



# U.S. Environmental Protection Agency ENERGY STAR Server Specification May 28, 2009

**Andrew Fanara**  
EPA ENERGY STAR®  
Product Development Team



Learn more at [energystar.gov](http://energystar.gov)

# Main Benefits of ENERGY STAR



- **Efficient power supplies** – lower conversion losses, generates less waste heat, reduces cooling load on facilities;
- **Improved power quality** - facility-wide efficiency benefits;
- **Real time power use, processor utilization, and air temperature measurement** - improves manageability and lowers total cost of ownership;
- **Advanced power management features**- save energy across various operating states; and
- **A power and performance data sheet** - standardizes key information on energy performance, features and other capabilities.

# Identifying ENERGY STAR Servers



## EPA Website

- Qualified Product lists published monthly (or more frequently early in the program)

## Manufacturer Websites

- ENERGY STAR mark used where product information and specifications are provided
- Special website sections dedicated to energy-efficiency / ENERGY STAR
- On power and energy calculators
- On the Power and Performance Data Sheet

# Greater Transparency of Information



- ENERGY STAR **Power and Performance Data Sheet** will allow buyers and end-users to compare energy use, thermal characteristics and performance of servers
  - Posted with product specs on manufacturer Web site
  - A template for the data sheet is available on the EPA Web site
  - Will reward manufacturers who are providing efficiency info on their products in an **open and transparent way**

**ENERGY STAR® Power and Performance Data Sheet**  
XYZ Manufacturer Model 12345

**System Characteristics**

Form Factor (1U, 2U, pedestal, dual-node, etc.)	1U Server
Available Processor Sockets	2
Available DIMM Slots / Max Memory Capacity	8 Slots / 32 GB
Available PCI or PCIe Slots	2 PCI & 2 PCIe
Minimum and Maximum # of Hard Drives	0 Minimum / 8 Maximum
Input Power Range (AC or DC)	100 - 240 VAC 50-60Hz
Redundant Power Supply Capable?	Yes
ECOC and/or Fully Buffered DIMMs	Yes - ECOC and Fully Buffered DIMMs
Operating Systems Supported	Windows Server, Linux, etc.

**System Configuration**

Processor Information (e.g. installed, model number, speed, # of cores, 2 x quad-core 3.0 GHz, etc.)	
Memory Information (total memory installed, memory types, # DIMMs, DIMM Size, etc.)	4 x 2 GB = 8 GB
Power Supply(s) (e.g. redundancy configuration n/2n/n+1, and wattage)	2 x 100 Watts (2n)
IO Devices (e.g. and type of devices, speed)	2 x 10W PCI/1000UT onboard Dual Port
Hard Drive Information (e.g. speed, capacity)	2 x 150 GB, 7.2K
Installed Operating System for Testing	Windows Server
Power Supply Efficiency at 10%, 20%, 50% and 100% Rated Load	72.0%, 87.0%, 91.0%, 99.0%
Service Processor Installed?	Yes
Other Hardware Features / Accessories	N/A

**Power Data**

Idle Category	Category D, 2P Managed Server
Test Voltage and Frequency	230V/60Hz
ENERGY STAR Idle Power Limit (15 and 25 only)	190.0
Measured Idle Power (watts)	170.0
Power at Full Load (watts)	282.0
Benchmark / Method for Full Load Test	SPECpower_bj_2005
Estimated kWh/year (Assumptions T20)	1979.76
Link to Detailed Power Calculator (if available)	<a href="http://www.vendor.com/powercalculator">http://www.vendor.com/powercalculator</a>

**Power and Performance Data for Benchmark #1**

Benchmark(s) Used and Type of Workload	SPECpower_bj_2005
Power @ Active Idle (watts)	148.0
Power @ 100% (watts)	225.0
Performance Score @ 100% (x1_1pt)	55458
Benchmark Score (Overall) (x1_1pt)	700
Estimated kWh/year (Assumptions T20)	1623.0
Link to Full Benchmark Report	<a href="http://spec.org/power_bj2005/results/sample.html">http://spec.org/power_bj2005/results/sample.html</a>

**Power and Performance Data for Benchmark #2**

Benchmark(s) Used and Type of Workload	
Idle Power (watts)	
Maximum Power (watts)	
Benchmark Performance Score(s)	
Benchmark and Power Score (max score/max power)	
Estimated kWh/year (Assumptions T20)	
Link to Full Benchmark Report	

# Next Steps

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- Tier 2 Server specification development currently underway to create an approach that reconciles both the energy consumed and work performed
  - Q1 2010 target to finalize Tier 2 requirements
  - Tier 2 effective date is October 15<sup>th</sup>, 2010
- Specification for Enterprise Storage equipment also under development
  - EPA will release a framework document in coming weeks
  - For more information and to participate in storage development please email [Storage@energystar.gov](mailto:Storage@energystar.gov).

# Benchmarking Entire Datacenters: DC Infrastructure Rating Goals



- Build on existing ENERGY STAR platform (1-100 scale)
- 75 or higher qualifies for ESTAR
- Applies to both stand-alone Data Centers & those in an office or other building
- Benchmark assess performance at data center level -- how a building performs not why
- Target date for new rating: **January 2010**
- For further information, contact:  
[ENERGYSTARdatacenters@icfi.com](mailto:ENERGYSTARdatacenters@icfi.com)

# Contact / More Information

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- Andrew Fanara, EPA ENERGY STAR
  - [Fanara.andrew@epa.gov](mailto:Fanara.andrew@epa.gov), 206-553-6377
- Arthur Howard, ICF International
  - [ahoward@icfi.com](mailto:ahoward@icfi.com), 206-280-2992

[www.energystar.gov/newspeccs](http://www.energystar.gov/newspeccs)

[www.energystar.gov/datacenters](http://www.energystar.gov/datacenters)



**Thank You!**