Utility Opportunities for IT Energy -Efficiency Programs: Beyond Power Management

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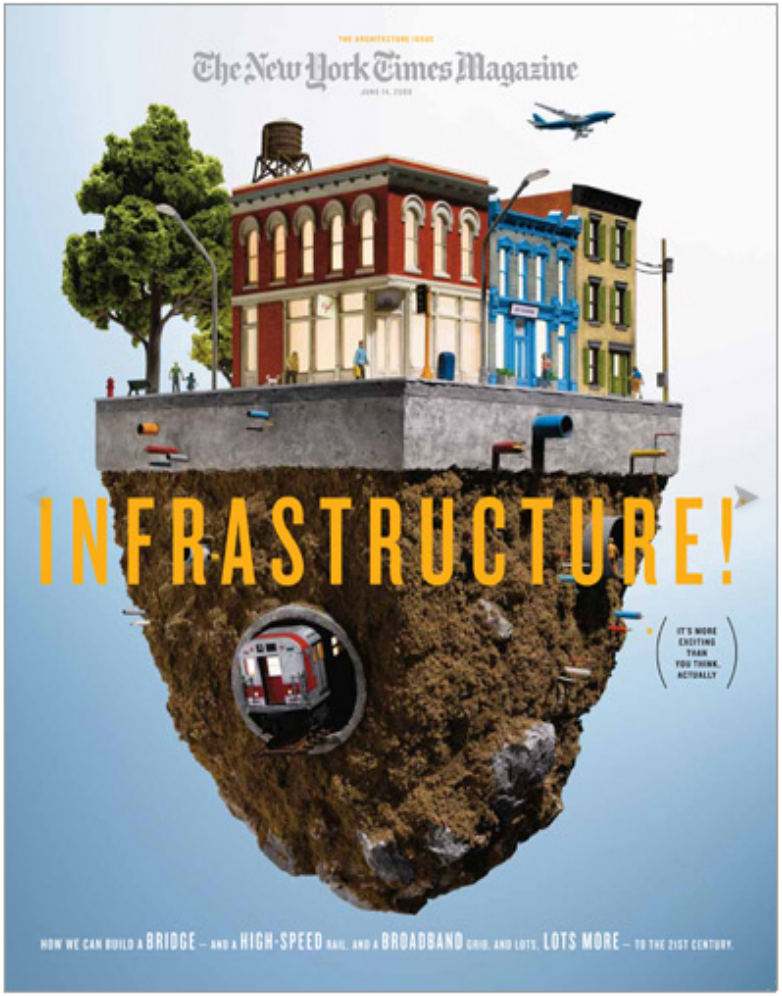
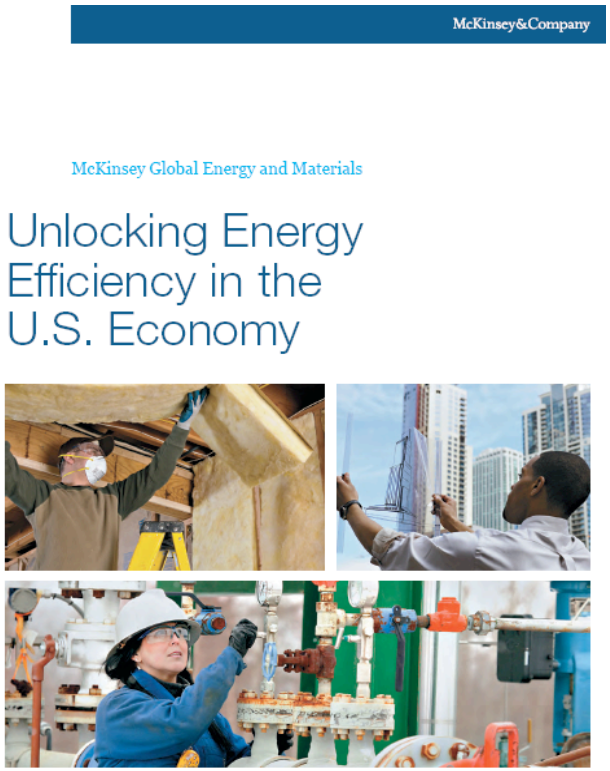
Data Center Overload
The NY Times Magazine - June 14, 2009



New McKinsey Report

- Unlocking Energy Efficiency in the U.S. Economy - released July 2009
- Notes EPA's projection of data center energy use growth by 9.6% /year through 2020
- 60% of the data center opportunity is in small to medium sized businesses
- Message – efficiency is a significant energy resource – abating as much as 1.1 giga-tons of CO_2 by 2020 - but accessible only if a national policy can be crafted to unlock it
- [www.mckinsey.com /USenergyefficiency](www.mckinsey.com/USenergyefficiency)



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ENERGY STAR Strategy: From the Desktop to the Data Center

- Computers
  - Version 5.0 now in effect
  - Active mode efficiency is the future goal
- Computer Servers
  - Tier 1 now in effect
  - Tier 2 being developed
- Data Center Storage (Tier 1 being developed)
- Data Center Facility Benchmark (preliminary meeting occurred 9-29-2009)
- Data Center Network Equipment /Uninterruptible Power Supplies (Next in Line)

ENERGY STAR Computers: Pushing Efficiency at Hi-Tech Speed

- Version 4.0 of spec (effective July 2007)
  - Average ENERGY STAR qualified computer uses 67 watts
- Version 5.0 of spec (effective July 2009)
  - Average ENERGY STAR qualified computer uses 46 watts
- In two years, ENERGY STAR partners decreased computer energy use by 30% on qualified computers
- Savings are considerable with new ENERGY STAR qualified computers compared to computers in stock

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Annual Savings with ES Version 5.0 Computer

- New 5.0 PC delivers substantial savings vs. typical stock PC

Computer Use Assumption	Annual Savings at…	
	$ 0.11 / kWh (Nat'l avg commercial rate)	$ 0.18 / kWh (Avg residential rate in NE)
CPM not utilized, PCs left on at night	$ 32	$52
CPM not utilized, but PCs turned off every night	$13	$22
New PC uses CPM, old doesn't, left on at night	$71	$116

Assumptions: old PC burned 79 watts on average, new PC burns 46 watts on average

Lifetime Savings with ES Version 5.0 Computer

- Energy savings can approach 50-100% of the cost of a new PC – around $400!

Assumption	**Lifetime** savings (4 yrs) at…	
	$ 0.11 / kWh (Nat'l avg commercial rate)	$ 0.18 / kWh (Avg residential rate in NE)
CPM not utilized, PCs left on at night	$ 127	$207
CPM not utilized, but PCs turned off every night	$53	$87
New PC uses CPM, old doesn't, left on at night	$282	$462

New Business-Class OptiPlex™ PCs start at $432 as of 9/17/09.)

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ENERGY STAR Server Specification - Highlights

- Requirements:
  - Power supply efficiency targets that scale with size
  - Maximum idle power consumption levels set by category & also scale
  - Server must have the ability to measure & report its power, temperature & processor utilization
  - Each server must have its own Power & Performance Data Sheet
  - Blade servers will be covered soon - timing depends ability to determine approach for Idle measurement
- Timeline
  - Tier 1 effective on May 1, 2009 and will be in place 12 to 24 months
  - Tier 2 framework document coming soon

ENERGY STAR Server Specification – Savings

- Standard computer servers can consume between 1,200 to 8,600 kWh annually.
- ENERGY STAR qualified servers could save as much as 1,000 kWh per server annually.
- Over a five-year lifetime, companies could save as much as $500 for each server they install.
- If all servers sold in the United States meet the ENERGY STAR requirements, the savings in energy costs will grow to $790 million each year, equivalent to the greenhouse gas emissions from over one million vehicles.

Future Initiatives

- Data Center Storage
  - Plan to adopt a taxonomy to segment the market, explore hardware & software strategies, identify efficiency metrics, review existing benchmarks & test procedures
  - A specification framework was distributed for comment on June 4, 2009 -- get involved! email storage@energystar.gov
- Data Centers
  - Build on existing ENERGY STAR buildings platform
  - Applies to both stand-alone DCs & those in an office or other building
  - **Assess performance at the building level -- how a building performs not why**
  - Point users to additional unbiased resources to help pursue a tailored strategic energy management plan based on business goals and available resources

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References and Resources

- Andrew Fanara: Fanara.andrew@epa.gov
- ENERGY STAR Computers and Servers: energystar.gov/products
- ENERGY STAR Data Center Initiatives: energystar.gov/datacenters