A Smarter Planet is
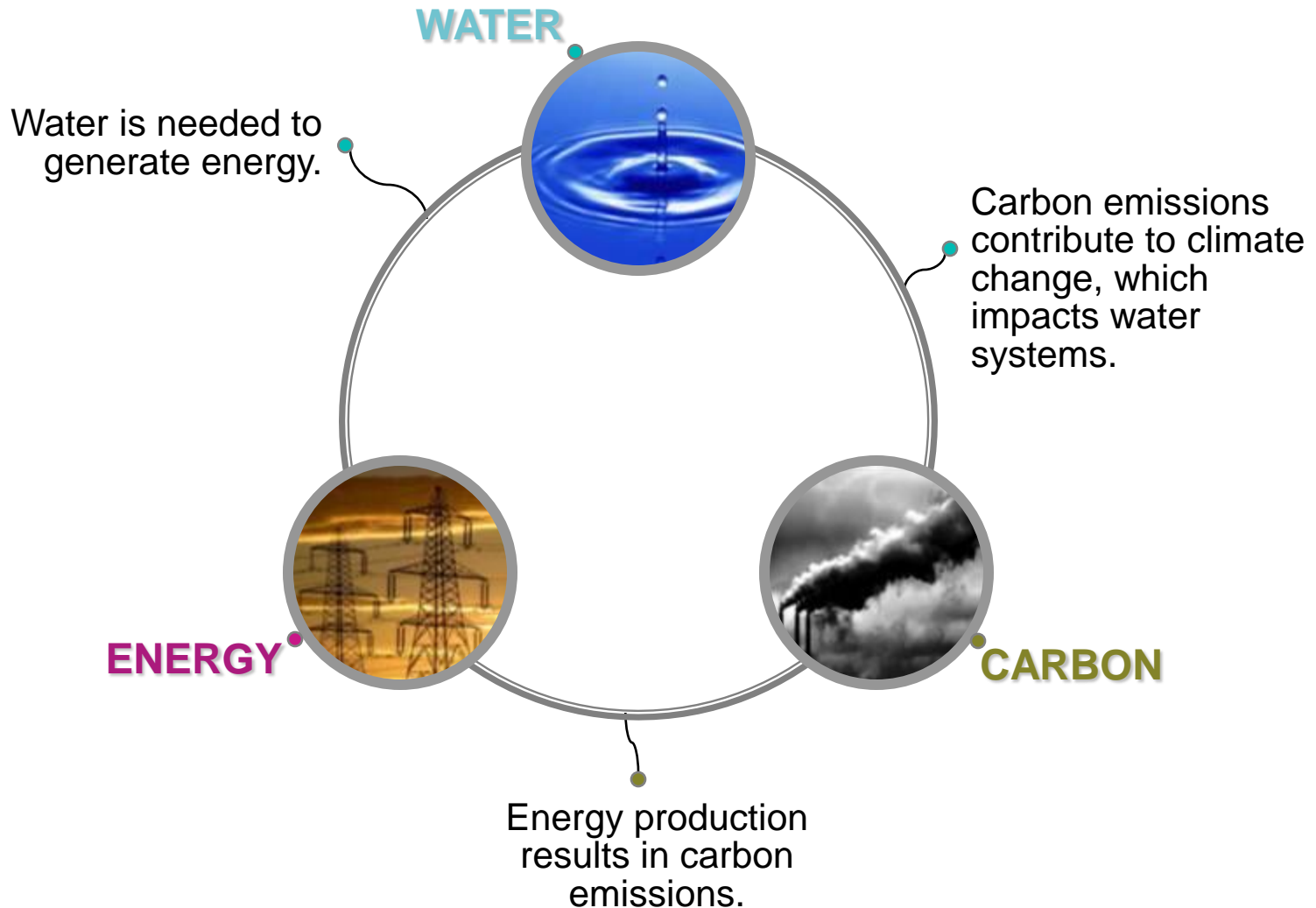# **Greener**
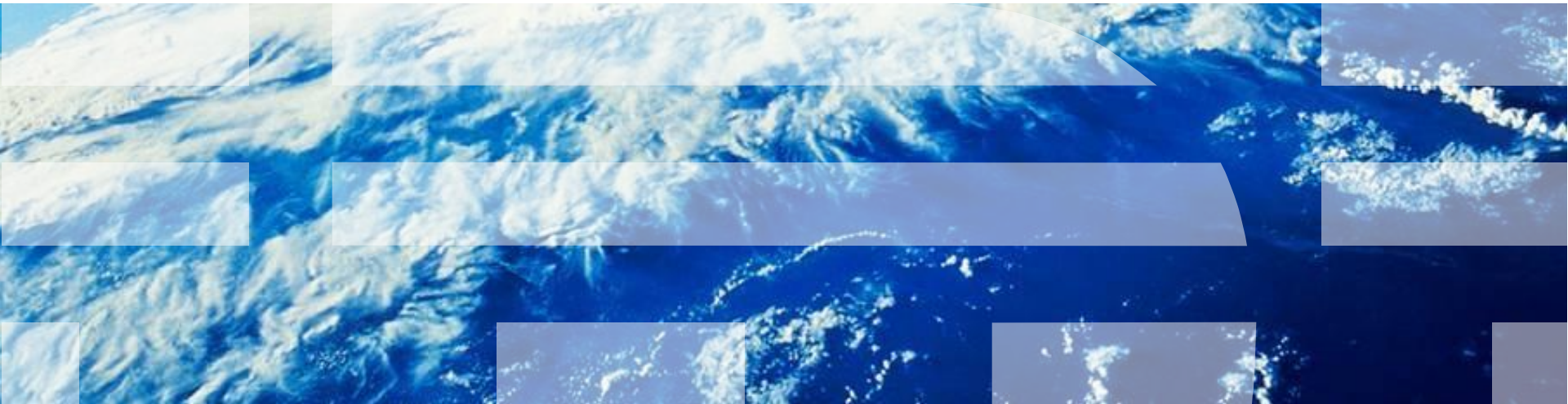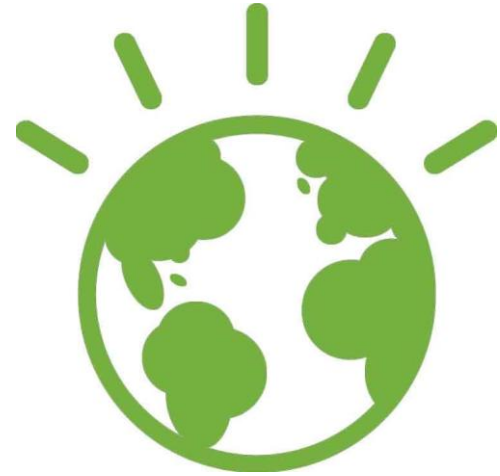
Organizations will manage their environmental impact –or "go green" by addressing three critical resources:

WATER

Water is needed to generate energy.

Carbon emissions contribute to climate change, which impacts water systems.

ENERGY

CARBON

Energy production results in carbon emissions.

Going green is an imperative – one that moves beyond recycling, energy saving and other popular forms of conservation – to enable the creation of entirely new **benefits** and source of **value**

Lower costs while overcoming operational barriers.	**Strengthen reputations while meeting regulations.**	**Create products and services that give rise to new markets.**

To realize the benefits organizations must take a **systemic** view of their **value chain,** uncover **hidden costs** and take advantage of **unexpected opportunities**

WORKFORCE　　MANUFACTURING　　SUPPLY CHAIN　　IT　　TRANSPORTATION　　CUSTOMERS　　FACILITIES
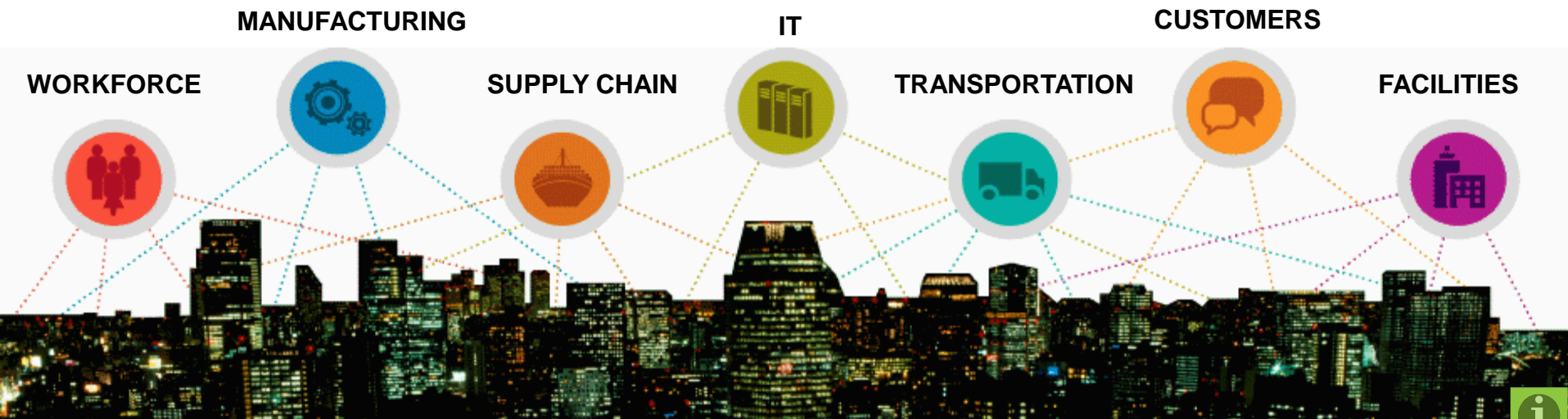
To achieve these benefits, organizations need to build … :

1 **Green infrastructure**   **2** **Sustainable solutions**   **3** **Intelligent systems**
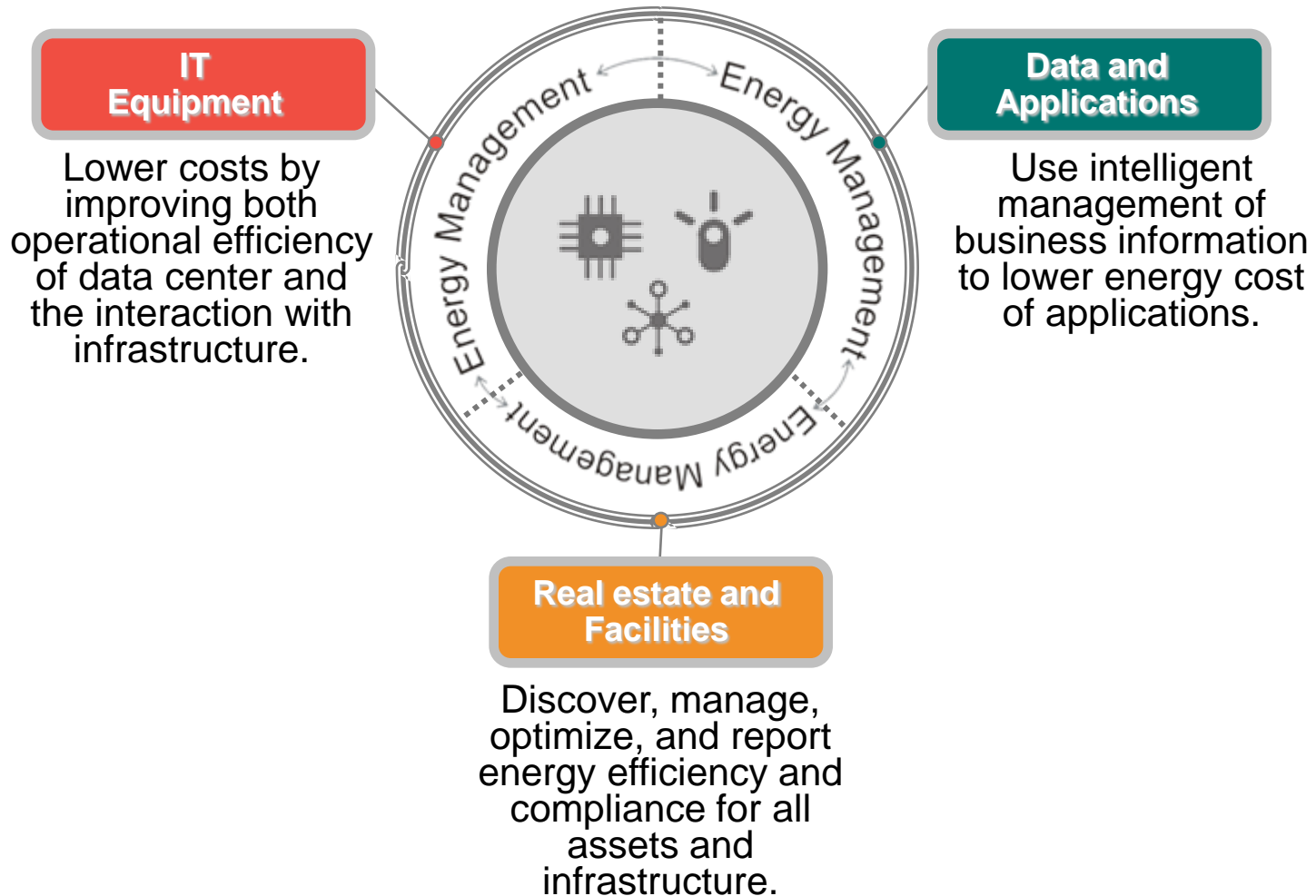
… and need to manage:

4 **"Green" Information**

1 Green infrastructure is instrumented, interconnected and made intelligent to mitigate the environmental impact of:

IT Equipment

Lower costs by improving both operational efficiency of data center and the interaction with infrastructure.

Data and Applications

Use intelligent management of business information to lower energy cost of applications.

Energy Management

Real estate and Facilities

Discover, manage, optimize, and report energy efficiency and compliance for all assets and infrastructure.

2 Sustainable solutions
Account for environmental and social impacts of activities to better equip organizations for smarter growth:
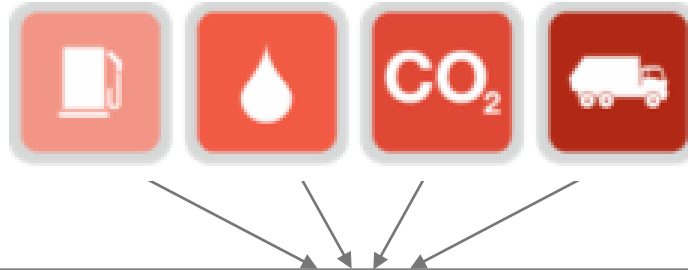
|	
Supply chain and distribution	From the supplier, to the manufacturer, to the shipping container, warehouse and beyond.
Manufacturing and business operations	Use fewer resources in the creation of products. Ensure products are environmentally friendly. Reduce costly disposal of harmful byproducts.
Governance and strategy	Understand customers' sustainability expectations. Develop sustainability strategies aligned with overall business strategy.
Workforce	Reduce environmental impact of employees without impact to productivity. Attract and retain employees through socially responsible practices.

# 3 Intelligent systems gather, synthesize and apply information to change the way entire industries operate.

Smart water

Apply monitoring and management technologies to help reduce the use of water, as well as related energy and chemicals.

Water

Chemicals
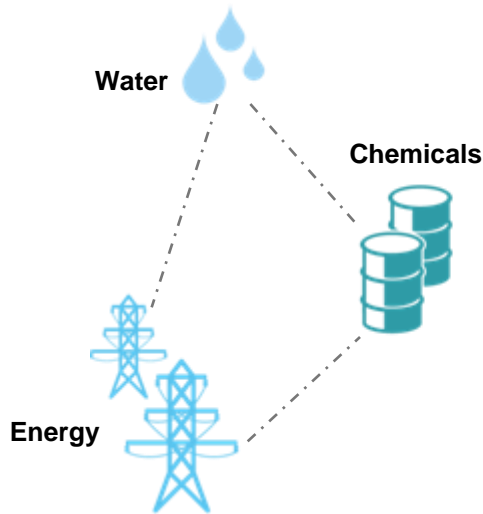
Energy

Smart traffic

Use real-time traffic prediction and dynamic tolling to reduce congestion and its byproducts while positively influencing related systems.

Congestion

Energy

CO_2

Carbon emissions

Noise pollution

Public transportation
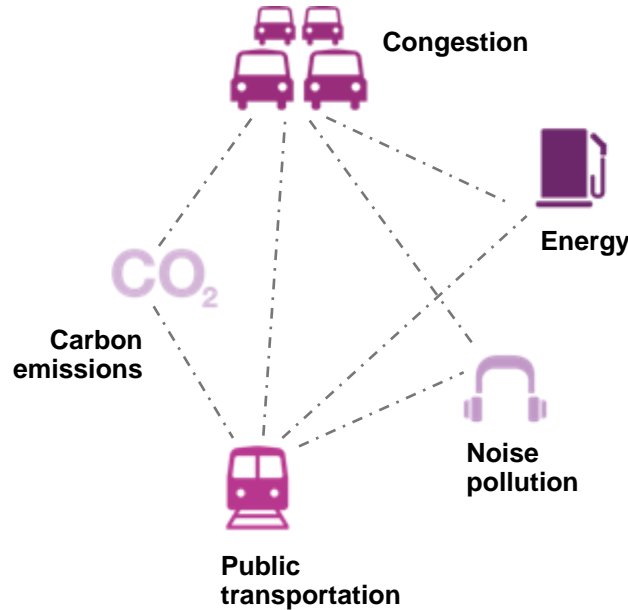
Smart energy

Analyze customer usage and provide customized products and services that help to boost efficiency from the source through the grid to the end user.

Energy grid

CO_2

Carbon emissions

Energy sources

Smart home
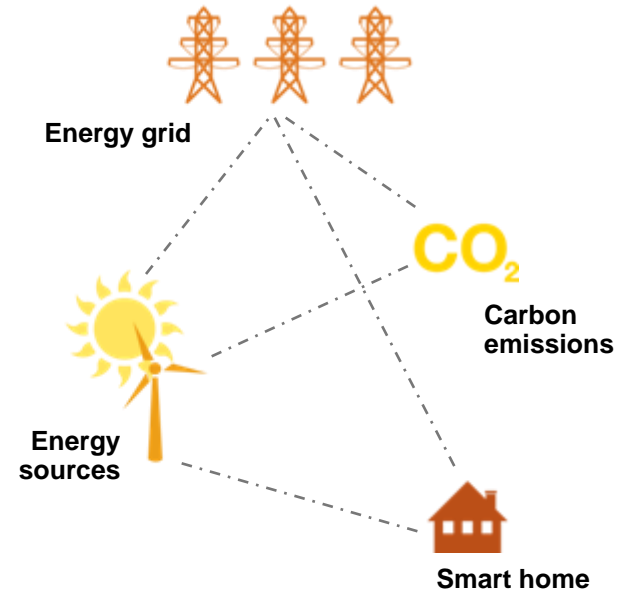
4 "Green" Information
Need to implement a Carbon emission Management information System

Provides an integrated approach to managing carbon

From strategic diagnostics through to execution

It helps organizations to evolve their information support as their carbon management matures.

4 Report on carbon & required management actions

- **Regulatory & Voluntary Compliance**
- **Disclosure**
- **Stakeholder Communication**

Decide actions to manage **1**

- **Carbon Trading**
- **Emissions Credits**
- **Risk**

Disclosure

Trading

CeMiS

Management

Operations

- **Business Processes**
- **Carbon Measures**
- **Activity KPIs**
- **Supply Chain & Carbon Mgmt**
- **Dashboard**

3 Manage risks & gains from reduction

- **Operations, emission, Supply Chain Mgmt.**
- **Carbon Workflow**
- **HR measures**
- **Employee Communication**

Execute actions to manage carbon **2**

CeMiS = Carbon emission Management information System

8

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What can Governments – Cities and elsewhere – do?

- **Understand the twofold role of IT**

- **Lead by example**

- **Promote and incent energy efficiency** and with lower GHG emissions associated

- **Set meaningful standards** for efficiency, consistent metrics for Monitoring and Verification to document sustained results

- **Promote standards for interoperability** - whether that be in the Smart Grid or in buildings or IT equipment – to enable consistent, **broad energy management**

The need and the challenge: role of the private sector

- Quickly identify what **changes procure cost saving**, while helping the environment

- **Scarce resources** will inevitably drive higher costs, so the **need to innovate** to use less resources

- Leverage the **improved information flow**, to drive changes for business processes and human behavior

- Develop and adopt new **challenging business models** necessary to support profitable deployment of these new kind of solutions

- Have a **Corporate Social Responsibility** focused on sustainability

IBM can help organizations on:

1 Green Infrastructure   **2** Sustainable solutions   **3** Intelligent Systems   **4**

IT Equipment

Data Center

Applications & Data

Facilities

Energy Management

Governance & Business Strategy

Business Process Management

Product Design & Supply Chain

Workforce & Stakeholders
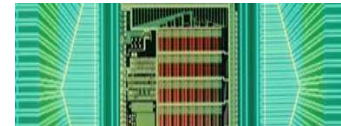
Intelligent Utility Networks

Intelligent Transportation

Advanced Water Management

Smarter Products

Green Information: Carbon Intelligence ™

IBM credibility is showed by our "green journey" started 35 years ago

- **Environmental management system** in place since 1970s
- Corporate environmental report since 1990

- **Remote working** for 42% saving **$100M/**yr
- $97M/yr saved in travel costs by using **online collaboration**

- **Product stewardship program** 1991
- Industry-leading **Product Design for the Environment** (DfE) and **product recycling** practices

strategy

people **information** **product**

IT **property** **business operations**

- **Doubling** the computing capacity every year no increase in energy use
- **Research** on climate change and water management

- Decreased **hazardous waste** by **94.7%** since 1987
- **PFC emissions** reduced by 32.7% since 1995

- 1990-2007 **energy use** saving for **$18.2 M/**yr
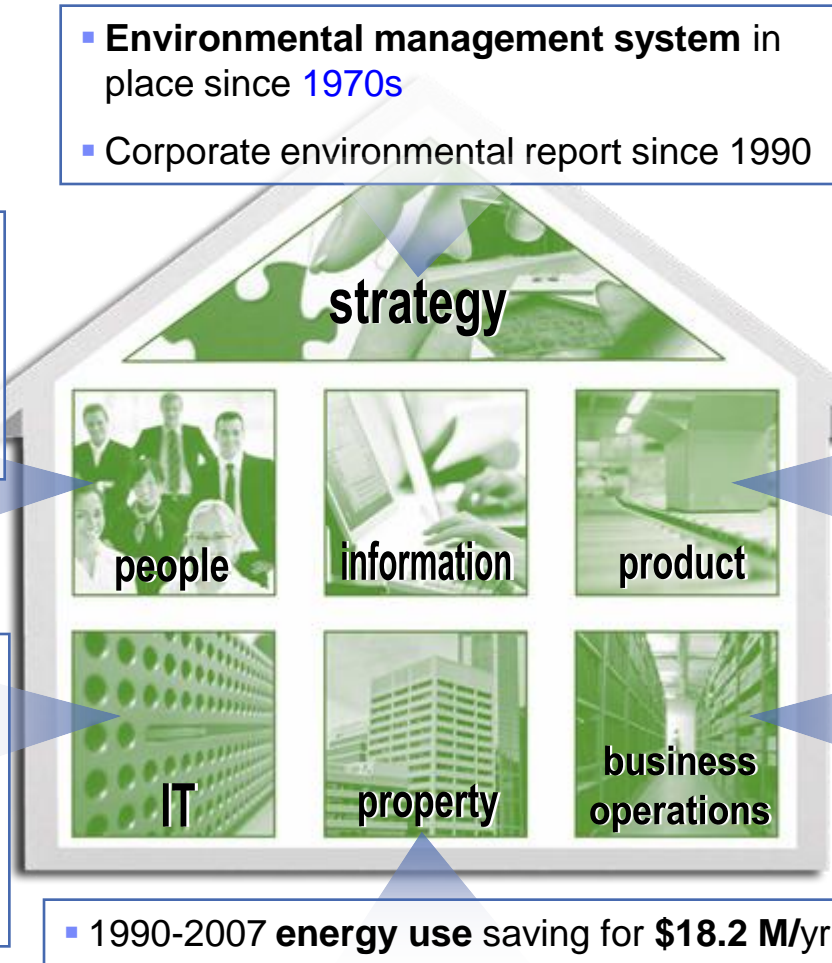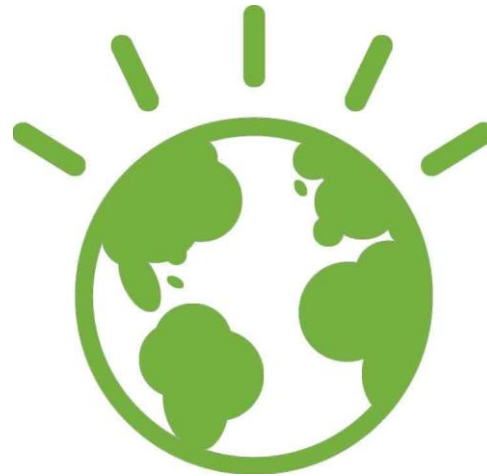
Thank You!

Visit our web site: www.ibm.com/green

Explore

What will "going green" help you do?

Visit our new interactive tool to explore ways to reach your energy, environment and corporate social responsibility goals.

→ Learn more

Or click here to try our interactive tool ➔

To realize the benefits organization must take a **systemic** view of its **value chain**

① Uncovering unexpected areas of **cost**

10,855 liters
Water required over the product lifecycle of a pair of jeans.

6.6 billion
Number of new trees needed to clear CO_2 emitted by data centers each year.

$46 billion
Value of the carbon offset purchases by 20 countries in order to meet emissions reduction targets in 2008.

② Uncovering unexpected areas of **opportunity**

20 million gallons saved
In water during chip manufacturing process each year by IBM's Burlington FAB. Resulted in $3 million annual savings.

74% less energy
By implementing a green data center, Care2, a global online community, cut costs, improved performance, and promoted its sustainability to attract new members.

2,400 tons avoided
UK retailer Tesco avoided an estimated 2,400 tons of carbon emissions by importing wines in bulk and bottling them in lightweight glass.

③ The **demand** for change is growing.

59
59 countries and jurisdictions have or are pursuing implementation of mandatory cap and trade systems.

75%
Of companies have seen an increase in the number of advocacy groups collecting and reporting corporate social responsibly (CSR) related information about their company.

1 in 4
Consumers say they would switch brands for a given product or service if provided with a more ethical alternative.
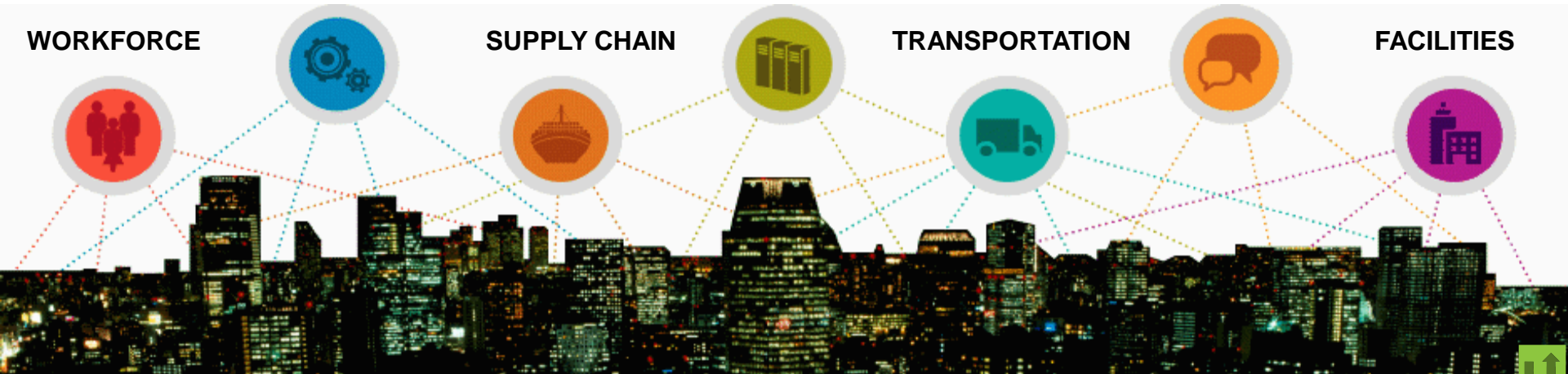
MANUFACTURING

IT

CUSTOMERS

WORKFORCE

SUPPLY CHAIN

TRANSPORTATION

FACILITIES

1 Green infrastructure:
Applications and benefits

SMART IS
Building green data centers to support corporate brand objectives

SMART IS
Proactively addressing information growth and environmental regulation.

SMART IS
Holistic view of energy consumption that enhances the efficiency of buildings, fleets and all physical assets.

kika\Leiner: Designed and build of a new energy efficient scalable modular data center –reducing electrical consumption by up to 40%. The new data center extended their environmental strategy to include their data center.

A smart organization: Can build a green infrastructure to anticipate and respond to information growth, measure and verify performance and achieve data compression rates of up to 80%.

Star Technology Services: Can manage both power and cooling capacity and begin to include non-IT resources into its event management. They use the same infrastructure monitoring IT to monitor and measure non-IT devices and view overall power use.

2 Sustainable solutions:
Applications and benefits

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

SMART IS
Reinventing manufacturing processes to use less water, energy and other chemicals.

SMART IS
Reducing travel, real-estate and office costs while appealing to top talent.

COSCO: Performed an analysis of its operations across product development, sourcing, production, warehousing and distribution. The company ultimately consolidated its distribution centers from 100 to 40 to prevent 100,000 tons of emissions each year.

IBM Burlington FAB: Retooled its chip-making process to cut annual water use by 20 million gallons, chemical use by 15,000 gallons and electricity use by more than 1.5 million kWh.

A smart organization: Can reduce paper consumption by 80%, cut annual real-estate costs by tens of millions of dollars and eliminate 20% of code—and associated energy costs—by re-engineering its workforce operations.

3 Intelligent systems:
Applications and benefits

SMART IS
Lowering congestion and carbon emissions by influencing traffic patterns on a city scale.

SMART IS
Knowing exactly where a power outage occurs and instantly dispatching a crew to fix the problem.

SMART IS
Using real-time information to help reduce the energy required to desalinate and deliver water.

Stockholm, Sweden: Implemented an intelligent toll system that uses cameras, sensors and central servers to identify vehicles and charge drivers based on when and where they drive—cutting traffic by 20% and emissions by 12%.

DONG Energy: Installed remote monitoring and control devices to gain an unprecedented level of information about the current state of the grid, lessening outage times by a potential 25-50%.

Malta: Is building an integrated water and energy system that will rely on 250,000 smart meters to monitor energy usage, identify water leaks and electricity losses, set variable rates and reward customers for using less.

IBM's capabilities and offerings are aligned with the needs of smarter organizations.

ORGANIZATIONS ARE FOCUSED ON…	IBM IS DELIVERING…
1 **Green infrastructures**	- Data Center Assessment and Services - IBM Data Center Family™ - Consolidation, Virtualization and Optimization Services - IBM Energy Efficient Servers and Storage Systems - IBM Tivoli Monitoring for Energy Management - Tivoli Usage and Accounting Manager - IBM Maximo Spatial - WebSphere Software - Rational Portfolio
2 **Sustainable solutions**	- Strategic Carbon Management , IBM Green Sigma™ - Carbon Intelligence - Sustainable Logistics Design, Asset Mgt. and Procurement - Environmental PLM - Sustainable Logistics Design, Asset Mgt, and Procurement - Tivoli Process Automation - Lotus Portfolio
3 **Intelligent systems**	- Intelligent Utility Network and Advanced Meters - Intelligent Transportation - Intelligent Oilfields - Strategic Water Information Management (SWIM)