
Pew Business Environmental Leadership Council Workshop

**Pew Center Corporate Energy Efficiency Report
Operations & Technology**

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Citi Operations & Technology and Energy Efficiency

- **The Business Case**
- **Frameworks and Strategy**
- **Buildings**
- **Information Technology**
- **People (Organization and Behavior)**
- **Efficiencies of Efficiency**
- **Results and Challenges**

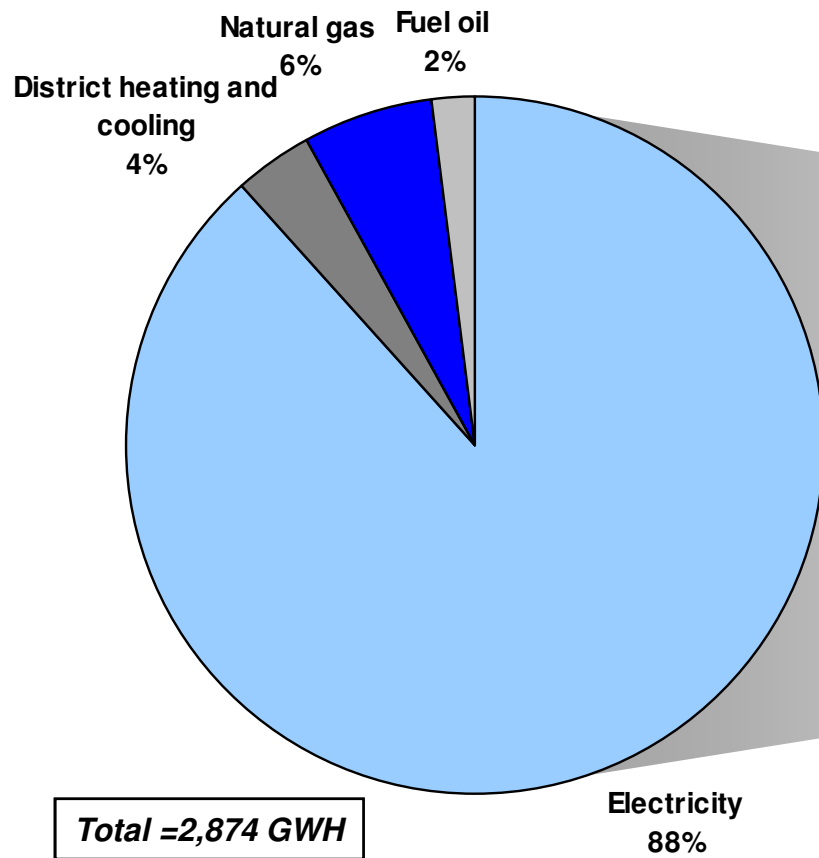
The Business Case

- **Reduce expenses**
- **Increase productivity**
- **Reduce risks**
 - Utility rates escalating
 - Anticipated carbon regulation
- **Develop expertise / Deepen client relationships**
- **Support stakeholder energy efficiency initiatives**
 - Governments (plaNYC 2030 – cut peak load by 25%)
 - NGOs (Clinton Climate Initiative)
- **Enhance our reputation**
 - Recruitment and retention

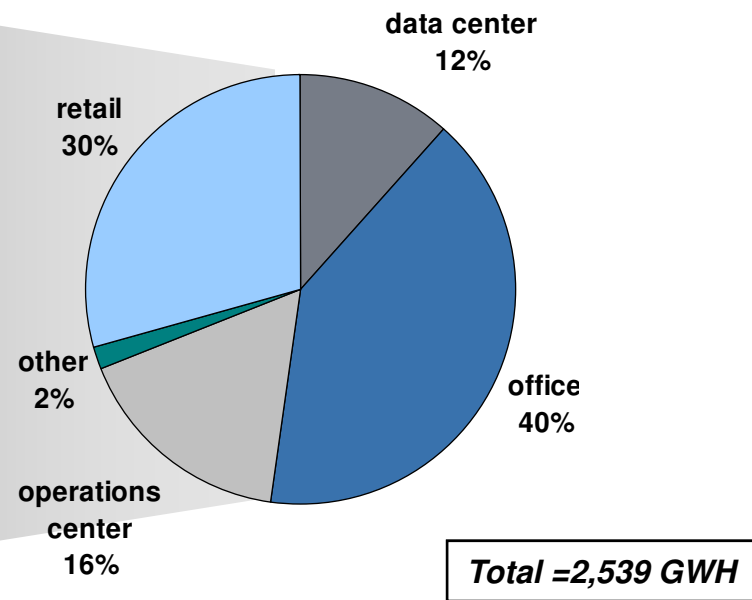
Frameworks and Strategy

Manage what you measure: Environmental Database

2007 Global Energy Use



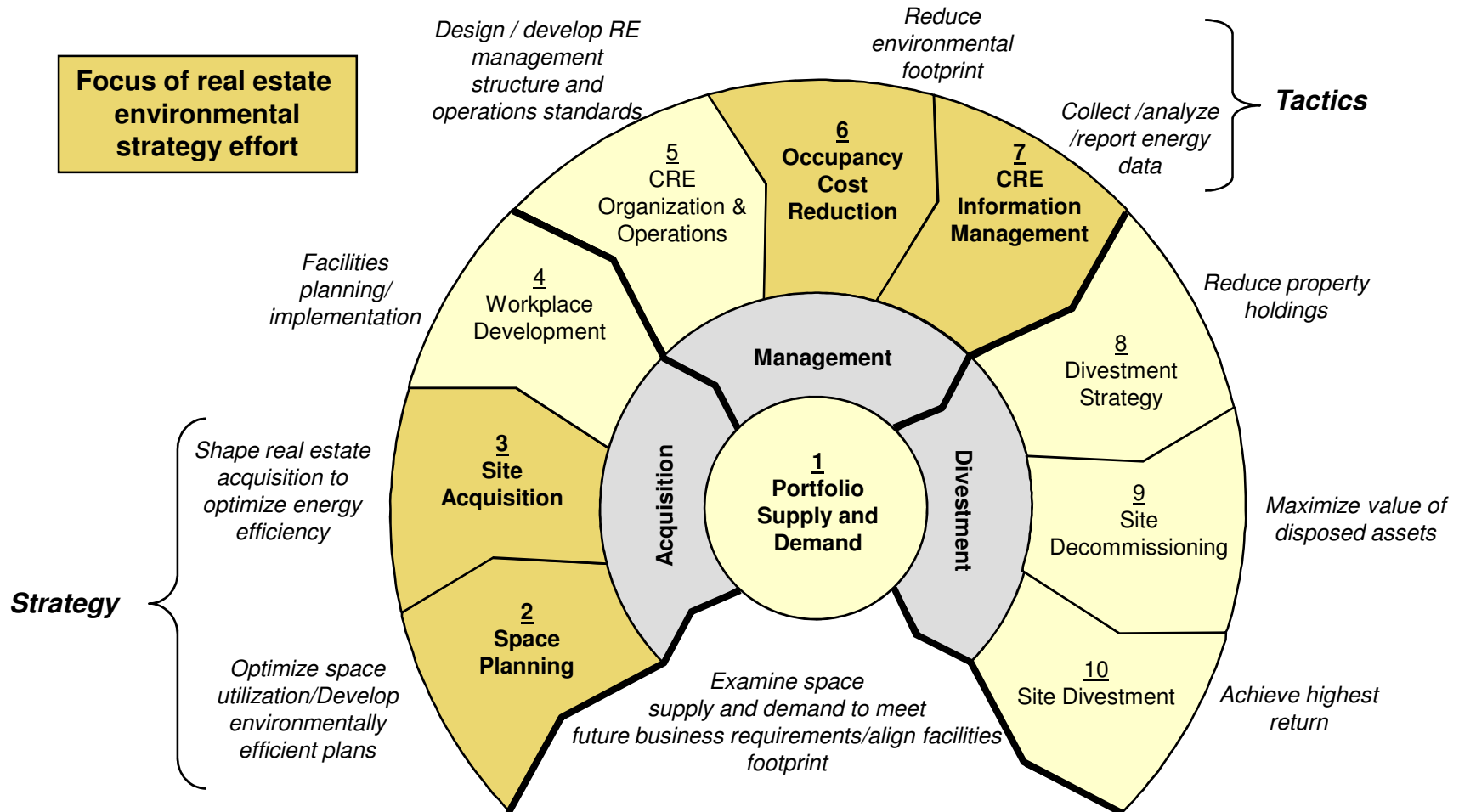
Global Electricity used by property type



Source: CRS Environmental Database

Frameworks and Strategy

Integration with Real Estate Cycle and Business Strategy



Frameworks and Strategy

Realty Services Prioritization Systems

- Define and Prioritize
- Build Teams
- Measure and Manage
- Market Success
- Assess Annually
- Adjust Program

Citi Green Strategies	Region							Real Estate Cycle	Balanced Scorecard					
	NA US/Canada	NA US Northeast	NA Private Client	Mexico	LATAM	EMEA	Asia Pacific		People (Employees)	People (Customers)	Process	Profit	Publicity	Planet
Site Design & Building/ Site Selection														
Access to public transportation (1st priority, transit for public, then staff commute)	■	■			■	■		PD	●	●		◐	●	●
Minimum 20% rainwater filtration								D/C			●	●	●	●
Environmental Impact Study	■	■	■	■	■	■	■	D/C			●	●	●	●
Tree inventory Layout	■			■				D/C	●				●	●
LEED strategies in Texas, NY, Germany	■	■				■		D/C	●	○	●	◐	●	●
Rainwater collection for irrigation	■	■		■				D/C	○	○	●	●	●	●
Building Orientation & Other criteria (I.E. daylighting, etc)								PD			●	●		
Pervious cover mitigation/ Rooftop anti-reflection/Solar structured os surface								D/C						●
Site selection standards/Specifications and branches								L/ PD	●	●	●	●	●	●
Site parking/ access to parking/ structured O.S. surface								L	●	●	●	●	●	●
Site parking/ access to parking/ structured O.S. surface								PD						●
Sharing ratios reduce "footprint"/density								PD / D/C	◐		●	●		●
multi-use space req's site access/planning/security								P/D	◐	●	●	○	●	●
Lease language to influence developer's and landlords (need to champion at indiv. Level)								L			●		◐	●

Frameworks and Strategy

Information Technology

*Employee Education & Engagement **

	Ways IT Can Reduce Its Own Environmental Impact	Ways IT Can Reduce Citi's Environmental Impact
IT Specific	Power Management <ul style="list-style-type: none"> • Client Computing • Data Centers • Sensor Controls 	Paper Substitution <ul style="list-style-type: none"> • Electronic document imaging and retention • Electronic Statements and Billing • Electronic Faxing
IT Enabled	Sustainable Supply Chain <ul style="list-style-type: none"> • Vendor evaluation on carbon footprint, risk analysis, contract policy language • Procurement Policy • Asset Management and Recycling 	Travel Substitution <ul style="list-style-type: none"> • Web / Video conferencing • Alternate Work Strategies • Online Collaboration and Training
Cross-Functional Team Collaboration		

* 80% of what we need to do to achieve our goals involves behavioral and cultural change.

Frameworks and Strategy

Quick Wins (No/Low Cost Immediate Actions)

- **Adjust temperature guidelines for owned and net leased facilities (78/70)**
- **Minimize AC and lighting hours of operation (7-12 to 7-7)**
- **Turn off redundant AC**
- **Maximize the use of unconditioned outside air**
- **Eliminate personal appliances**
- **Turn off equipment when not in use and during off-hours**
- **Turn off escalators during non-business hours**
- **Minimize outdoor lighting hours**
- **Replace all incandescent lamps with EE self-ballasted CFLs**
- **Ensure preventive maintenance for equipment peak efficiency**
- **Optimize elevator operations**
- **Keep exterior doors closed**
- **Communicate with employees**

Buildings

Retail Branches

- **Energy efficiency**
 - HVAC, Lighting & building systems controls
 - Exterior signage
 - Low-mercury fluorescent lighting
 - Metal halide accent lighting
 - Equipment & computers
- **Water efficiency**
- **Recycled content**
- **Refurbishment/Repurposing**
- **IAQ, low emissions & daylight**



Buildings & Information Technology

Data Centers

- Consolidation 55 > 24 by 1010; replacing older, less efficient
- Variable frequency chiller/motor drives on optimize performance
- Electrical distribution scheme uses fewer transformers
- Siting and building design maximizes natural cooling
- Emergency lighting run from a central battery source

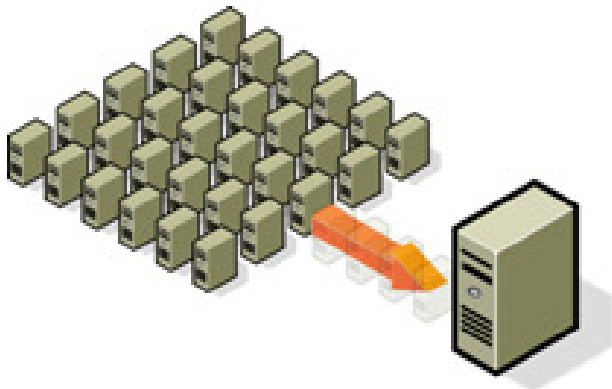
Frankfurt, Germany



Information Technology

Server Optimization and Virtualization

- “Virtually” split up the physical resources to create several smaller servers within one physical server
- Hardware reduction results in reduced energy consumption. Further savings from reduced cooling requirements.
- 7.3% of our environment is virtualized today.
- Virtualizing approx 300 servers/month across the globe, with plans to target an increase of up to 500 by year end.
- Have instituted global mandates for new server request in non-critical environments to be virtualized by default unless otherwise justified



Information Technology

Thin Client Implementation


- Server-based computing where applications are deployed, managed, supported and executed on the server and not on a PC at a user's desk.
- The Thin Client publishes applications to the user's screen and as such all support, software management and data storage happens at the server, with only mouse clicks, keystrokes and screen updates moving across the network.
- A thin client device uses only one tenth of the power a PC uses, and generates far less heat and noise, resulting in substantial savings and an improved user environment.
- Targeting to move 50% of the desktop population into a thin client environment. Program kicked off in 2007 and is targeted through 2010.

Information Technology

PrintWise Campaign

- Paper, equipment and energy reductions
- Encourage double sided printing (Year to-date, paper consumption reduced by 9.5%)
- Reduce color output (Year to-date decreased by 2.4%)
- Reduce plastic document bindings (Year to-date reduced by 16%)
- Marketing campaign key to success

Some things are just right in black and white.



Some communications are clearly meant for black-and-white printing, which is three times faster and costs 90 per cent less than colour. Over time, printing in black and white will also decrease the turnaround times for jobs that call for colour printing.

Just ask yourself if you need to print in colour to make a good impression.

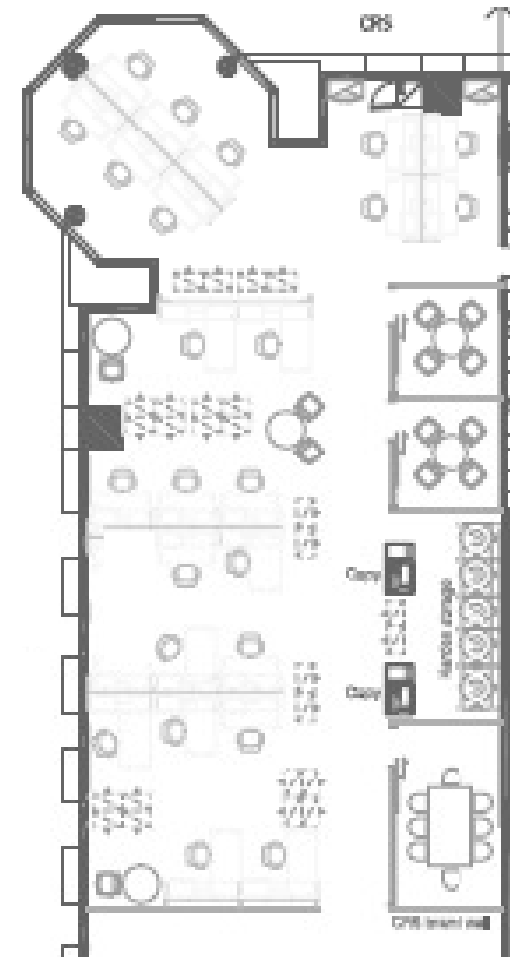
Are you **printwise?**

To find out more about the Printwise initiative, email steven.hall@citi.com or visit www.emea.citigroup.net/GSD/printwise/

print in black and white | print on both sides | use friendly binding

People (Organization and Behavior) *Alternative Work Strategy*

- **Combination of working from home, “hoteling” (shared space) and travel**
- **Benefits**
 - Provide employee flexibility of location
 - Reduce employee commuting time & cost
 - Reduce costs and GHG emissions
 - Improve team communications
- **Requires**
 - Identification of appropriate job functions
 - Categorization of employees (Resident, Team Worker, Independent, Traveler)
 - Work culture shift
 - Space configuration
 - Implementation manual/training



People (Organization and Behavior)

Project Candlelight

- Hong Kong employee-driven initiative (8% reduction) evolved into competition between buildings and countries
- Employees encouraged to switch off appliances, lights, computers, copiers, faxes, water dispensers, etc. at the end of the day and especially during weekends and public holidays
- Success based on intensive marketing effort, employee desire to do good, and competition

Country	MWH Reduction To Date (Jan- Apr 07)	Projected MWH Reduction	Target MWH Reduction	2007 Projected Reduction vs 2006 (%)	2007 Target Reduction vs 2006 (%)
Australia	32	97	431	0.86	3.80
China	157	472	891	4.61	8.70
Hongkong	318	953	907	4.52	4.30
India	-243	-728	681	-2.67	2.50
Indonesia	-36	-108	229	-1.18	2.50
Japan	467	1,400	4,251	3.06	9.30
Korea	193	578	2,082	1.47	5.30
Malaysia	304	911	597	8.39	5.50
Philippines	88	265	467	3.12	5.50
Singapore	617	1,851	862	5.37	2.50
Taiw an	-143	-428	921	-3.12	6.70
Thailand	-123	-370	241	-7.22	4.70
	1,631	4,892	12,560	1.43	5.11

People (Organization and Behavior)

Education and Awareness Building

- Quick tips to be eco-friendly at work
- Best practices
- Carbon calculator
- Daily updates
- Recommended reading

Operations & Technology

Eco < Operations & Technology < Citigroup.net

E.C.O.
Environmentally Conscious Operations

750,000 approximate number of trees planted by Citi businesses on behalf of clients who have opted to receive paperless statements.

Calculate Your Carbon Footprint

WHAT'S YOUR EARTH IMPACT?

"The FREE Earth Conservation Plan Carbon & Lifestyle Calculator is the first calculator of its kind that allows you to factor in your lifestyle – not just your Carbon Footprint.

[Read about what to have ready >](#)

Eco Video

Learn how the Two Court Square skyscraper in New York became Citi's first building to earn LEED (Leadership in Energy and Environmental Design) Gold status.

[View the Video >](#)

Suggested Reading

Cradle to Cradle by William McDonough and Michael Braungart

[More >](#)

Welcome

Citi is committed to directing \$50 billion over the next 10 years to address global climate change through investments, financings and related activities to support the commercialization and growth of alternative energy and clean technology among the clients and markets it serves, as well as within its own businesses and operations.

Visit this Website to learn about actions underway in Operations & Technology -- from reducing energy consumption and conserving water to consolidating our IT infrastructure and recycling programs -- and how you can support these initiatives and become an advocate for the environment.

Make An Impact **Green Resources** **Leadership Highlight**

10 THINGS YOU CAN DO AT WORK

Ask yourself:

- Do I really need to print this document?
- Print in black & white, instead of color
- Speak with your System Administrator to have your printer's default option set to double-sided printing

1 2 3 4 5 6 7 8 9 10

Latest News

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- » [Green Travel Trending Up For Corporations](#)
- » [Nokia Phone â€œRemadeâ€ From Recycled Tires, Cans, Plastic Bottles](#)
- » [FT500 Warns Up To Releasing GHG Data](#)
- » [Ad Groups Tell FTC To Go Slow On Green Marketing Guidelines](#)

O&T News

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- » [Houston Goes Green](#)
- » [Citi Opens First "Gold-Certified" LEED Building](#)
- » [Small Changes Make a Big Impact](#)
- » [Citi Celebrates "Green" Certification](#)
- » [Making Procurement Greener](#)
- » [Cell Phone & Blackberry Drive](#)
- » [How Low Can Green Go?](#)
- » [Citi Featured on Clinton Global Initiative Panel](#)

OPERATIONS & TECHNOLOGY

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Efficiencies of Efficiency

Achieving Scale

- **The USGBC Portfolio Program pilot**
 - Prototype (volume build) certification
 - Six new branches: Austin, TX; Flint, MI; Warrington, PA; Cottman, PA; Buffalo, MN; and, Mechanicsville, VA
 - May 2008: Citi first company to achieve LEED pre-certification for a retail commercial interior prototype
- **Industry group initiatives**
 - Equipment standards (e.g. heat thresholds)
 - Common lease language (e.g. sub-metering)
- **Capacity building and training**
 - Sophisticated equipment operational requirements
 - Employee behavior change

Results and Challenges

- **Significant energy and CO2 reduction per SF, Seat and Headcount**
 - CO2/RSF MT down 4.3% in 07
 - CO2/seat MT down 4.5% in 07
 - **Recognition**
-
- **Absolute CO2 increased by 4.4% in 2007**
 - Business growth
 - Technology growth (12.9% increase in data center electrical consumption)
 - **Tensions (e.g. paper vs. power)**
 - **Who pays vs. who benefits**
 - PC power management
 - **ROI and tenors**
 - Compete for capital w/business
 - Hurdle rates vary by geography
 - Communication gaps
 - **The attractive but unproven**
 - **Metrics on other benefits**
 - Absenteeism / retention
 - Health costs
 - Commuting time