

Topic: Energy-related investment decisions for Data Centers.

Focus Group Questionnaire

First name: David

1. Which of the following do you do in your position?

a. Participate in decisions about purchasing equipment for your data center (e.g., servers, software, racks, lighting, cooling equipment)? Yes No

b. Participate in decisions about servicing or maintaining equipment for your data center?

Yes No

2. Do you rent space in someone else's data center? Yes No

If yes, what percentage of your data center needs are met by renting space from others?

less than 50%

3. How many data centers, server rooms, and server closets does your company own or operate?

Enter number here more than 20

4. [If more than one data center] For how many data centers are you involved in major equipment purchase and maintenance decisions?

Enter number here all

5. The majority of the data centers you help manage are:

- a. Server closets or rooms (less than 500 square feet)
- b. Localized data centers (500 – 5,000 square feet)
- c. Enterprise data centers (> 5,000 square feet)
- d. Mega or utility-scale data centers (>10,000 square feet)

6. What is the average number of racks in your typical data center?

Enter number here _____ or if > 2000

7. What percentage of your racks are outsourced to others? _____%

8. Which sectors does your data center support? (Name top three)

- a. IT services
- b. Energy and utilities
- c. Media and telecommunications
- d. Banking and financial services
- e. Health care
- f. Education
- g. Co-location/shared
- h. Other: _____

9. What state(s) are your data centers located in?

Enter states here: WA, CA, IA, VA, others

10. When did you last pursue a major equipment purchase/upgrade for your data center?

- a. Within the last 3 years
- b. 3-5 years ago
- c. More than 5 years ago

11. Do you actively participate in the EnergySTAR Buildings, Green Grid, or another third-party energy-efficiency program?

- Yes No

12. Have you had an energy audit performed by a third party within the last three years?

- Yes No

13. What type of data centers does your company operate?

- Server rooms or closets
- Enterprise/corporate data centers
- Cloud/hyperscale computing
- High-performance/scientific computing
- Multi-tenant/colocation data centers

14. How many servers are there in your organization as a whole?

- < 2000
- 2000 – 10,000
- 10,000 – 50,000
- > 50,000

15. How often do you replace servers in your data centers? _____

16. How often do you make major infrastructure upgrades to your data centers? When cost advantged

17. Do you track energy use on a regular basis? Yes

a. What is the typical annual electricity consumption (kwh) of one of your data centers?
more than 100,000kwh

18. Do you track power usage effectiveness (PUE) or any other energy efficiency measures? Yes

a. If so, what is the average PUE of your data centers? less than 1.4

19. Do you track server utilization? Yes

a. Is so, what is the average server utilization rate of your data centers? _____

20. Do you lease or outsource any of the following elements of your data centers?

	Yes	No	Sometimes
b. Lease space	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Lease servers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Facility management	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Maintenance & repairs	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Other, specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. If you lease DC space to or from another company, does the tenant or facility owner typically pay for electricity costs? tenant

22. Has your company considered or used any of the following technologies and energy saving strategies: **(check all that apply)**

	Has used		Never used		Don't know
	would use again	would not use again	would consider in the future	would not consider	
<u>Facility Management</u>					
Isolating hot/cold aisles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blanking panels	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enclose server racks (e.g., strip curtains)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data center infrastructure management (DCIM) software	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raising temperature set points	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
List typical facility temperature: <u>_85 degF___</u>					
Variable speed fan drives	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy-efficient air handling units	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Modular facility design for data center expansion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air-side economizer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water-side economizer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy-efficiency lighting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Predictive modeling of future IT deployments	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Servers</u>					
Energy-efficient server hardware (e.g., power supply, fans, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Underclocking	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Virtualization	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decommission idle servers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consolidate lightly used servers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improve data storage efficiency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IT power management software	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>[Multi-tenant DCs] Adjust pricing models to incentivize energy efficiency</u>					
Space-based pricing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Space and power block pricing (differentiate power and energy)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Space and actual power pricing (differentiate power and energy)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>