Auditing Green IT and IT Sustainability

Gordon Chatterton
Senior Manager
Deloitte & Touche LLP, Atlanta, GA

ISACA®
Trust in, and value from, information systems

Learning Objectives

After attending this session, participants will be able to:

- Understand basics of IT sustainability and Green - IT initiatives in IT's context as well as in the context of overall enterprise level sustainability and carbon foot print reduction initiatives
- Appreciate the linkages between IT cost reduction, Green - IT and IT-sustainability initiatives
- Relate Green - IT and IT sustainability concepts with relevant COBIT processes
- Apply knowledge of Green - IT and IT sustainability to scope, plan and deliver IT governance audits that focus on or include IT sustainability/greening considerations
- Deliver value in helping reduce their organization's IT driven carbon foot print
- Advise senior management on how Green - IT and IT sustainability initiatives can be aligned and integrated with enterprise sustainability and carbon disclosure initiatives

ISACA®
Trust in, and value from, information systems

Agenda

1: Green IT primer

- *Micro exercise #1*
- *Micro exercise #2*

2: The IT approach to greening

- *Micro exercise #3*

3: IT Auditor's role in Green IT

- *Micro exercise #4*

4: Concluding remarks and wrap-up

ISACA®
Trust in, and value from, information systems

Green IT Primer

What is Green IT?

Green IT = IT's contribution to reduce carbon footprint, sustainability and regulatory compliance via:

- Managing electrical power used by IT infrastructure
- Managing wastes and consumables used by IT and systems
- Environmental friendly practices (ex. Travel reduction)
- Sustainable IT Practices
- Enabling the enterprise to capture, process, use and report (internal/external/regulatory) carbon footprint data
- Integrating with building automation & power management systems
- Integrating and aligning with enterprise level carbon management targets and initiatives

ISACA®
Trust in, and value from, information systems

Green IT Trends

Gartner, a leading information technology research company, issued a press release in January 2010 that highlighting:

Key Predictions for IT Organizations and Users in 2010 and Beyond. One of their predictions was:

- "By 2014, most IT business cases will include carbon remediation costs"

Identifying the top 10 Strategic Technologies for 2011:

- Cloud Computing was at the top of the list
- Mobil Applications & Media Tablets were second

ISACA®
Trust in, and value from, information systems

Both of these technologies offer significant "green" benefits.

Business Drivers Behind “Green IT”

Technology

- Managers face power, cooling and space issues
- New technologies bring significant ‘green’ benefits
- New thinking and simple policy changes create environment impact

Environment

- Electronics = toxic waste = lead, cadmium and mercury
- Demand for IT capacity is increasing rapidly
- Air Transportation– 2% of global greenhouse gas emissions

Regulation

- Complex tax and financial implications
- E-waste legislation keeps hardware costs lower
- Compliance failures may result in fines or litigation

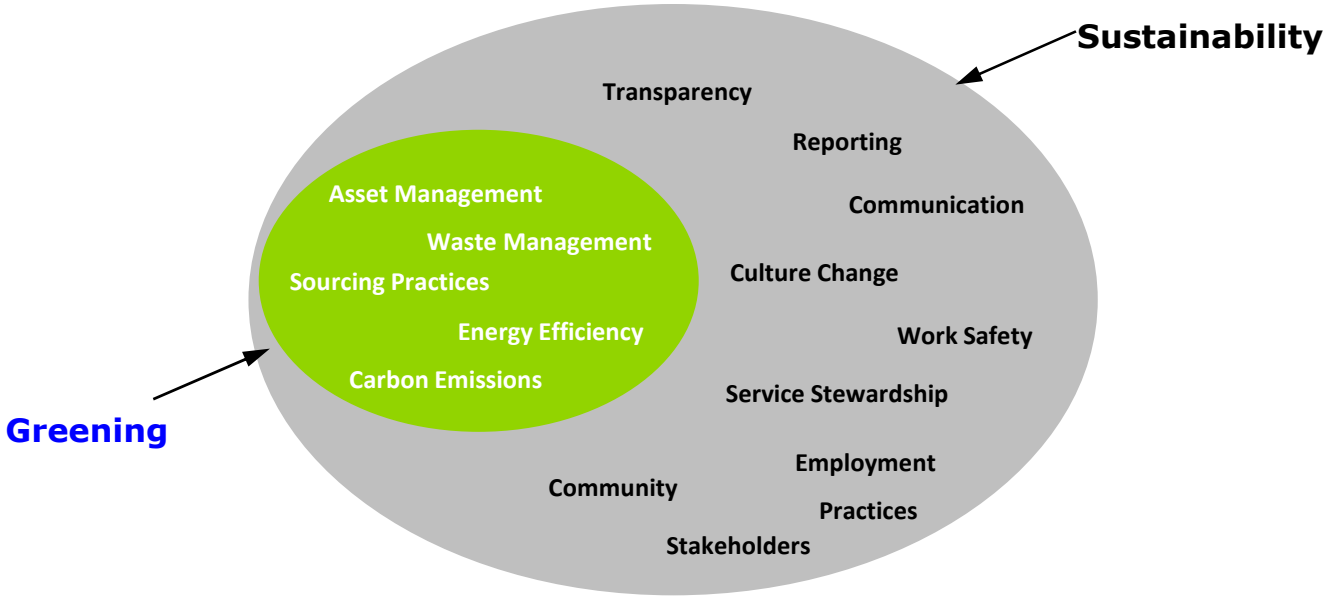
Challenges

- Future: energy costs>cost of IT hardware
- ‘Green’ and ethical Corporate Social Responsibility policies are increasingly important

From “Green IT” to Sustainable IT”

To recognize the complexity and interconnectivity of the current challenges, organizations today should consider expanding their focus from “Greening” to the more holistic approach of sustainability.

Consistent with the U.N./Brundtland Commission definition, Deloitte’s definition of sustainability is: *“The continual improvement of business operations to ensure long term resource availability through environmental, socially sensitive, and transparent performance as it relates to consumers, business partners, and the community”*



ISACA®
Trust in, and value from, information systems

Note: Environmental, Social and Economic Programs included here are consistent with the GRI Reporting Framework

Why CIO's are/should be interested ?

By adopting green business practices companies can:

- ✓ Develop a competitive advantage
- ✓ Gain almost immediate return on investment through reduced energy costs
- ✓ Gain long-term business benefit
- ✓ Reduce environmental impacts
- ✓ Enhance marketplace reputation
- ✓ Satisfy anticipated regulatory requirements
- ✓ Support innovation

ISACA®
Trust in, and value from, information systems

A number of factors have combined to put green issues firmly on the Corporate Social Responsibility agenda

Electricity use for servers has increased by 40% in the past 5 years, after doubling from 2000-2005. e-week.com

A PC left on all day will cost about $70 a year. If switched off at night and on weekend this drops to about $20 a year. Carbon Trust.

Energy efficiencies of up to 55% can be achieved in the data center. EPA Report to Congress

The IT industry is estimated to produce 2% of global CO2 emissions. Garter Research

Today, energy costs typically form less than 10% of the IT budget. This could rise to more than 50% in the next few years. Rakesh Kumar, research VP of Gartner

Micro Exercise 1

Question 1

What % of a company's energy consumption is attributed to IT?

Question 2

What % of cost savings can companies expect to realize from undertaking greening initiatives?

ISACA®
Trust in, and value from, information systems

Green IT = Greater Profits

Answer 1

IT typically represents **30-40%** of a company's energy consumption

Answer 2

Companies can on average realize approximately **20 – 30%** of cost savings from undertaking greening initiatives

<u>Marketplace example</u>

Organization: Adobe Systems

Actions: Implemented a $ 1.4M green renovation

Results: 121% ROI - Savings of $ 1.2M/year

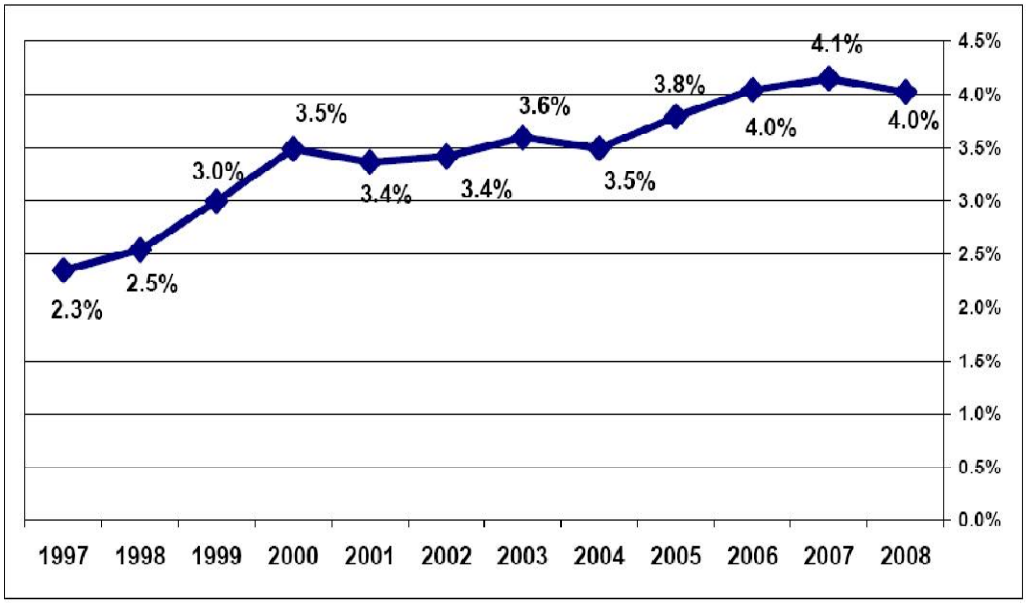
ISACA®
Trust in, and value from, information systems

Source: http://www.tradelineinc.com/reports/EAB5E3A6-2B3B-B525-8D330EE0D9E6A531

Why Managing the Cost of IT Matters

With IT costs representing a substantial portion of overall operating expense and revenue, the current economic downturn is pressuring IT organizations to reduce their spending.

Cross Industry - IT Spend as % of Revenue - 2008



Trends in IT spending

- Gartner benchmarks indicate average IT spending growth during good economic times is of 2-3 %
- IT spending during tough economic times is generally flat or down up to 5%
- IT spending trends are dependent on the industry and therefore some IT organizations will have to reduce the costs of their activities more than others
- The banking and financial sector is particularly focused on reducing its IT spending

ISACA®
Trust in, and value from, information systems

Regulatory Compliance Requirements

Around the World

Kyoto Protocol: Environmental treaty developed by the United Nations, and rationed by several countries. Sets targets for countries to reduce greenhouse gas emissions.

Waste Electrical and Electronic Equipment (WEEE): Enforced since Feb 2003 for all EU member states. Restricts the use of hazardous material in electronics and promotes proper recycling.

Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) – also in the EU - hazardous materials – related to toxic materials – useful for green IT supply management; embed IT considerations within IT green life cycles.

IT streamlines and improves the former legislative framework on chemicals of the European Union (EU).

LEED is a third-party certification program and an Internationally accepted benchmark for the design, construction and operation of high performance green buildings.

ISACA®
Trust in, and value from, information systems

Micro Exercise 2

Question:

What do the following four companies in each category have in common?

Category A

1.PriceWaterhouseCoopers LLP

2.State Street

3.Citigroup Inc.

4.Earth Rangers

Category B

1.Fujitsu America Inc.

2.Dell Inc.

3.Net App Inc.

4. Verizon Wireless

ISACA®
Trust in, and value from, information systems

Micro Exercise 2 (cont'd)

Answer:

According to Computer world's 3rd annual Top Green organizational awards

Category **A** = Top 4 Green IT *Users* of 2010

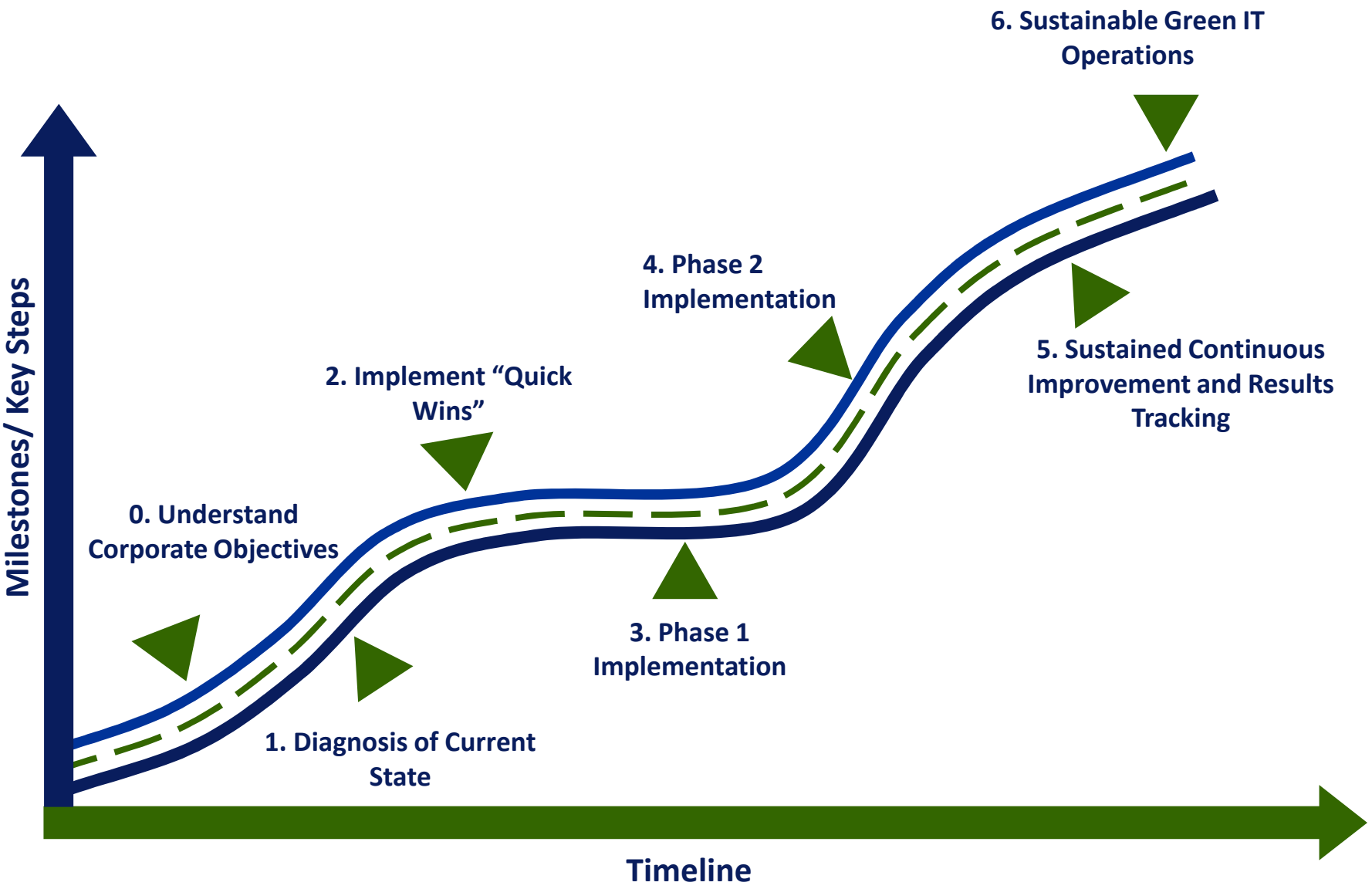
Category **B** = Top 4 Green IT *Vendors* of 2010

ISACA®
Trust in, and value from, information systems

http://www.computerworld.com/s/article/335943/Fertile_Ground_for_Green_IT_Innovation

Information Technology approach to Greening

Green IT Roadmap



Implementing a Green Program

Establish a solid baseline against which progress can be tracked.

Short term, focus on those areas that will produce immediate results:

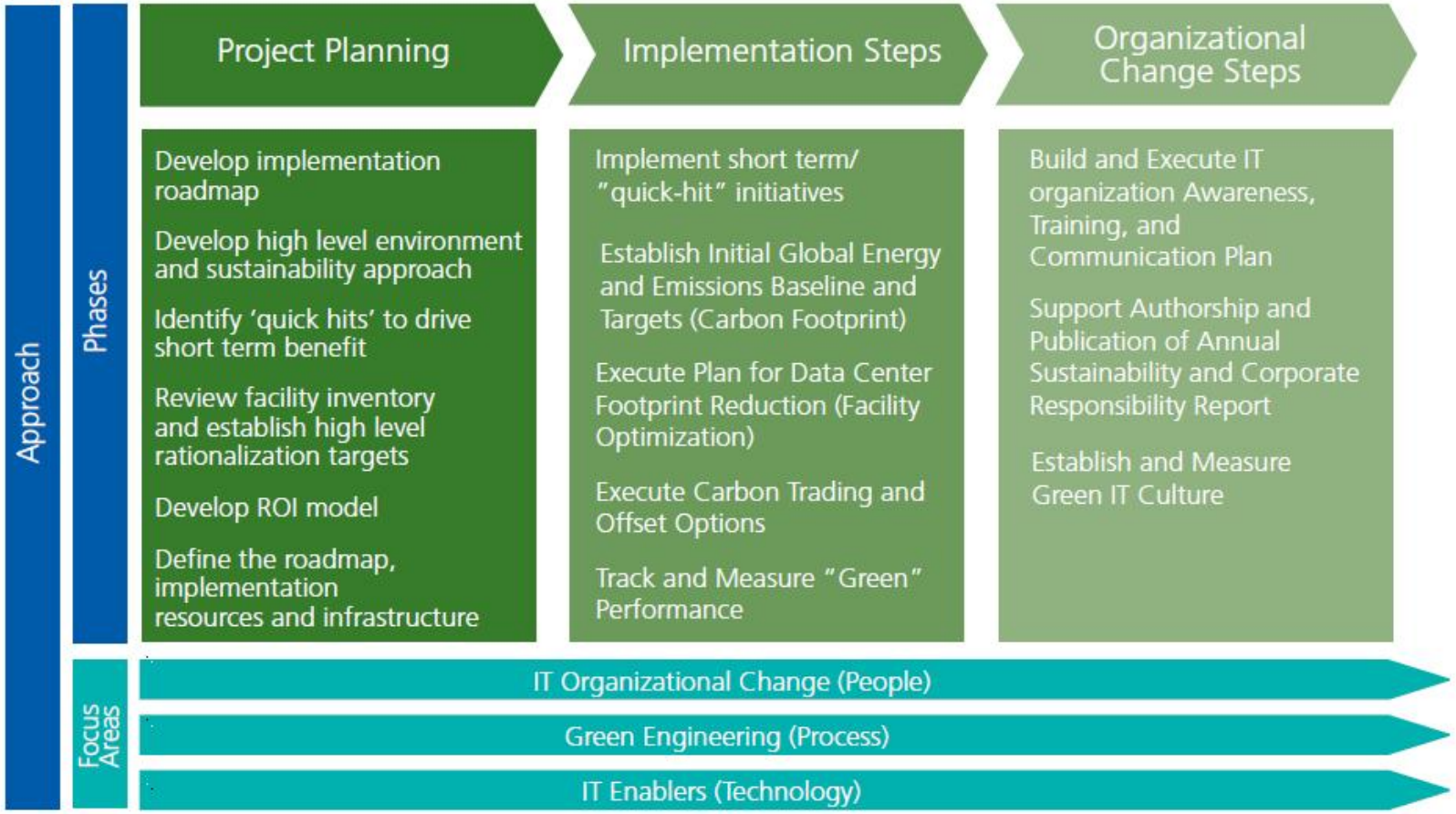
- Air management and electrical distribution in the data center
- Storage consolidation and virtualization
- Efficiency improvements in the distributed environment
- Optimized application code
- Hence delivering Green and prolonging the life of your data centers and deferring major investment

Define and deliver a strategy to align IT with your businesses corporate & social responsibility agenda

Taking advantage of available grants, R&D tax credits, optimizing spend for capital allowances' & brown field development allowances. All of these steps can vary the NPV of facility by +/- 20%

Ensuring the measurement regime is rigorous and meets external audit standards enabling uplift into CSR reporting will be increasingly essential

Implementing a Green Program



ISACA®
Trust in, and value from, information systems

How to go Green

11 Green IT Initiatives

1. Server virtualization and consolidation *
2. Storage consolidation *
3. Desktop virtualization
4. Existing server room upgrades
5. New server room builds
6. IT energy measurement
7. PC power management
8. Printer consolidation
9. Remote conferencing *
10. Telecommuting *
11. IT equipment recycling

Controlling costs is the strongest factor driving these initiatives.

Discussion:
How does "Cloud Computing help?

ISACA®
Trust in, and value from, information systems

* Most popular initiatives adopted today – all of which yield immediate cost reduction benefits

Grouping the 11 Initiatives Into Four Main Implementation Drivers

Virtualization & Consolidation

- 1. Server Virtualization and Consolidation *
- 2. Storage Consolidation *
- 3. Desktop Virtualization

Energy Efficiency

- 1. Existing Server Room Upgrades
- 2. New Server Room Builds
- 3. IT Energy Measurement
- 4. PC Power Management
- 5. Printer Consolidation

Travel Reduction

- Remote Conferencing *
- Telecommuting *

Asset disposal

- IT Equipment Recycling

ISACA®
Trust in, and value from, information systems

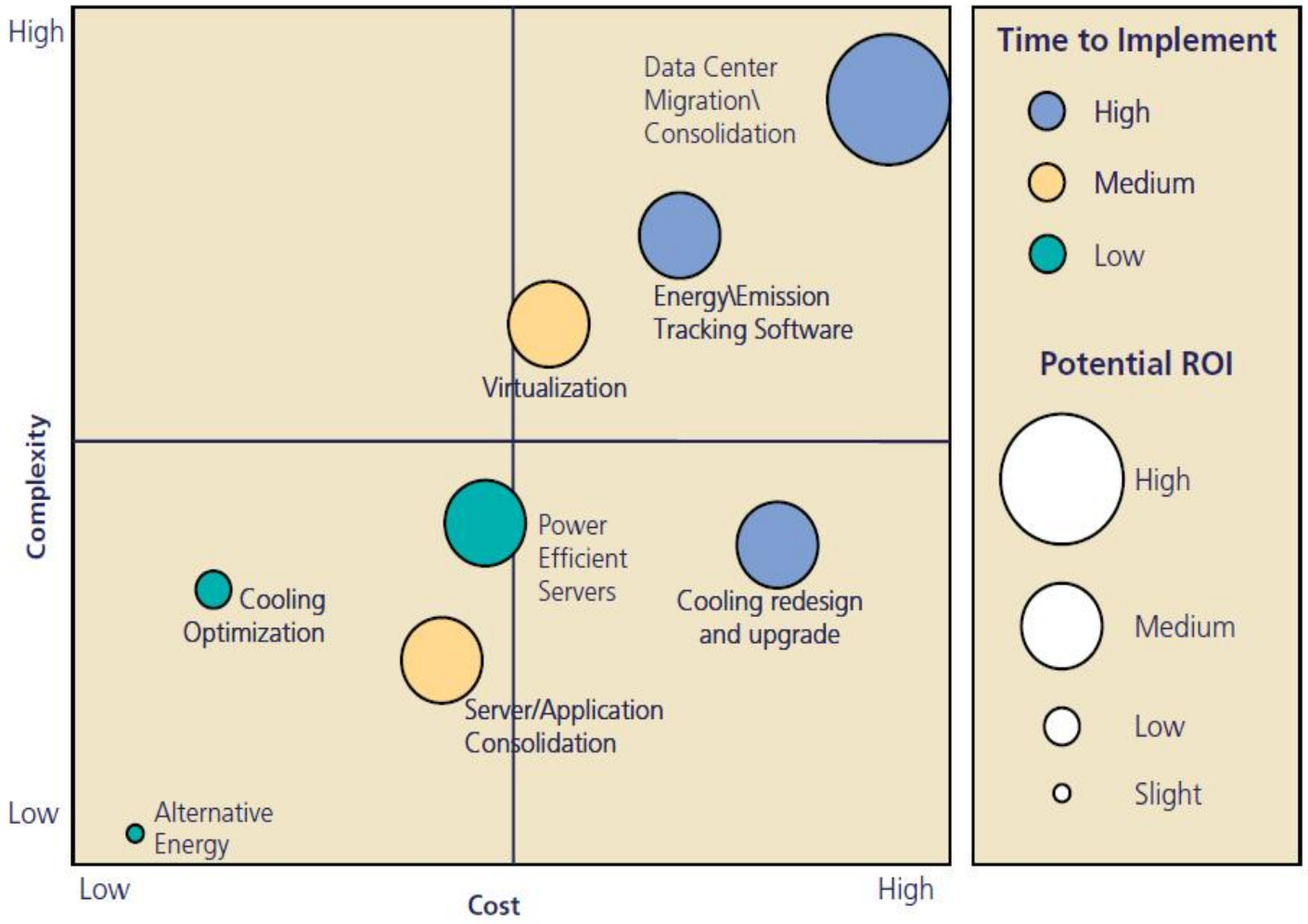
Benefits Realized

		Main Benefit of Initiatives			
		Decreased Energy	Decreased Consumables	Increased Features & Functionality	Decreased Other Expenses / Future Investments
Virtualization & Consolidation	Storage Consolidation			●	●
	Server Virtualization & Consolidation			●	
	Desktop Virtualization & Thin Clients				●
Energy Efficiency	Existing Server Room Upgrades			●	
	New Server Room Build				●
	IT Energy Measurement			●	
	PC Power Management	●			
	Printer Consolidation & Reduction	●			
Travel Reduction	Remote Conferencing & Collaboration		●		
	Telecommute Strategies & Capabilities		●		
Asset Disposal	IT Equipment Recycling		●		

ISACA®
Trust in, and value from, information systems

Generating the Greatest Value

To begin, IT organizations should look for opportunities where the shared potential value is the greatest.



ISACA
Trust in, and value from, information syste

Micro Exercise 3

Question:

How can organizations “go green” by making strategic decisions about the **location** of their IT workspace?

ISACA®
Trust in, and value from, information systems

Micro Exercise 3 (cont'd)

Answer:

Organizations can make environmentally-based location decisions for new IT workspaces such as:

a. Locating their data centers in cooler climates to minimize the need for air conditioning

b. Seeking locations with easy access to alternative and renewable energy sources

ISACA®
Trust in, and value from, information systems

Micro Exercise 3 (cont'd)

Marketplace examples:

Google has built a new data center at The Dalles, Oregon, to take advantage of the location's cool climate and hydro-electric power plant.

Pepsi Co has located a Tropicana manufacturing facility near a city landfill so that it can use the methane gas from the dump to help power the facility.

ISACA®
Trust in, and value from, information systems

Case Study: Server Room Upgrades Save a Danish Manufacturer 80% in Energy Costs

Who: An 800-employee Danish manufacturer

How:

Upgraded its cooling technology in the server room by installing equipment that employs, cold, outside air to reduce the need for air conditioning, thereby reducing energy costs.

Invested in blade servers and virtualization allowing the company to expand processing capacity without adding physical space

Result:

By adopting "free cooling," the firm's air conditioner – a traditional tool in cooling its 270 square-foot server room – is only used about 25% of the time

Savings of **65 – 80%** in energy costs over current consumption

ISACA®
Trust in, and value from, information systems

Enablers of Green IT

1. **Energy management and emissions tracking software**
   - IT can draw on a variety of emissions tracking and energy management software to monitor its energy usage
   - Will need to customize the off-the-shelf package to meet IT function's needs

2. **Power efficient hardware and alternative energy**
   a. Invest in new, high-efficiency technologies – e.g. efficient microprocessors and storage solutions
   b. Deploy energy efficient user workstations
   c. Install renewable energy systems for all IT equipment or purchase renewable energy credits for IT operations

3. **Cooling redesign and upgrade**

4. **Consolidation**

5. **Green purchasing policies**

6. **Waste management**

ISACA®
Trust in, and value from, information systems

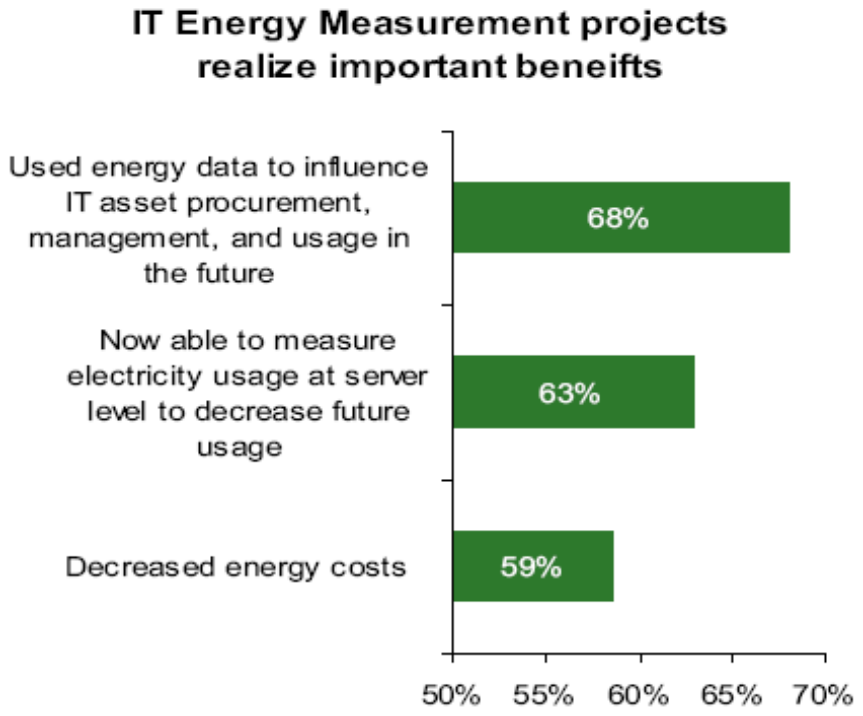
Analyzing data and leveraging tools used to measure and disclose carbon foot print

IT energy measurement

You can't manage what you can't measure.

Initiatives in this group include:

- Sub-metering for the for the server room
- PC energy measurement
- Assessment of total IT energy use



ISACA
Trust in, and value from, information systems

Energy measurement
Used as a strategic tool

Carbon Disclosure Reporting Tools
in the market

IBM unveiled an extension to its Zodiac Service providing customers with a new toolset for measuring the carbon emissions associated with their data centers

Expense management software specialist **Systems@Work** has added a similar carbon reporting module to its expense and billing software capable of automatically calculating employees' carbon emissions based on their travel expenses.

CA ecoSoftware can provide valuable up-to-date information about energy patterns using data captured directly from your organization. It helps organizations efficiently measure, report, govern and take action. CA ecoSoftware is comprised of two products: **CA ecoMeter** and **CA ecoGovernance**

Supply Chain Consulting launched the new **CarbonView** suite which integrates together all the various databases used to manage a firm's extended supply chain and can calculate the carbon and broader environmental footprint from each stage of the supply chain.

SAP has created **Business Objects Sustainability Performance Management** which is an application that helps companies pull together data about their corporate sustainability, analyze the information and create reports.

ISACA®
Trust in, and value from, information systems

Key Success Factors for Green IT Projects

Likelihood that companies will successfully implement Green IT initiatives depends on three factors:

1. **Stakeholder support** - Having the support of key stakeholders is critical to the success of any project but, particularly for Green IT initiatives as they require education and a shift in attitude.

2. **Lack of implementation barriers** – A lack of choice due to missed refresh cycles, inadequate funding, misalignment with physical facilities, and a lack of resources, such as IT staff, can all be barriers.

3. **Economic tradeoff –** Need to anticipate the impact of the economic downturn on a company's revenues, IT budget, prioritization of projects, and funding for Green IT projects.

ISACA®
Trust in, and value from, information systems

IT Auditor’s Role in Green IT

IT Auditors Role's in Auditing Green IT

1. Understand **risks** related to Green IT
2. Assess **awareness** on the importance of green IT within the organization
3. Provide management with a **diagnostic** of their existing green IT plan, policies, program/projects
4. Perform an **audit** of the IT systems/tools supporting carbon disclosure reporting

ADF (O)5

ISACA®
Trust in, and value from, information systems

Slide 34

ADF (O)5 gordon, u should elaborate a bit on this last one. the use of IA in the sustainability arena can/should be significant (and not limited to IT). make the comment to the audience that internal assurance related to the quality of sustainability reporting information that is used internally or reported externally is something that IA should be focused on. deloitte provides those services in a cosource capacity for IA depts.

Alan D Faver (Open)
, 8/9/2011

Micro Exercise 4

Question:

What risks can you think of related to Green IT?

(Risk = Uncertainties that negatively impact your organizations ability to achieve its goals or to create value)

ISACA®
Trust in, and value from, information systems

Categories of Risks Related to Green IT

1. Lack of alignment with corporate sustainability programs
2. Unsustainable and/or expensive IT practices [or] Risk of missing cost-saving and sustainability opportunities
3. Project risks related to Green IT projects
4. Lack of integration and missed synergies between multiple initiatives (cost reduction, green IT, compliance and sustainability initiatives)
5. Risks that impact the integrity of sustainability reporting (systems)
6. Any others?

ISACA®
Trust in, and value from, information systems

Where is the Organization Currently?
Green IT Roadmap

- Review organization's current initiatives in process as well as planned initiatives
- Identify and report "inaction" or lack of action from your organization from an IT Governance perspective
- Gain and share knowledge on how IT can contribute to overall enterprise/corporate sustainability
- Review and provide assurance on data and tools used to measure and report on sustainability

ISACA®
Trust in, and value from, information systems

What are the Challenges?
Green IT Diagnostic

- Motivating corporations to undertake this activity
- Access to data – e.g. power consumption used by data centre (hard to determine reliability of data)
- Benchmarking of infrastructure (difficulty in identifying baseline components)
- Baseline information from companies is not readily available
- Skepticism from organizations about undertaking these greening activities (i.e. will only be convinced if large, well-known companies approach these companies)
- Verifying information integrity of the data obtained and using it to meet the accounting assertions: completeness, accuracy, cutoff, presentation, validity

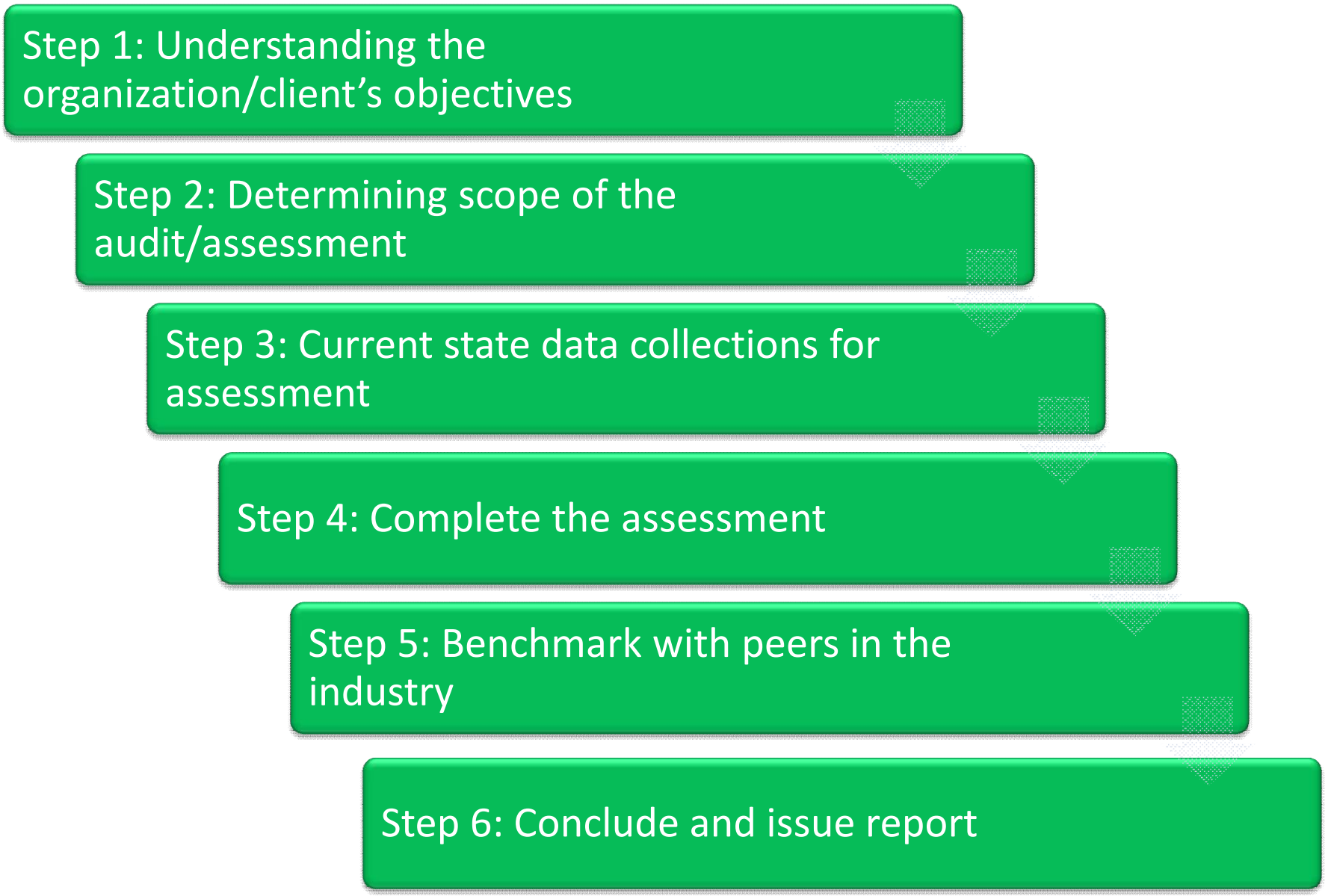
ISACA®
Trust in, and value from, information systems

How Can We Motivate Organizations?
Green IT Diagnostic

- Emphasize the cost-reduction potential of greening initiatives
- Emphasize the green strategy benefits obtained:
  - Sustainability
  - Improved market image
  - Return on Investment

ISACA®
Trust in, and value from, information systems

Basic Stages of a Green IT Assessment



Using COBIT to Help

COBIT's purpose is to align IT with business objectives:

1. Understand COBIT processes that align with Green IT and Sustainability concepts (next three slides) and identify gaps
2. Use COBIT to perform an audit of the IT systems related to greening program (Carbon disclosure/greenhouse gas data tracking system) – e.g. security, data integrity, processing

ISACA®
Trust in, and value from, information systems

How IT Greening Eliminates Waste

IT Greening Activities: Organizational Model	Types of Waste							
	Overdoing	Transportation	Inventory	Waiting Time	Processing	Defects	Motion	Unused Intellect
Evaluate business function and establish shared services across the organization	X		X					
Establish shared services at a location with easy access to affordable and renewable energy	X	X						
Review travel policies and minimize number of employees from one office travelling to the same location for the same purpose		X		X				
Minimize number of flights and look for alternatives		X		X				
Enable work at home through teleconferencing and collaboration tools		X		X				
Implement self-services	X			X	X			
Simplify / automate routine tasks and processes	X			X	X	X		
Review and optimize telecommunications related costs e.g. mobile phones and Blackberry allocation			X					
Default printers on double-sided printing			X					

How IT Greening Eliminates Waste (cont'd)

IT Greening Activities	Applications data, network architecture and and strategic sourcing	Types of Waste							
		Overdoing	Transportation	Inventory	Waiting Time	Processing	Defects	Motion	Unused Intellect
	Migrate from traditional telephony to VOIP and wireless technology			X					
	Implement / optimize IT systems management tools with role-based capabilities	X			X	X			
	Increase storage virtualization			X					
	Establish Green Architecture Standards			X					
	Implement integrated local and remote management								
	Review number of desktops/laptops per user			X					
	Optimize utilization of printers and peripherals	X		X	X				
	Consolidate sourcing	X		X	X	X			

How COBIT Eliminates Waste

Cobit Processes	Types of Waste							
	Overdoing	Transportation	Inventory	Waiting Time	Processing	Defects	Motion	Unused Intellect
PO2 Define the Information Architecture	X			X	X			
PO4 Define the IT Processes, Organization and Relationships	X	X	X	X	X	X	X	X
PO7 Manage IT Human Resources								X
PO10 Manage projects	X	X	X	X			X	X
AI1 Identify automated solutions				X	X			
AI2 Acquire and Maintain Application Software	X			X	X			
AI3 Acquire and Maintain Technology Infrastructure	X	X		X	X		X	
DS3 Manage Performance and Capacity	X	X					X	X
DS7 Educate and Train Users					X	X		X
DS8 Manage service desk and incidents	X				X	X		
DS9 Manage the configuration				X	X			X
DS12 Manage the physical environment		X		X			X	
DS13 Manage Operations	X	X	X	X	X	X	X	X

Concluding Remarks and Wrap-Up

Not “if”, but “when”

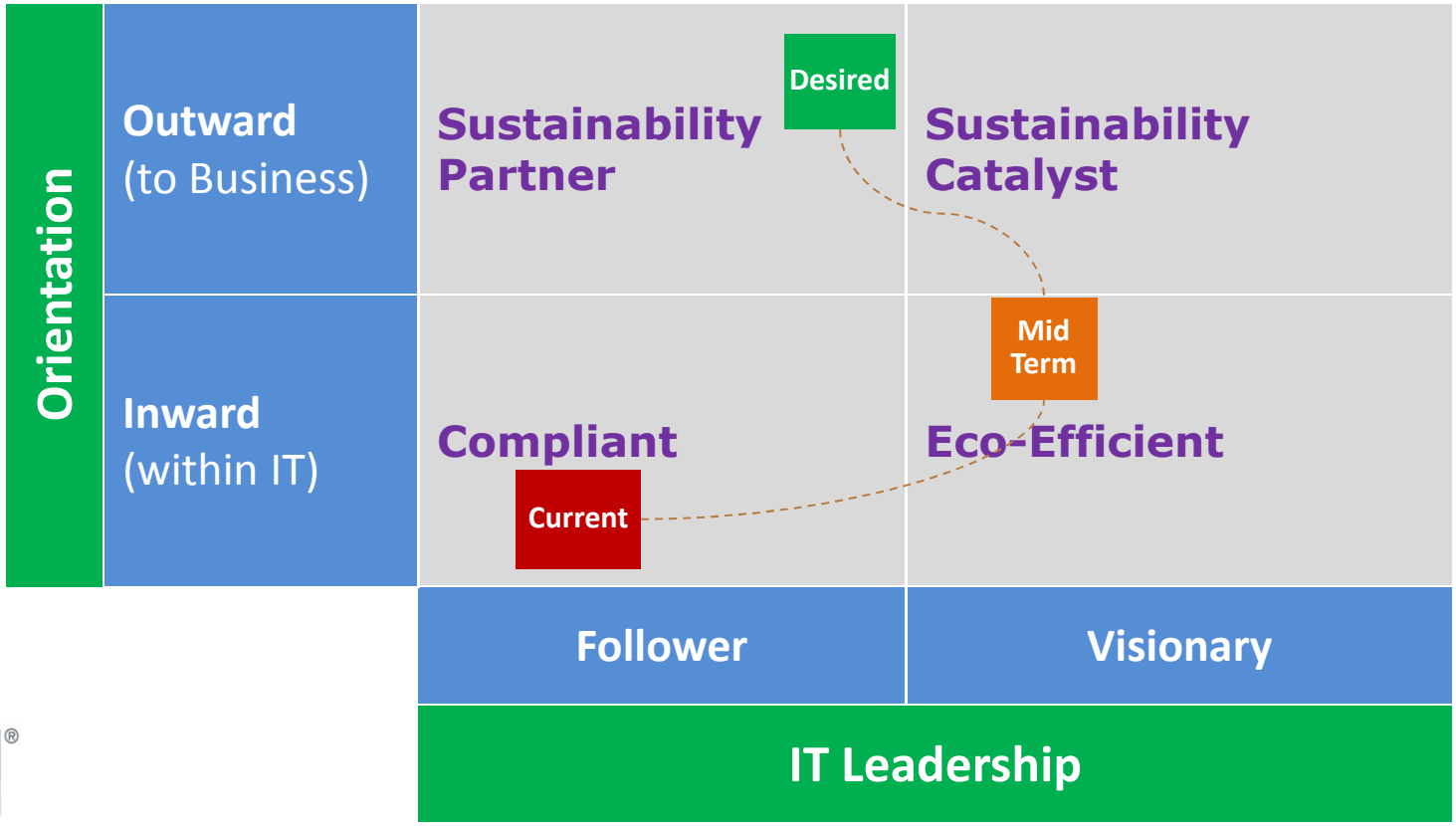
- Enterprise **sustainability is here to stay**.
- The **real question is** not whether your information technology should go green, but **when**?
- **Can your company afford to wait** until federal regulations are mandated, then spend capital and face significant risks to play “follow the leader”?
- **IT is** being driven to go green, and the companies who use IT “quick wins” as **the catalyst** to promulgate sustainability throughout the rest of the organization will be the ones that reap the most rewards

ISACA®
Trust in, and value from, information systems

The Role of IT

in the Context of Greening and Sustainability

IT organization should aim to minimize the impact of its own operations before playing a proactive role as a sustainability partner to the business.



ISACA®
Trust in, and value from, information systems

Green IT

Capability Maturity Model

Identify your existing and desired capabilities

Desired state

Maturity Gap

Current state

Process evolution	Process characteristics	Method of achievement
Optimizing	Improved feedback into the process yielding continuous improvement	• Automation
Managed	(Quantitative) Process measurements indicating performance levels	• Complete control structures • Performance analysis
Defined	(Quantitative) Process defined and institutionalized	• Policies, procedures and standards defined • Corporate knowledge
Repeatable	(Intuitive) Process highly dependent on individuals and their commitment	• Quality people • Defined tasks
Initial	(Ad hoc / chaotic)	• Undefined tasks • Relies on initiative

Quality and control

Risk

Process Evolution

Build on what's already in place

ISACA®

Trust in, and value from, information systems

Thank You

Gordon Chatterton
Senior Manager
Deloitte & Touche LLP
Atlanta, GA
Email: gchatterton@deloitte.com
Phone: 402.220.1828

ISACA®
Trust in, and value from, information systems