



Let's build a Smarter Planet.



**Let's Build a Smarter Planet  
Enabling Sustainability**

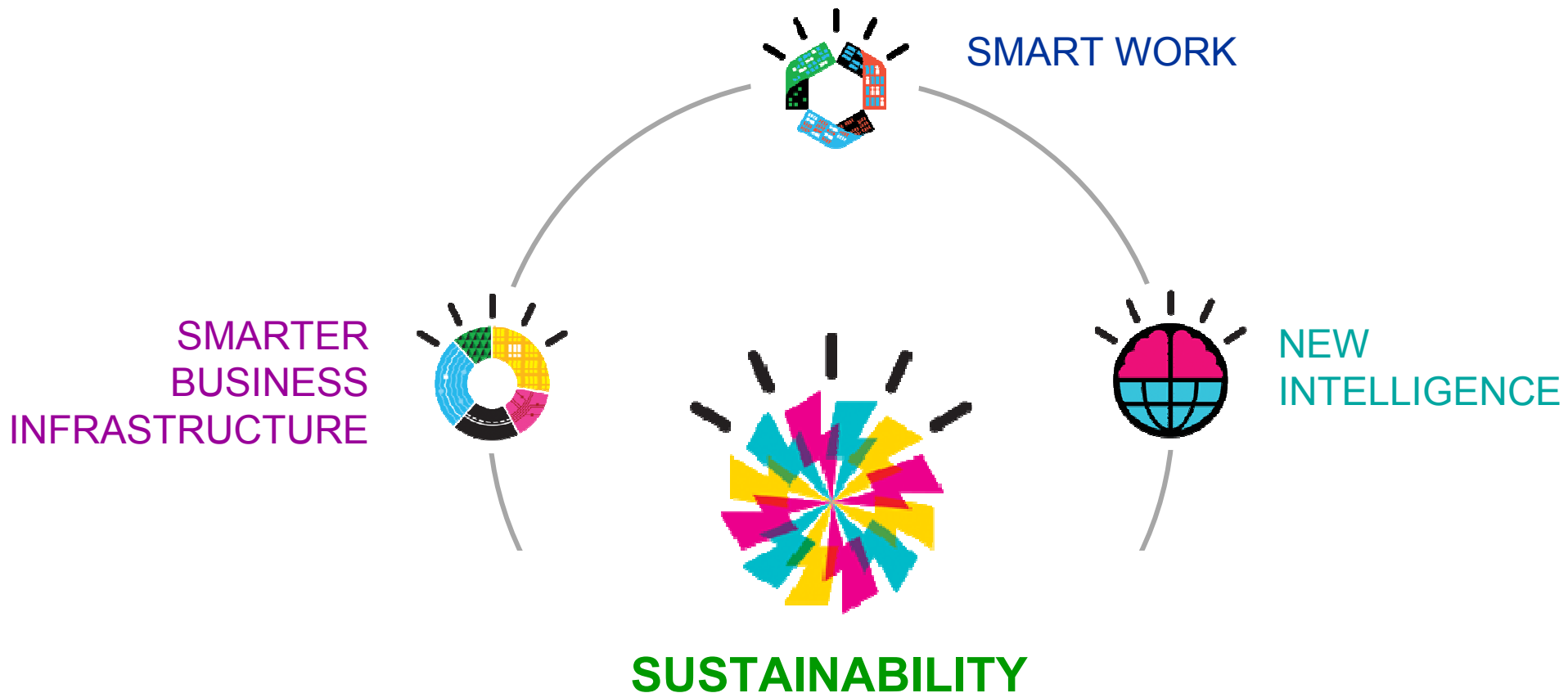
**Liz Smith**  
GM, Infrastructure Services  
Global Technology Services

**SMARTER PLANET**

**Warsaw, June 8<sup>th</sup>, 2010**

**Let's build a Smarter Planet.**

**Sustainability:** Enable economic and environmental sustainability by improving the efficiency of assets, operations and the workforce across the value chain.



## The mandate for change is strong

### 35%

IT energy expense is expected to increase 35% in the next four years.



**Inefficiencies in current infrastructure.**

### 8 in 10

More than 80% of CEOs expect climate change regulation 5 years.



**No accurate measure of energy use across the enterprise.**

### 40%

Buildings account for 40% of worldwide energy consumption.



**Facilities management is not integrated.**

There are substantive gaps to overcome

**85%**

Of companies focusing on sustainability to improve efficiency, but only



**30%**

Are collecting data frequently enough.

**69%**

Of companies see sustainability as opportunity for revenue growth, but only



**35%**

Understand customers sustainability expectations.

**87%**

FTSE 500 companies feel exposure to climate change impact, but only



**38%**

Have undertaken quantified risk analysis.

To operate smarter, organizations need...

## Green infrastructures

Instrumented, interconnected, and enabled by intelligent energy management.

## Sustainable operations

Accounting for the environmental and social impacts of doing business.

## Intelligent systems

Optimized at macro level –utility grid, transportation system, water infrastructure.

# A Green Infrastructure is an instrumented and interconnected system enabled by intelligent energy management

## IT Equipment



- Energy efficient hardware.
- Virtualization and consolidation.
- Active energy management.
- Tiered storage.

## Applications and Data



- Lifecycle management, retention, archiving of data.
- Optimization of application servers.
- Application performance monitoring.
- Data deduplication, compression and clean up.

## Data Center



- Accurate thermal and energy usage assessments.
- Extend life of existing infrastructure.
- Rationalize infrastructures across company.
- Design flexibility into new data center infrastructure.

## Real estate and facilities



- Trend analysis and building maintenance diagnostics.
- Building management systems integration.
- Process management automation.
- Dashboard reporting.

## Energy Management



- IT and Infrastructure interfaces.
- Threshold controls.
- Optimize assets for energy efficiency.
- Track and verify energy efficiency.

## Green Infrastructures: Applications and benefits

### kika\Leiner

- Cost take out and improved efficiency of IT and other infrastructure.
- Building green data centers to support corporate brand objectives.

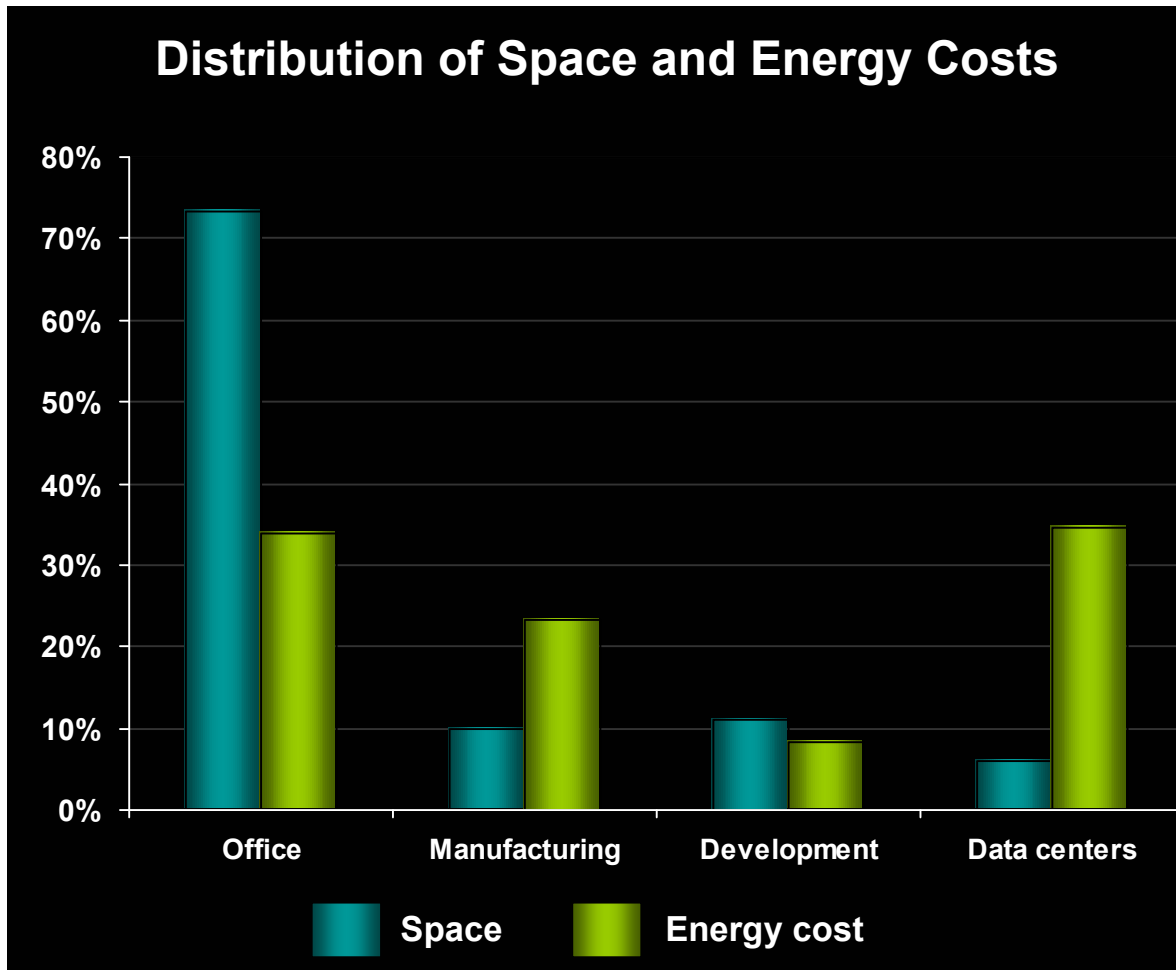
### Benefits

Designed and built new energy efficient scalable modular data center, reducing electrical usage by up to 40%.

The new data center extended their environmental strategy to include their IT infrastructure.



# IBM RTP: Minimize capital and operational costs with data center energy efficiency.



Source: IBM Corporate Environmental Affairs, Year end 2007.

## Business objectives

- Increase growth 6% per year (SO clients)
- Keep overall IBM energy costs flat by 2012
- Reduce data center energy costs

## RTP Solution:

**DCiE 66% – 71% (PUE 1.4)**

- Water side economizer for free cooling
- Variable speed CRAC and chillers
- High efficiency equipment especially UPS systems with static double-conversion UPS
- Elevated temperature and humidity criteria
- Hot/cold aisle configuration as standard operational practice
- Software management tools to integrates IT data center Infrastructure with sophisticated control systems
- Establish server utilization and virtualization metrics



# Sustainable operations optimize for energy, carbon, and water across all aspects of the business and value chain

## Governance & Business Strategy



- Develop Corporate Social Responsibility and sustainability strategies.
- Benchmark for sustainability and corporate social responsibility (CSR).
- Develop strategies to reduce energy and CO<sub>2</sub> emissions.
- Provide reliable and verified collection and reporting of energy and environment data to streamline compliance.

## Business Process Management



- Apply lean and six sigma principles to reduce energy and water usage, CO<sub>2</sub> emissions and waste generation.
- Model, simulate, redesign and automate processes for energy efficiency and environmental impact.
- Reduce use of paper in business processes.
- Monitor & analyze green KPIs across operations.
- Adapt processes dynamically to environmental challenges that affect operations.

## Product & Supplier Management



- Optimize the supply chain for service levels, quality, cost, and CO<sub>2</sub> emissions.
- Product Lifecycle Management.

## Distribution & Logistics



- Optimization strategies to balance environmental impact and cost.
- RFID tagging and tracking systems.
- Networked sensors and meters for environmental data collection.

## Workforce & Stakeholders



- Travel reduction and work from home strategies.
- Distributed employee collaboration via email, instant-messaging, online conferences, and other tools.
- Online events and collaboration Jams.

## Sustainable operations: Applications and benefits

### **COSCO**

Consolidating distribution centers to reduce emissions by 15% and fuel costs by 25%.

### **Benefits**

After analyzing its operations across product development, sourcing, production, warehousing and distribution, the Chinese shipping giant consolidated its distribution centers from 100 to 40 to prevent 100,000 tons of emissions each year.



## IBM is partnering with business and government to deliver Intelligent Systems:

### Intelligent Utility Networks



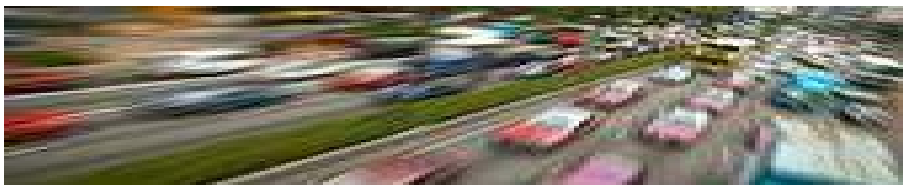
- Advanced electric meter management systems.
- Network automation and analytics best practices.
- Power generation optimization.
- Utility company networked revitalization services.
- Customer operations transformation assistance.

### Advanced Water Management



- Strategic water information management of natural, utility, and enterprise water systems.
- Smart water infrastructure solutions (e.g. smart levees, smart storm water management).
- Smart water meter management and asset management solutions.

### Intelligent Transportation Systems



- Road user charging and tolling practices.
- Integrated fare management systems.
- Transport information management systems.
- Innovations in telematics, GPS, etc.

### Smarter Products



- Hybrid vehicles that increase energy efficiency and reduce CO<sub>2</sub> emissions.
- Electronic devices with smart energy saving features.
- Fleet management solutions that use hardware and software to improve fleet efficiency and reduce fuel consumption.

## Intelligent systems: Applications and benefits

### Malta

70 million euro, five-year plan to design and deliver a nationwide Smart Grid implementation

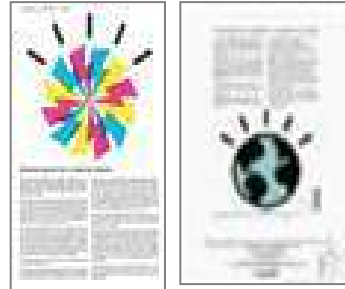
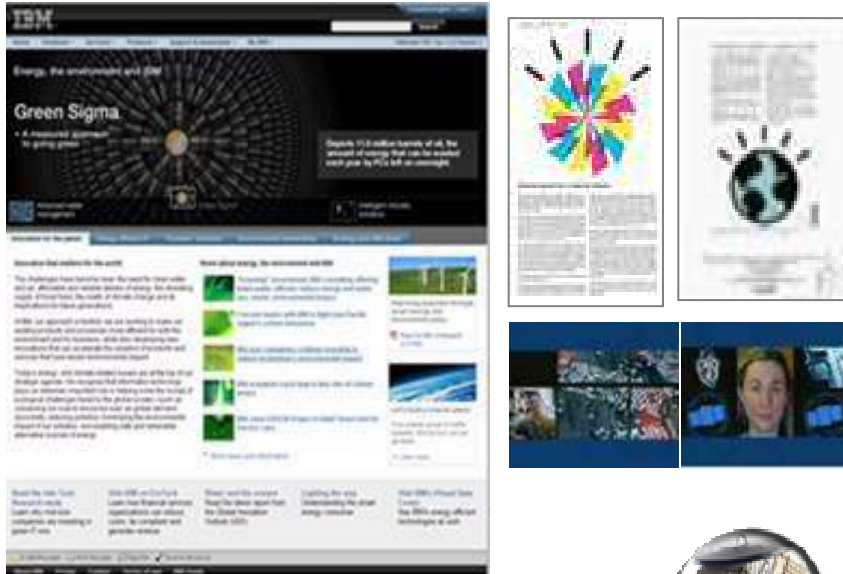
### Benefits

End-to-end electricity and water smart utility system will completely transform the relationship between Maltese consumers and utilities suppliers

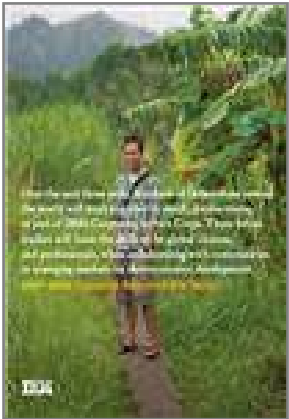
Will enable more efficient consumption of energy and water.



# Environmental leadership: IBM case study results



- From 1990 – 2007, reduced/avoided CO<sub>2</sub> emissions by 45% relative to 1990.
- Energy conservation over past 16 years equivalent to total energy use in 2008.
- 42% of IBM's employees do not regularly come into an office saving \$100M annually in real estate costs.
- \$97M in travel costs by using online collaboration in 2008.
- Renewable energy purchases grew from 11M kWh in 2001 to 455M kWh in 2008.
- For every 2 metric tons of IT equipment manufactured and sold, IBM processed and recycled 1 ton of product waste.
- Annual average water efficiency gain of 6% against target of 2%.



<http://www.ibm.com/ibm/responsibility/>

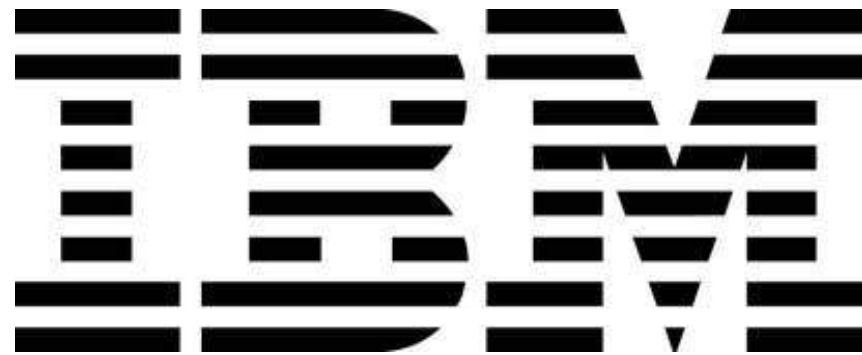
Smarter organizations find value in sustainability

Lower costs while overcoming operational barriers.

Strengthen reputations while meeting regulations.

Create products and services that give rise to new opportunities.





[ibm.com/green](http://ibm.com/green)