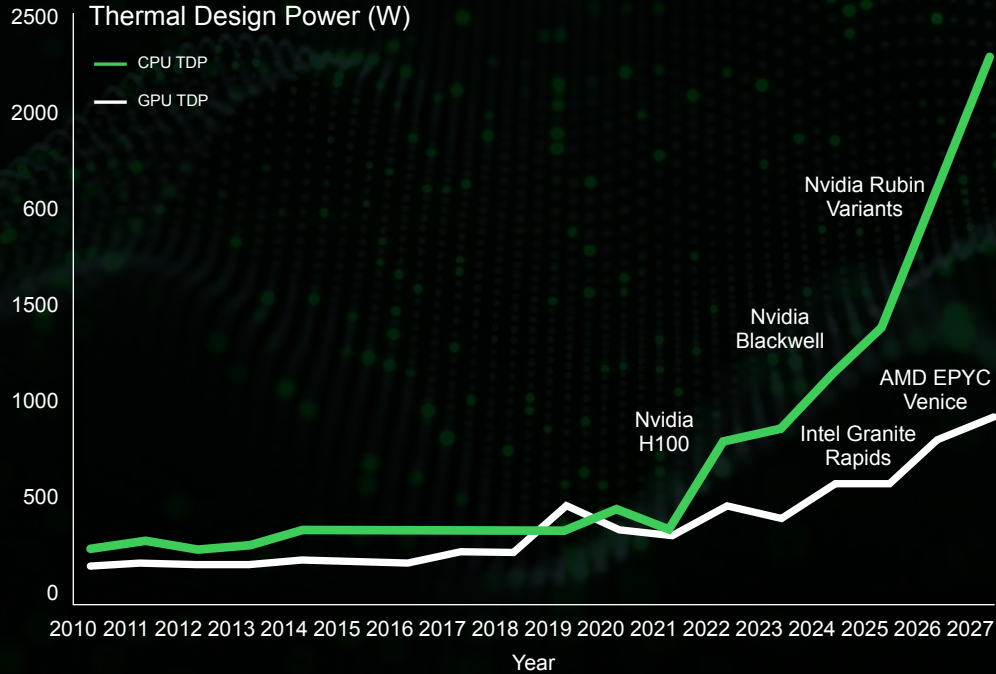
Our speaker



Erik Gjesdal

C&SP Director Nordics & Baltics

The GPU disrupted the way data centers are built & cooled



From:
IT Rack
(White Space) Dominant



To:
Facility
(Gray Space) Dominant

TDP **4X** In two years

700W (H100)
2700W (GB200)

Source: Data based on Schneider internal sources and market analysis.

GPU based servers are driving rack densities towards 1MW – equivalent to 200 standard ovens



 The Registrar

Google details plans for 1 MW IT racks exploiting electric vehicle supply chain

Google is planning for datacenter racks supporting 1 MW of IT hardware loads, plus the cooling infrastructure to cope, as AI processing...

1 day ago

AI servers of the future: 'rack density' of 1000kW+ with NVIDIA's next-gen Rubin Ultra AI GPUs

AI servers are projected to consume over 1000 kW of power due to NVIDIA's upcoming Rubin Ultra AI GPU and HBM4 memory.

Nov 24, 2024

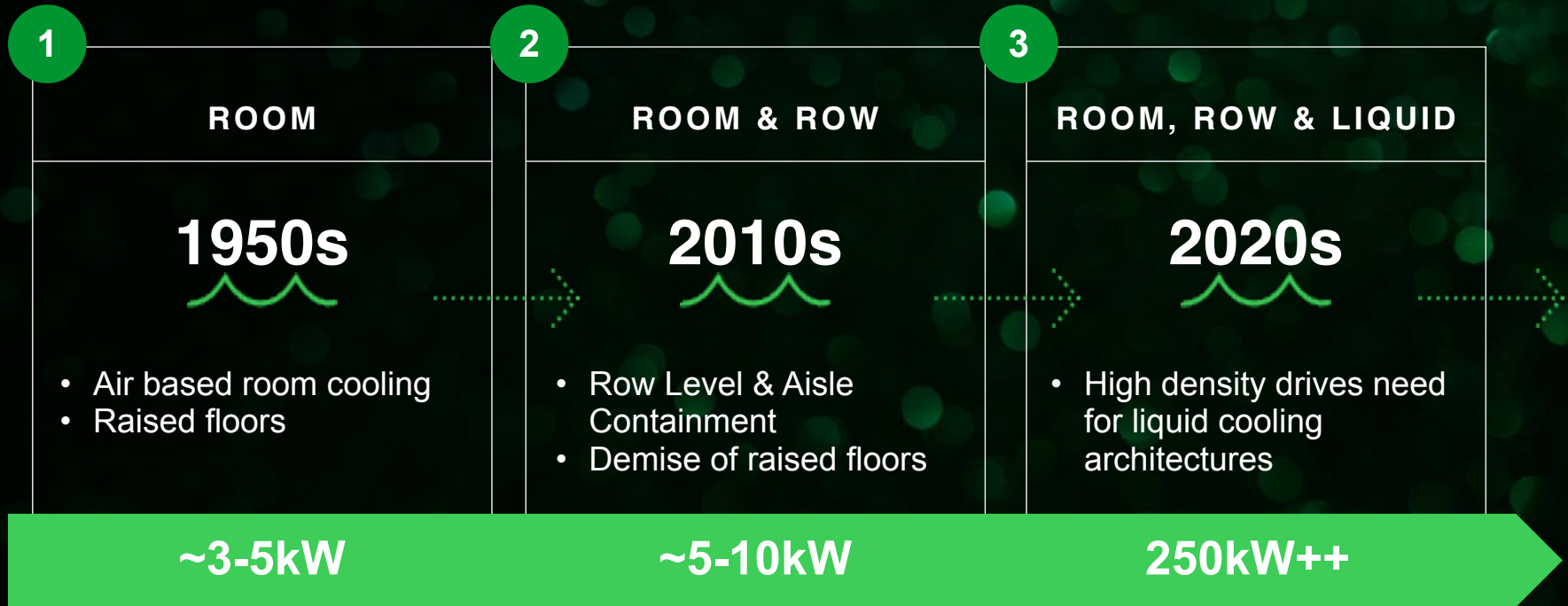
 DCD

Data Center Dynamics
<https://www.datacenterdynamics.com/news/hypersca...>

Hyperscalers prepare for 1MW racks at OCP EMEA

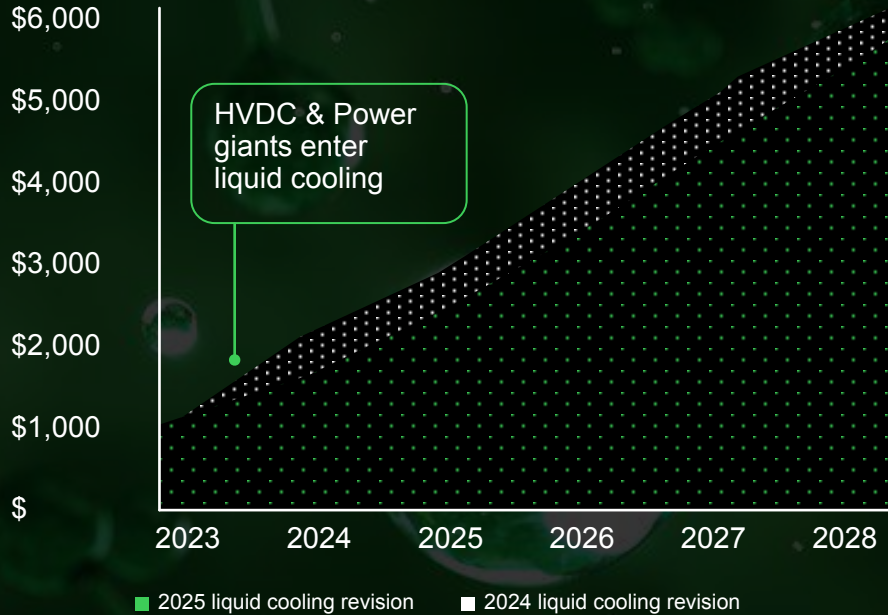
7 days ago — Google has joined Meta and Microsoft's collaboration project on a power rack the companies hope will help them reach rack densities of 1MW.

The third wave is liquid cooling for the AI-powered future



Deploying Liquid cooling at scale is NEW

Liquid Cooling Market Forecast Update



Our global footprint and experience in liquid cooling, deliver on a large scale to meet the current demands of AI and what's coming next.

6X in 5 Years

\$1B (2023)



\$6B (2028)

Air cooling will not disappear, in fact the need for air cooling increases...

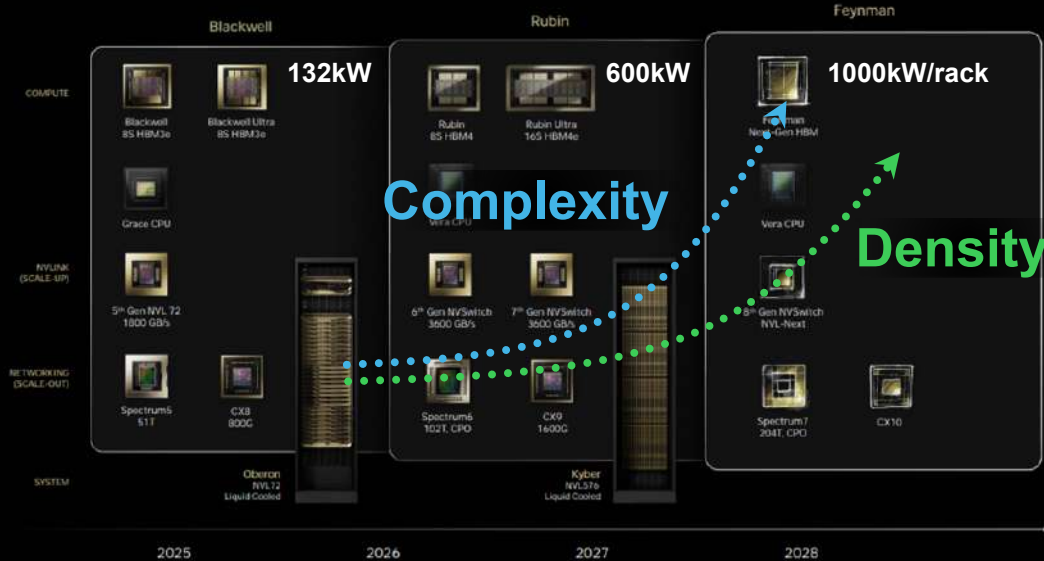
Direct-to-chip liquid cooling still requires **air cooling for 10 to 30 percent** of the heat load



A 130kW rack requires **10-40 kilowatts** of air cooling

Cooling complexity tracks densities and after 70 years, the industry still has challenges with air cooling

NVIDIA Paves Road to Gigawatt AI Factories One-Year Rhythm | Full-Stack | One Architecture | CUDA Everywhere



Data Center Dynamics

Cooling system failure takes down UNC Health data center in North Carolina

A failed air conditioning system at UNC Health's remote data center brought down computer operations at its hospitals and clinics in North...

Jul 24, 2024



Heatwave, Cooling Failure Bring iiNet Data Center Down in Perth

A data center in Western Australia was knocked offline due to equipment failure and record-breaking temperatures in the area.

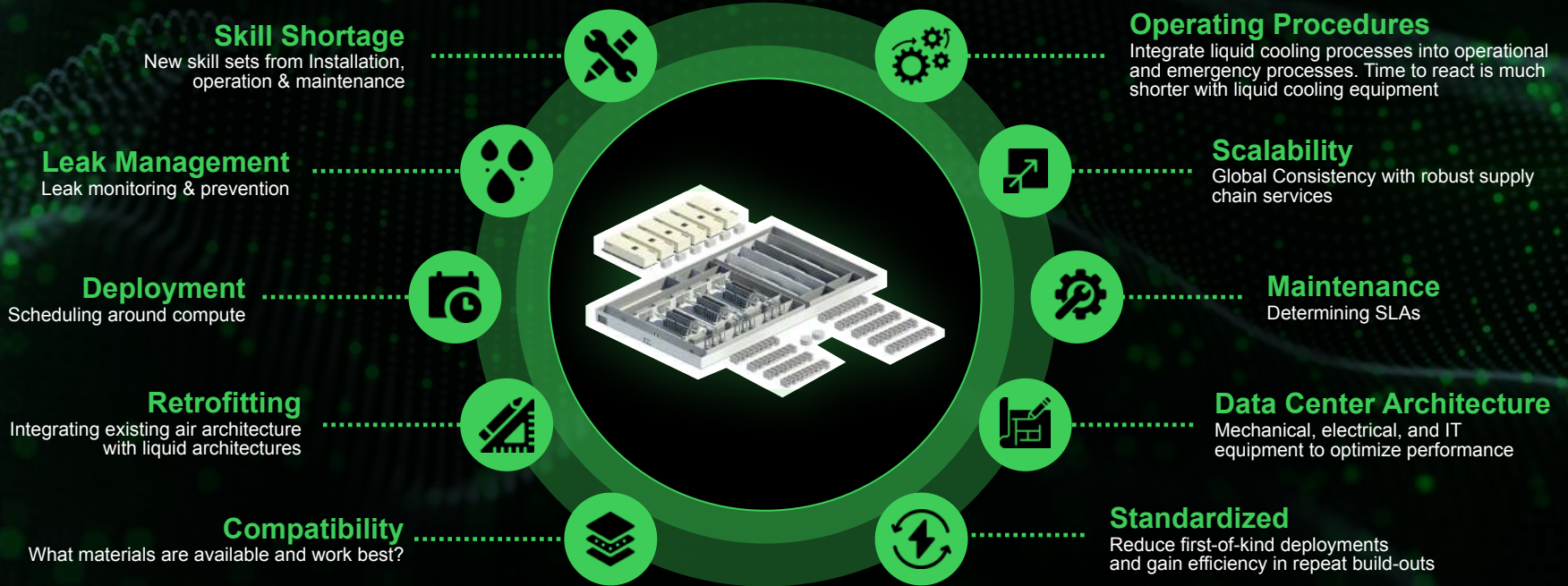
Jun 1, 2024

Google's London data center outage during heatwave caused by "simultaneous failure of multiple, redundant cooling systems"

Google said the data center hosting one of its London cloud regions suffered "simultaneous failure of multiple, redundant cooling systems" during the UK's...

Aug 2, 2022

The unprecedented change in cooling architecture has created unique challenges



Questions are being asked..
and we are answering them...

How to scale and move fast?

Needed ops/management changes?

Best service practices?

Infrastructure Management software needs?

Most efficient, sustainable cooling?

How to support hybrid cooling?

Right CDU/pod size?

Best architecture for application?

Liquid cooling risks (e.g., black water & filtration)?

How to upskill team?

Can I retrofit my air-cooled data center with liquid cooling?

Direct Liquid Cooling System Challenges in Data Centers

White Paper 210

Navigating Liquid Cooling Architectures for Data Centers with AI Workloads

White Paper 133

Liquid Cooling Technologies for Data Centers and Edge Applications

White Paper 265

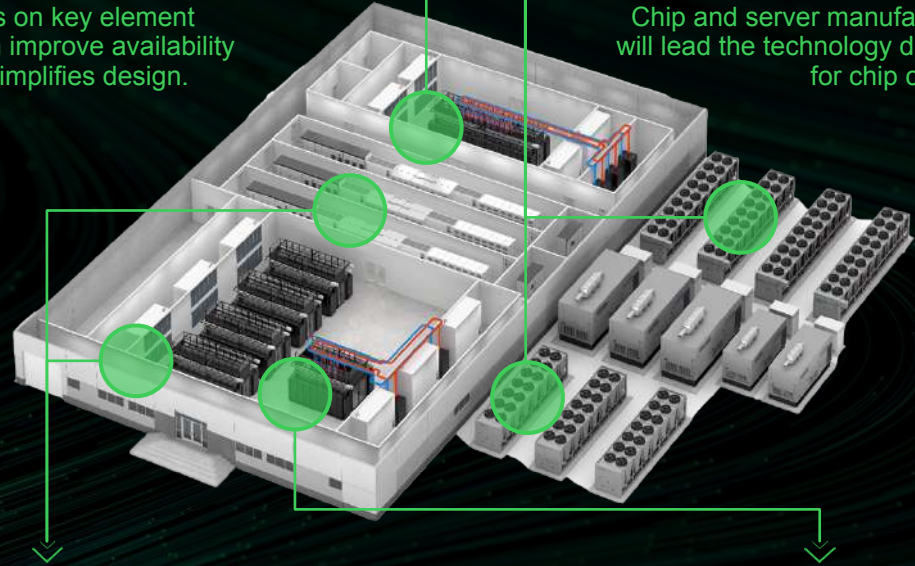
Liquid cooling requires an end-to-end understanding, whether you are retrofitting an existing building, constructing a new one, or considering any stage of the lifecycle.

Transition to liquid cooling requires site-specific designs based on density, efficiency and location.

Innovative heat rejection systems are essential for efficient liquid cooling solutions.

Focus on key element which improve availability and simplifies design.

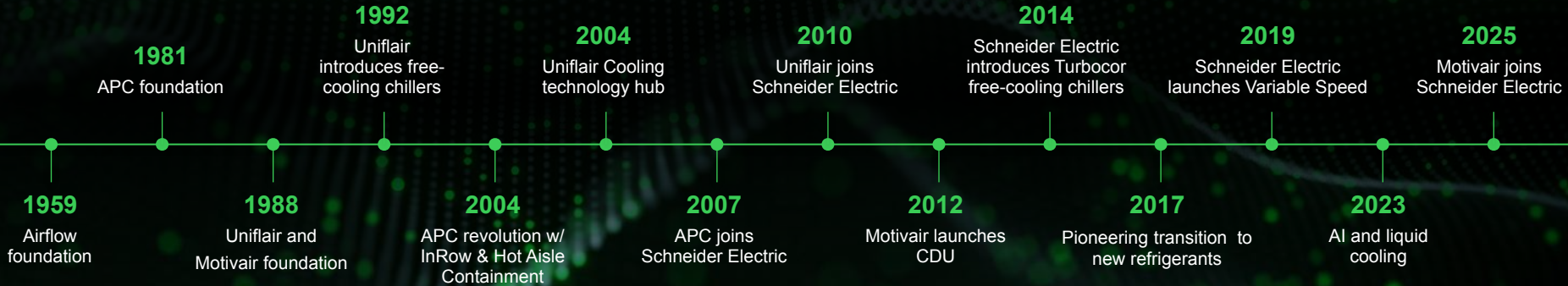
Chip and server manufacturers will lead the technology decision for chip cooling.



Heat rejection systems must balance efficiency & flexibility while accommodating direct liquid cooling, hybrid air cooling, and support space cooling.

Hybrid environments need a complete and broad cooling portfolio adaptable to greenfield and brownfield data centers.

A 50+ Year History of



High efficiency cooling supporting
AI workloads

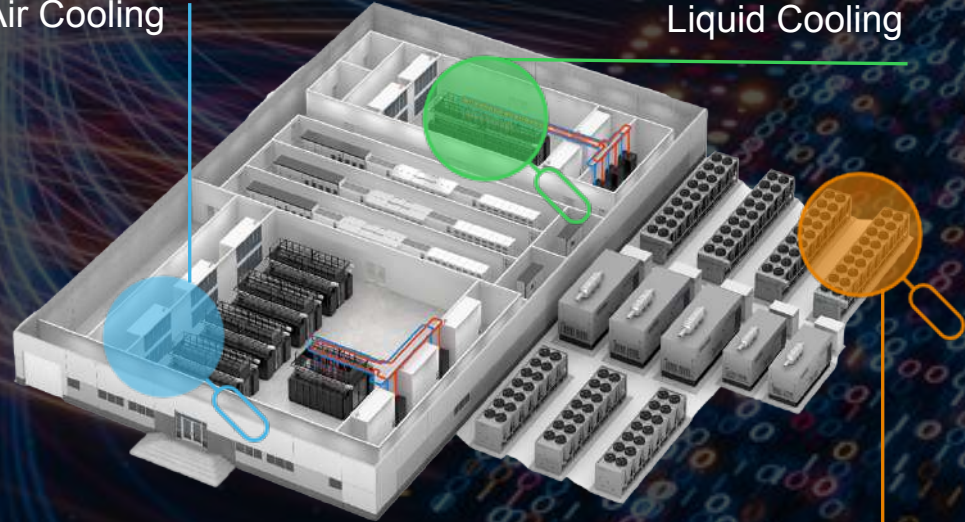


From Chip to Chiller: the fully-integrated liquid cooling ecosystem

More than just a collection of components,
this is a **co-ordinated architecture**. One that
is designed to scale with AI, adapt to hybrid
environments, and deliver performance
without compromise.

Air Cooling

Liquid Cooling



Heat Rejection

AI-Ready high-performance power trains

LV/MV Switchgear

High-performance, compact design

AI compatible UPS

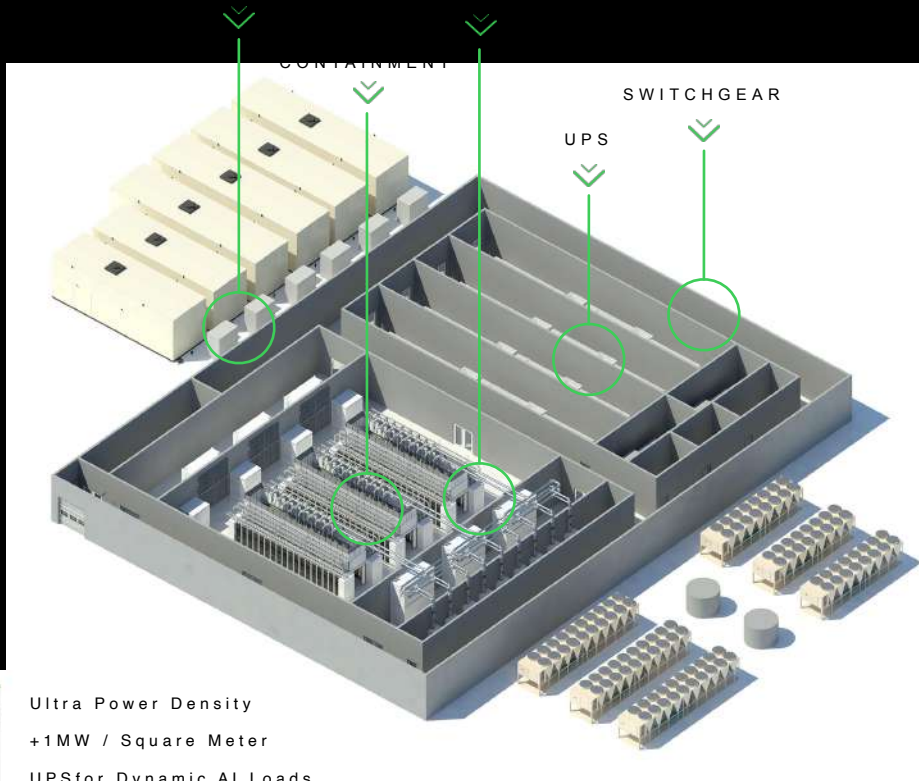
10-1500kW, modular and redundant

High Power Distribution

Easy install, precise control, distribution and monitoring

NetShelter Racks and Containment

Secure and configurable rack-systems



Ultra Power Density

+1MW / Square Meter

UPS for Dynamic AI Loads

G



Schneider Electric is aligned with all the main players in the AI ecosystem for solution design and deployments

Chips / GPUs



NVIDIA is the single most influential voice today

Most collaborated and partnered across the IT stack

System Integrators



Various partnerships with top AI players

Awarded by Nvidia and Intel in various categories of AI partnerships

Servers



Together make up 32% of server vendor unit shipments WW (44% of market is ODM direct)

Most partnered servers in alliance networks

Coverage by dedicated teams

Schneider Electric
enables you to move
faster and scale smarter
with our unrivalled &
proven liquid cooling
expertise and end-to-
end cooling solutions.

- ✓ Engineering Experience
- ✓ Reference Designs
- ✓ Chip to Chiller – Liquid & Air
- ✓ Software & Services
- ✓ AI Ecosystem of Partners

Stay Updated on AI-Ready Data Centers

