

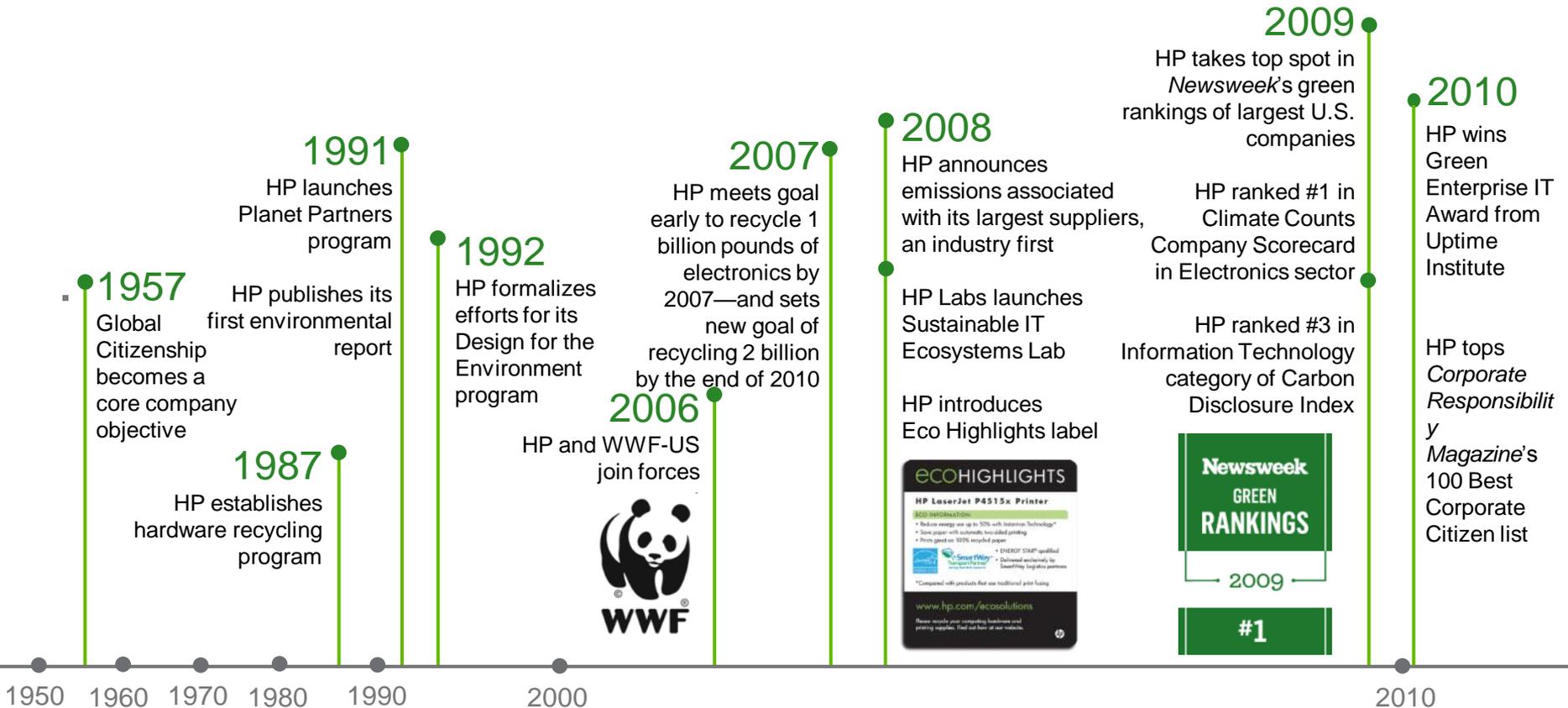
# Energy Efficiency: Taking an Enterprise Approach

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# HP Environmental Milestones

A legacy of leadership



# Recognized for Environmental Leadership



HP ranked first among technology companies and placed fifth overall among listing of Best Global Green Brands



HP Trade Data Center in Wynyard won 2010 Green Enterprise IT Award



HP named in top 20 green companies in Brazil by Época Empresa Verde for 2011



HP has been on the FTSE4Good Index since 2003



HP ranked #1 in Electronics sector of 2011 Climate Counts Company Scorecard



HP received Carbon Trust Standard 2010



HP listed on the Carbon Disclosure Project's S&P 500 Carbon Disclosure Leadership Index



HP listed in top of rankings from 2009-2011. In 2011, HP kept the #2 spot on the U.S. 500 list, and is one of three technology companies in the top 15 of the Global 500.



HP ranked #2 on the 2011 Top Green-IT Vendors



HP listed on DJSI North American Index



People.com.cn, one of the most influential government websites in China, recognized HP China as the China Low Carbon Champion for 2010



HP ranked #1 in the 17<sup>th</sup> Greenpeace Guide to Greener Electronics (2011)



HP ranked #15 on Top 25 Supply Chain for 2010



HP China named to "50 Green Companies 2010" by *Business Watch* magazine



HP won the Environmental Printing Award from *PrintAction* from 2006–2010



HP won the International Green Award Silver 2011 for the HP Wynyard datacenter



# Strategy – Alignment to Mission and Directives

## RISKS

- Higher costs
- Supply chain disruptions
- Operational inefficiencies
- Tighter regulations
- Weakened brand in global economy

## OPPORTUNITIES

- Legislator and stakeholder trust
- Higher productivity
- ~~Top-line growth~~
- Do more with less
- Greater innovation
- Competitive differentiation



Some things to think about ...

"To measure is to know."

"If you can not measure it, you can not improve it."

*Lord Kelvin*



# Firm foundation – Getting the Baseline

HP is applying our own solutions and best practices to limit our footprint

## Portfolio

- In 2009, we set a goal to reduce the energy consumption of our products by 40% from 2005 levels by the end of 2011. We achieved that goal 9 months ahead of schedule, and today HP products are on average 50% more energy efficient than they were in 2005.
- By 2011 we used more than 100 million pounds of recycled plastic in HP printing products – achieving our goal 1 year early.
- HP offers the largest selection of ENERGY STAR®-qualified, EPEAT® and other ecolabel guidelines electronic products in the industry

## Partnerships

- We're working NGOs such as the Climate Group, World Wildlife Fund and National Resources Defense Council to address environmental issues with HP technologies, education programs and public policy efforts.
- HP is co-leading a working group in the Electronic Industry Citizenship Coalition to develop an online carbon reporting system to help suppliers to measure and disclose greenhouse gas emissions.

## Supply chain

- In 2008 HP became the first in the IT industry to report its supply chain emissions.
- We've conducted nearly 600 audits to ensure our suppliers meet HP's stringent environmental standards.

## Operations

- We're committed to reducing our greenhouse gas emissions 20% below 2005 levels by 2013.
- We've consolidated 85 data centers to six energy-efficient facilities, helping reduce costs by 60%.
- With HP Visual Collaboration, we avoid 20,000 business trips annually, reducing CO<sub>2</sub> emissions by 35,000 tonnes and saving millions of dollars.



# Data, Data, Data – Making Sense of the Deluge

Environment	Society	HIGHLIGHTS DATA TABLE						
<b>Energy and climate</b>		GRAPH	GOALS	2006	2007	2008	2009	2010
	Energy use from operations <sup>1</sup> [million kWh]					4,441	4,249	4,140
+	Electricity use from operations <sup>1</sup> [million kWh]					3,972	3,850	3,704
+	Natural gas use from operations <sup>1</sup> [million kWh]					469	399	435
	Voluntary purchases of renewable energy [million kWh energy and renewable energy credits, in addition to the renewable energy available by default in the power grid]					102	131	311
+	GHG emissions from operations <sup>1</sup> [tonnes CO <sub>2</sub> e]					2,165,500	2,060,300	1,865,200
+	PFC emissions <sup>2</sup> [tonnes CO <sub>2</sub> e]			15,337	13,489	11,627	3,114	3,430
	PFC emissions <sup>2</sup> [as a % of 1995 emissions]			59%	52%	45%	12%	13%
+	PFC emissions, by type <sup>2</sup> [tonnes CO <sub>2</sub> e]			15,337	13,489	11,627	3,114	3,430
+	GHG emissions from employee business travel [tonnes CO <sub>2</sub> e]							
	Energy and climate - Operations goals		↔					
	GHG emissions from product manufacturing (estimated) <sup>3</sup> [tonnes CO <sub>2</sub> e]		↔		3,500,000	4,100,000	3,500,000	
	GHG emissions from product transport (estimated) <sup>4</sup> [tonnes CO <sub>2</sub> e]		↔		2,000,000	1,800,000	1,700,000	1,900,000
	Product use		↔					
<b>Sustainable design</b>		GRAPH	GOALS	2006	2007	2008	2009	2010
	Life cycle assessment		↔					
	Materials		↔					
	Packaging		↔					
	Paper		↔					



Cybersecurity is not an option



# Solution Evolution

Deployment Approaches Aligned to Mission and Time



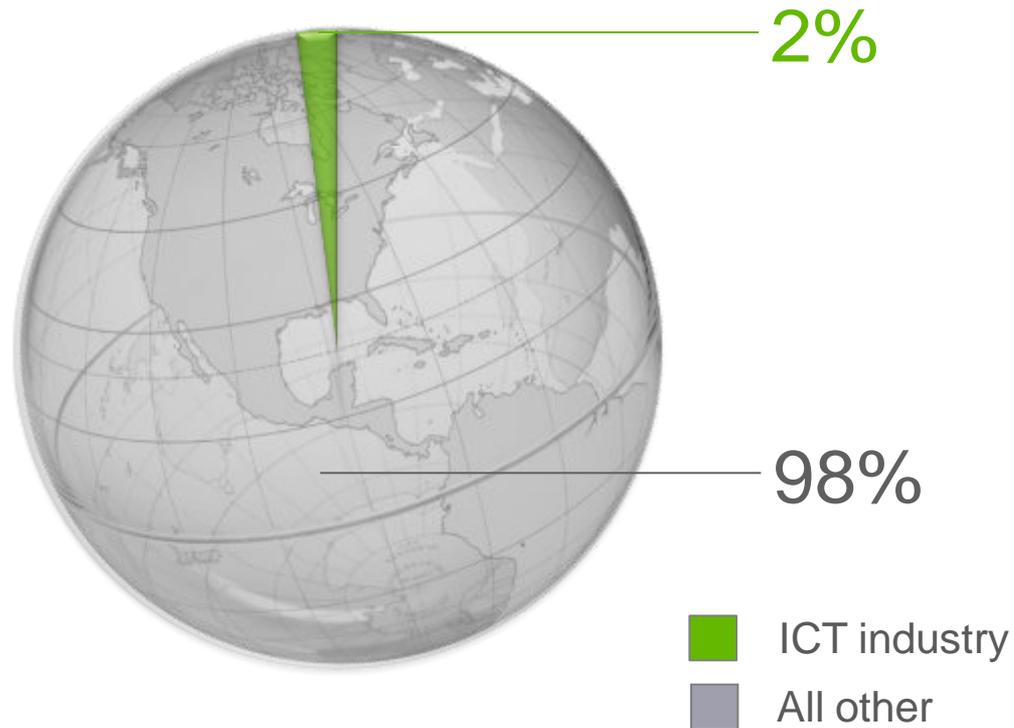
# IT Meets OT – the Power of Team

- Understand the cultures and relationships
- Who pays the bills?
- Who gets the benefits?
- What are the geo-differences?
  - Unions
  - Vendors
  - Security postures
  - Data protection & privacy
- Buildings for the Future
  - Open standards versus proprietary
  - Security built in – not bolted on
  - Enterprise versus buildings or sites



# Beyond Technology's Footprint

Reducing technology's impact while responding to the larger opportunity



## The power of "if"

# Optimize Resources

OPTIMIZE  
RESOURCES

BUILD  
INTELLIGENT  
INFRASTRUCTURE

DRIVE  
SUSTAINABLE  
TRANSFORMATION

## Engage the Work Force

### Opportunities

- Save energy and money without sacrificing business and IT performance
- Reduce costs and risks associated with your carbon footprint
- Conserve paper and other resources
- Lower demand for natural resources by purchasing IT made from recycled materials
- Maximize reuse and recycling of old IT and supplies
- Implement and manage green procurement guidelines
- Real estate consolidation – mobilizing the work force

Speed of government =  $f$ (speed of communications)



## Optimizing print efficiency and advancing environmental citizenship with HP MPS



- Realized substantial cost savings from printer consolidation of previous 1:1 employee-to-printer ratio to ~12:1.
- Engaged HP Education Services to help clients adopt and use new print features and functionality.
- Deployed HP's Output Server solution to consolidate and manage over 1,400 SAP print queues -- key to global SAP implementation.
- Reduced power consumption through consolidation and integration of ENERGY STAR® printer models.
- Leveraged duplex printing to reduce print output approximately 30%.
- Reached goal to recycle 100% of print cartridges through MPS program.

## Creating a new standard for data centers



- HP designed and built one of the largest, most energy-efficient data centers in Europe
- Takes advantage of local geography and climate for cooling
- Reduces energy consumption by 40% compared to similar sized conventionally cooled facilities
- Produces about half the emissions of a typical data center
- Saves up to \$4 million annually

# Build Intelligent Infrastructure

OPTIMIZE  
RESOURCES

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DRIVE  
SUSTAINABLE  
TRANSFORMATION

Apply IT to maximize performance and make better decisions faster.

## Opportunities

- Integrate IT management to deploy energy-efficiency measures across the network
- Integrate a wide range of BAS, SCADA, smart meters to improve visibility
- Reduce waste by more accurately anticipating and responding to resource needs
- Use IT to increase transparency and drive more informed decision making



# Detroit Water and Sewerage

Increasing transparency to change behavior

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- HP Advanced Meter Infrastructure solution monitors water consumption in real time
- Seamless integration of multiple systems
- Identifies, analyzes and forecasts usage trends
- Increased productivity by 15%
- Prompts more responsible consumption among customers



# CeNSE

## Creating a Central Nervous System for the Earth

OPTIMIZE  
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TRANSFORMATION



- Vision for an IT ecosystem that senses, collects, sends and analyzes information about the world's infrastructure in real time
- Deploy billions of tiny, inexpensive, ultrasensitive sensors
- Transmit data over powerful computing network for rapid analysis
- Reveal deeper insights to guide research, business, utilities and more
- Manage systems, reduce waste and shift behaviors
- Anticipate and respond to issues before they become crises



# Drive Sustainable Transformation

OPTIMIZE  
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INFRASTRUCTURE

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SUSTAINABLE  
TRANSFORMATION

Shift to more productive and sustainable technology solutions

## Opportunities

- Replace energy-intensive, carbon-heavy processes with more efficient alternatives
- Plan/execute to optimize total performance
  - Understand utility supply/demand and its impact on your P&L
- Redefine how people, businesses and industries work
- Shift priority from reducing costs and risks to creating platforms for top-line growth



# HP 240a - EcoPOD

(Performance Optimized Data Center)

Advanced energy efficiency in a modular design

OPTIMIZE  
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SUSTAINABLE  
TRANSFORMATION



- Deploy fast — An EcoPOD can be up and running in as little as 12 weeks
- Reduce costs — by leveraging HP's modular design and supply chain economies, an organization can save up to 75% over a traditional data center
- Be efficient — Up to 95% more energy efficient than a brick-and-mortar data center
- Shrink footprint — High density rack design can reduce a data center footprint by up to 88%
- Save energy — Enough in fact, to help power more than 1.8 million homes in the U.S. for one year
- Be cool — The EcoPOD is an air-cooled modular data center that automatically adjusts to the most efficient cooling method



# ABRIL GROUP

When less means more

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- HP used server virtualization to simplify and standardize the complex IT environment
- Consolidated 250 physical servers to 14
- Saved 530,000 kWh of power annually
- Reduced total cost of ownership by 30%
- Cut IT costs by \$33 million over 7 years
- Cut yearly carbon emissions by 320 kg, the equivalent of planting 1,600 trees or removing 120 cars from the road



Thank you!

