

# Global Supply Chain Compliance

The Greening of Electronics in  
a Global Economy

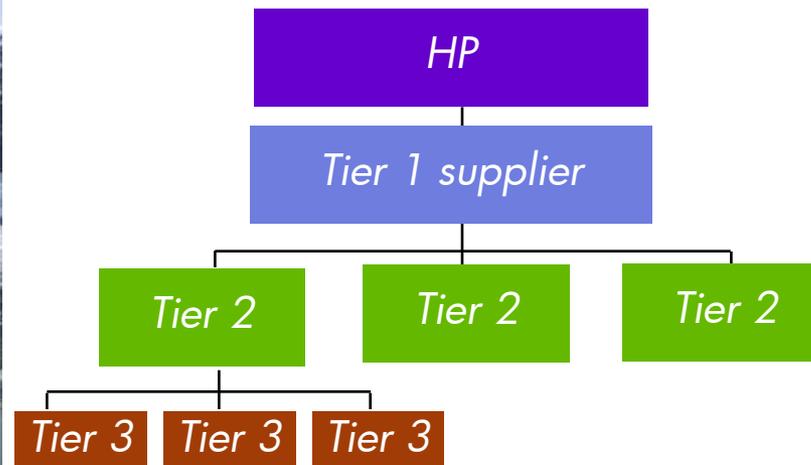


February 18, 2009

**Judy Glazer**  
Director,  
Global Social & Environmental Responsibility Operations

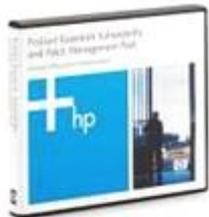
# Outline

- Environmental Sustainability at HP
  - Approach
  - Supply chain focus areas
- Global supply chain materials compliance management
  - Transition program management
  - Ongoing compliance management

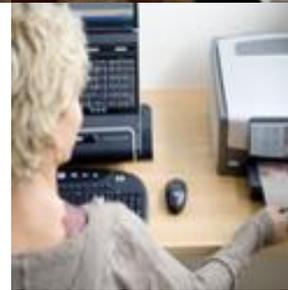


# HP: Broad Portfolio of IT Products & Services

## Technology Systems Group



## Imaging and Printing Group



## Personal Systems Group



# HP Supply Chain

- Procurement
  - Largest purchaser of electronic components, ~\$50B
- Logistics
  - Every day HP delivers 1.3 million Inkjet cartridges, 110,000 printers, 75,000 personal systems, 3,500 servers
- Suppliers
  - Hundreds of Direct Material Suppliers
  - Thousands of Indirect Suppliers



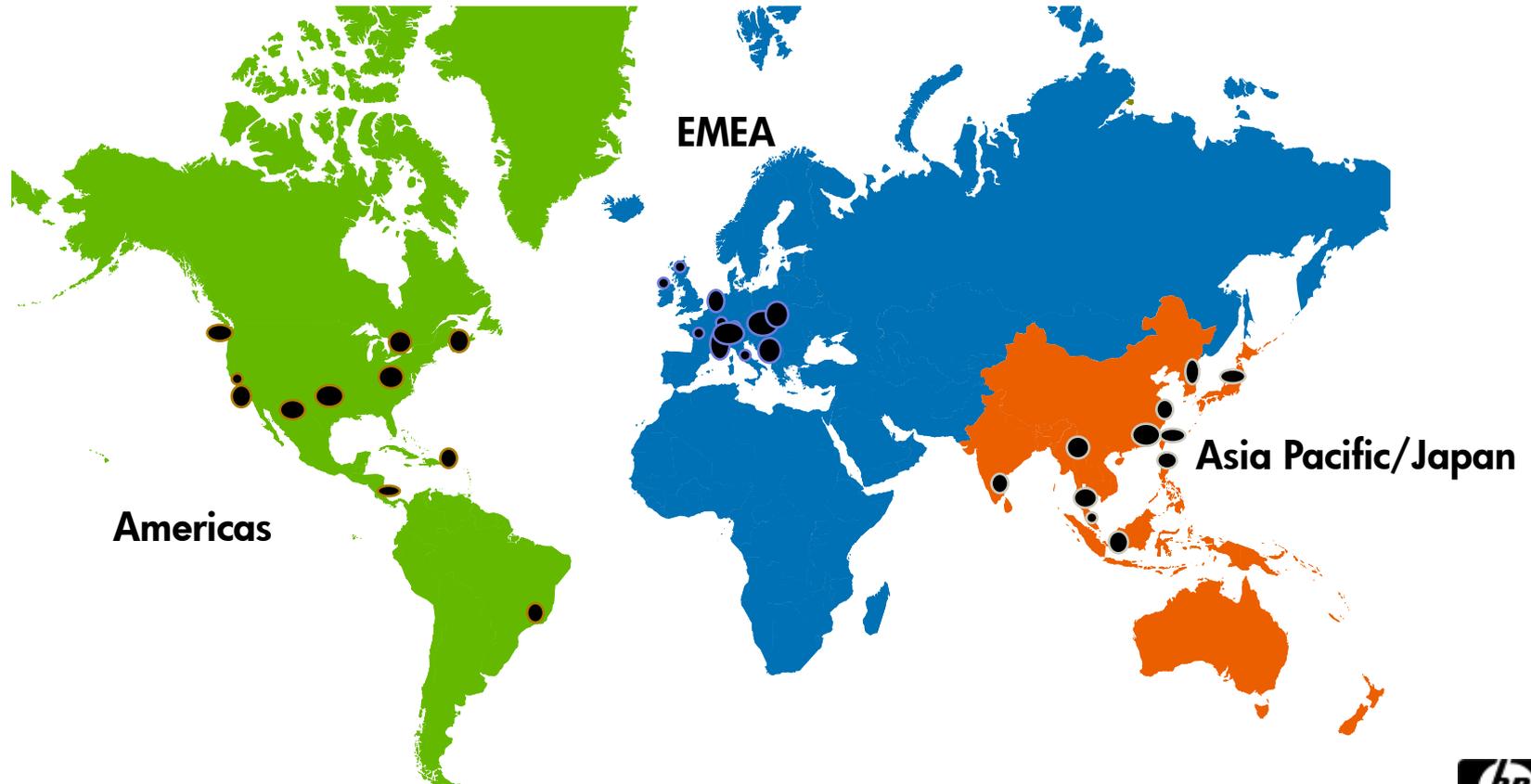
# Global Supply Chain, Global Sales

HP's suppliers of product materials, components and services

Americas  
20% of spend / 41% of sales

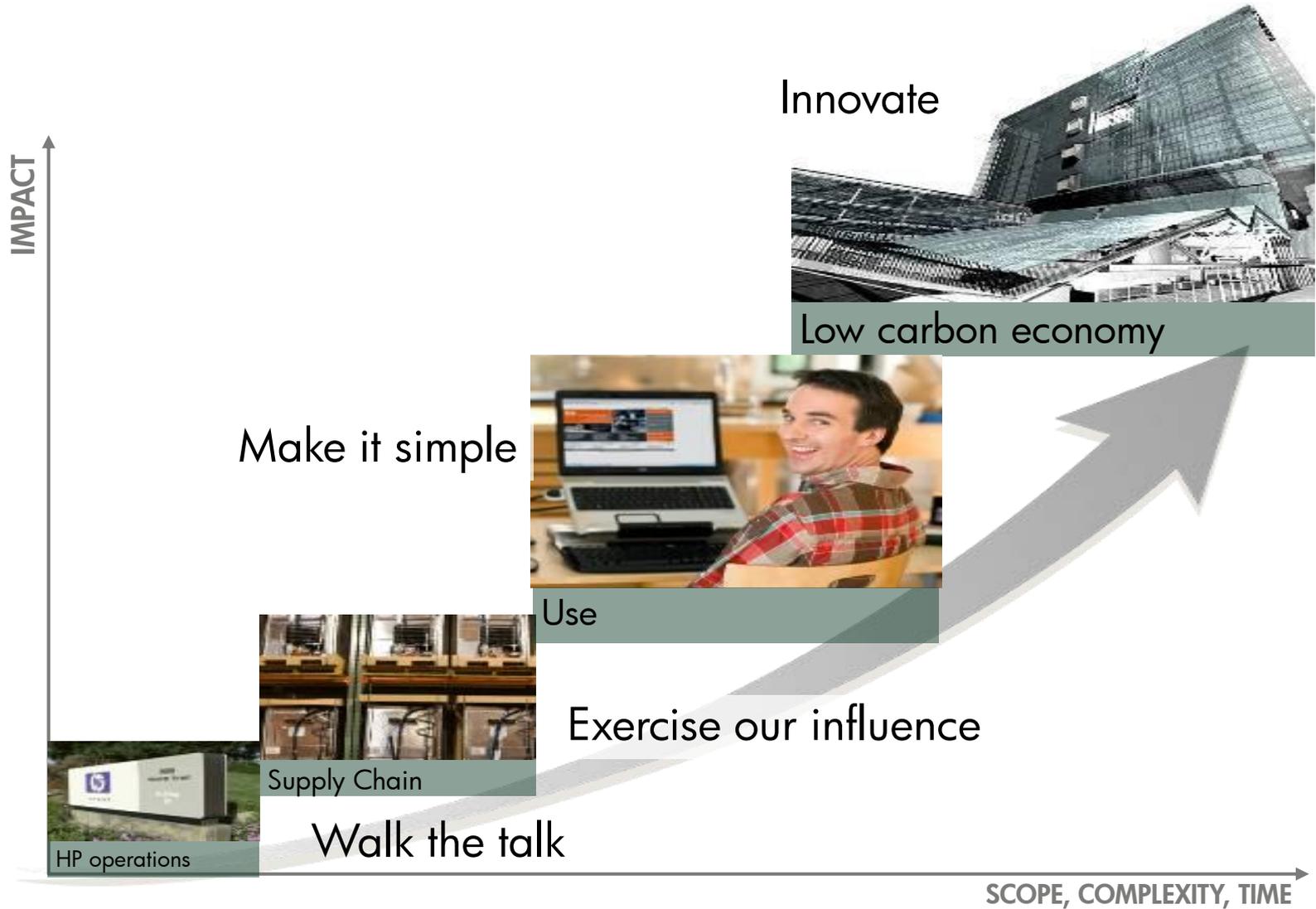
Europe, Middle East & Africa  
5% of spend / 40% of sales

Asia Pacific & Japan  
75% of spend / 19% of sales

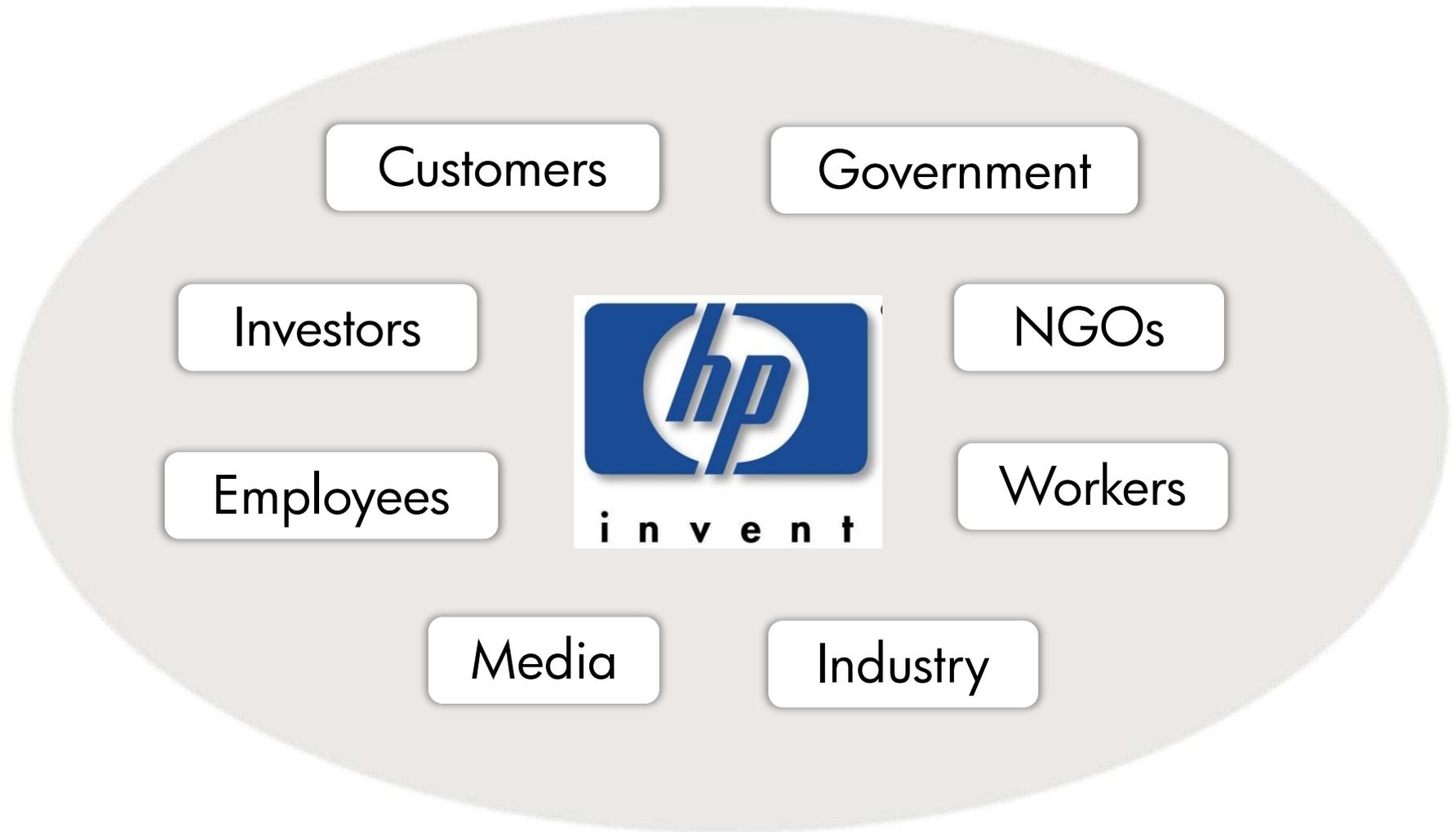


Major locations of HP product materials, components and services suppliers

# HP's lifecycle approach to sustainability



# Key sustainability stakeholders



# Designing for the environment at Hewlett Packard

*"Environmental responsibility is good business. We've reached the tipping point where the price and performance of IT are no longer compromised by being green, but are now enhanced by it."*

*-- Mark Hurd,  
CEO,  
Hewlett Packard*



# What Sustainability Means to HP: Supply Chain Focus Areas

Reducing impact throughout the product lifecycle



- Design for the environment
- Responsible manufacturing and supply chain practices
- Efficient energy usage
- Product reuse and recycling

# Notebook Computer

Walmart Home Entertainment Design Challenge Winner

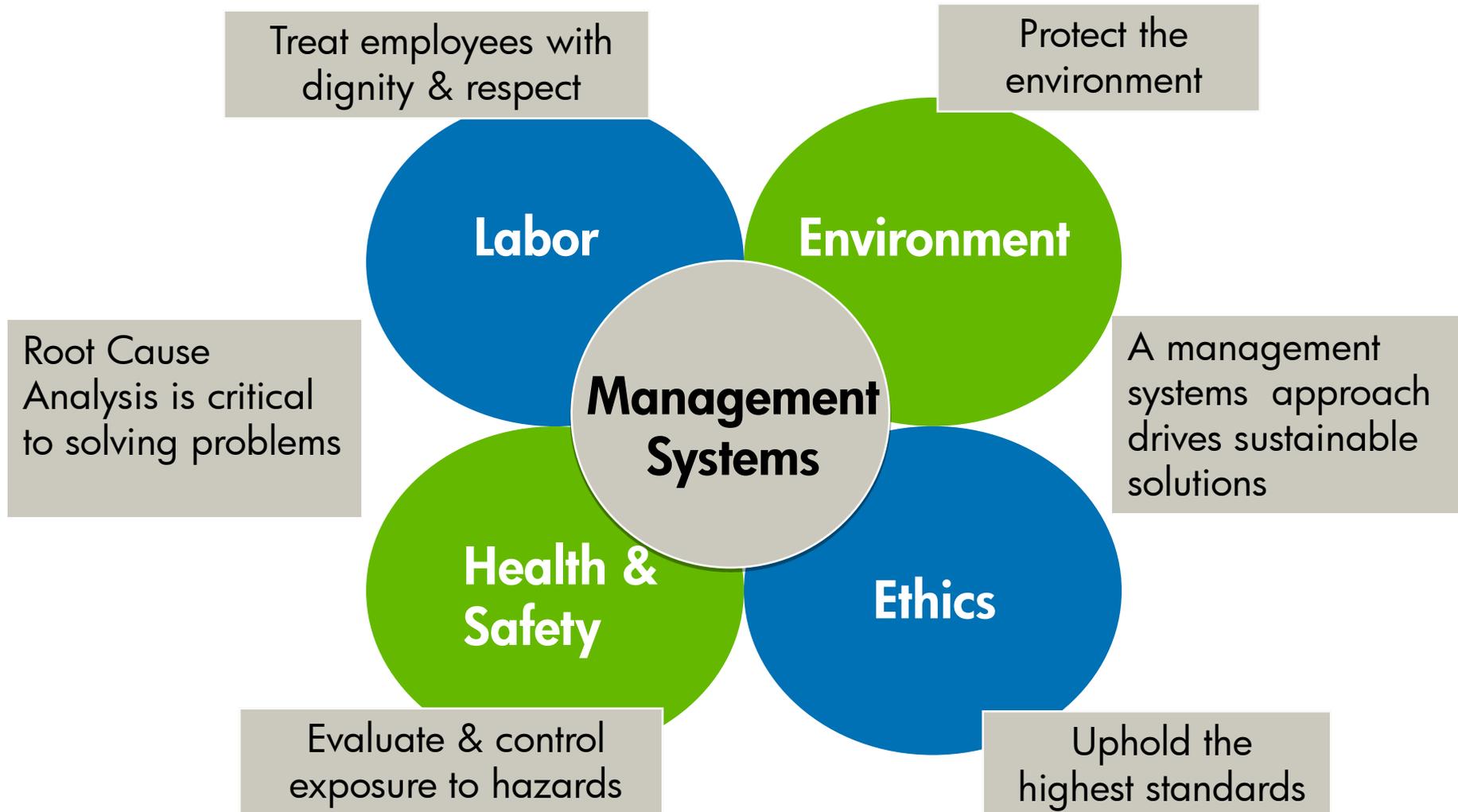


Reductions:

Customer waste  
(97%)

Shipping volume  
(~25%)

# Electronic Industry Code of Conduct



# Common standards and processes accelerate progress



**GeSI**  
GLOBAL e-SUSTAINABILITY  
INITIATIVE

[www.eicc.info](http://www.eicc.info)  
[www.gesi.org](http://www.gesi.org)



**NOKIA**  
Connecting People



Telefonica



acer



LEXMARK

Microsoft

EGATRON  
SATRON • UNIHAN CORPORATION



SANMINA - SCI  
SONY

tellabs



DSG international plc

FOXCONN

JABIL

LITEON



PHILIPS



SPANSION

VENTURE

AMD



DELL



Kodak



Sun  
microsystems

WD Western  
Digital

ANALOG  
DEVICES

Celestica

EMC<sup>2</sup>  
where information lives<sup>®</sup>

IBM

lenovo

Micron

NVIDIA

SAMSUNG  
SAMSUNG ELECTRONICS

SOLETRON

Talison  
Ai

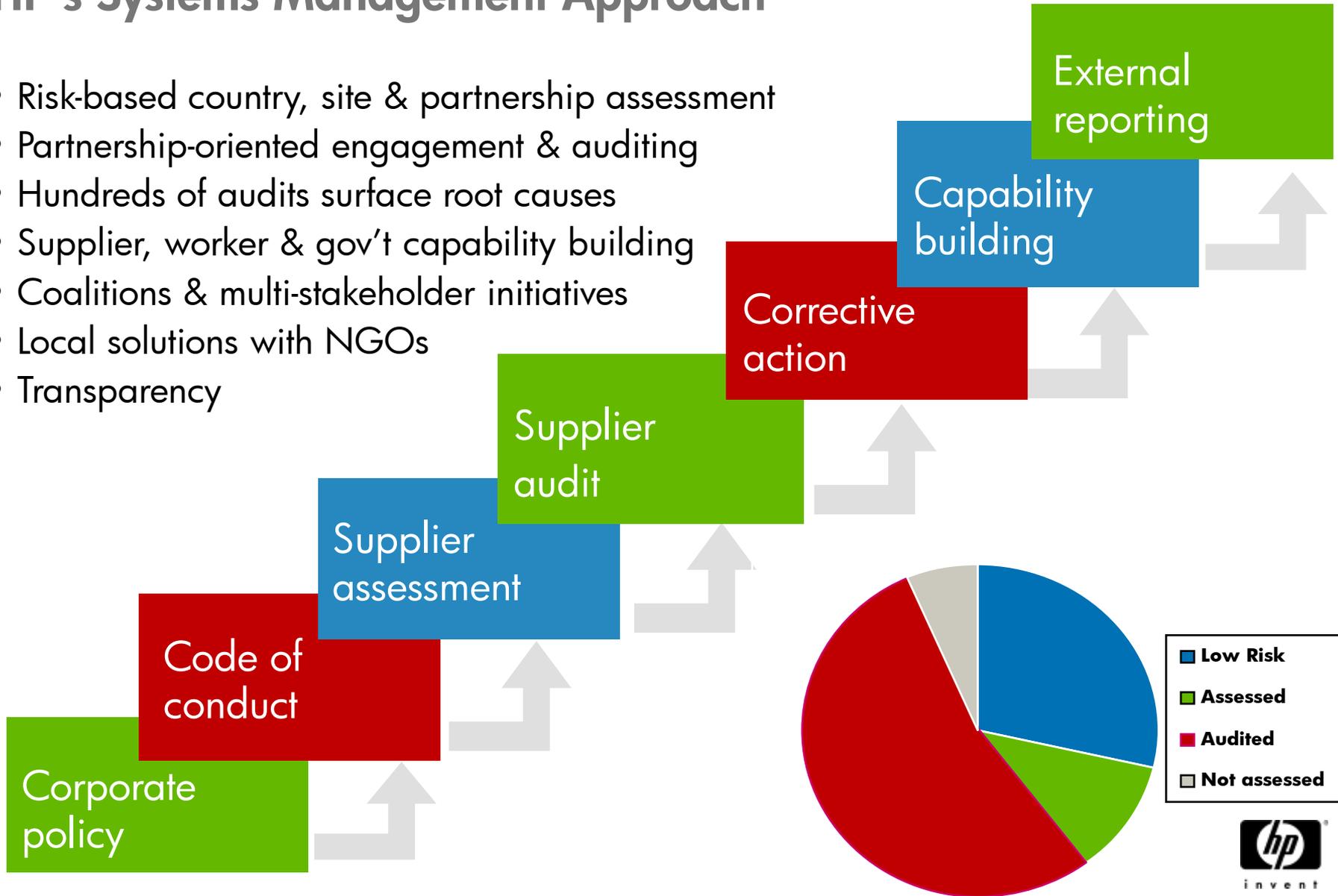
xerox



# Supply Chain Steps & Progress

## HP's Systems Management Approach

- Risk-based country, site & partnership assessment
- Partnership-oriented engagement & auditing
- Hundreds of audits surface root causes
- Supplier, worker & gov't capability building
- Coalitions & multi-stakeholder initiatives
- Local solutions with NGOs
- Transparency



# Setting Goals and Measuring Progress

- Industry's first supply chain code of conduct
- 500+ supplier audits coupled with capability building
- Annual Global Citizenship Report cites goals, results
- Winner of ISM 2008 Richter award for Leadership and Innovation in Supply Management



# Reducing Truck Transportation Impacts

- All shippers in US and Canada
- 1<sup>st</sup> to qualify for EPA SmartWay logo labeling program
- US EPA 2008 SmartWay Excellence award



# Designing for the environment

## Energy-efficient products

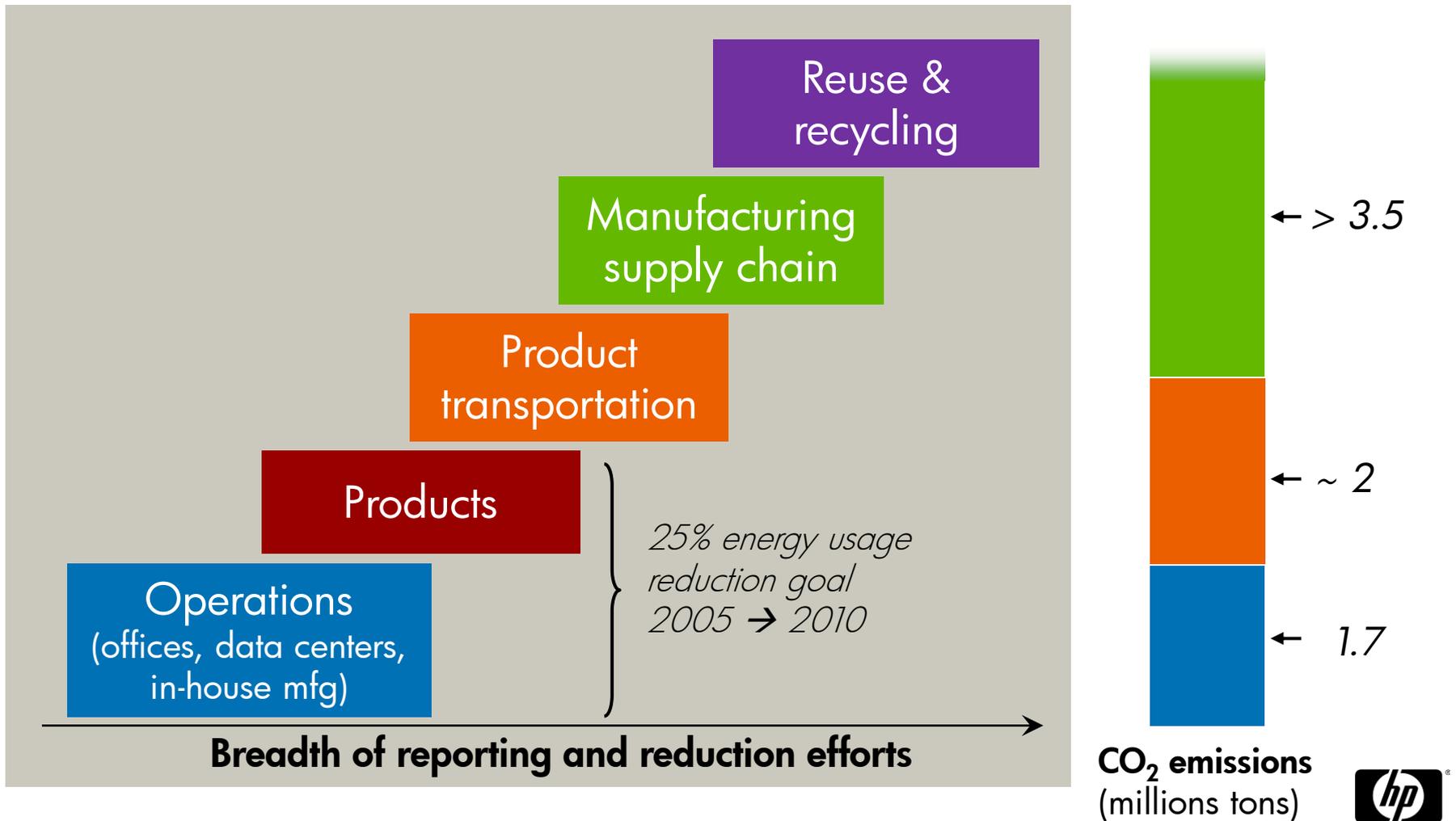


# Toward a low carbon economy

HP's Halo Collaboration Studio simulates face-to-face meetings, enabling interactive collaboration while avoiding CO<sub>2</sub> emissions.

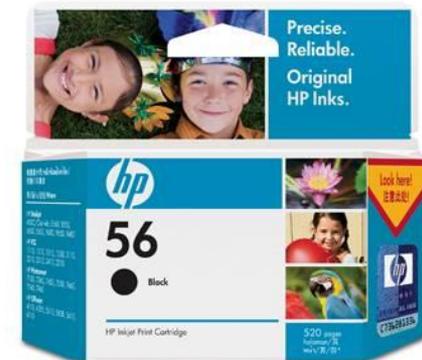


# Energy usage & CO<sub>2</sub> footprint reduction throughout the product lifecycle



# Product reuse & recycling

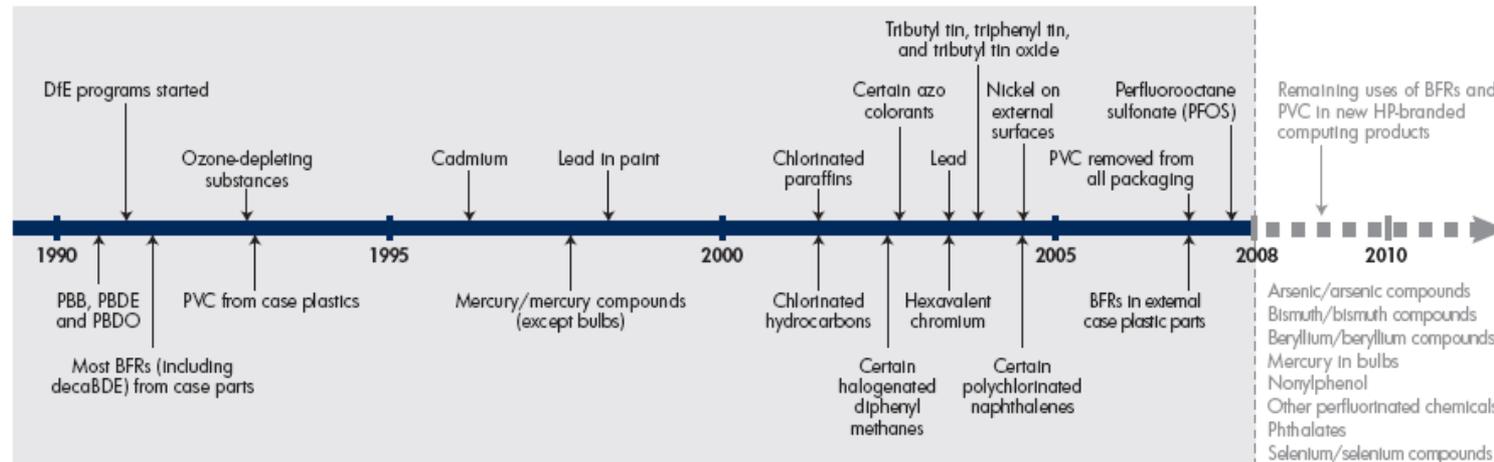
- Variety of reuse and recycling offerings for customers
- 1B lbs recycled since 1987
- Goal of 2B lbs goal reused or recycled by 2010
- Audit to published high standards
- Incorporate recycled material in products



# Minimizing environmental impact through materials innovation

- Reducing materials use (dematerialization)
- Materials substitution
- Eliminating materials of concern
- Innovative and recycled materials

HP product materials restriction/substitution timeline<sup>1</sup>



<sup>1</sup> Dates refer to when the materials restrictions were adopted by HP. Materials in gray text beyond 2007 have been identified by stakeholders as potential materials of concern. Future possible restriction of those materials depends, in part, on the qualification of acceptable alternative materials.

# HP's RoHS Program

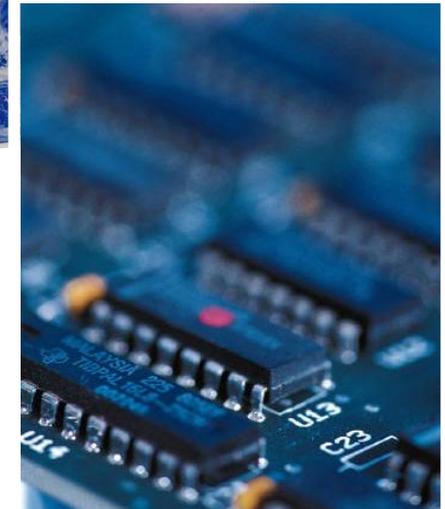
- 1991:** First Pb-free solder investigations
- 1998:** Cd, PBB/PBDE, Hg restricted HP-wide
- 2001:** RoHS technical effort launched
- 2002:** iNEMI Pb-free assembly & rework launched (co-chair)
- 2003:** HP-wide team chartered
- 2006:** Virtually all HP-wide products WW meet EU RoHS requirements; Japan RoHS compliance
- 2007:** China RoHS phase 1 and CA RoHS compliance
- 2009:** Korea RoHS; China RoHS Phase 2 and EU RoHS 2 preparations

Led or heavily engaged in numerous industry standardization and harmonization efforts



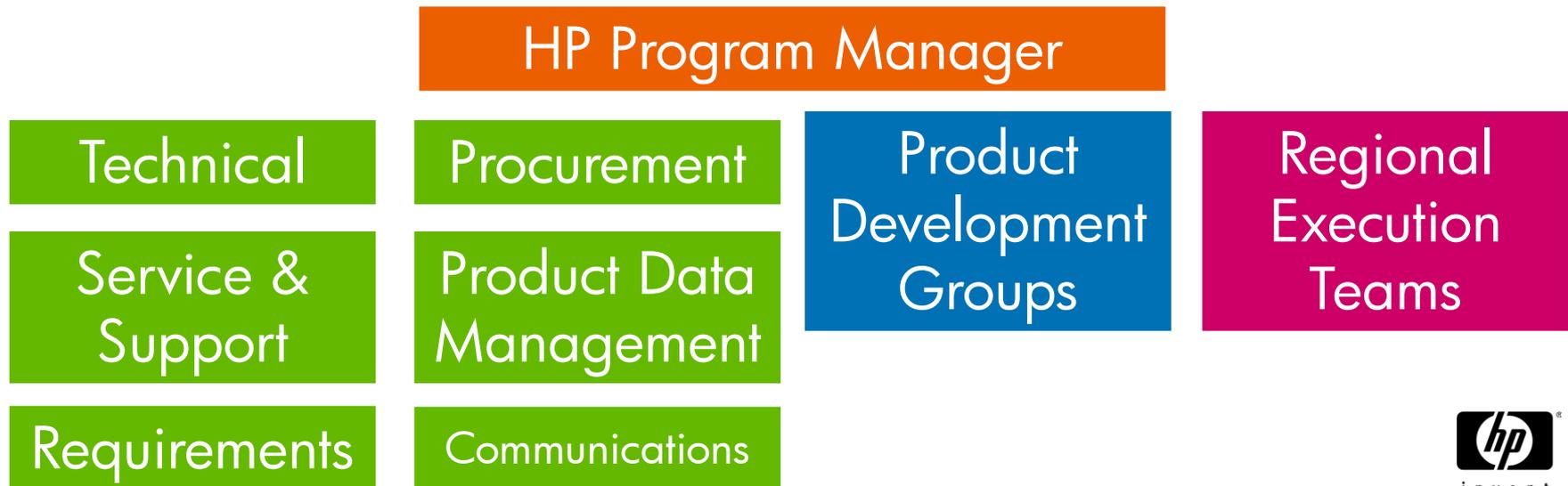
# RoHS: Regional legislation, global impacts

- Component transitions
- Customers
- Existing legislation
- Pending legislation and government procurement guidelines

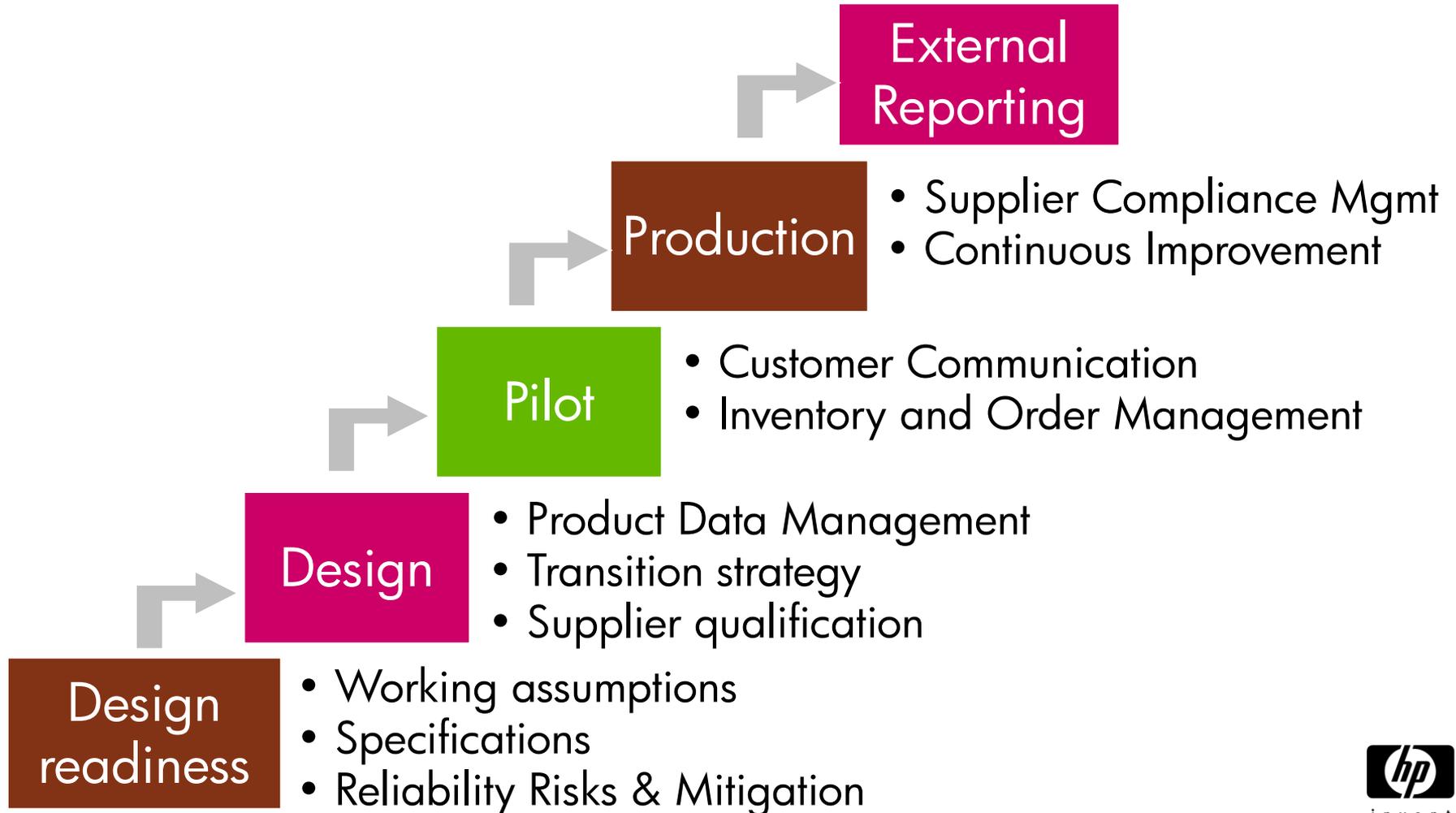


# Hewlett-Packard Approach

- Cross-functional team with senior sponsorship
- Worldwide product transition
- Engage with suppliers early
- Drive industry standardization

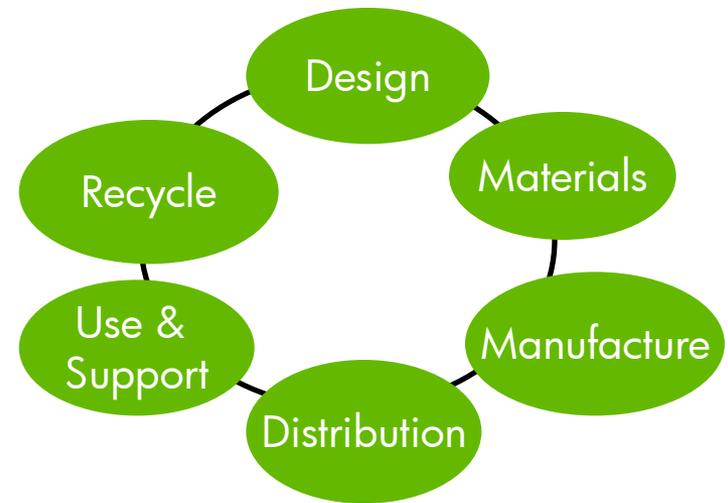


# HP RoHS Transition Lifecycle



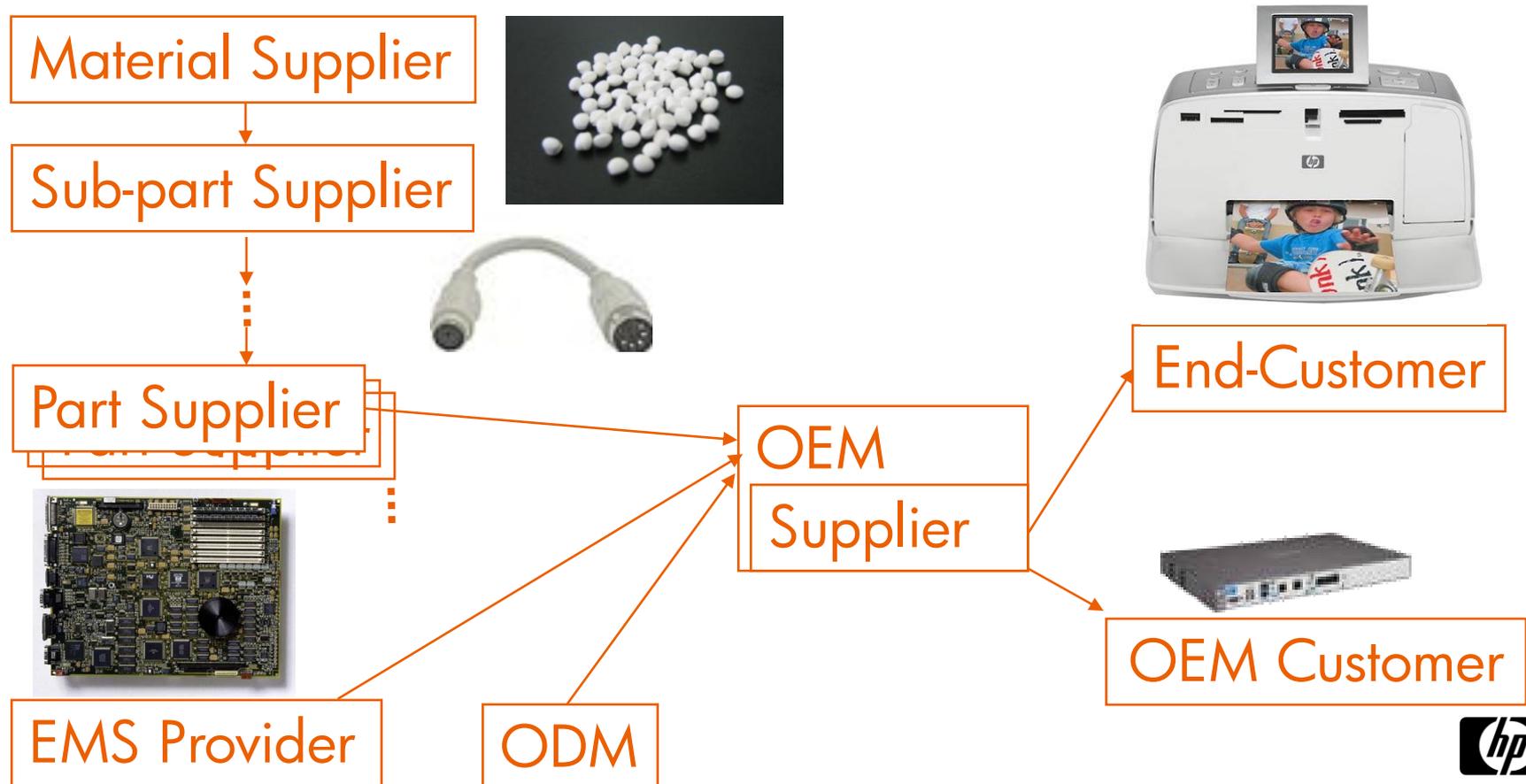
# Key success factors

- Use working assumptions to manage uncertainty
- Consider the entire value chain and product lifecycle
- Prepare for data requirements
- Support and utilize industry standards
- Start early
- Engage with suppliers



# Environmental Management Supply Chain

- 100's to 1000's of suppliers in the supply chain



# Product and Manufacturing Requirements: HP General Specification for the Environment

- Requirements that allow products to comply with environmental laws and regulations
- Applicability:
  - Product design and manufacturing
  - HP and HP suppliers (and their suppliers)
    - Includes suppliers that manufacture HP's products, parts, components & materials
- Scope
  - Restricted materials
  - Battery restrictions
  - Shipping packaging material restrictions
  - Product labeling and marking requirements for recycling and disposal
  - Chemical registration requirements
  - Supplier verification

## HP Standard 011 series -- General Specification for the Environment (GSE)

Title: *HP Standard 011-0 General Specification for the Environment (GSE)*

Released Revision: L --  [HTM File](#)

Release Date: 01-Aug-2008

Expiration Date: 01-Aug-2010

Order Number: HP-00011-00

Responsible Person: Diane Fisher, Global Social and Environmental Responsibility Operations

**Abstract:** HP Standard 011 defines Hewlett-Packard Company's (HP's) environmental requirements for HP brand and HP owned brand products. HP Standard 011 is a document series that is comprised of this overview document and the subsidiary documents referenced in this document.

Title: *HP Standard 011-1 General Specification for the Environment -- Restricted Materials*

Released Revision: L --  [HTM File](#)

Release Date: 01-Aug-2008

Expiration Date: 01-Aug-2010

Order Number: HP-00011-01

Responsible Person: Diane Fisher, Global Social and Environmental Responsibility Operations

**Abstract:** This document describes HP's global environmental requirements for restricting or prohibiting certain chemical compounds or materials in HP brand and HP owned brand products.

[www.hp.com/go/supplierE](http://www.hp.com/go/supplierE)

# Quality management system is essential to compliance

A manufacturer must ensure its suppliers have control processes in place that DO NOT allow non-compliant material to enter the manufacturing process

## Control Process

- Material specifications
- Material documentation
- Material tracking
- Material testing (as required)
- Manufacturing process



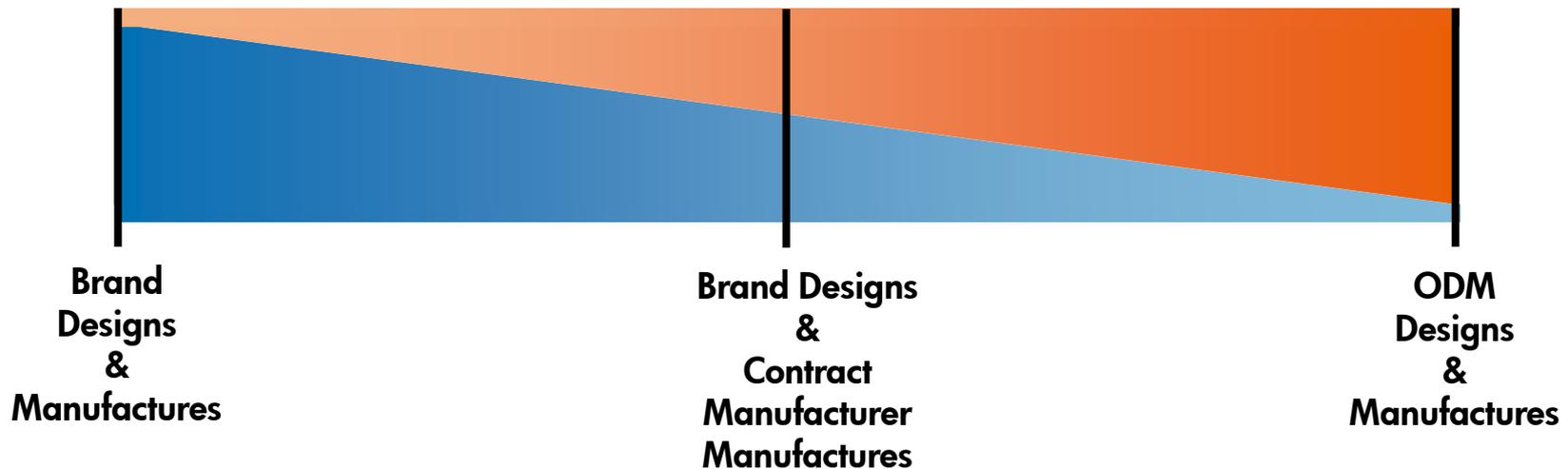
“Clean”  
Materials  
In



“Clean”  
Product  
Out

# Product compliance approach must be implemented in various business models

## Design & Manufacturing Responsibility



➤ *Consistent compliance requirements and controlled processes are a must; brand's documentation will vary*

# Levels of RoHS Compliance Verification

Level 1: Ensure part/material compliant

Level 2: Ensure Supplier Management processes

Level 3: Additional supplier data, if needed

Level 4: Analytical testing, if needed



# Example: Product RoHS Bill of Materials (BOM) Roll Up

## ROHS Bill of Material Example AIO (for illustration only)

Status:

COMPLIANT	50
NONCOMPLIANT	0
NA	6
(no info)	0
<b>TOTAL</b>	<b>56</b>

BOM rolls up as RoHS Compliant

Complex sub-assembly

Material#	Description(40)	UOM	PL	RoHS ID
[REDACTED]	AIO - BASE Unit	EA	5M	Compliant
'0515-4424	SCREW-TPG M2.9X1.27 11.35MM-LG	EA	83	Compliant
'0515-4556	SCREW-MACH K30X1.34 9MM-LG TOF	EA	5M	Compliant
'0515-4642	SCREW-MACH K22X0.98 6MM-LG TOF	EA	5M	Compliant
'0960-2245	LABEL 915 MHZ 96 BIT 3X3 PAPER	EA	IP	NA
9170-2120	CORE-FERRITE RIBBON CORE	EA	5M	Compliant
Q1608-00015	LABEL - SERIAL	EA	5M	NA
Q1647-00004	CLAMP-MOTOR	EA	5M	Compliant
Q1647-40003	Gear-worm/pinion	EA	5M	Compliant
Q1647-40045	gear-drag	EA	5M	Compliant
Q1647-60021	ASSY PLUNGER-WHEEL	EA	5M	Compliant
Q1647-80003	SPRING PLUNGER	EA	5M	Compliant
Q5584-00001	LABEL - REGULATORY	EA	5M	NA
Q5584-00002	LABEL - PEN INSTALL	EA	5M	NA
Q5584-00008	PLATEN - GLASS	EA	5M	Compliant
Q5584-00011	SPRING - DRAG	EA	5M	Compliant
Q5584-00014	FIRESHIELD - CARRIAGE	EA	5M	Compliant
Q5584-00030	GROUND PLANE	EA	5M	Compliant

# Levels 3 and 4: Additional data

- Level 3: Additional supplier data, if needed
  - Examples: material specs, analytical test data
  - Requests based on supplier history, material used, etc.
- Level 4: Analytical testing
  - If needed after exercising level 1, 2, and 3
  - Random sampling spot checks

Level 1: Requirements for all products/parts
Level 2: Supplier SER* Management
Level 3: Additional supplier data, if needed
Level 4: Analytical testing, if needed

# Example: Part Supplier Test Data

- Pb, Cd, Hg, Cr+6, PBB, PBDE less than the RoHS threshold limits

## Test Report

LARGAN PRECISION CO., LTD.  
 NO.4, 16TH ROAD TAICHUNG INDUSTRIAL ZONE  
 TAICHUNG CITY, TAIWAN, R.O.C.

Report No : CE/2004/06169  
 Date : 2004/06/09  
 Page : 1 of 2

The following merchandise was(were) submitted and identified by the client as :

Type of Product : TAC8+COATING  
 Sample Received : 2004/06/02.  
 Testing Date : 2004/06/02 TO 2004/06/09

Test Result : - Please see the next page -

  
 Dennis Yen, M.P., Operation Manager  
 Signed for and on behalf of  
 SGS TAIWAN LTD.

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification, and jurisdictional issues defined therein. This results shown in this test report refer only to the samples tested unless otherwise stated. This Test Report cannot be reprinted, copied in full, without prior written permission of the Company. 此份測試報告係本公司根據客戶委託所發出之報告，僅供客戶內部使用，未經本公司書面許可，不得再行複製。  
 TW 0881194

SGS Taiwan Ltd. | No. 1161 Wu Kang Road, Wuku Industrial Zone, Taichung County, Taiwan. / 台 北 縣 五 股 工 業 區 五 工 路 116-1 號  
 台灣檢驗科技股份有限公司 | 電話 886-3-2256-3333 | 傳真 886-3-2256-3237 | www.tai.sgs.com  
 Member of SGS Group

LARGAN PRECISION CO., LTD.  
 NO.4, 16TH ROAD TAICHUNG INDUSTRIAL ZONE  
 TAICHUNG CITY, TAIWAN, R.O.C.

Report No : CE/2004/60169  
 Date : 2004/06/09  
 Page : 2 of 2

## Test Result

PART NAME NO.1 : MULTI-COLORED GLASS

Test Item(s)	Unit	Method	MDL	Result		
				NO.1		
PBBs(Polybrominated biphenyls)CAS NO.67774-32-7)	%	With reference to B3/264/EEC. Analysis was performed by GC/MS/ECD or HPLC/DAD/MS.	0.0005	N.D.		
PBDEs(PBDEs)(Polybrominated biphenyl ethers)	%	With reference to B3/264/EEC. Analysis was performed by GC/MS/ECD or HPLC/DAD/MS.	0.0005	N.D.		

Test Item(s)	Unit	Method	MDL	Result		
				NO.1		
Chromium VI (Cr+6)	ppm	As per US EPA 7196A and US EPA 3060A.	2	N.D.		
Cadmium (Cd)	ppm	ICP-AES After As per EN 1122, Method B:2001 or other acid digestion.	2	N.D.		
Mercury (Hg)	ppm	ICP-AES After As per US EPA 3052 or other acid digestion.	2	N.D.		
Lead (Pb)	ppm	ICP-AES After As per US EPA 3050B or other acid digestion.	2	N.D.		

NOTE: (1) N.D. = Not detected.(<MDL)  
 (2) ppm = mg/kg  
 (3) MDL= Method Detection Limit

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification, and jurisdictional issues defined therein. This results shown in this test report refer only to the samples tested unless otherwise stated. This Test Report cannot be reprinted, copied in full, without prior written permission of the Company. 此份測試報告係本公司根據客戶委託所發出之報告，僅供客戶內部使用，未經本公司書面許可，不得再行複製。  
 TW 0881193

SGS Taiwan Ltd. | No. 1161 Wu Kang Road, Wuku Industrial Zone, Taichung County, Taiwan. / 台 北 縣 五 股 工 業 區 五 工 路 116-1 號  
 台灣檢驗科技股份有限公司 | 電話 886-3-2256-3333 | 傳真 886-3-2256-3237 | www.tai.sgs.com  
 Member of SGS Group



# Example: HP Printed Circuit Assembly Process RoHS Audit

**PCA PROCESS RoHS AUDIT CHECKLIST**

Company name: \_\_\_\_\_

**1.0 System** Yes/No/NA

1.1 SDOC (Supplier's Declaration of Conformity) available for RoHS parts?

1.3 Does materials system differentiate between RoHS & non-RoHS parts?

Remarks

---



---



---

**2.0 Incoming/Outgoing Inspection**

2.1 Can "RoHS" marking be found on parts packaging?

2.2 Can "RoHS" marking be found on the PCB?

2.3 Are store personnel trained on RoHS materials handling?

2.3.1 Are training & exam materials available?

2.3.2 Are certification records available?

2.4 Are there separate storage locations for RoHS & non-RoHS materials?  
Applies to both direct, indirect materials & finished goods.

Remarks

---



---



---

**3.0 In-Process**

3.1 Are there process/procedure for RoHS line conversion?

3.2 Are there RoHS specific procedures for parts height measurement?

3.3 Are there RoHS specific procedures for Reflow & Wave profiling?

3.4 Are there RoHS specific procedures for wave pat control & preventive maintenance?

3.5 Are there RoHS specific workmanship standards?

3.6 Are there RoHS specific procedures for PCB handling?  
Especially for OSP & Immersion Sn.

3.7 Are there RoHS specific procedures for handling moisture sensitive devices?

3.8 Are there RoHS specific procedures for handling thru-hole or left over parts?

3.9 Are there RoHS specific procedures for segregating RoHS & Non-RoHS materials?  
Applies to both direct & indirect materials.

3.10 Are there RoHS specific procedures for manual & automated rework?

3.11 Are there RoHS & non-RoHS rework areas kept separated?  
Applies to both prime & RMA/PCA.

3.12 Are there RoHS specific procedures for wave flux density control?  
Applies to flux applied to PCA.

3.13 Are there RoHS specific procedures for ICT/FCT maintenance?

3.14 Are the RoHS designated areas clearly indicated?  
Example: A highly visible RoHS sign.

3.15 Are in-line personnel trained on RoHS?

3.15.1 Are training & exam materials available?

3.15.2 Are certification records available?

3.16 Are there RoHS specific procedures for machine preventive maintenance?

Remarks

---



---



---

**4.0 RMA**

4.1 Are there RoHS specific procedures for RMA/PCA return?

# Key success factors going forward

- For government:
  - Balancing public policy goals with harmonization and clarity that enable effective global compliance programs
  - Pragmatic and effective enforcement
- For manufacturers and their suppliers
  - Creating certainty around a long-term roadmap
  - Consistent requirements, interpretations, testing
  - Pushing compliance management upstream



# Thank You

[www.hp.com/hpinfo/globalcitizenship/gcreport](http://www.hp.com/hpinfo/globalcitizenship/gcreport)



i n v e n t