

EXECUTIVE SUMMARY

## **Special Report: Data Center Capacity and Energy Efficiency Survey**

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## Executive Summary

Currently, there is much emphasis in the uptime industry press, in meetings of industry groups, and among industry professionals on the importance of green initiatives. Indeed, the Uptime Institute's own research has pointed to the intimate connection between profitability and green. For example, the Institute white paper, *The Invisible Crisis in the Data Center: The Economic Meltdown of Moore's Law*, alerted the industry to the economic impact of the rapid, and seemingly boundless, growth of facilities infrastructure costs (power and cooling) as a percentage of the IT budget. In the Institute white paper, *Four Metrics Define Data Center Greenness*, an explicit tie is made between the definition of data center greenness and bottom line profitability.

If green is the topic of the day, how much attention and effort are green initiatives actually getting in enterprise computing organizations today? To answer this question, the Institute developed a data center capacity and energy efficiency survey. The survey was distributed to 21,000 facilities, IT, and other professionals throughout the enterprise computing industry. To date, the Institute has received 311 responses to the survey. The survey clearly struck a nerve among industry professional: the bulk of survey responses were received in fewer than 24 hours after being distributed. This report provides a summary of the results.

## Response to the Survey

Senior managers (C-level, EVP, Director) account for 28 percent of respondents, 34 percent characterized themselves as being in management, and 31 percent said they were senior analysts and/or professional/technical staff. Only 7 percent said they were in operations. 90% of respondents said that they were involved in purchasing and planning decisions regarding facilities/infrastructure equipment.

Interestingly, 41 percent of respondents said that their data centers were less than 25,000 square feet. 20 percent reported that their data centers were between 25,001 and 50,000 square feet. 18 percent stated that their data centers were between 50,001 and 100,000 square feet. Only 22 percent of respondents reported having data centers over 100,000 square feet.

## Results Validate Position on Energy Efficiency Issues

What makes the responses to the survey especially powerful is how they validate the position that the Institute and its research partners have been developing. For example, as mentioned above, the Institute has been arguing that there is an invisible crisis in the

data center due to rapidly increasing site infrastructure costs. This growth requires that careful attention be paid to available means of controlling energy usage in the data center. As if in support of this claim, 42 percent of respondents claimed that their data centers would run out of power capacity within 12-24 months. 23 percent claimed they would run out of power capacity in 24-60 months. Similarly, 39 percent claimed that their data centers would run out of cooling capacity in 12-24 months. 21 percent claimed they would run out of cooling capacity in 24-60 months.

At the forthcoming Symposium 2008: *Green Enterprise Computing*, the Institute and McKinsey & Company will release a report titled *Revolutionizing Data Center Energy Efficiency*. This report will identify the root causes of out-of-control costs which are threatening the economic viability of IT. Recommendations will be focused on the Board of Directors and C-suite executives. Six major structural recommendations will be made, each having many subparts. Two of the sub-recommendations will include moving accountability for data center CapEx, OpEx, and facility operations from Corporate Real Estate to IT and the appointment of an Energy Czar with a mandate for rapid change. Interestingly, 67 percent of respondents reported that their Board or C-Suite had NOT developed green policy and governance mandates. In addition, 84 percent of respondents reported that their enterprise IT and data center organizations consider green initiatives to be a primary or secondary concern or not a concern at all (16 percent).

## Conclusions:

The results of the data center capacity and energy efficiency survey do not include input from the largest enterprise computing organizations that make up the membership of the Institute's Site Uptime Network®. These results are being collected separately and will be published shortly. The contrasts and comparisons between these larger organizations and the rest of the industry will be telling.

While the survey results largely speak for themselves, it is important to note certain points:

- The aggregate of responses from industry professionals seem to indicate that, despite all the hype, greater attention to energy consumption and green initiatives is required in the enterprise computing industry.
- The threat of running out of cooling and power capacity is far too common and represents a growing issue.
- The C-Suite is not adequately involved in or committed to the reduction of data center energy consumption.

## About the Author

**Kenneth G. Brill** is the founder and Executive Director of the Institute and its 100-corporate member Site Uptime Network in both North America and Europe. He holds an undergraduate degree in electrical engineering and an MBA from the Harvard Business School. Many industry innovations including dual power and the industry's Tier system for evaluating data center design level trace back to his original conceptual work. In 1999, recognizing that increasing heat density would become critical to IT availability; Mr. Brill worked closely with the Thermal Management Consortium to publish the first *2000-2010 Heat Density Product Trends* white paper. This foundational document predicting many of the problems now facing IT executives was updated in April 2006. He has authored or contributed to many white papers and is a frequent commentator in business and technology media on data center and site infrastructure design, engineering, and management issues. His current focus is on strategic and business impacts of The Economic Meltdown of Moore's Law.

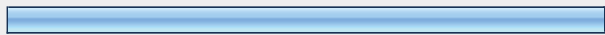
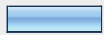
## About the Uptime Institute®

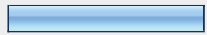
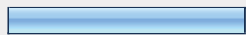


Since 1993, the Uptime Institute, Inc. has been a respected provider of educational and consulting services for Facilities and Information Technology organizations interested in maximizing data center uptime. The Institute has pioneered numerous industry innovations, such as the Tier Classifications for data center availability, which serve as industry standards today.

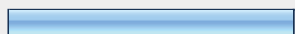
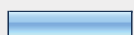


At the center of the Institute's offering, the 100 global members of the Site Uptime Network® represent mostly Fortune 100 sized companies for whom site infrastructure availability is a serious concern. They collectively and interactively learn from one another as well as from Institute-facilitated conferences, site tours, benchmarking, best practices, and abnormal incident collection and analysis.


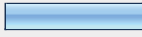


For the industry as a whole, the Institute publishes white papers, offers a Seminar Series, Symposium and data center design Charrette on critical uptime-related topics. The Institute also conducts sponsored research and product certifications for industry manufacturers. For users, the Institute certifies data center Tier level and site resiliency.

## Data Center Capacity and Energy Efficiency Survey Results

1. Do you work in the data center environment?				
			Response Percent	Response Count
Yes		86.8%	269	
No		13.2%	41	
			<b>answered question</b>	<b>310</b>
			<b>skipped question</b>	<b>1</b>

2. What is your job?				
			Response Percent	Response Count
Senior management (C-level, EVP, Dir.)		28.1%	87	
<b>Management</b>		<b>34.2%</b>	106	
Senior analyst and/or professional/technical staff		31.3%	97	
Operations staff		6.5%	20	
			<b>answered question</b>	<b>310</b>
			<b>skipped question</b>	<b>1</b>


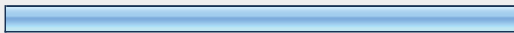
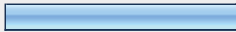


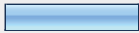
3. Which of the following are you involved in the planning or purchase decision-making for? (Check all that apply.)				
			Response Percent	Response Count
IT hardware (servers, storage, network equipment)		41.3%	128	
IT software		17.7%	55	
<b>Facilities/infrastructure equipment</b>		<b>90.3%</b>	280	
None of the above		5.2%	16	
			<b>answered question</b>	<b>310</b>
			<b>skipped question</b>	<b>1</b>


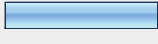
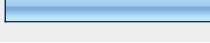
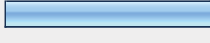
4. What is the size of your data center?			
		Response Percent	Response Count
Under 25,000 sq. ft.		41.0%	127
25,001 to 50,000 sq. ft.		19.7%	61
50,001 to 100,000 sq. ft.		17.7%	55
Over 100,001 sq. ft.		21.6%	67
		<b>answered question</b>	<b>310</b>
		<b>skipped question</b>	<b>1</b>


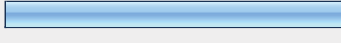
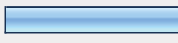

5. Is data center physical space a challenge facing your organization?			
		Response Percent	Response Count
Out of capacity in 12-24 months		33.2%	103
Out of capacity in 24-60 months		21.6%	67
Not sure		10.3%	32
No		34.8%	108
		<b>answered question</b>	<b>310</b>
		<b>skipped question</b>	<b>1</b>

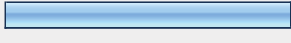
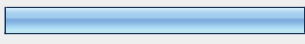

6. Is data center cooling capacity a challenge facing your organization?			
		Response Percent	Response Count
Out of capacity in 12-24 months		39.0%	120
Out of capacity in 24-60 months		20.8%	64
Not sure		9.7%	30
No		30.5%	94
		<b>answered question</b>	<b>308</b>
		<b>skipped question</b>	<b>3</b>






7. Is data center power capacity a challenge facing your organization?			
		Response Percent	Response Count
Out of capacity in 12-24 months		41.7%	129
Out of capacity in 24-60 months		23.3%	72
Not sure		10.0%	31
No		24.9%	77
		<b>answered question</b>	<b>309</b>
		<b>skipped question</b>	<b>2</b>

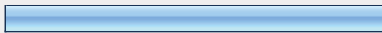
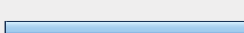

8. Please check the initiatives that you're now undertaking to improve the efficiency and capacity of your current facilities. (Check all that apply.)			
		Response Percent	Response Count
Turning off dead servers		56.1%	171
Virtualization		73.8%	225
Enabling power-save features		33.1%	101
<b>Improving power and cooling efficiency</b>		<b>78.7%</b>	240
Increasing ability to measure and predict capacity demand		62.6%	191
Changing chargeback system to make business units aware of cost		19.0%	58
		<b>answered question</b>	<b>305</b>
		<b>skipped question</b>	<b>6</b>





9. What are your data center plans for the next 24 months?			
		Response Percent	Response Count
Primarily expanding existing facilities		19.0%	58
Primarily new construction		22.0%	67
<b>A mix of both</b>		<b>29.5%</b>	90
<b>Nothing planned right now</b>		<b>29.5%</b>	90
(If new construction, please specify when)			102
<b>answered question</b>			<b>305</b>
<b>skipped question</b>			<b>6</b>

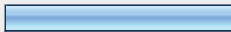
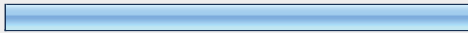
10. How well is IT utilizing its hardware assets?			
		Response Percent	Response Count
Diligently		11.0%	34
<b>Moderately well</b>		<b>48.7%</b>	150
Not well		25.0%	77
Don't know		15.3%	47
<b>answered question</b>			<b>308</b>
<b>skipped question</b>			<b>3</b>

11. How seriously do your enterprise IT and data center organizations take "green" initiatives?			
		Response Percent	Response Count
Very seriously		41.2%	126
<b>Secondary concern</b>		<b>43.1%</b>	132
Not a concern now		15.7%	48
<b>answered question</b>			<b>306</b>
<b>skipped question</b>			<b>5</b>

12. What is the status of your organization's deployment of virtualization?			
		Response Percent	Response Count
Fast-track adoption		35.9%	111
Limited pilot project		28.5%	88
In planning		19.1%	59
No plans		5.2%	16
Don't know		11.3%	35
		<b>answered question</b>	<b>309</b>
		<b>skipped question</b>	<b>2</b>

13. How are you measuring energy consumption in the data center?			
		Response Percent	Response Count
From the UPS and the rack		54.4%	166
Receive energy consumption information from the facilities team		34.8%	106
Currently don't measure energy consumption		10.8%	33
		<b>answered question</b>	<b>305</b>
		<b>skipped question</b>	<b>6</b>

14. If, in the previous question, you said you were measuring energy consumption or receiving data on it from facilities, are you measuring the ratio of incoming energy to the energy provided to the IT load?			
		Response Percent	Response Count
Yes		49.4%	122
We plan to		26.3%	65
No		20.6%	51
Don't understand		3.6%	9
		<b>answered question</b>	<b>247</b>
		<b>skipped question</b>	<b>64</b>

15. Has your Board or C-suite developed green policy and governance mandates?				
			Response Percent	Response Count
Yes			32.7%	99
No			67.3%	204
			<i>answered question</i>	<b>303</b>
			<i>skipped question</i>	<b>8</b>

16. Rank what drives your company's long-term approach to data center energy efficiency.						
	Most important	Second most important	Third most important	Least important	Rating Average	Response Count
Potential for governmental intervention/regulation	8.4% (26)	13.5% (42)	26.0% (81)	<b>52.1% (162)</b>	3.22	311
Data center capacity	<b>54.7% (170)</b>	27.7% (86)	12.2% (38)	5.5% (17)	1.68	311
Makes good business sense	31.5% (98)	<b>47.3% (147)</b>	16.4% (51)	4.8% (15)	1.95	311
Social/environment concern	5.5% (17)	11.6% (36)	<b>45.3% (141)</b>	37.6% (117)	3.15	311
<i>answered question</i>						<b>311</b>
<i>skipped question</i>						<b>0</b>

17. Do you believe that your IT and data center organizations currently have enough information, knowledge, and expertise to begin meaningful energy efficiency improvement?			
		Response Percent	Response Count
Yes, we're fully engaged		40.3%	124
<b>Not yet; we're in research and planning now</b>		<b>49.0%</b>	151
Don't know; we're at the very beginning of consideration		10.7%	33
<i>answered question</i>			<b>308</b>
<i>skipped question</i>			<b>3</b>

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