ENERGY STAR® for Data Centers

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Reflecting on the state of the US building market....

And signs of changing times...
Americans Grapple with Global Warming

The US represents 5% of the world’s population...

...But emits 19% of the world’s carbon dioxide (CO$_2$)

- 2008 U.S. emissions of CO$_2$ equivalent: 7.0 billion metric tons
- CO$_2$ is the most prevalent greenhouse gas driving climate change
- Over 94% of CO$_2$ emissions are from fossil fuel combustion
Energy efficiency legislation & building energy performance disclosure
Rising Energy Costs

Average Retail Price of Electricity
(cents per kWh)

- Residential
- Commercial

[Graph showing the trend of average retail price of electricity from 1995 to 2008, with separate lines for residential and commercial sectors.]
Impact of Data Center energy consumption

- Data center industry consumed 61 billion kWh for a total cost of $4.5 billion
  - ~1.5% of total US electricity consumption
- National energy consumption by data centers could nearly double by 2011
  - > 100 billion kWh representing a $7.4 billion annual electricity cost
How do “we” as market participants solve the energy puzzle?
... and how do you stay competitive in an evolving market?
Smart Decision Making is **all about information**...

- Each option offers a different combination of nutrition
  - *Which choice is best for a low salt diet? Low calorie? High calorie?*

- A nutrition label gives the consumer the ability to make an informed decision

**Corn Flakes**
- Calories: **100 cal**
- Salt: **200 mg**
- Sugar: **2 g**

**Oatmeal**
- Calories: **75 cal**
- Salt: **0 mg**
- Sugar: **0.5 g**

**Granola**
- Calories: **598 cal**
- Salt: **20 mg**
- Sugar: **7 g**

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**Energy STAR**

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**EPA**
Creating a competitive advantage with information

- EPA’s ENERGY STAR Program has worked with commercial real estate sector for over 10 years
- After benchmarking and demonstrating superior energy performance, building managers can earn the ENERGY STAR
- Buildings that earn the ENERGY STAR:
  - Save $.50 sq/ft (on average)
  - Consume 35% less energy
  - Have increased asset value from performance improvements
  - Have increased tenant satisfaction and retention
  - Have increased visibility (e.g. online listings in CoStar, Travelocity)
  - Have additional opportunities for savings (e.g. discounted insurance rates)

Kats & Perlman, 2006
Bringing Information to the Market: Solutions from ENERGY STAR

- The Government is responding with a broad based effort to help data center operators reduce overhead by gaining control of rising energy costs.

- EPA & DOE have developed tools targeted to break down key barriers to implementing efficiency efforts.

- Solutions are broad based, holistic and focus on information first – rather than technology.
ENERGY STAR Qualified Products

- Computer Servers
- Data Center Storage – in development
- Uninterruptible Power Supplies (UPS) – early development
Standardized Building Performance Metric

- Assess whole building energy performance in an easy-to-understand metric
- Compare a building’s energy performance to national peer group

**Fuel Efficiency Rating**

Is 51 MPG high or low for an automobile?

**Energy Performance Rating**

Is 90 kBtu/sf/year high or low for an office building?

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Superior Energy Management!
Information is a key component of both the ENERGY STAR products and buildings efforts.

The PPDS is being incorporated into efforts for servers, storage, and UPS.

- Communicates key efficiency, configuration, and operational information.
- Assists with purchase comparisons, product research.

Portfolio Manager can create reports for internal business discussions.

**Power and Performance Data Sheet**

**Statement of Energy Performance**

(Products)
Closing Thoughts

- **Sustainability is a survival strategy**
- **Data center operators have opportunity to reduce energy consumption, costs, and GHG emissions**
- **Develop a long term plan & phase in over time**
  - Emphasize collaboration & learning to identify, measure and track -- before investing in “technology”
- **ENERGY STAR provides tools and information that can be used to make decisions resulting in reduced energy consumption and costs**