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Public Law 109-431**

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Abstract

This report was prepared in response to the request from Congress stated in Public Law 109-431 (H.R. 5646), “An Act to Study and Promote the Use of Energy Efficient Computer Servers in the United States.” This report assesses current trends in energy use and energy costs of data centers and servers in the U.S. (especially Federal government facilities) and outlines existing and emerging opportunities for improved energy efficiency. It also makes recommendations for pursuing these energy-efficiency opportunities broadly across the country through the use of information and incentive-based programs.

Findings from this report include:

- An estimate that data centers consumed about 61 billion kilowatt-hours (kWh) in 2006, roughly 1.5% of total U.S. electricity consumption, or about \$4.5 billion in electricity costs.
- Federal servers and data centers alone account for approximately 6 billion kWh (10%) of this electricity use, at a total electricity cost of about \$450 million/year.
- Assuming current trends continue, in 5 years the national energy consumption by servers and data centers is expected to nearly double, to nearly 100 billion kWh.
- Existing technologies and strategies could reduce typical server energy use by an estimated 25% — even greater energy savings are possible with advanced technologies.
- Assuming state-of-the-art energy efficiency practices are implemented throughout U.S. data centers, this projected energy use can be reduced by up to 55% compared to current efficiency trends.

This report makes several recommendations for policies to achieve this savings potential. Among these recommendations are standardized performance measurement for data centers and their equipment, leadership on energy efficiency in federal data centers, a private sector energy challenge, information on best practices, and further research and development on energy efficiency technologies and practices.

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