Green IT Expo 2008

The New Enterprise Data Centre

Efficient IT Delivery Providing Freedom for You to Drive Business Innovation

Optimising IT in an Environmentally Sensitive World

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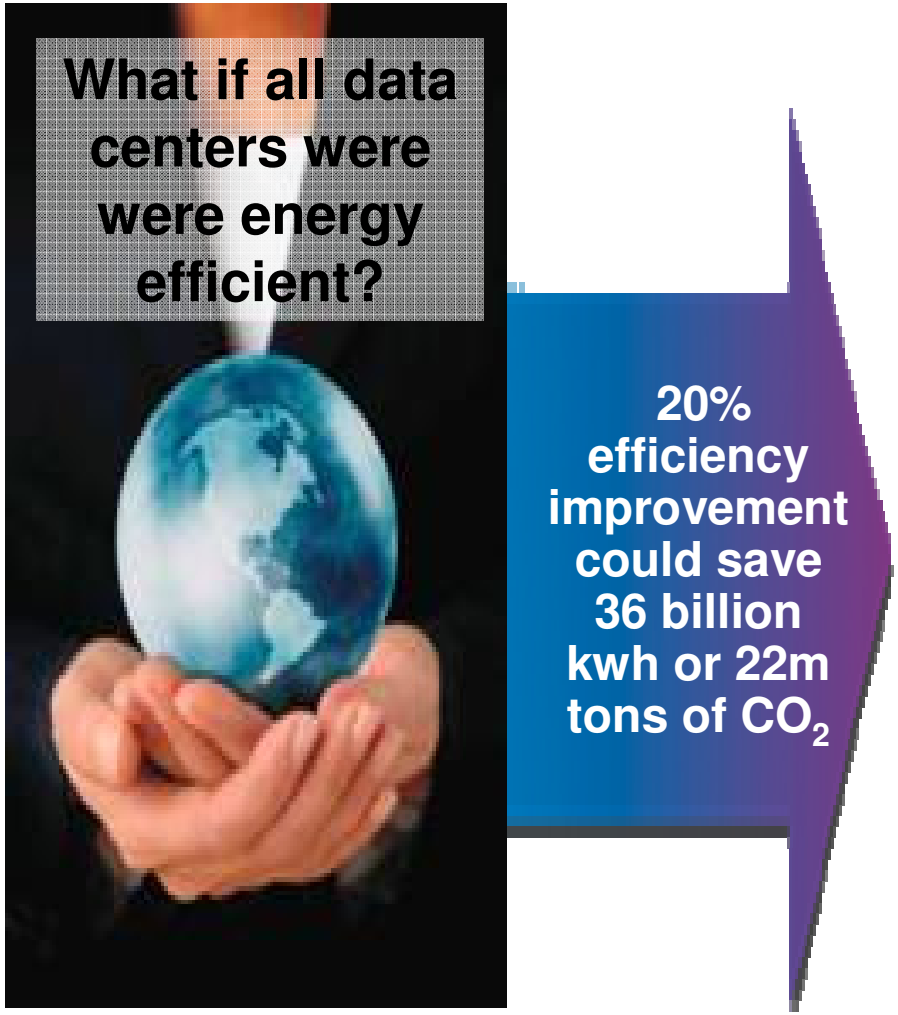
Green IT vs. Other Abatement Options



…or you could remove 3,505,401 cars and light trucks from company fleets.

…or you could plant 502,440,757 tree seedlings and grow them for 10 years.

…or you could manage and preserve 16,329,325 acres of pine forest per year.

..or you could recycle 6,597,707 tons of company waste instead of sending to landfills.

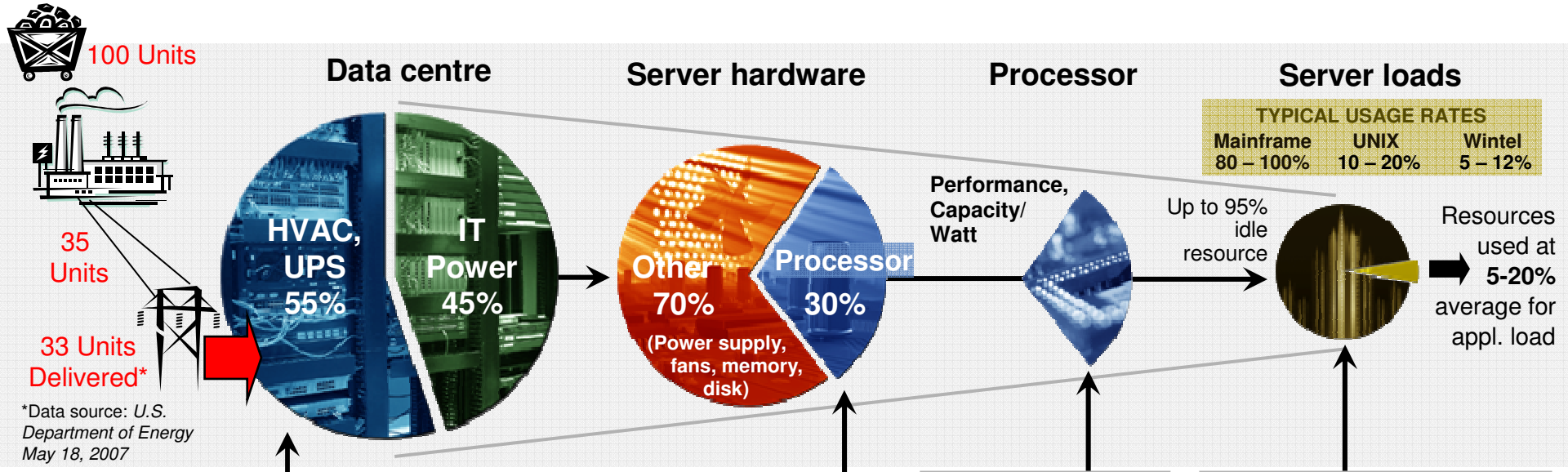
Data source:
http://www.usctcgateway.net/tool/

The Vision……

0.4% or 10%?

Servers PC's Printers Mobile Network

Energy has become significant part of the TCO, how is it consumed?



How to improve efficiency

Reduce cooling/UPS needs vs. energy going in servers, capture heat at source (Potential gain 10%)

More efficient cooling and energy supply

Higher efficiency infrastructure, power management' (≥ 3yrs older is good target)

Better server hardware design

Reduce consumption @ chip level
(Cap power usage)

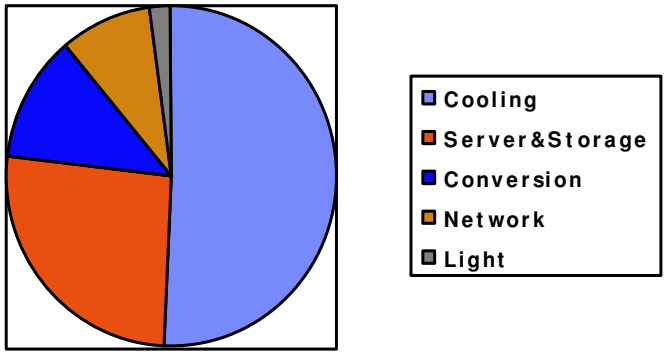
Advanced processor design + process

Reduce idle/unused capacity which still consumes energy
(Utilization 5 to 20 % gain)

Enhance resource usage rate (consolidation/virtualisation)

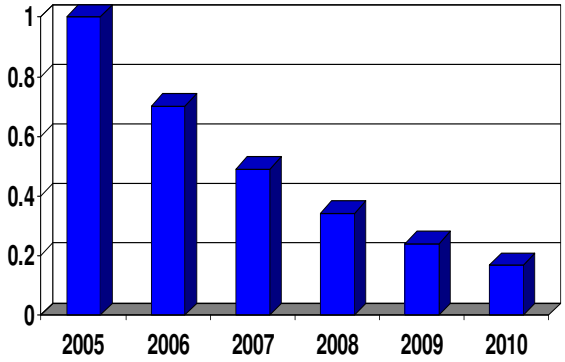
Storage Power Landscape

Components of Data Center Power Consumption



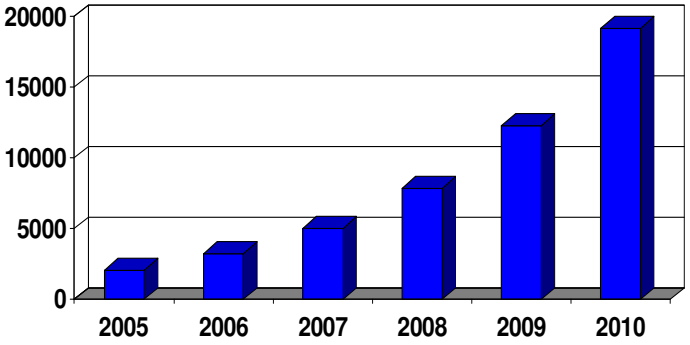
Source: IBM

Storage Power Consumption/GB



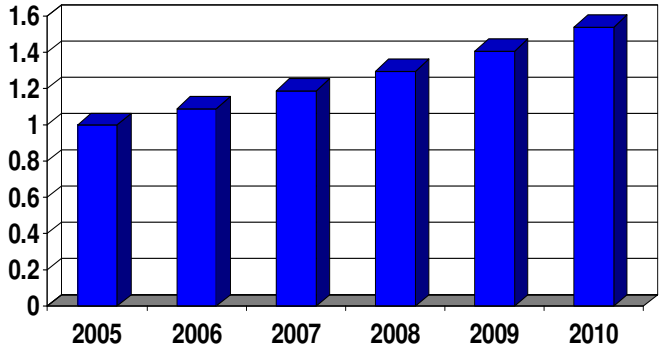
Source: IBM

Data Center Storage Usage External PB Shipped



Source: IDC

Data Center Storage Power Growth



Source: IBM

Enabling the New Enterprise Data Center

– *A holistic, integrated approach*

Information Infrastructure

Highly Virtualized Resources

Business Resiliency and Security

Efficient, Green and Optimized Infrastructure and Facilities

Business-Driven Service Management

IBM Energy Efficient Datacenter

Business Service Management

Facility Design, Maintenance and Remediation

Energy Usage and Accounting

IT Server Provisioning and Load Balancing

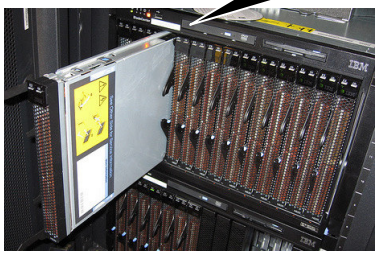
Data Center Optimization for Power – Systems & Arch.

Monitoring

Data Warehouse

IT Asset Lifecycle Management

Application Response Time



Virtualised IT Assets
(Servers, storage)

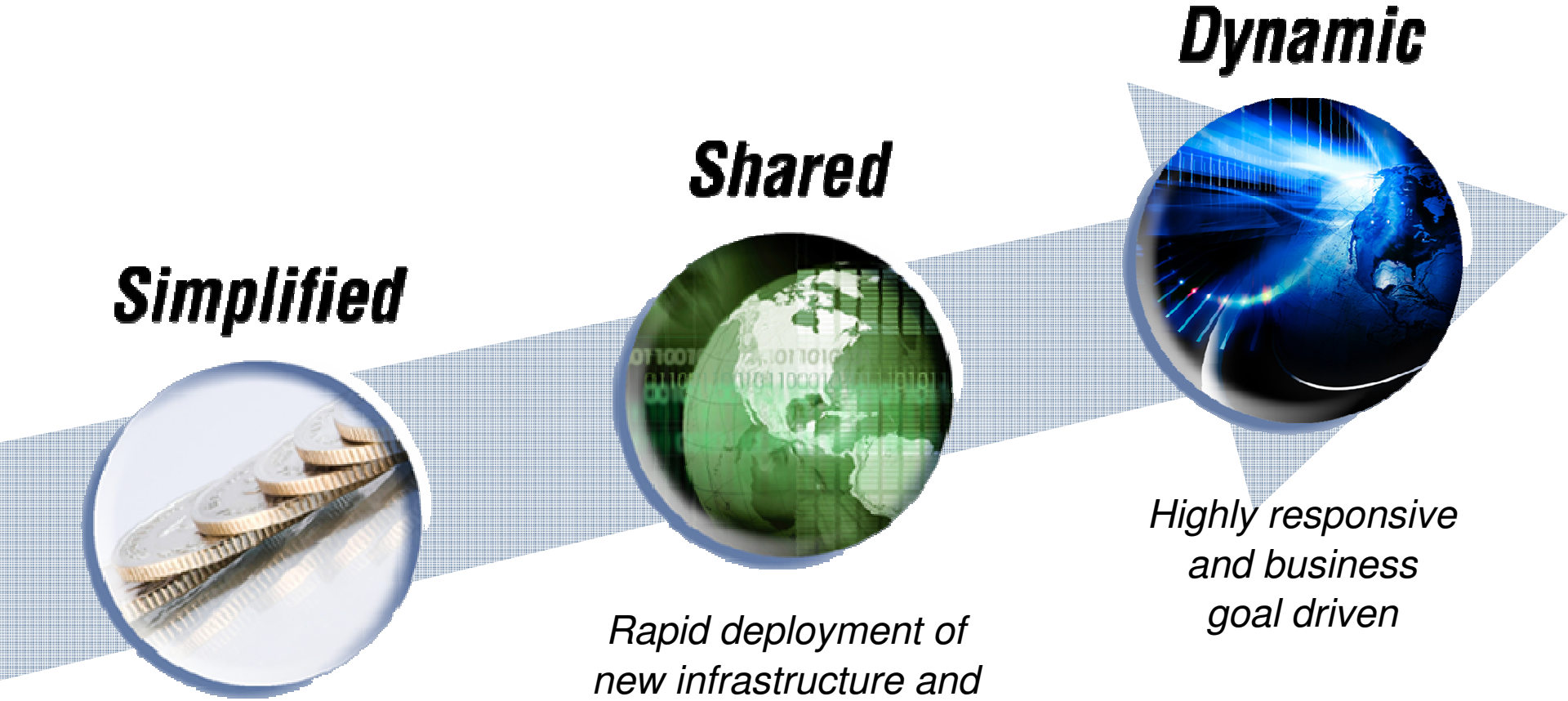
Data Center Infrastructure
(UPS, PDUs)

Building Systems
(HVAC, power, lighting, security)

The New Enterprise Data Center:
An evolutionary new model for efficient IT delivery. . .

- *New levels of economics delivered by simplified IT*
- *Rapid deployment of services with improved manageability*
- *Tight alignment with the business to support innovation*

The New Enterprise Data Center – Stages of adoption



The New Enterprise Data Center

An evolutionary new model for efficient IT service delivery

Fragmented, inefficient islands of computing

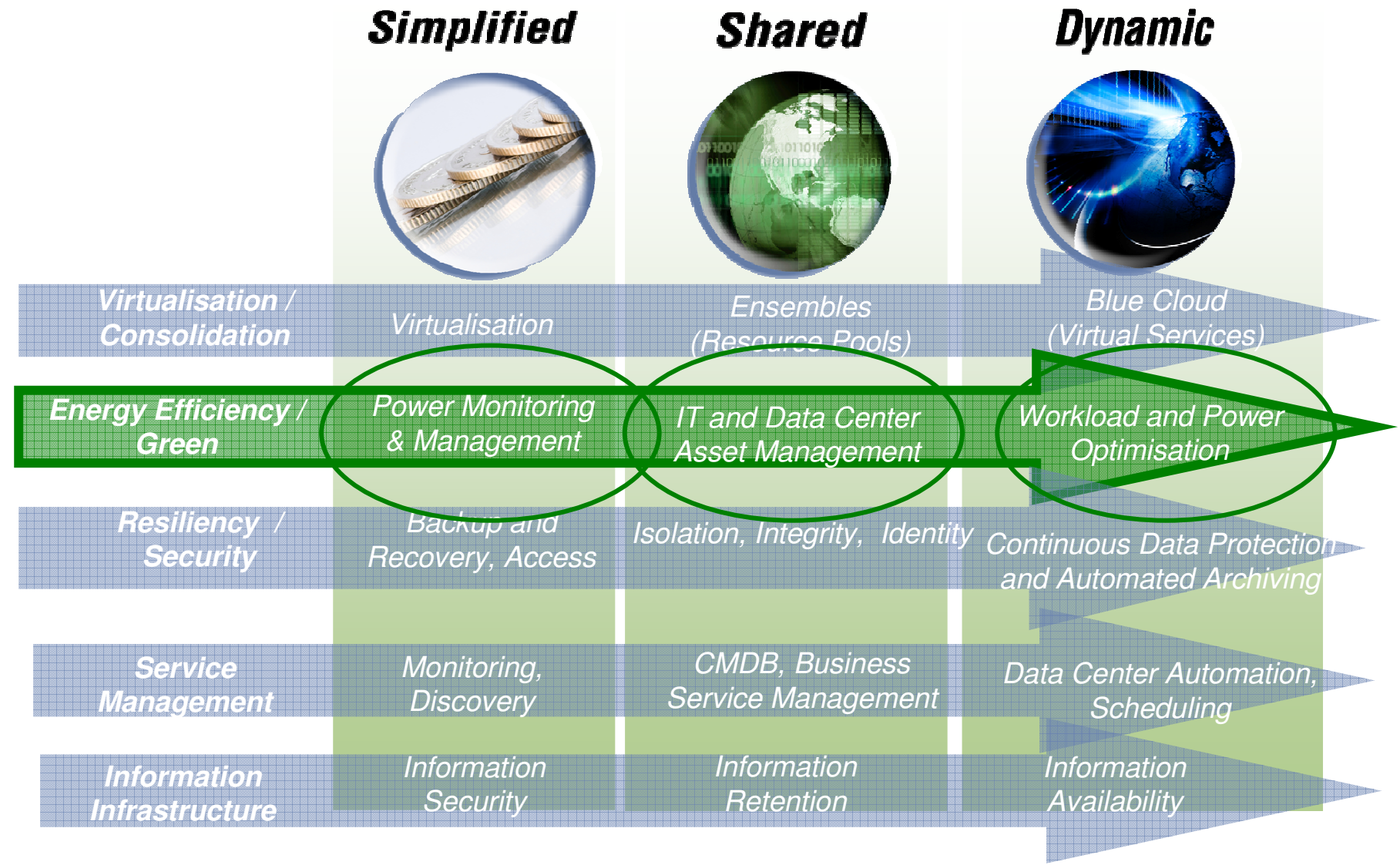
Simplified ***Shared*** ***Dynamic***

Efficient, dynamic and responsive

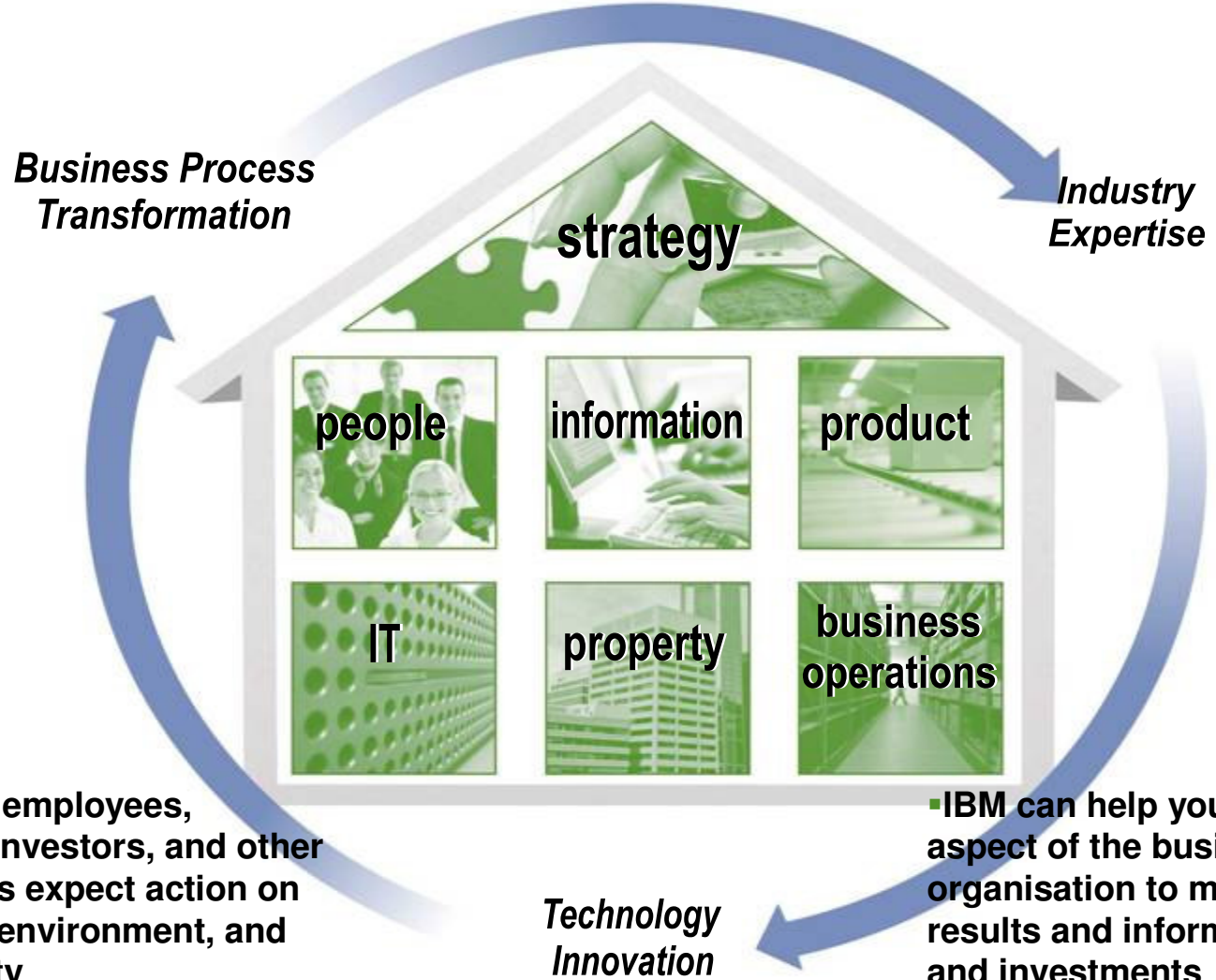
Initiatives

Consolidation and Virtualization	***Energy Efficiency***	***Business Resiliency and Security***	***Service Management***	***Information Infrastructure***

NEDC Leadership Center - Energy Efficiency



IBM Energy & Environment Framework



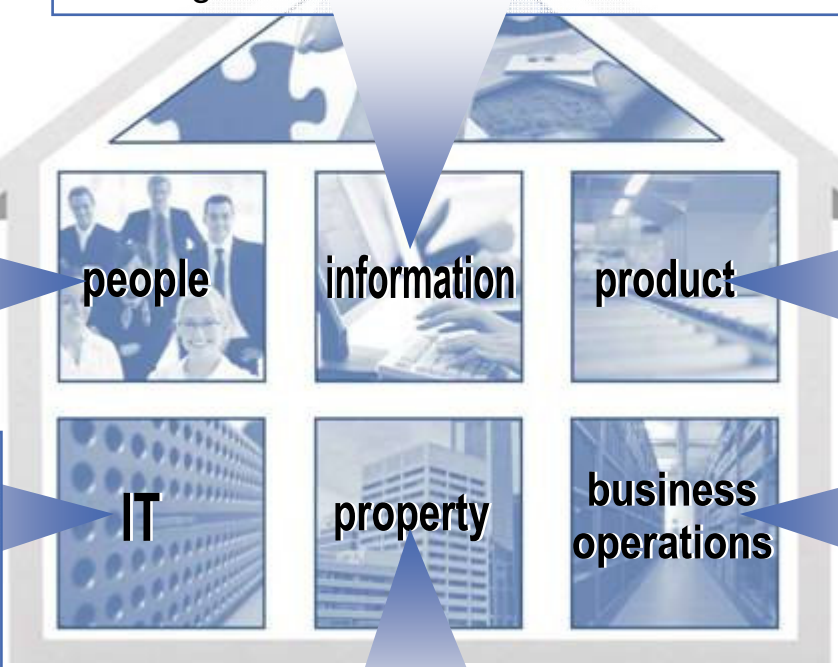
Customers, employees, regulators, investors, and other stakeholders expect action on energy, the environment, and sustainability

- IBM can help you look across all aspect of the business or organisation to measurably improve results and inform future direction and investments

IBM as a Case Study

- IBM has produced an annual corporate environmental report since 1990
- IBM's comprehensive global environmental management ace since 1970s

- 42% of IBM's employees do not regularly come into an office saving $100M annually in real estate costs
- Last year IBM saved $97M in travel costs by using online collaboration instead.



- IBM established product stewardship program 1991
- Resulted in industry-leading Product Design for the Environment (DfE) and product recycling practices

- IBM is doubling the computing capacity of its IT centers from 2007 to 2010 w/o increasing energy use
- IBM is providing its IT to enable research on climate change and water management

- IBM has decreased its generation of hazardous waste 94.7% since 1987
- IBM reduced its PFC emissions from chip mfg. by 32.7% since 1995

- 1990-2007, avoided energy-use-CO2 emissions equivalent to 45% of IBM's 1990 energy use, average saving of $18.2 million per year in utility cost

Project 'Big Green'

Double compute capacity with no increase in consumption or impact by 2010

IBM to reallocate $1 billion each year

- **To accelerate "green" technologies and services**
- **To offer a roadmap for clients to address the IT energy crisis while leveraging IBM hardware, software, services, research, and financing teams**
- **To create a global "green" team of almost 1,000 energy efficiency specialists from across IBM**

Re-affirming a long standing IBM commitment

- **Energy conservation efforts from 1990 – 2005 have resulted in a 40% reduction in CO2 emissions and a quarter billion dollars of energy savings**
- **Annually invest $100M in infrastructure to support remanufacturing and recycling best practices**

Major proof point for Project Big Green

IBM'S PROJECT BIG GREEN SPURS GLOBAL SHIFT TO LINUX ON MAINFRAME

ARMONK, NY, August 1, 2007

- *IBM is consolidating thousands of servers onto approximately 25 IBM System z™ mainframes*
- *Substantial savings expected in multiple dimensions: energy, software and system support costs*
- *The consolidated environment will use 80% less energy and 85% less floor space*
- *This transformation is enabled by the System z sophisticated virtualisation capability*

Energy Efficient Data Centre Summary

- *Consolidate* - Datacentre and distributed computing environments
- *Virtualise* - Maximise server, storage and network utilisation
- *Measure* - Holistic integration between IT and Facilities assets and energy
- *Visualise* - Role-based operational and business impact dashboards
- *Control* - Active energy management within business service context
- *Automate* - Dynamically adapting environment based on optimised service, energy and demand
- Exploit - Innovative use of technology across the business to reduce energy and carbon in other areas

Visit us on our Stand if you would like to discuss further…