EPA Technical Workshop on Energy-efficient Servers and Data Centers in the U.S.

February 16, 2007
Santa Clara Convention Center

Preliminary Working Group Session Topics

WORKING GROUP 1: IT EQUIPMENT

This working group will discuss study tasks and information needs related to IT equipment (i.e., server components, servers, networking equipment, and storage devices) in support of the following H.R. 5646 study objectives:

- Analysis of growth trends associated with data centers and the utilization of servers in the Federal Government and private sector;

- Analysis of the industry migration toward the use of energy-efficient microchips and servers designed to provide energy-efficient computing;

- Analysis of the potential cost savings to the Federal Government and private sector through the adoption of energy-efficient servers (and related IT equipment);

- Analysis of the potential impacts of energy efficiency on reliability and performance;

- Recommendations regarding potential incentives, voluntary programs, and future research that could be used to advance the adoption of energy-efficient servers (and related IT equipment).

Topics of particular interest for discussion include:

- Estimating the energy use of IT equipment (methodology and data);
- Estimating the number of Federal versus private sector servers and data centers;
- IT equipment industry trends;
- Definitions and metrics for the energy efficiency of IT equipment;
- Identifying plausible near-term energy efficiency improvement scenarios related to IT equipment;
- Estimating the potential energy and cost savings associated with energy efficiency improvements to IT equipment;
- Identifying potential impacts of energy efficiency on IT equipment reliability/performance;
- Identifying opportunities for incentives, voluntary agreements, and future R&D.

Preliminary Working Group 1 agenda items:

1. Presentation of relevant study objectives and proposed work plan
2. Solicitation of working group input on proposed work plan
3. Discussion of preliminary data assumptions and identified information gaps
4. Definition of process and sources to address information gaps
5. Summary of key working group outcomes and next steps

WORKING GROUP 2: POWER AND COOLING INFRASTRUCTURE

This working group will discuss study tasks and information needs related to data center power (UPS, backup power, grid supply, and distributed generation) and cooling infrastructure in support of the following H.R. 5646 study objectives:

- Analysis of growth trends associated with data centers and the utilization of servers in the Federal Government and private sector;

- Analysis of the potential cost savings to the Federal Government and private sector through the adoption of energy-efficient data centers;

- Analysis of the potential cost savings and benefits to the energy supply chain through the adoption of energy-efficient data centers and servers;

- Analysis of the potential cost savings and benefits to the energy supply chain through the use of stationary fuel cells for backup power and distributed generation;

- Recommendations regarding potential incentives, voluntary programs, and future research that could be used to advance the adoption of energy-efficient infrastructure systems.

Topics of particular interest for discussion include:

- Estimating the energy use of data center power and cooling systems (methodology and data);
- Data center power and cooling industry trends;
- Estimating the power grid impacts of improved data center energy efficiency;
- The application of fuel cells and distributed generation to data centers;
- Opportunities related to combined heat and power in data centers;
- Identifying plausible near-term energy efficiency improvement scenarios related to power and cooling systems;
- Estimating the potential energy and cost savings associated with energy efficiency improvements to power and cooling systems;
- Identifying opportunities for incentives, voluntary agreements, and future R&D.

Preliminary Working Group 2 agenda items:

1. Presentation of relevant study objectives and proposed work plan
2. Solicitation of working group input on proposed work plan
3. Discussion of preliminary data assumptions and identified information gaps
4. Definition of process and sources to address information gaps
5. Summary of key working group outcomes and next steps

WORKING GROUP 3: INTEGRATED DESIGN, OPERATION, AND MANAGEMENT ISSUES

This working group will discuss study tasks and information needs related to integrated data center design, operation, and management issues (i.e., those spanning both IT equipment and power and cooling infrastructure) in support of the following H.R. 5646 study objectives:

- Analysis of the industry migration to the use of energy-efficient microchips and servers designed to provide energy-efficient computing;

- Analysis of the potential cost savings to the Federal Government and private sector through the adoption of energy-efficient servers (and related IT equipment) and infrastructure systems;

- Analysis of the potential impacts of energy efficiency on reliability and performance;

- Recommendations regarding potential incentives, voluntary programs, and future research that could be used to advance the adoption of energy-efficient servers (and related IT equipment) and infrastructure systems.

Topics of particular interest for discussion include:

- Identifying management and operational practices and policies that impede energy efficiency in the data center;
- Discussion of integrated measurement and control strategies to improve data center energy efficiency;
- Identifying plausible near-term energy efficiency improvement scenarios related to integrated design, operation, and management strategies;
- Estimating the potential energy and cost savings associated with energy efficiency improvements related to integrated design, operation, and management strategies;
- Identifying potential impacts of data center energy efficiency on reliability and performance;
- Discussion of whole-facility benchmarking approaches;
- Identifying opportunities for incentives, voluntary agreements, other initiatives (e.g., training) and future R&D to overcome identified management and operational barriers.

Preliminary Working Group 3 agenda items:

1. Presentation of relevant study objectives and proposed work plan
2. Solicitation of working group input on proposed work plan
3. Identification and discussion of treatment of integrated strategies
4. Definition of process and sources to address information gaps
5. Summary of key working group outcomes and next steps

WORKING GROUP 4: INCENTIVES AND VOLUNTARY PROGRAMS

This working group will discuss study tasks and information needs related to incentives and voluntary programs in support of the following H.R. 5646 study objectives:

- Summarize current government incentives offered for energy-efficient products and services, and consideration of similar incentives to encourage the adoption of energy-efficient data centers and servers;

- Offer recommendations regarding potential incentives and voluntary programs that could be used to advance the adoption of energy-efficient data centers and computing.

Topics of particular interest for discussion include:

- Discussion of existing market barriers to improved energy efficiency for servers and data centers;
- Review of existing and emerging incentives and voluntary programs;
- Discussion of other types of incentives and programs that could be used to address identified market barriers;
- Discussion of Federal versus non-Federal incentives;
- Discussion of other initiatives that could help improve energy efficiency (e.g., industry standards, information/education/training, R&D policies, and utility incentive programs);
- Identification of key information inputs necessary from other study tasks to inform the final policy recommendations;
- Identification of logical categories for final policy recommendations.

Preliminary Working Group 4 agenda items:

1. Presentation of relevant study objectives and proposed work plan
2. Solicitation of working group input on proposed work plan
3. Discussion of existing initiatives and voluntary programs
4. Discussion of ideas and process to develop final policy recommendations
5. Summary of key working group outcomes and next steps