



OCP
SUMMIT

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European
Focus Track

A Study of Energy Efficiency in European Data Centers

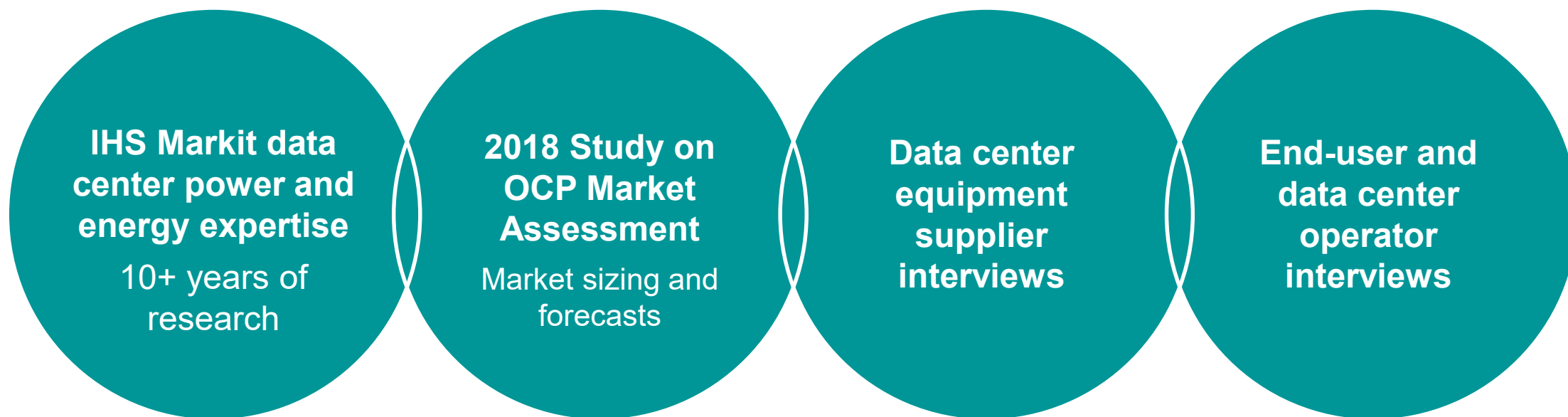
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Study methodology

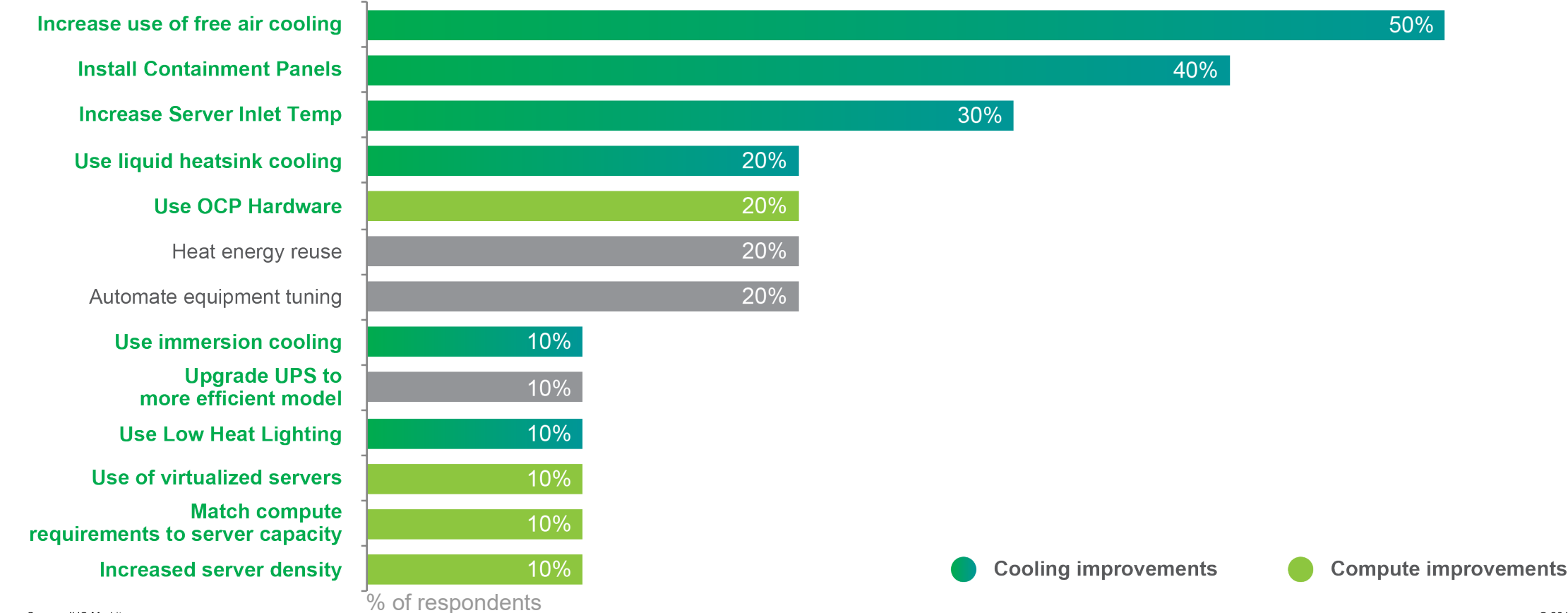




Data center operator and OCP product vendor survey results

Cooling, then compute

Q: What recent improvements have you made to your data center's energy efficiency?



Source: IHS Markit

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Respondents realized significant savings

Q: What was the improvement in energy consumption?



● 11-20% ● 21-30% ● 31-40% ● Don't know

Source: IHS Markit

% energy savings

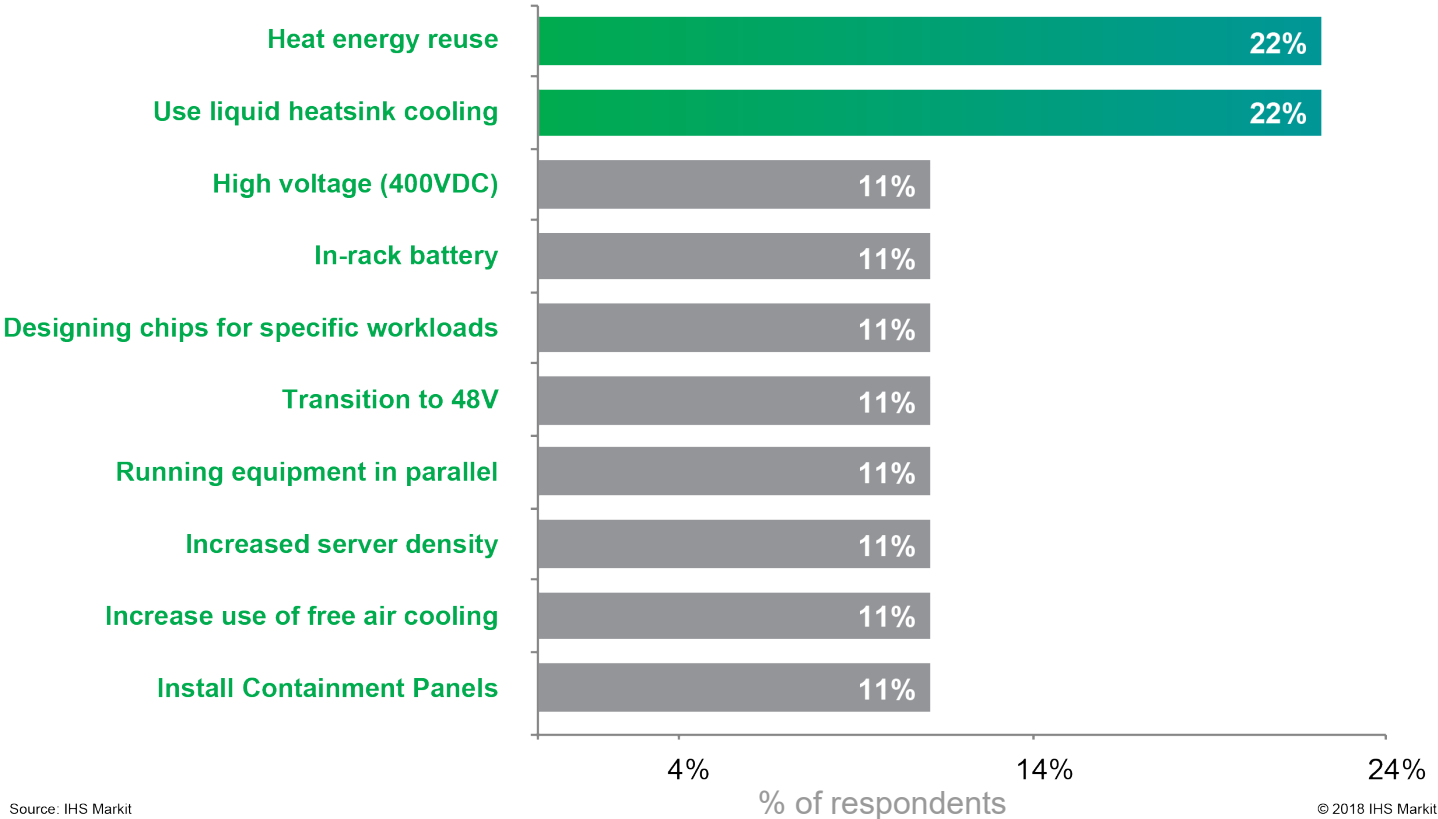
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Top improvements cited:

- Cooling systems
- Migrate to immersion cooling
- Raise room temperature to 35C
- Use OCP servers
- Use 12V to server
- Increase rack density

Liquid cooling more than just a science experiment

Q: What plans do you have over the next 2 years to improve data center energy efficiency?



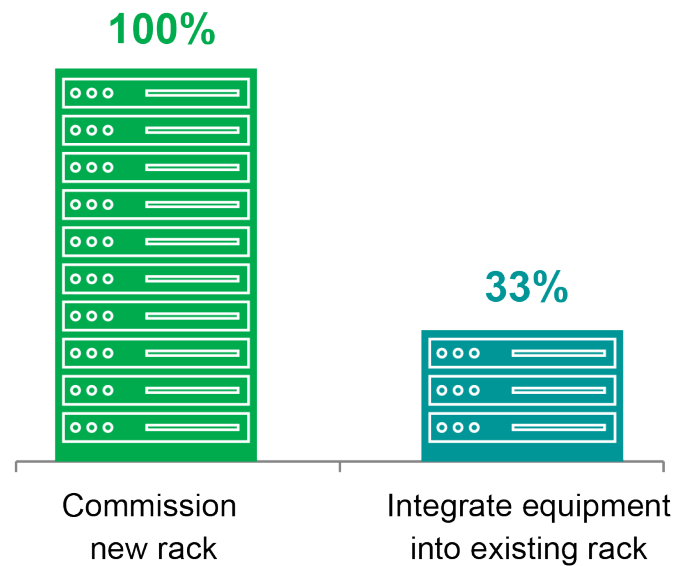
Heat reuse requires multiple stakeholder involvement.

Opportunity for system integrators to deliver complete racks

Q: Commission complete racks?

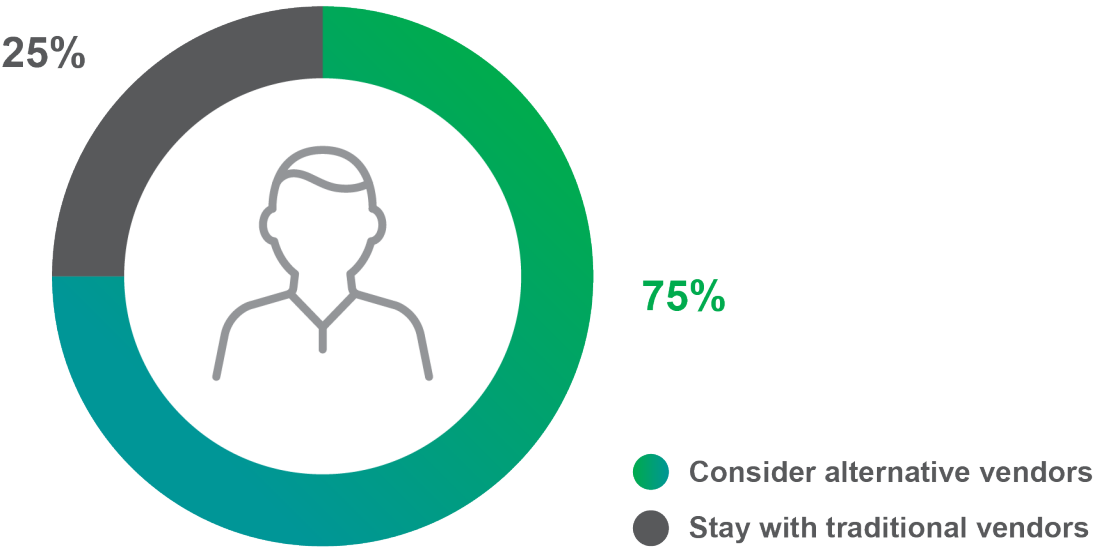
Q: Considering new suppliers?

Rack Integration



Source: IHS Markit

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Budgets grow as ROI timeframe shortens

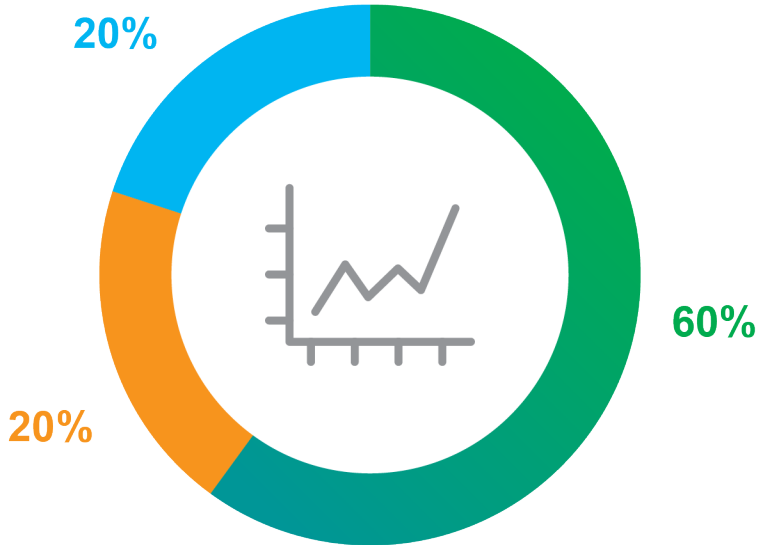
Q: DC energy efficiency budget?

Q: ROI time period?



- Organization has a specific budget
- Organization does not have a specific budget

Source: IHS Markit © 2018 IHS Markit

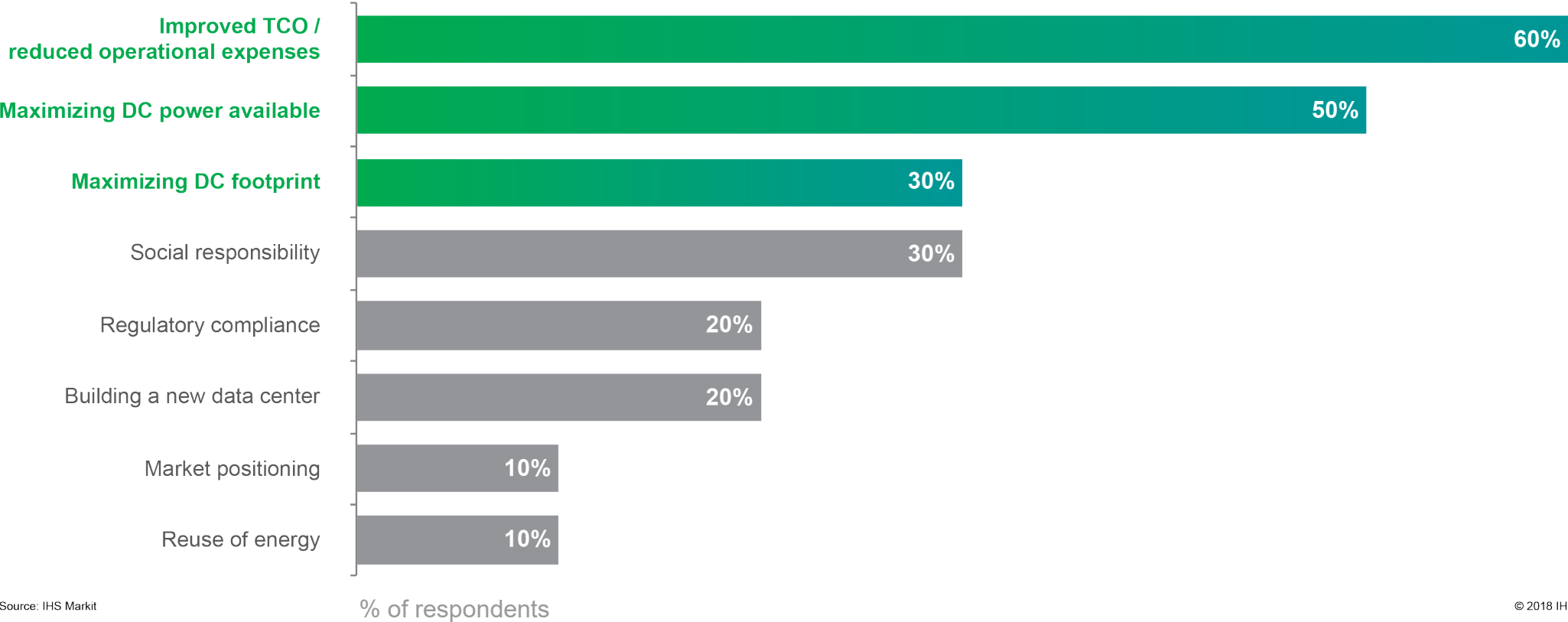


- <5 Years
- <3 Years
- <1 Years

Source: IHS Markit © 2018 IHS Markit

Operational expenses must come down

Q: Drivers for improving energy efficiency in data centers?

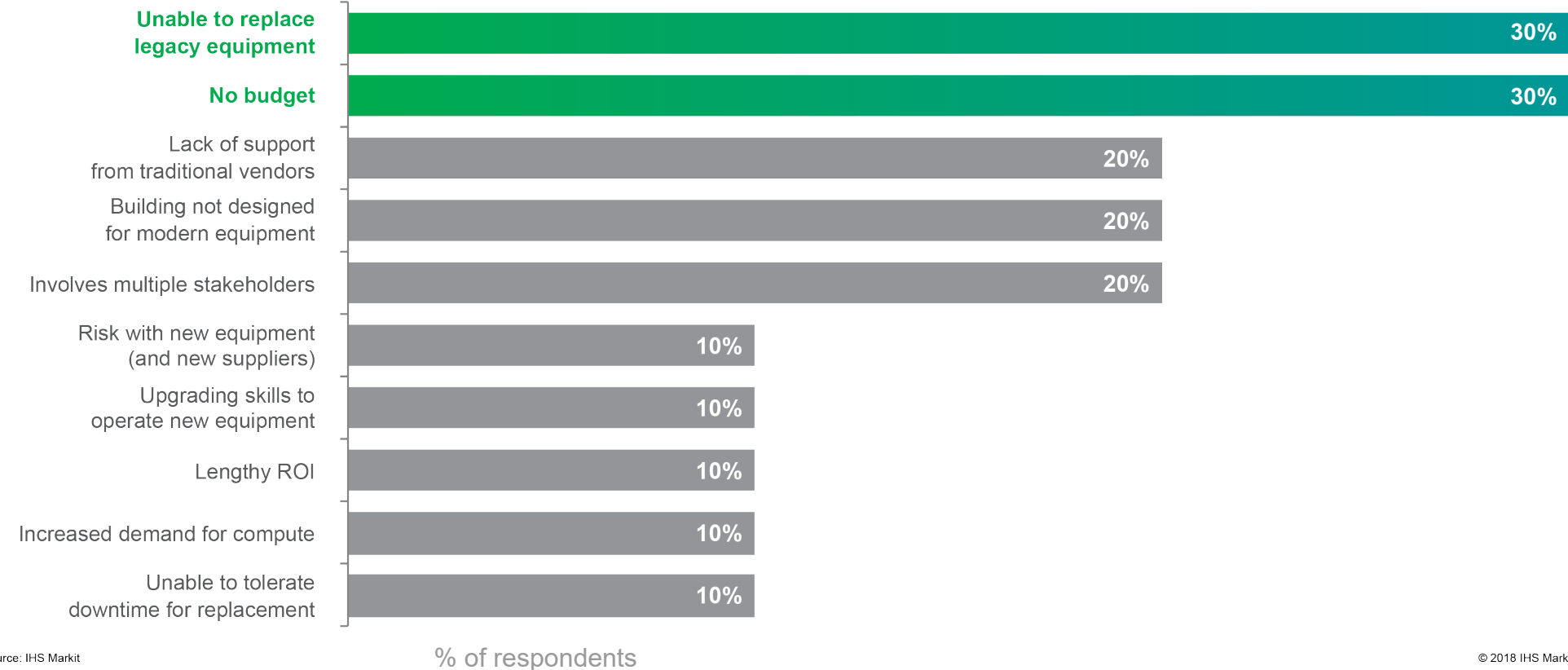


Source: IHS Markit

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Budget constraints, changing vendors, legacy equipment impede progress

Q: Barriers for improving energy efficiency in data centers?



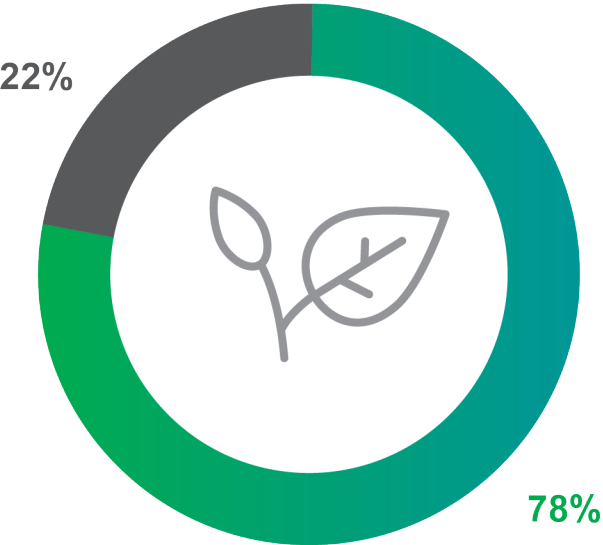
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EU-ECO Awareness: **Yes.** Change? **Maybe.**

Q: Awareness of EU Eco-design?

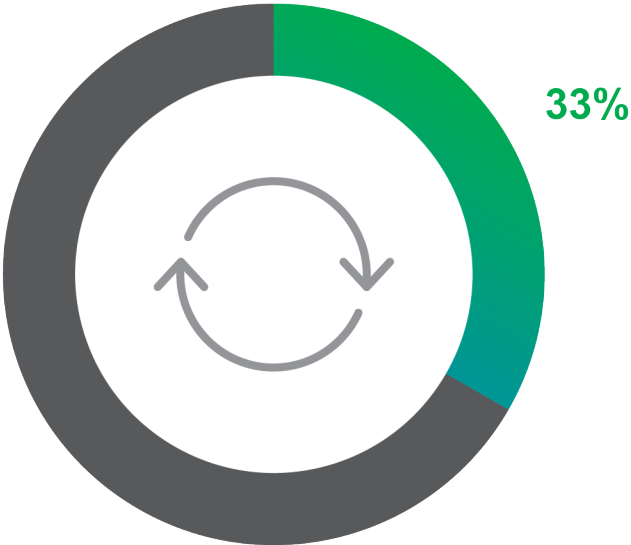
Q: Affecting change?



● Yes
● No

Source: IHS Markit

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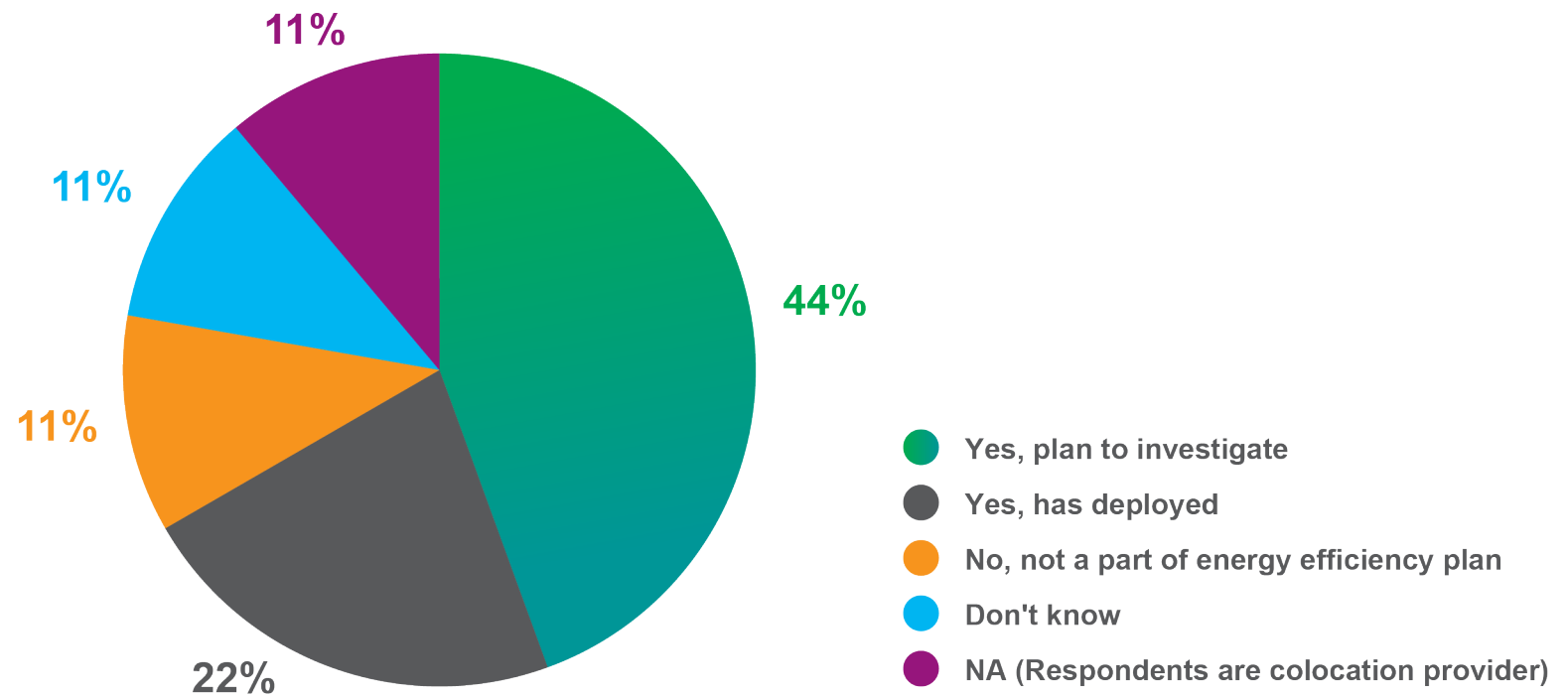
● Yes
● No

Source: IHS Markit

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2/3 look to OCP equipment for energy reduction

Q: OCP equipment a part of plans for energy reduction?



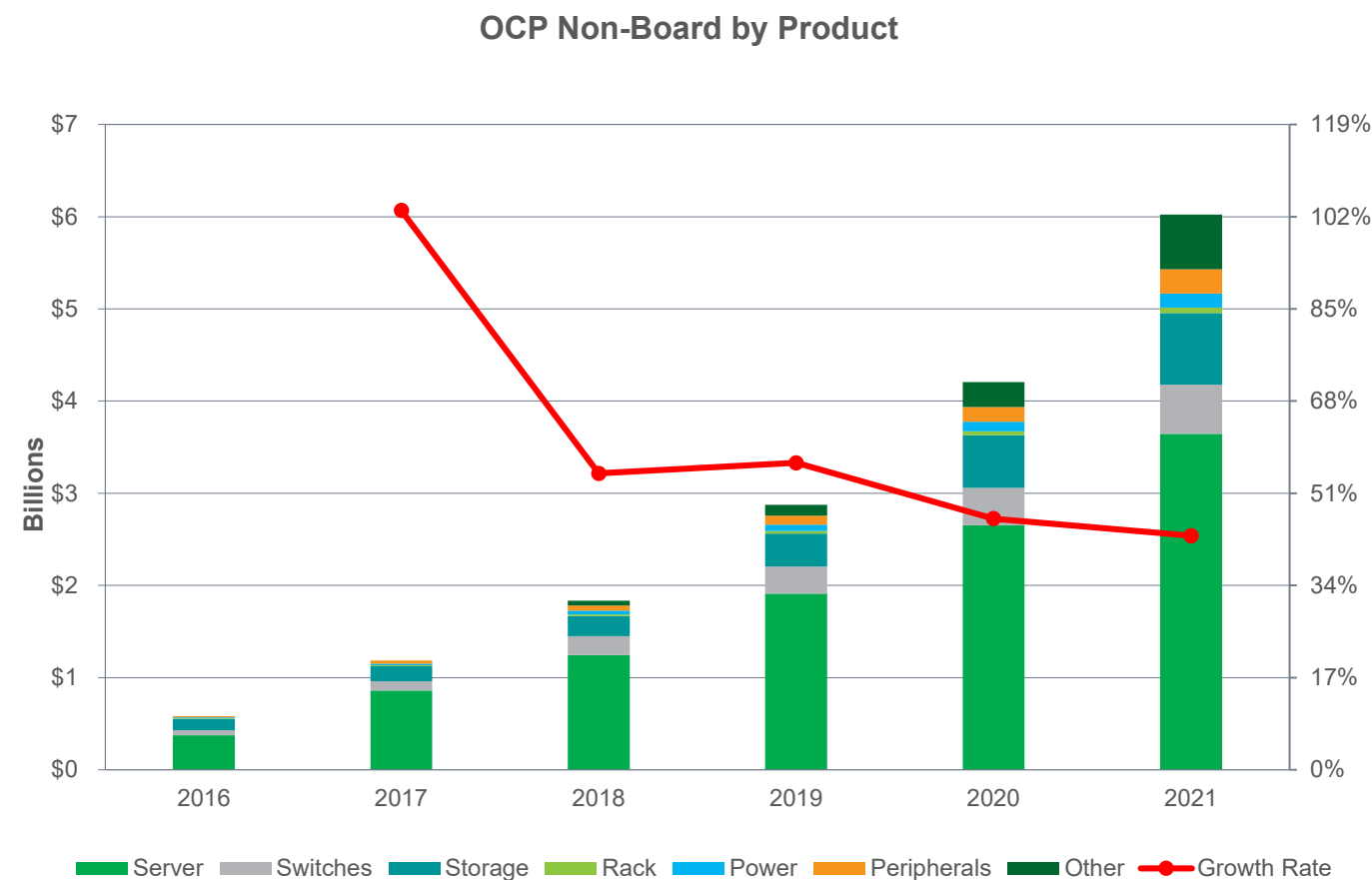
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A photograph of a server room aisle. The perspective is looking down a long, narrow corridor formed by rows of server racks. The racks are dark with many small, glowing green and blue lights. The floor is a light-colored, perforated metal grating. In the far distance, a person is standing, silhouetted against a bright light source, possibly a doorway or window. The overall lighting is dim and blue-toned.

Market trends and key takeaways

OCP addresses cooling and compute, and adoption is growing

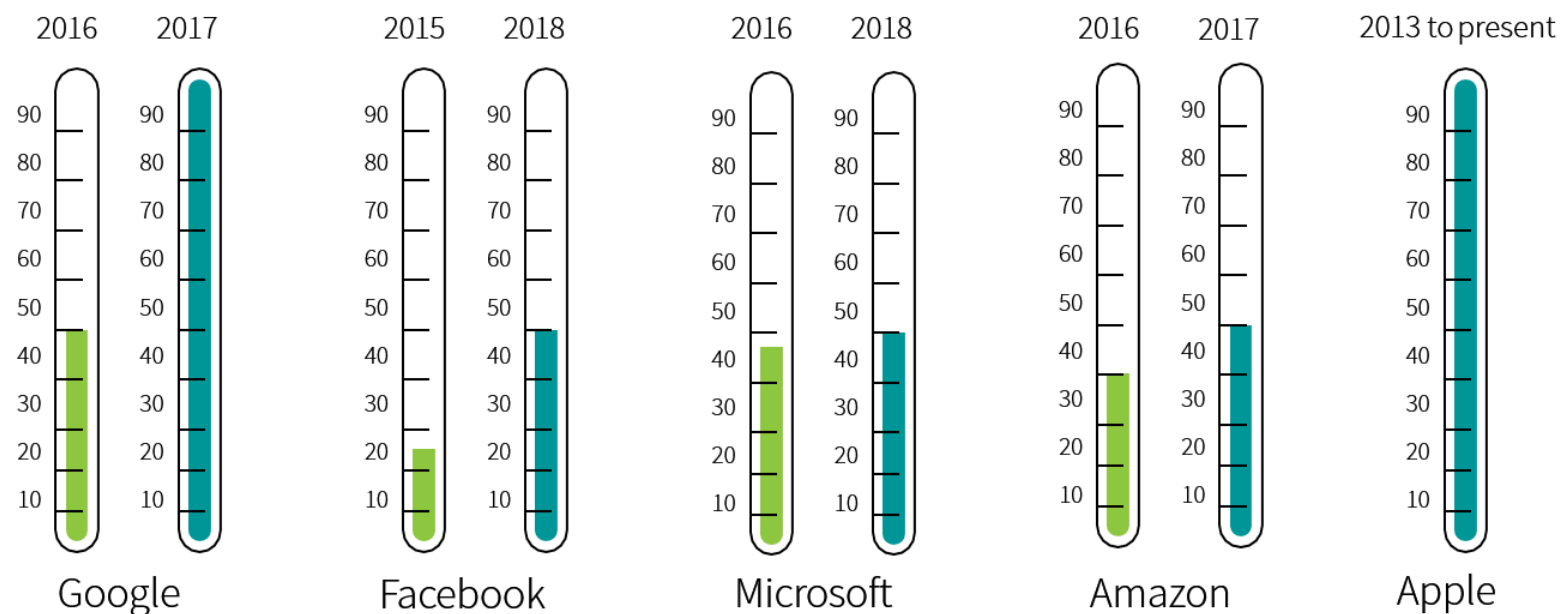


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Use of renewable energy limits negative impact of electricity consumption

Percentage of hyperscale data center power produced by renewable energy over time



Note: stating that a data center is powered by 100% renewable energy does not mean that the data center only consumes renewable energy. Because data centers are still connected to the grid, they are consuming non-renewable sources also used by the utility companies. Even data centers that have onsite renewable generation are connected to the grid as they need a redundant power source in the case primary power source fails.

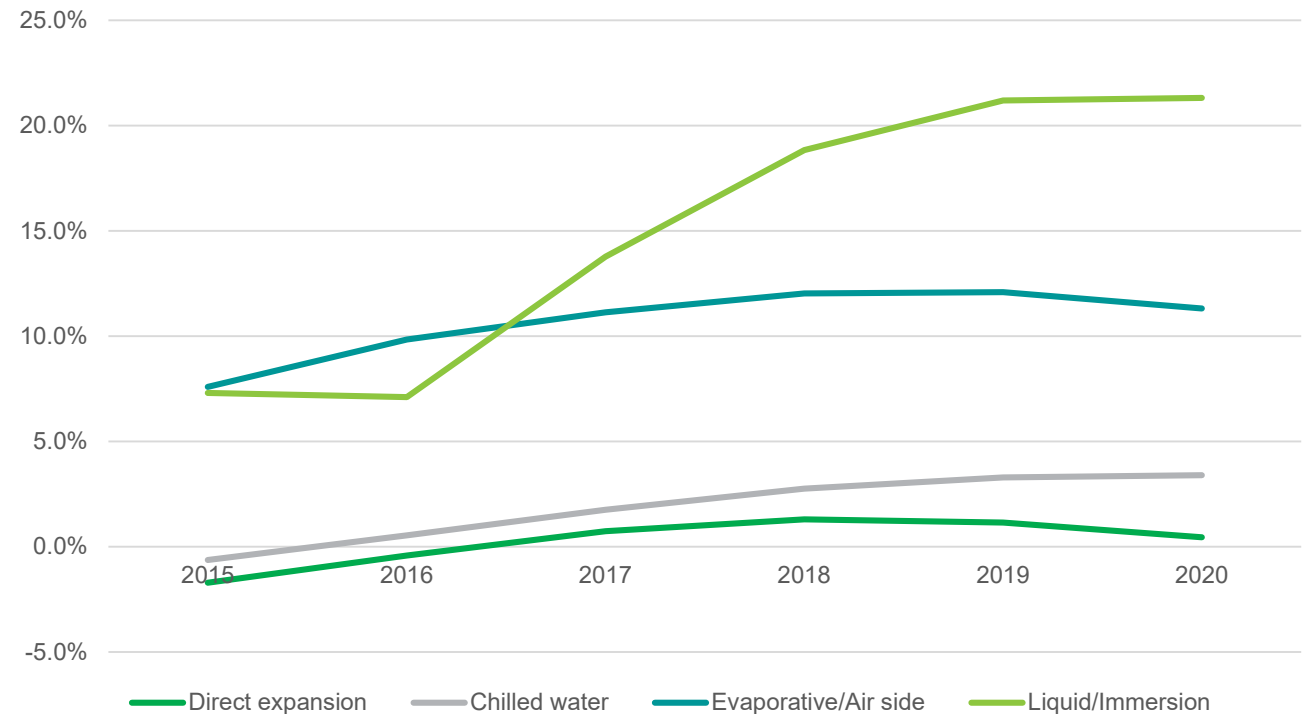
Liquid and 'free cooling' forecast to grow double digits

Key Market Takeaways:

Liquid and “free cooling” have highest growth trajectories

Direct expansion and chilled water currently account for ~70% of revenues

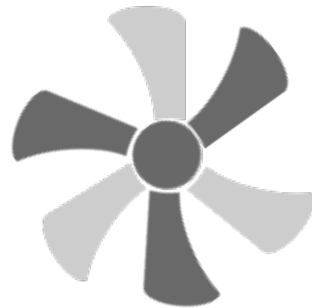
Growth rates by heat rejection method – Global



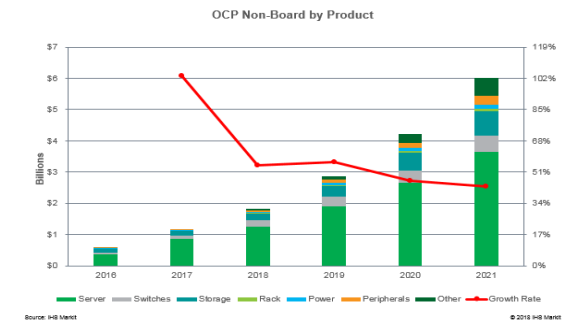
Takeaways



Energy efficiency is a fundamental part of data center design



Today, it's about cooling.
Tomorrow, about compute.



Adoption of OCP will aid in all these, and is growing.

Case study in data center energy efficiency

The London Internet Exchange



LINX Goals

- A new network architecture that offered quick development of new features, better resilience and robustness
- Make deployment more **modular, cost and energy efficient**
- Adopt **automation** to manage complexity
- **Increase bandwidth** to 100G and prepare for 400G
- **Improve data center interconnect** – better redundancy and transparency for workloads
- **Improve density and maximize space** utilization in data centers

Key decision making criteria

- Flexibility
- Simplicity
- Comprehensive quality of service
- Visibility on network issues
- Accommodate 800+ customers
- Total cost



Previous mode of operation

- Chassis switch-based architecture with fixed format switches at the edge
- Aggregated hardware and software supplied by traditional switch vendor
- Expanding capacity done in 15RU increments
- Power draw fixed at 3kW per rack
- Limited ability to add inter-site connectivity

The new architecture

- Fixed-switch architecture
- Adopt disaggregated approach with switches from Edgecore and switch OS from IP Infusion

Vendors evaluated

- Traditional switch vendors
- Vendors offering integrated solutions
- New vendors offering disaggregated solutions

Vendors were asked to propose recommended architecture for new solutions.

Results

More speed, less power, higher density and ready for automation

- 40% reduction in energy consumption
- Over 50% savings in space
- Move to 100G, ready for 400G
- Increased troubleshooting visibility

What's next?

- Increased analytics for troubleshooting
- Policy infrastructure for automation
- Increase deployment speed for new features

Thank you!

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