

Efficient and Green IT

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Autumn 2008



Agenda

- ⊕ About Nemertes
- ⊕ What Is “Green IT”?
 - ⊕ Technologies
 - ⊕ Policies
- ⊕ Cost Components and Carbon Footprints
- ⊕ Technologies That Increase Efficiency
- ⊕ Green Policies
- ⊕ Putting It All Together
- ⊕ The Business Case
- ⊕ Bottom Lines

Introductions

About Nemertes:

- ⊕ Research advisory firm focused on analyzing business value of emerging technologies
- ⊕ Key differentiator: Real-world, real-time benchmarks of 1000s of leading-edge enterprise organizations (data centers, advanced communications services, virtualization in 2003, 2004, 2005, 2006, 2007, 2008)
- ⊕ No sponsored research! 100% objective.
- ⊕ Factual data captured from real enterprises

What Is “Green IT”?

- ⊕ “Green is about saving greenbacks, not saving the world”—IT executive
- ⊕ “Green computing is the socially responsible thing to do”—John Chambers, Cisco CEO
- ⊕ So which is it?



Green AND EFFICIENT IT Is...

- ⊕ Reducing power consumption by deploying energy-efficient technologies
- ⊕ Reducing carbon footprint by minimizing travel
- ⊕ Leveraging renewable energy sources where possible
- ⊕ Reducing rate of hardware consumption (fewer servers, less storage)
- ⊕ Reducing facilities footprint by consolidating data centers and telecommuting
- ⊕ Ensuring sustainable supply chains

Technology + Policy = Green

⊕ Technologies:

- ⊕ Virtualization (increases utilization)
- ⊕ Automated power management
- ⊕ Modular HVAC
- ⊕ Conferencing (audio, video, presence)
- ⊕ Renewable energy (solar, wind, thermal)

⊕ Policies:

- ⊕ Consolidation
- ⊕ Telecommuting, virtual work
- ⊕ Sustainable supply chains
- ⊕ Recycling

Not Either/Or, Both/And

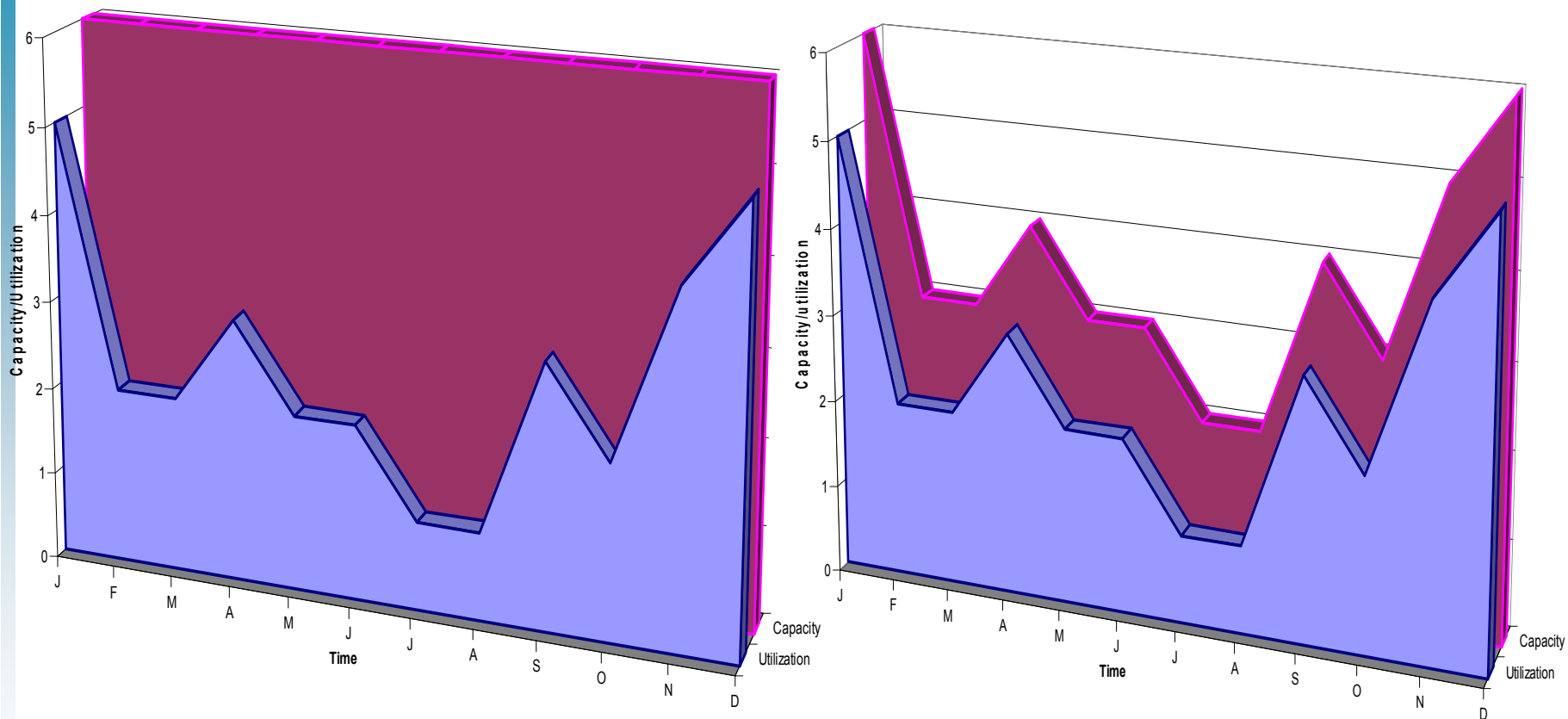
Component	Cuts Cost?	Reduces Carbon Footprint?
Consolidation	✓	✓
Virtualization	✓	✓
Automated Power Management	✓	
Modular HVAC	✓	
Renewable Energy		✓
Conferencing	✓	✓
Telecommuting		✓
Sustainable supply chains		✓
Recycling		✓

So Let's Talk Technologies

⊕ Technologies:

- ⊕ Virtualization (increases utilization)
- ⊕ Automated power management
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Virtualization Increases Utilization



Automated Power Decreases Energy Consumption

- ⊕ Most servers use 50% of their rated power even when idle
- ⊕ So you're using 50% of the electricity but only doing 5% work
- ⊕ Solution: Consolidate workloads with virtualization, turn off idle servers
- ⊕ For every productive \$ in your servers almost \$2 are wasted in UPS, AC/DC conversions and fans
- ⊕ Which means that every dollar you cut in consumption cuts \$2 more in losses and inefficiencies
- ⊕ Alternate hot-cold aisles to make most efficient use of cooling

Alternative Energy Reduces Footprint

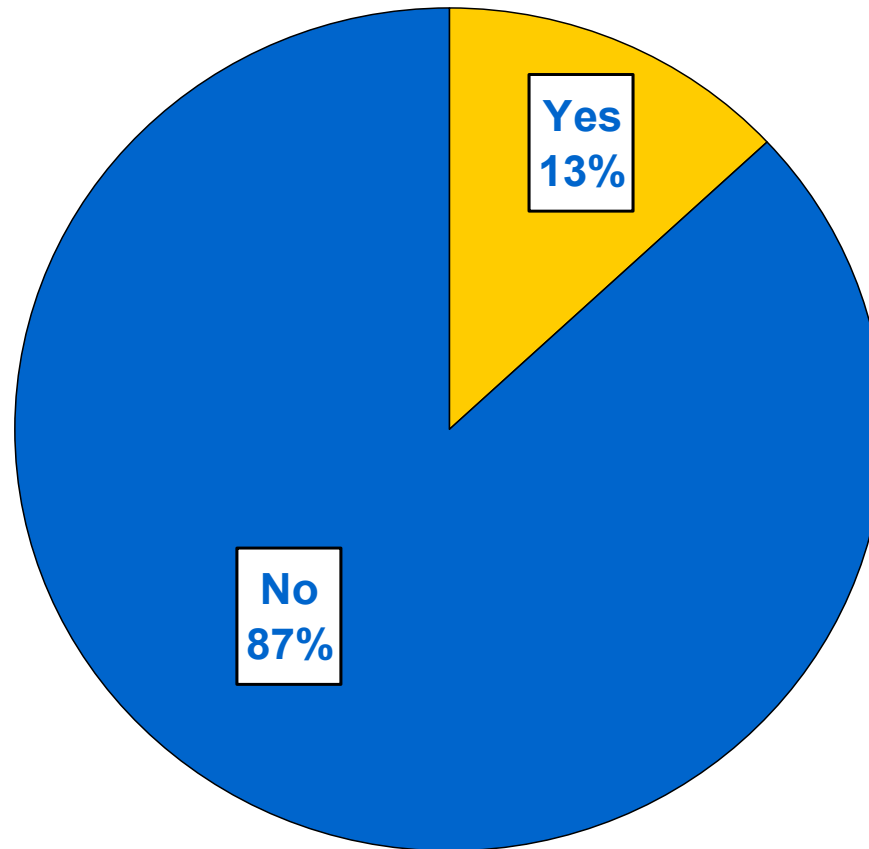
- ⊕ Where do I put a new data center?
- ⊕ kWh trumps IT staff
- ⊕ Why is Google in Oregon? Hydro!
- ⊕ Why is Google in SC? Chinese T-Shirts!



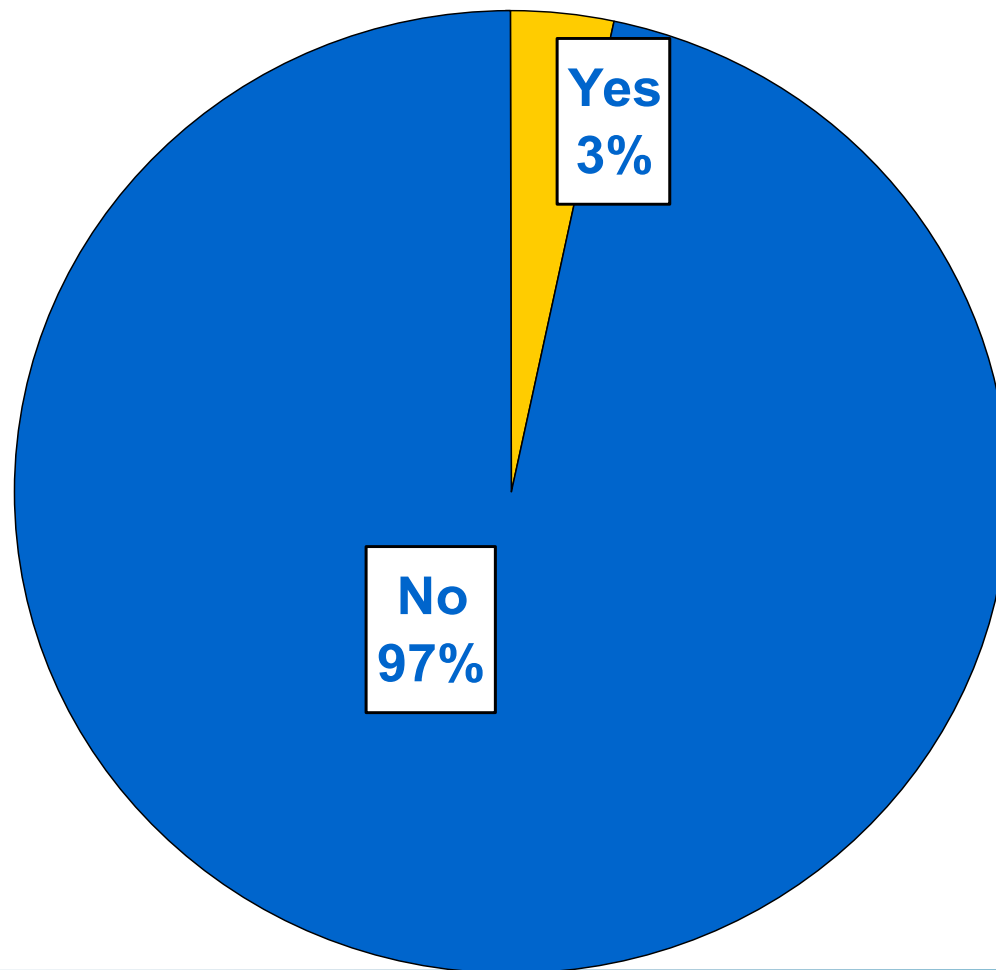
We Know What to Do, But...

- ⊕ Even though most companies have consolidated data centers, deployed virtualization (97%)...
- ⊕ ...basically nobody knows their data center energy costs
- ⊕ ...basically nobody is turning off servers when not in use
- ⊕ ...basically nobody is turning off desktops when not in use
- ⊕ This can be changed!

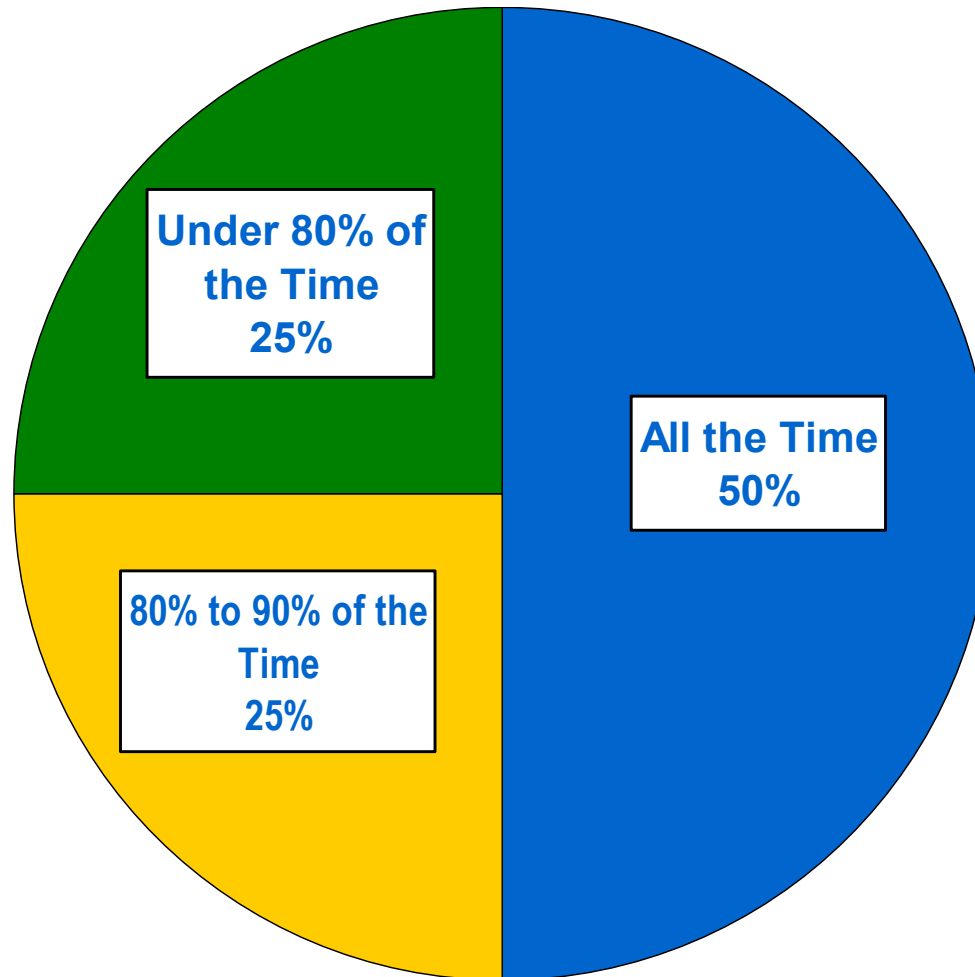
Know Data Center Energy Costs?



Turn Off Servers When Not In Use?



Desktops Are On...



Why This Is A Problem

- ⊕ If most servers use 50% of rated power when idle, and...
- ⊕ If average utilization is 5%, that means...
- ⊕ For every 100 servers, only 5 are in use...
- ⊕ Turning off the other 95 results in a 47.5% decrease in power consumption
- ⊕ Bottom line: Turning off unused servers can cut your server power bills almost in half!
- ⊕ (Assumption: You're using virtualization to consolidate workloads to servers in use)

You Can't Fix What You Don't Measure!

- ⊕ Get acquainted with your data center utility bills
- ⊕ Track server and desktop on-time
- ⊕ Measure impact of virtualization
- ⊕ Deploy technologies known to cut energy costs

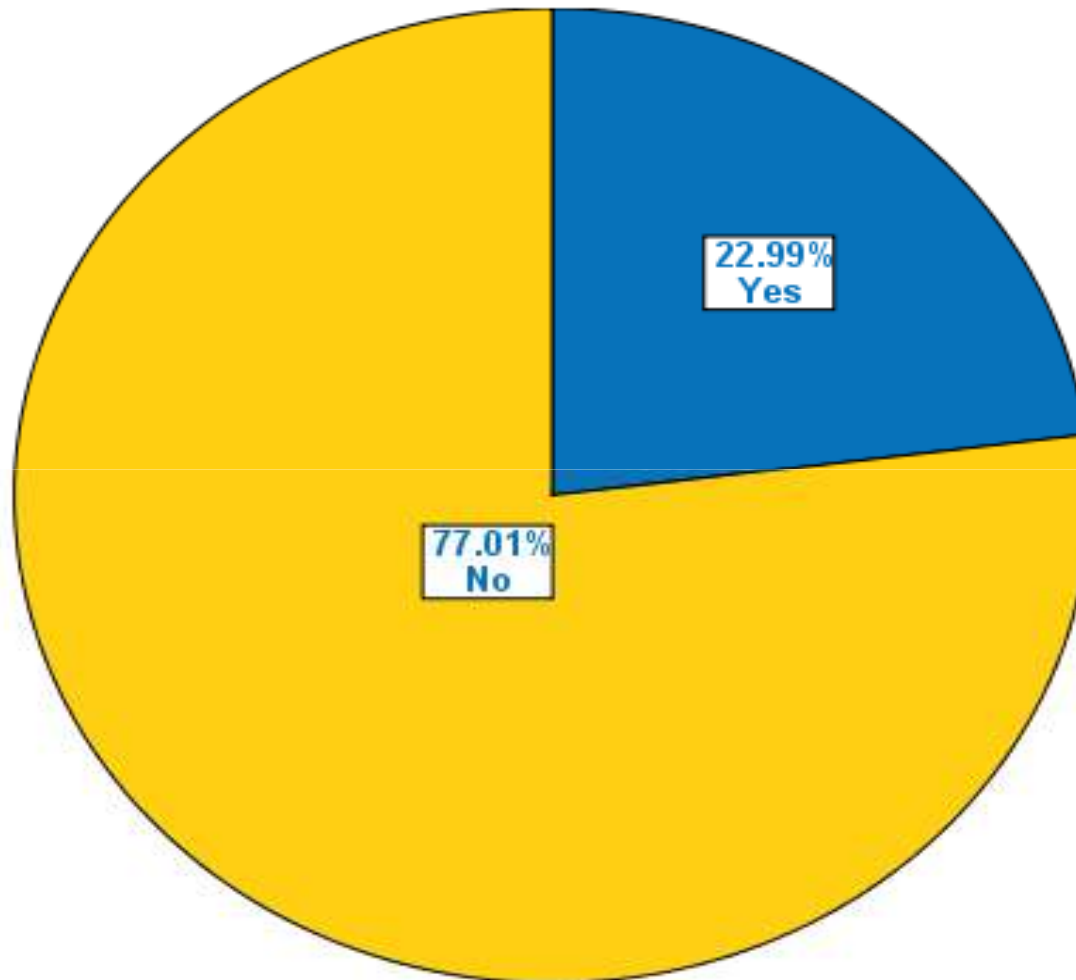


A Matter of Policy

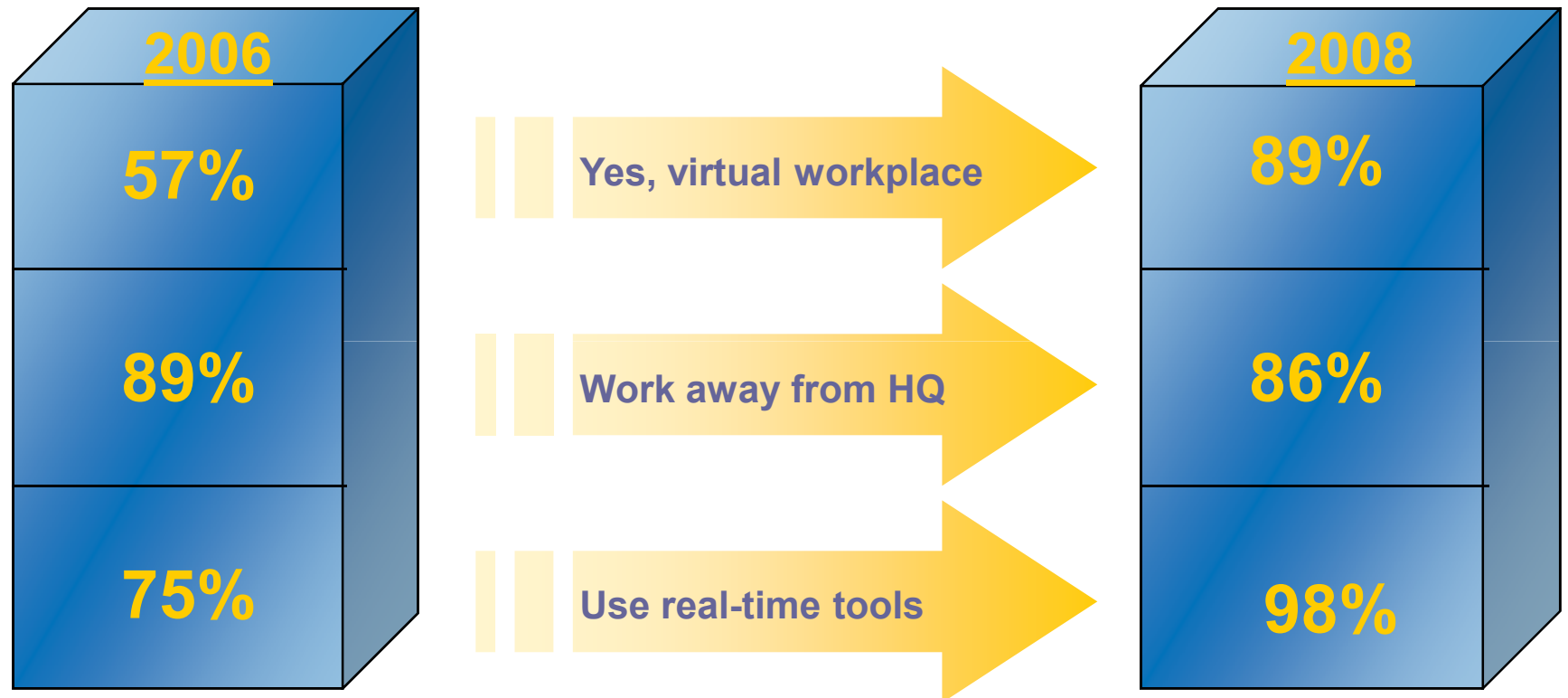
- ⊕ Corporate policies and mandates have a measurable impact on deployment of green practices
- ⊕ Yet most companies lack a consistent, coherent set of policies, whether:
 - ⊕ Energy minimization/cost reduction
 - ⊕ Green strategy/carbon footprint reduction



Corporate Green Policies



Virtual Workplace 2008



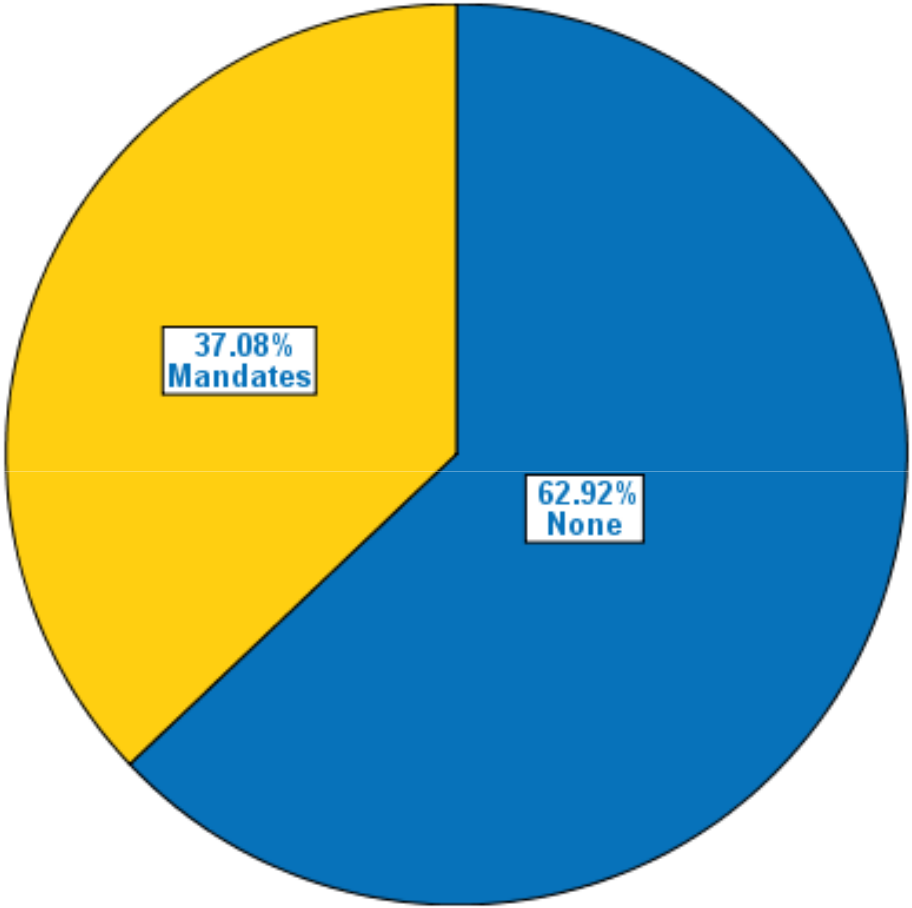
Telecommuting Cuts Carbon Footprint

⊕ Commute statistics:

- ⊕ Average American takes 50 minutes to go 32 miles (roundtrip)
- ⊕ Sun: commuting accounts for 98% of employee's carbon footprint
- ⊕ Eliminating commuting 2.5 days each week saves 5400 kwhr/yr per employee!

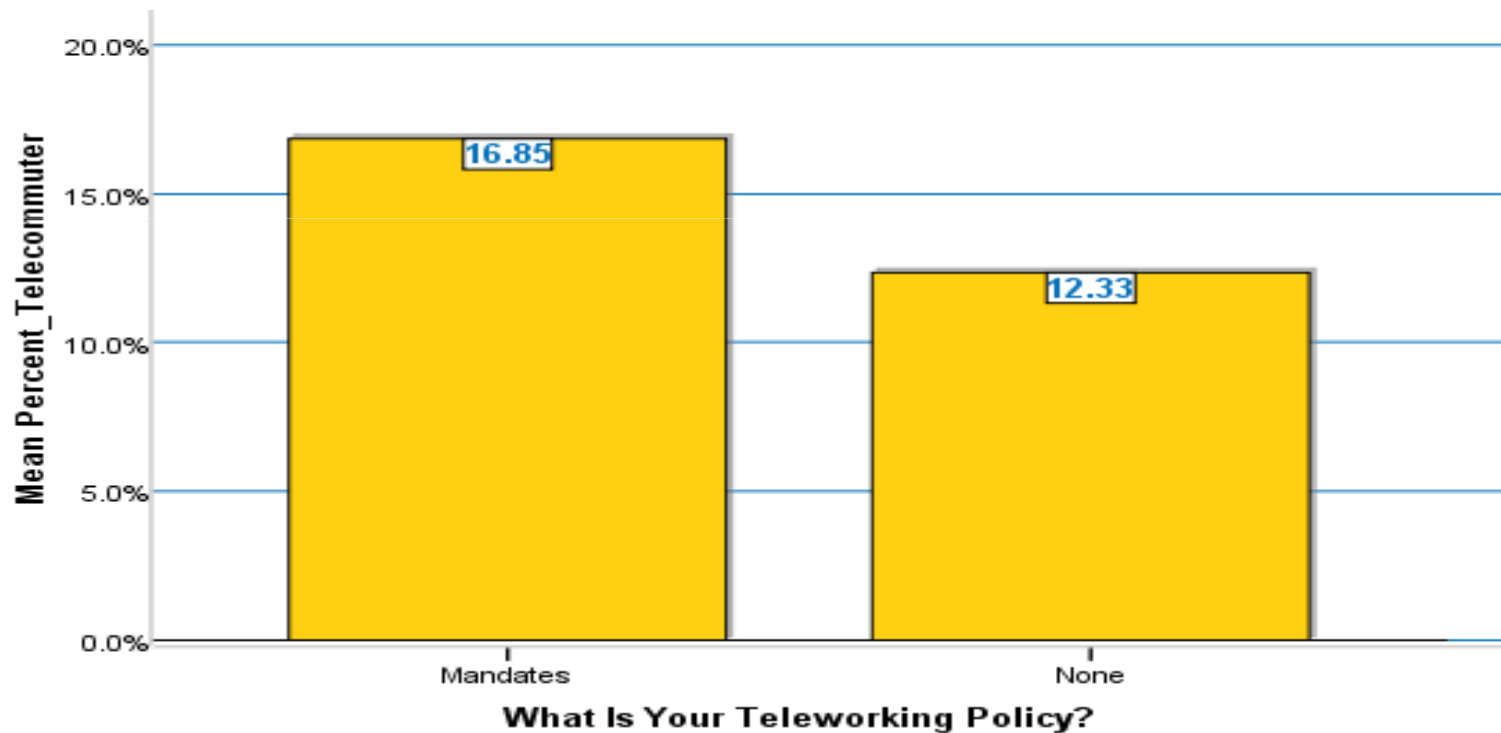


What Teleworking Policies Do You Have?



Mandates Matter!

- ⊕ Fewer than 20% of employees telecommute
- ⊕ Companies that mandate telecommuting have 37% more telecommuters than those that don't

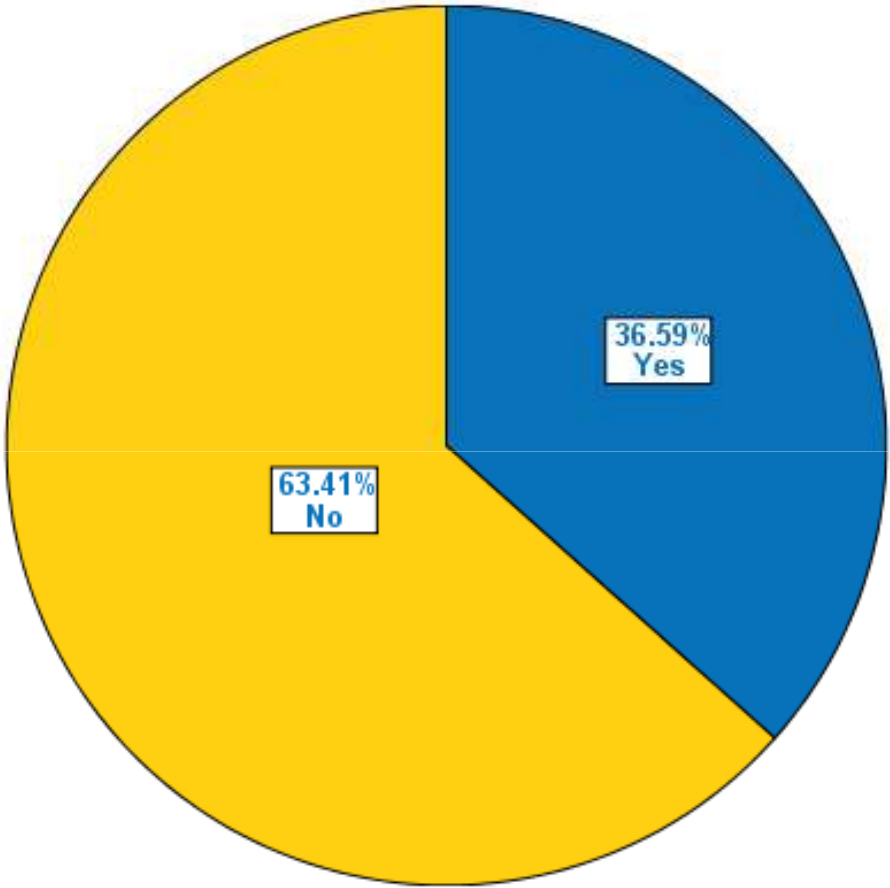


Technologies That Cut Commuting, Travel



- ⊕ Audio, video, web conferencing
- ⊕ Social computing
- ⊕ Mobility (no need to go into the office)
- ⊕ Presence (can locate people quickly without needing them to be physically present)

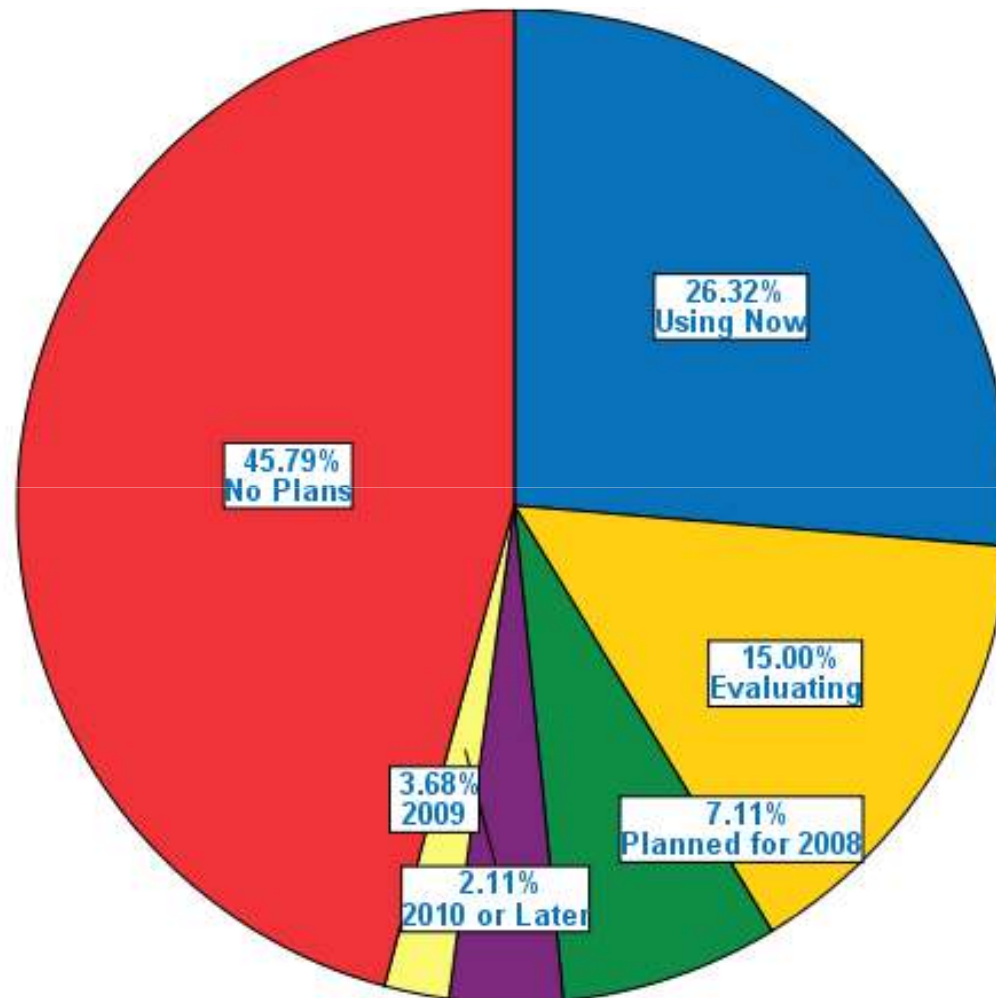
Policies To Promote Video Conferencing?



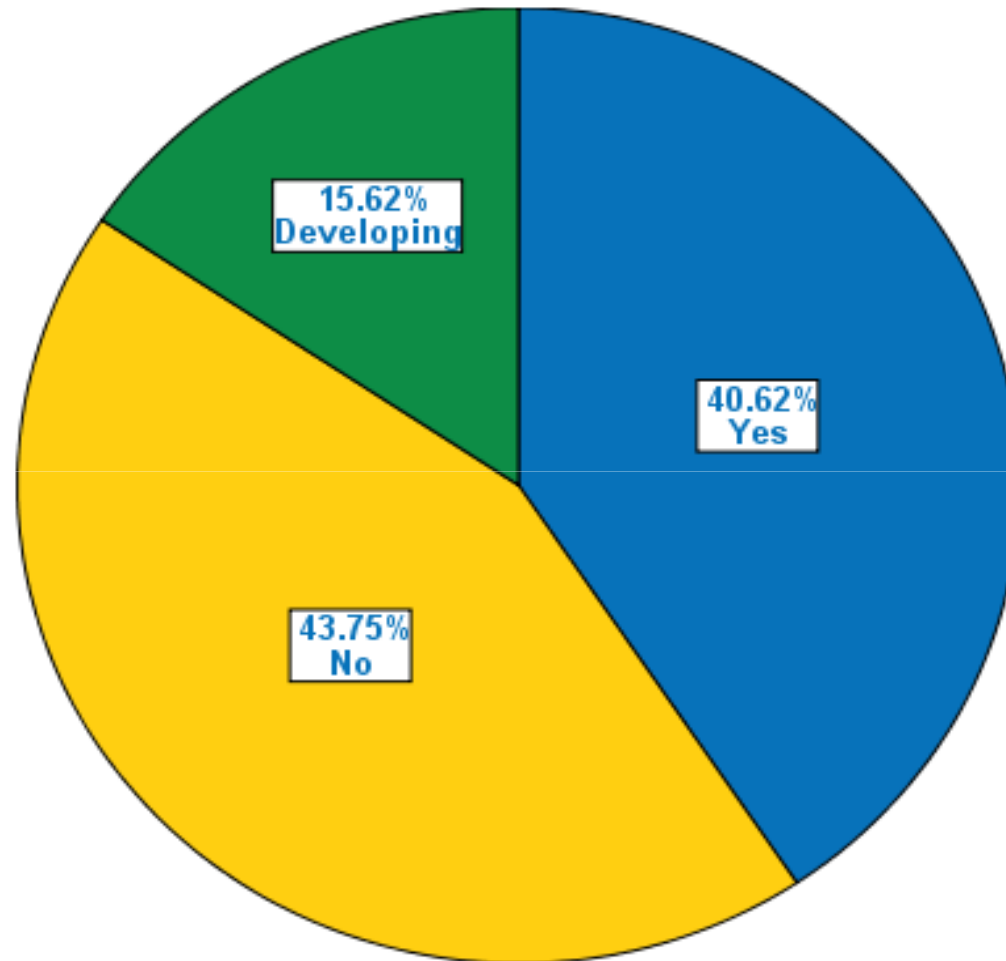
Deployment State of Selected Technologies

- ⊕ Telepresence: 38% using or planned, 27% evaluating
- ⊕ Desktop video: 52% using or planned, 24% evaluating
- ⊕ Web conferencing: 67% using or planned, 17% evaluating
- ⊕ Instant messaging: 68% using or planned, 14% evaluating

Use of Social Computing



Do you have a Mobility Strategy?



Putting It All Together

- ⊕ Turning off servers and desktops when not in use can cut your power bills for these devices by 40%
- ⊕ Mandating telecommuting can increase percentage of telecommuters by 37%
- ⊕ Having a policy makes a measurable difference
- ⊕ Effectively implementing these policies requires:
 - ⊕ Server and desktop virtualization
 - ⊕ Automated power management
 - ⊕ Collaboration technologies (web, audio, video conferencing, social networking, mobility)

The Business Case for Green & Efficient

Long-term savings equals:

- ⊕ “**Internal energy**” reduction (power bills for desktops, servers, facilities) plus
- ⊕ **Hard-dollar travel** reduction (car rental, plane fare, hotel costs), plus
- ⊕ “**External energy**” reduction (energy consumption of commuters and travellers, elimination of supply line inefficiencies)

Minus

- ⊕ **Amortized technology capex** (cost of installing collaboration, management, and virtualization technology) plus
- ⊕ **Operational technology costs**

That is:

$$\text{Savings} = (\$ \Delta \text{IE} + \$ \Delta \text{HDT} + \$ \Delta \text{EE}) - (\$ \text{ATC} + \$ \text{OTC})$$

Bottom Lines

- ⊕ Have a policy.
- ⊕ Consolidate data centers.
- ⊕ Deploy desktop and server virtualization.
- ⊕ Invest in automated power management.
- ⊕ Turn off servers and desktops when not in use.
- ⊕ Encourage telecommuting.
- ⊕ Invest in collaboration technologies.
- ⊕ Measure everything! Metrics are your friends!

Thank you!

