Five data center predictions for 2022

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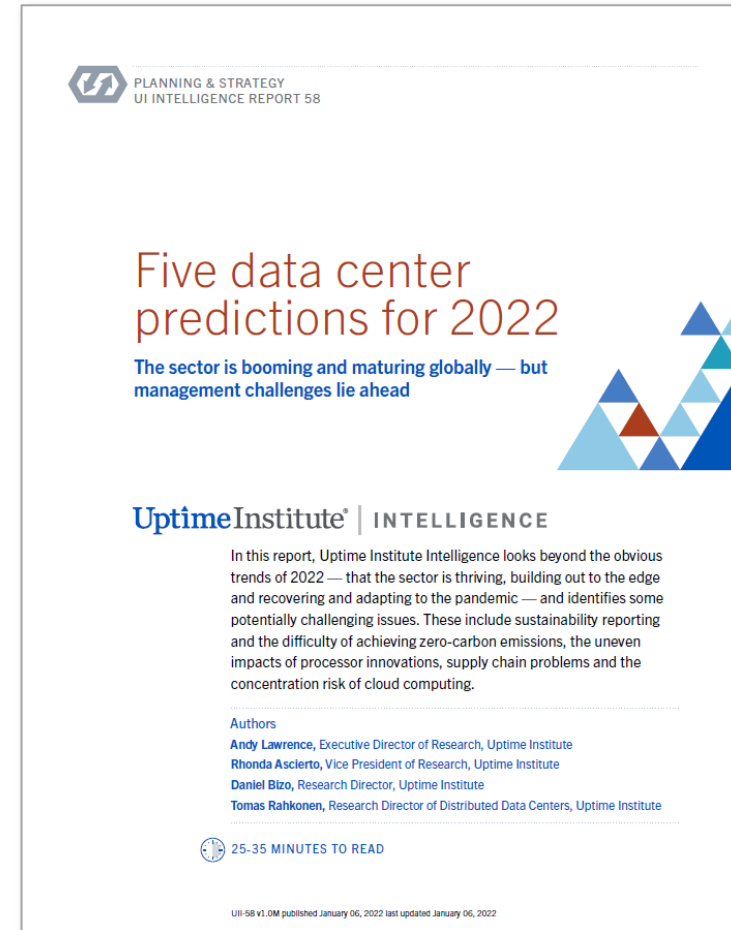
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Five data center predictions for 2022

The sector is booming and maturing globally — but management challenges lie ahead

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In this report, Uptime Institute Intelligence looks beyond the obvious trends of 2022 — that the sector is thriving, building out to the edge and recovering and adapting to the pandemic — and identifies some potentially challenging issues. These include sustainability reporting and the difficulty of achieving zero-carbon emissions, the uneven impacts of processor innovations, supply chain problems and the concentration risk of cloud computing.

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25-35 MINUTES TO READ

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Data center predictions for 2022

- ▲ Moore's law resumes — but not for all

- ▲ Industry consensus on sustainability looks fragile

- ▲ Data center operators ponder nuclear option

- ▲ Concerns over cloud concentration risk grow

- ▲ Supply problems favor standardization and scale

# Moore's law resumes — but not for all

- Chip processing speeds and efficiency stalled in recent years

- Intel is set to find its mojo again

- A more diverse supply of chips
  - AMD continues to push the limits for performance and efficiency
  - NVIDIA, AWS, Alibaba, etc. outsource manufacturing to cutting-edge suppliers (incl. TSMC*, Samsung Electronics)

*Taiwan Semiconductor Manufacturing Company

Moore's law resumes — but not for all

- ▲ Advances in chip technology will mainly benefit at-scale infrastructure operators (and a few cutting-edge end users)

- ▲ High levels of workload consolidation are required to make use of (soon) hundreds of cores

- ▲ Advances do <u>not</u> apply for light loads (<10%) or idle servers

Historical trending of idle server power
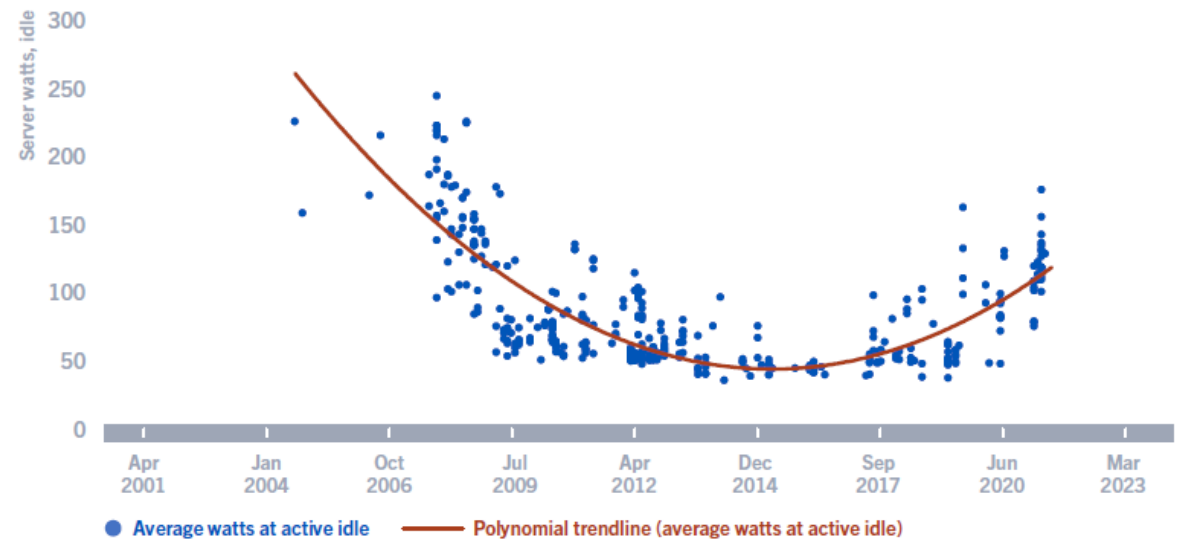
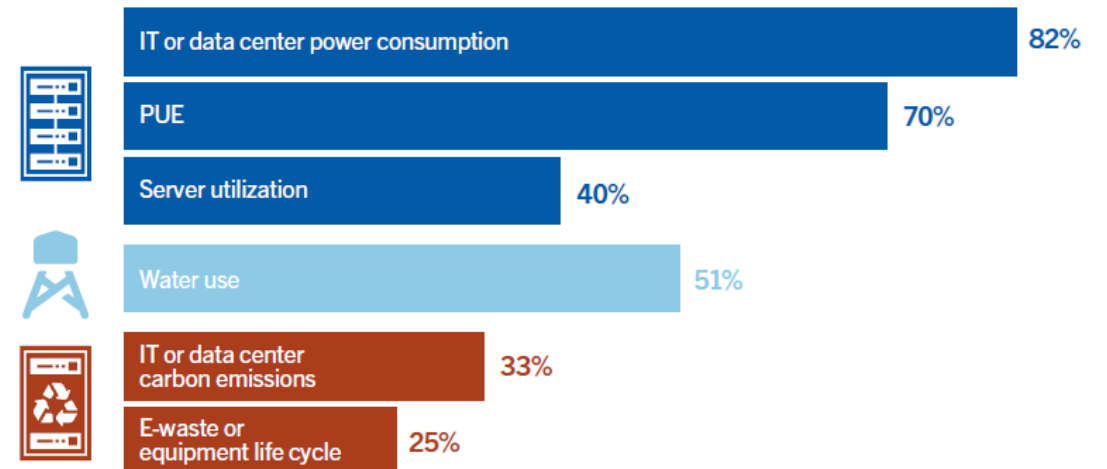STANDARD PERFORMANCE EVALUATION CORPORATION, 2021
COMPILED BY UPTIME INSTITUTE

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Industry consensus on sustainability looks fragile

▲ Operators will become frustrated with how to assess and report on sustainability

▲ Most recognize the need for action but trust in regulators is low

▲ EU leads a likely global wave of legislation

  ▲ More granular and open reporting

  ▲ Data centers down to 300–400 kW likely to face public audits

Power consumption and PUE are top sustainability metrics tracked

Which IT or data center metrics do you compile and report for corporate sustainability purposes? Choose all that apply (top respondents only). (n=539)

Metric	%
IT or data center power consumption	82%
PUE	70%
Server utilization	40%
Water use	51%
IT or data center carbon emissions	33%
E-waste or equipment life cycle	25%

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Industry consensus on sustainability looks fragile

- ▲ Regulators and investors want to see annual improvements

- ▲ Cloud suppliers and bigger colos are (mostly) already highly energy efficient – significant improvements would be costly

- ▲ Cloud suppliers want to avoid analysts calculating application utilization levels and energy efficiency of availability zones

- ▲ +70% of colo energy use is tied to IT clients (some request more resiliency using more energy)

- ▲ IT owners and operators hesitate to take Scope 2 resp. – to avoid accountability for poor energy purchases made by their colo or cloud companies

Data center operators ponder nuclear option

▲ Nuclear power is a near-zero carbon energy source (but not classed as clean)

▲ Sustainable data centers need low-carbon power generation that does not depend on local weather

▲ We expect some major data center operators, influencers and leaders to more actively support nuclear power

  ▲ Publicly endorse nuclear as a carbon neutral power source

  ▲ Buy nuclear power as part of the mix in their power purchasing agreements (PPAs)

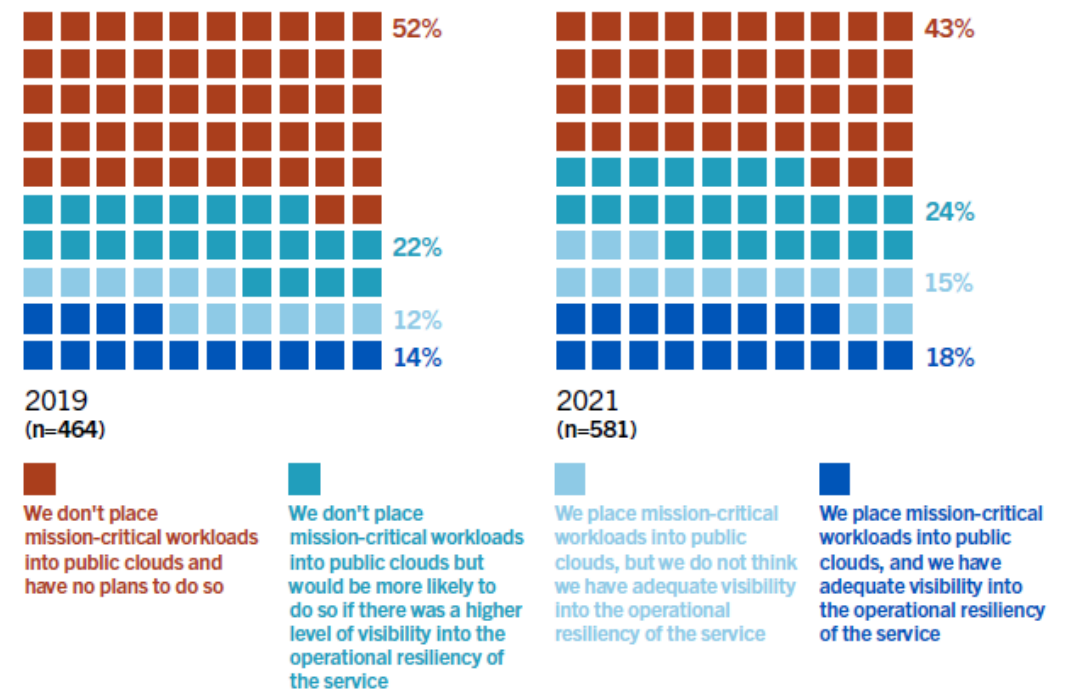▲ Next generation modular reactors (10–100 MW) can be funded by large data center operators via PPAs

Concerns over cloud concentration risk grow

▲ There is growing concern that using a big cloud provider is a single point of failure (also as a business-risk)

▲ Organizations and regulators are worried about a lack of cloud transparency / client control and concentration risks

▲ Multicloud strategies can be too costly and complex

▲ While cloud providers have high reliability, failures do happen

　　▲ Due to the black box nature, it is difficult to scrutinize designs, eliminate single points of failure, and rehears failure processes

More mission-critical workloads in public clouds, but visibility issues persist

Does your organization have adequate visibility into the resiliency of public cloud operations (e.g., AWS, Azure, Google Cloud Platform) in terms of architecture, availability record, management processes, and full understanding of options?

Cloud strategies are often described as an operating model rather than a location.

2019 (n=464): 52%, 22%, 12%, 14%

2021 (n=581): 43%, 24%, 15%, 18%

We don't place mission-critical workloads into public clouds and have no plans to do so

We don't place mission-critical workloads into public clouds but would be more likely to do so if there was a higher level of visibility into the operational resiliency of the service

We place mission-critical workloads into public clouds, but we do not think we have adequate visibility into the operational resiliency of the service

We place mission-critical workloads into public clouds, and we have adequate visibility into the operational resiliency of the service

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Concerns over cloud concentration risk grow

- Regulators are worried, especially for financial services
  - Bank of England is introducing new rules to ensure better oversight over large banks' reliance on cloud
  - European Banking Authority rules force financial institutions to conduct due diligence on cloud providers
  - EU's proposed Digital Operational Resiliency Act means cloud providers could face large fines if financial services are disrupted
- Problems at one big supplier can cause issues for completely unrelated services
- Large customers will demand a better view of cloud suppliers' infrastructure (and potential vulnerabilities)
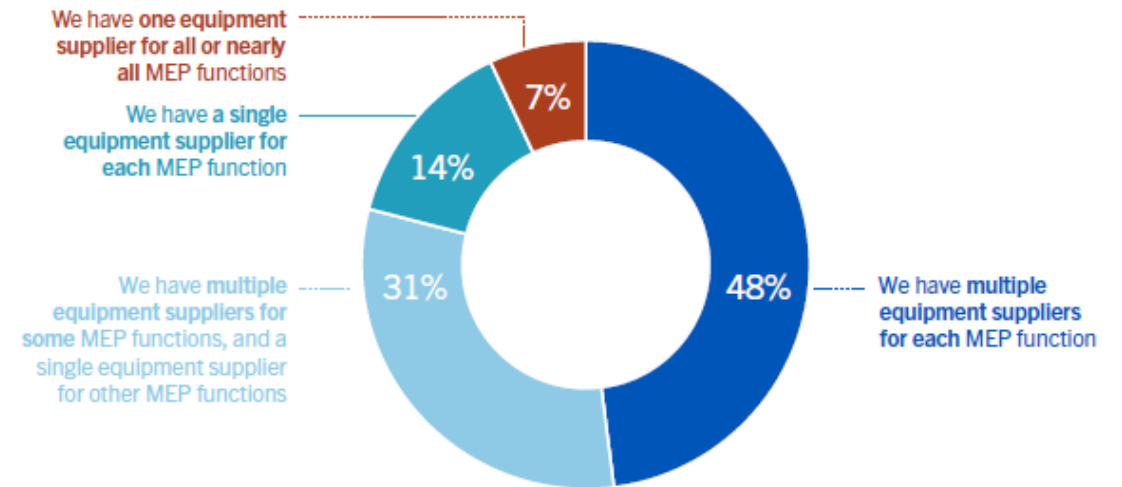- We expect greater regulatory attention in more regions and across more mission-critical sectors

Supply problems favor standardization and scale

- Shortages and delays are likely to persist into 2022 (and beyond) as demand for new data center capacity continues to increase

- Large operators are using their buying-power, relationships and scale to secure supplies, while smaller ones may struggle

- The overall expectation is still that the total cost and time to deliver data centers will continue to decrease
  - Increased supply-chain collaboration
  - More joint engineering and standardization
  - Raised IT rack loads (reducing facility footprint & cost)
  - Increased use of off-site system integration

- Smaller data center operators not adapting to more industrialized, standardized building blocks are likely to fall behind

Half of data centers are exposed to vendor-specific delays

Which statement best describes the sourcing strategy of your data center's capital equipment suppliers for mechanical, electrical, and plumbing (MEP) functions? (n=226)

We have **one equipment supplier for all or nearly all MEP functions** — 7%

We have **a single equipment supplier for each MEP function** — 14%

We have **multiple equipment suppliers for some MEP functions, and a single equipment supplier for other MEP functions** — 31%

We have **multiple equipment suppliers for each MEP function** — 48%

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Thank you. Questions?

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