IPC Electronics Midwest 2010

Leveraging IPC 1752 for Product Lifecycle Analytics

Jorgen Vos

PTC

Biography

Jørgen is a Product Management Director on PTC's Insight team where he is responsible for the creation and delivery of the Life Cycle Assessment module, amongst others. With a background in ecological foot printing and environmental input-output analysis, Jørgen brings a deep understanding of sustainability issues to PTC. Prior to joining the company, he managed an enterprise networking product line at Cisco Systems and worked with several Fortune 500 companies and startups in the carbon offset, solar energy, and biomass gasification fields, helping them determine and analyze financial models, opportunities and risks associated with carbon offsetting. Jørgen was a founding member of DriveNeutral.org; an organization that offsets carbon emissions for car owners. Jørgen has been on the board of Presidio School of Management, one of the first business schools to focus exclusively on sustainability. He earned his Masters in Electrical Engineering from Eindhoven University of Technology in the Netherlands and earned his MBA in Sustainable Management from Presidio School of Management in San Francisco.

Executive Summary

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Using IPC 1752 v2 for attaining Product Environmental Performance data

Jørgen Vos,

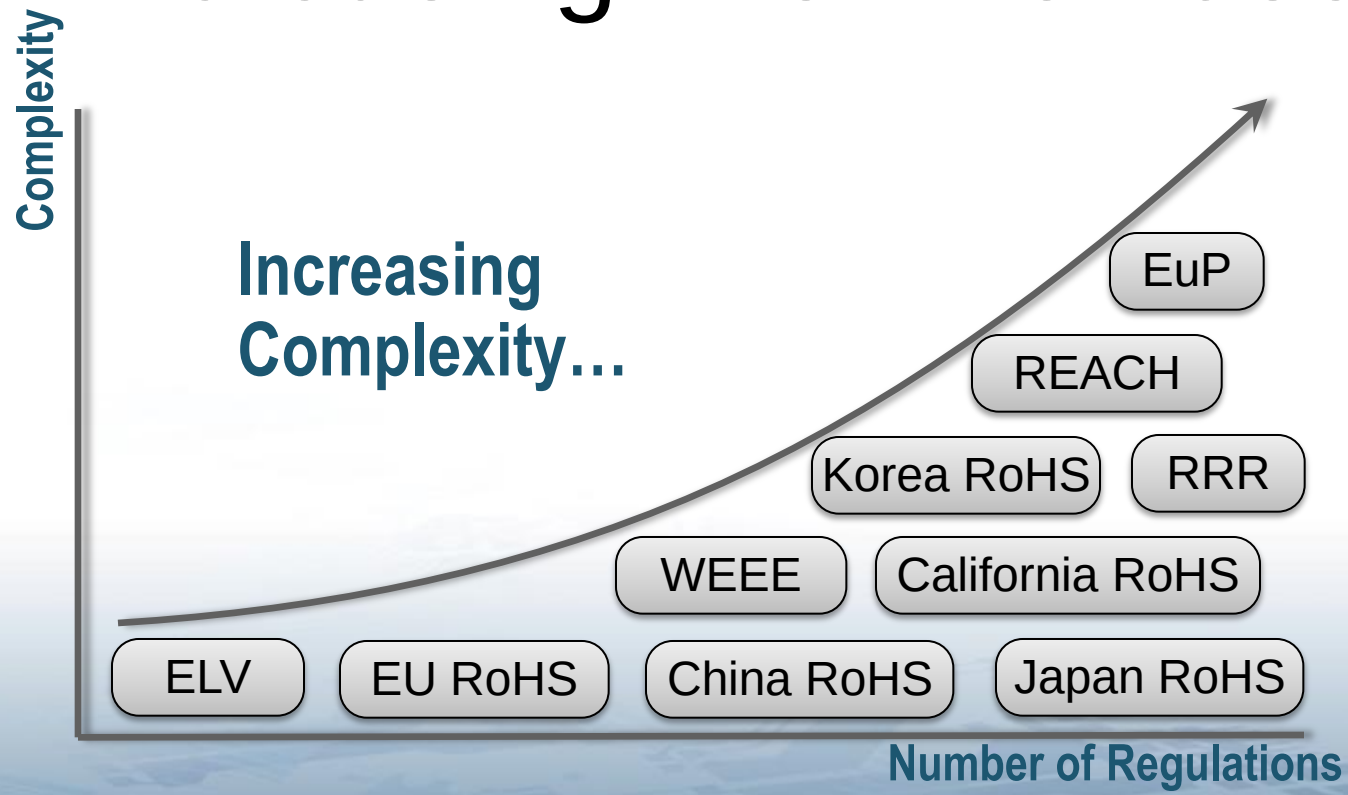
Product Management Director,

PTC - InSight

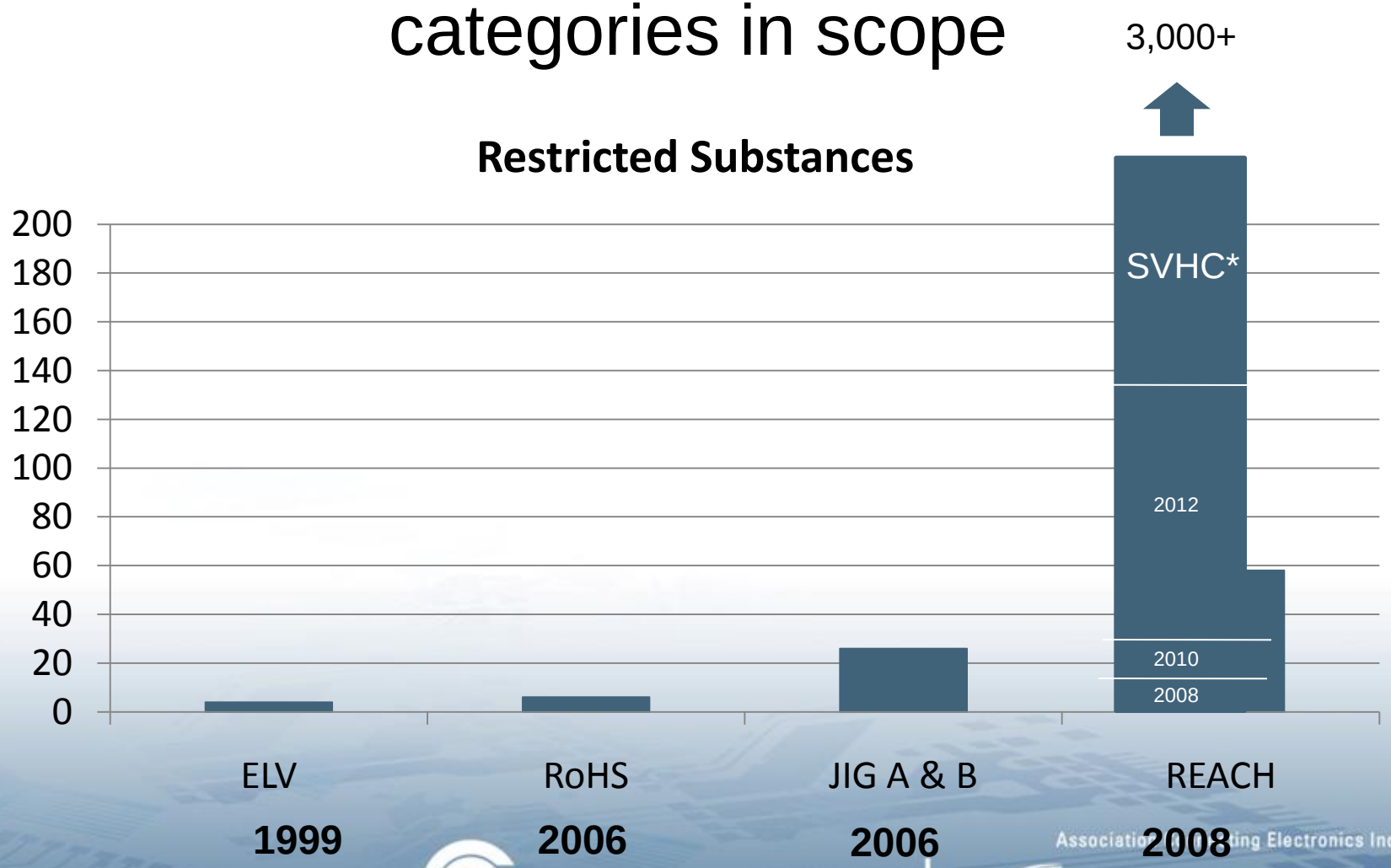
Association Connecting Electronics Industries

CANON COMMUNICATIONS LLC | IPC

Regulations are driving increasing IPC-1752 use



More restricted substances and product categories in scope

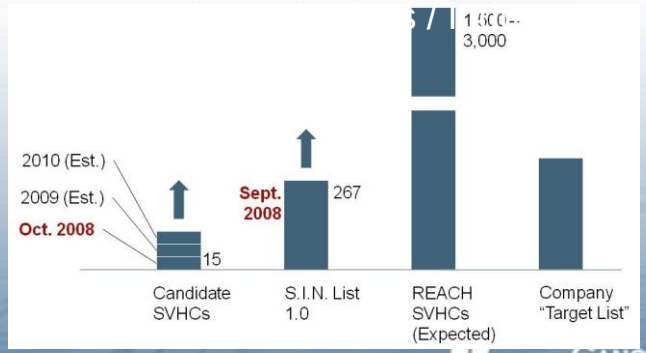


*Substances of Very High Concern

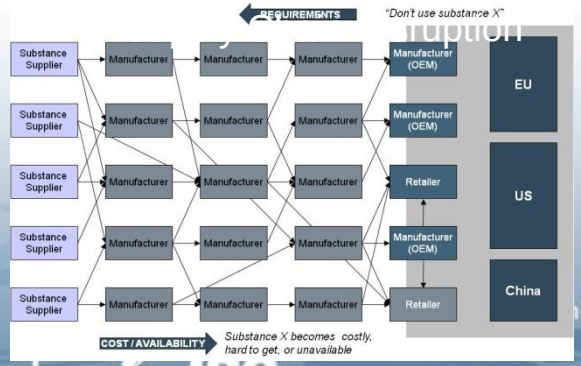
*Substances of Very High Concern

The business challenge is much bigger than "regulatory compliance"

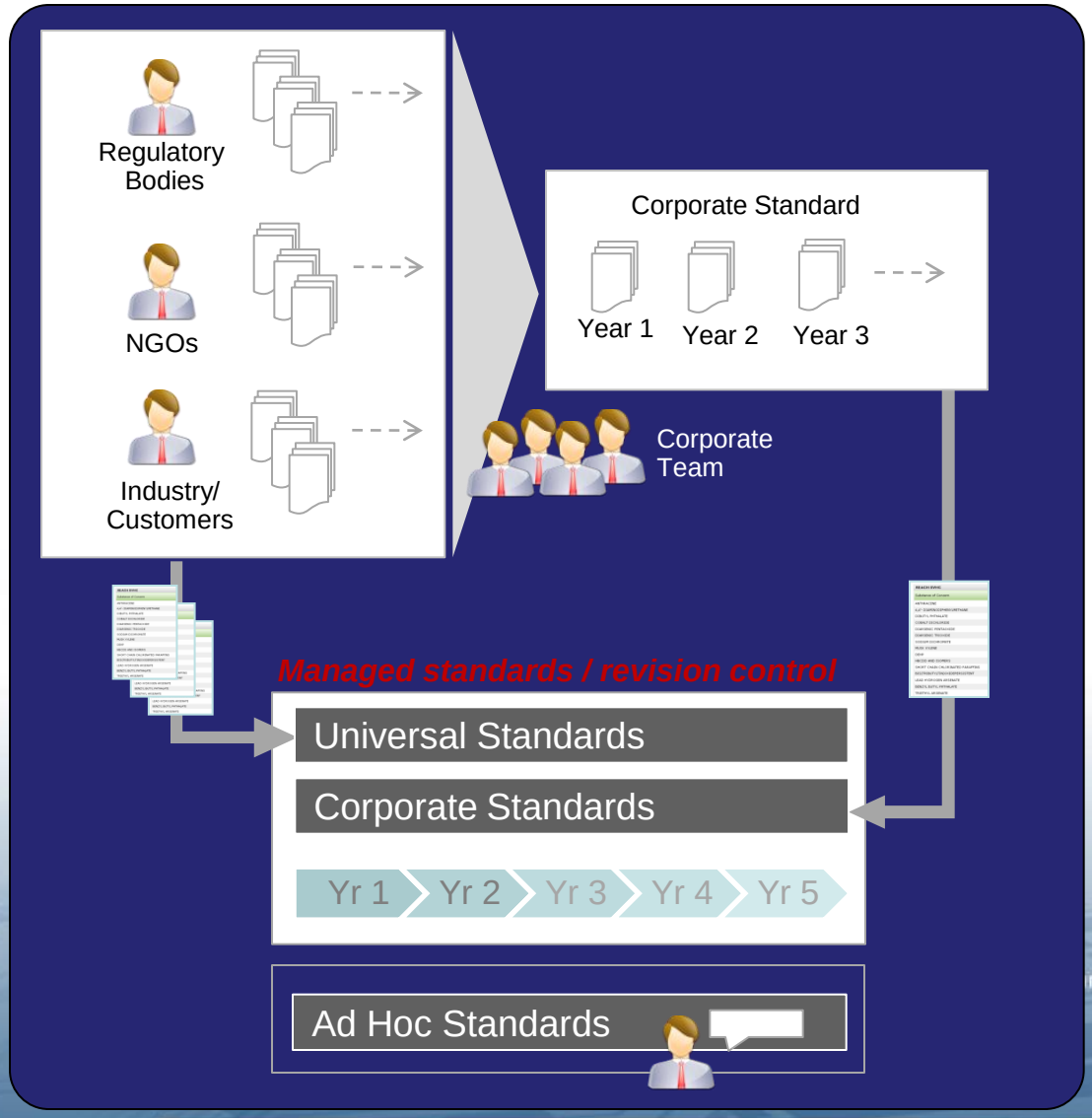
Global Market Trends



Business Risk



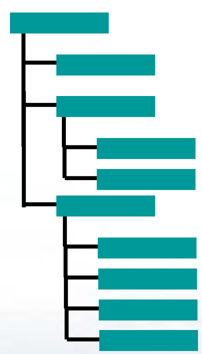
Teams increasingly manage multiple, evolving standards



Business goal: Early visibility

Plan → Concept → Design → Validate → Production → Support

Identify risks in <u>early</u> BoM



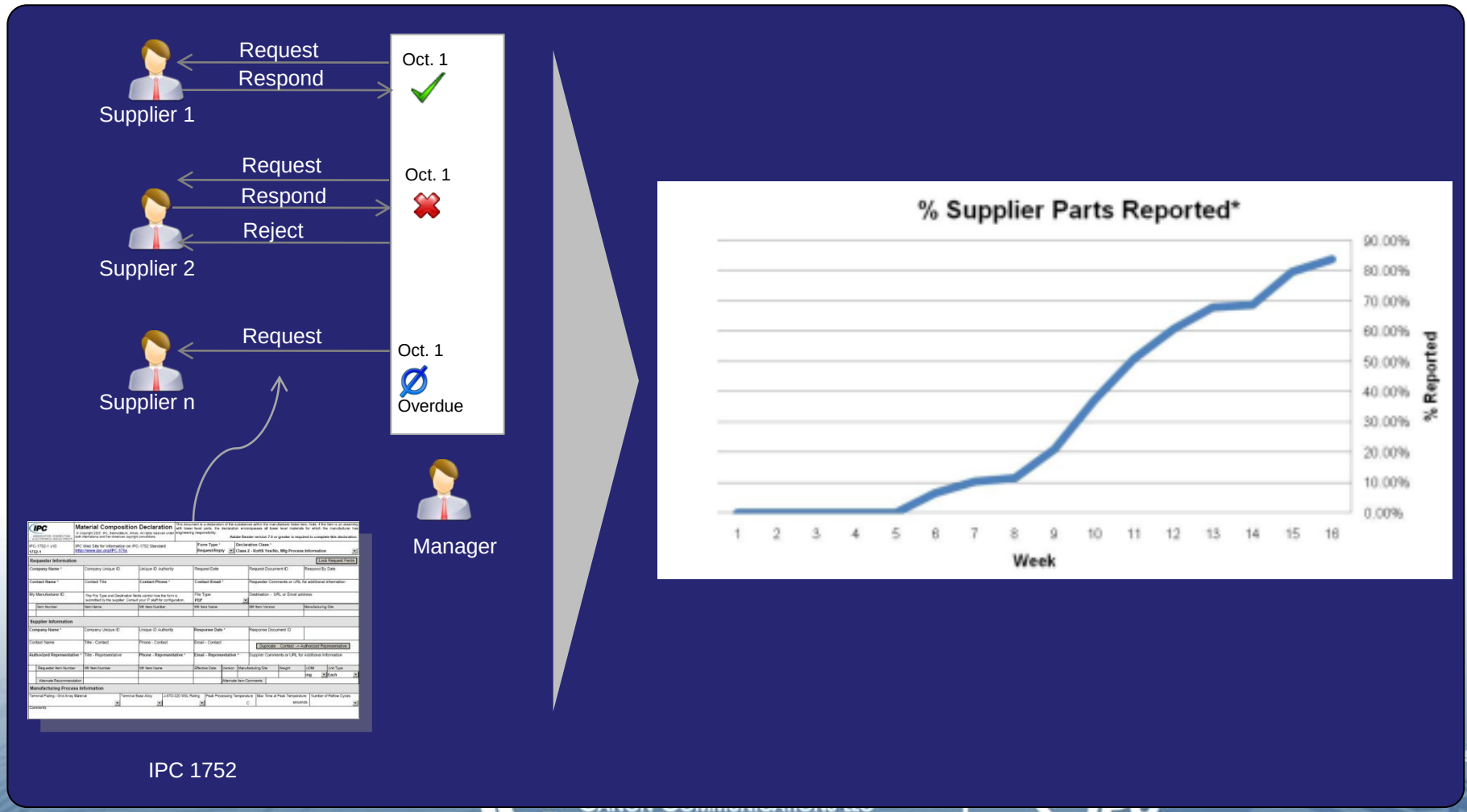
Establish performance targets as part of gate process

Dashboards

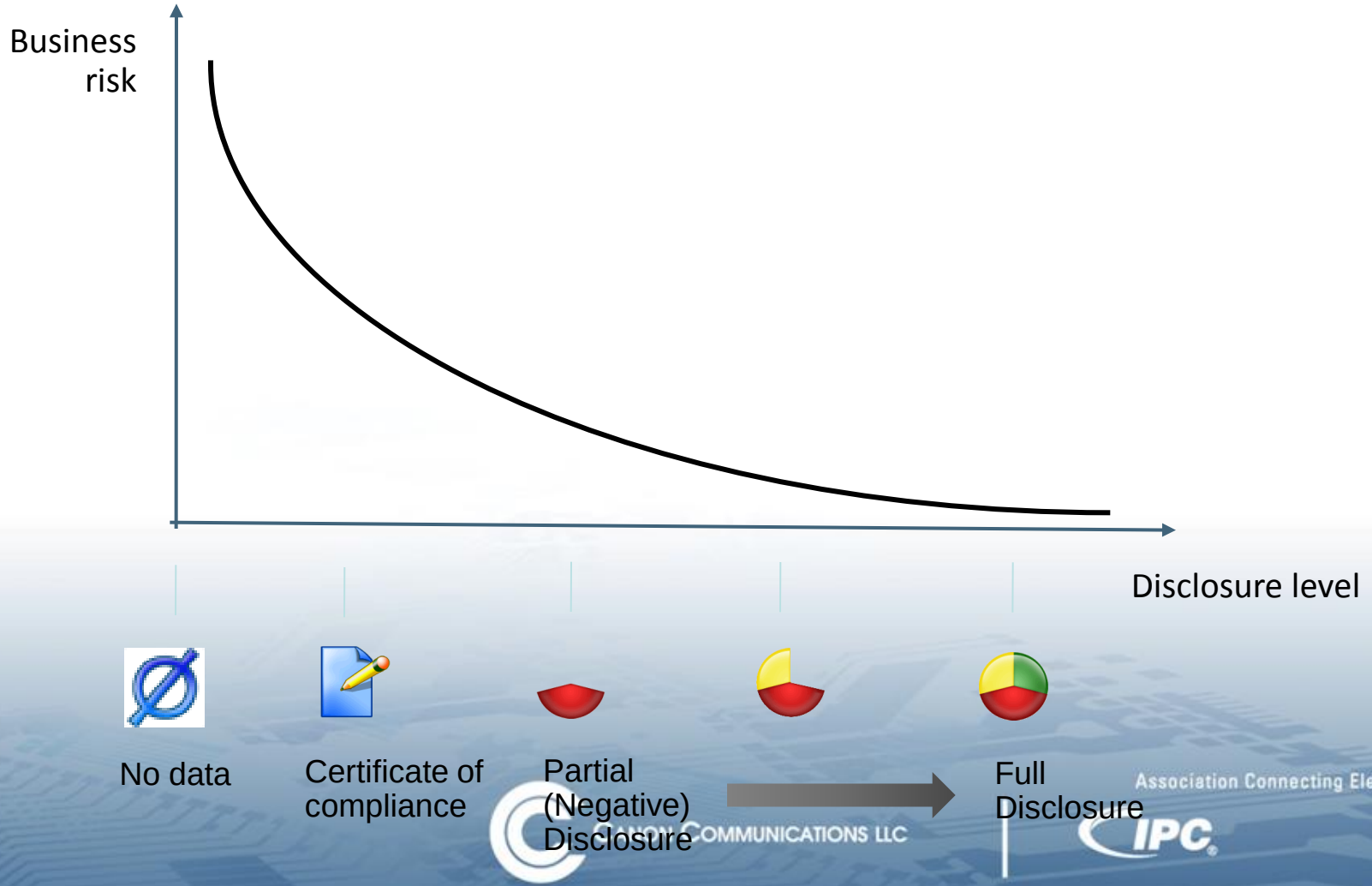
Supplier	Supplier ID	Part Owner	Request Status	Reported	Disclosure	ROHS(C)	ROHS(I)	JIG A	REACH SVHC	REACH SUSPECT SVHC
AVX	10194	bgreen	Open		Ø	Ø	Ø	Ø	Ø	Ø
AVX	10194	bgreen	Completed	06/12/2006 00:00:00		✓	✓	✓	✓	✓
AVX	10194	bgreen	Completed	06/12/2006 00:00:00		✓	✓	✓	✓	✗
AVX	10194	bgreen	Completed	06/12/2006 00:00:00		✓	✓	✓	✓	✗
T R FASTENINGS LTD	PTRFAS02	bgreen	Completed	02/11/2009 00:00:00		✓	✓	✗	✓	✓
A	A	bgreen	Not Requested	06/25/2004 08:40:50		✓	✓	✓	✓	✓
A	A	bgreen	Not Requested	06/25/2004 08:40:50		✓	✓	✓	✓	✓
A	A	bgreen	Not Requested	06/25/2004 08:40:50		✓	✓	✓	✓	✓
A	A	bgreen	Not Requested	06/25/2004 08:40:50		✓	✓	✓	✓	✓
A	A	bgreen	Not Requested	06/25/2004 08:40:50		✓	✓	✓	✓	✓
SUPA	SID101	bgreen	Overdue	06/12/2006 00:00:00		✗	✗	✗	✓	✓
ATMEL CORP	118235	bgreen	Completed	07/17/2006 00:00:00		✓	✓	✓	✓	✗
ATMEL CORP	118235	bgreen	Completed	07/17/2006 00:00:00		✓	✓	✓	✗	✗
SKYWORKS SOLUTIONS LTD	423800932	bgreen	Not Requested	07/14/2008 00:00:00				✗	✗	✗

Track performance relative to current <u>and</u> future standards

How? Systematically acquire, validate, and maintain environmental data



Progressive disclosure



Required: Data Management and Systems Integration

CAD systems

Product information Systems (e.g. PLM)

Numeric Rev

Alpha Rev

Part information

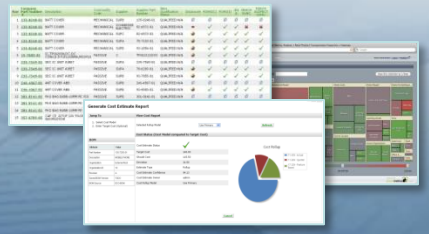
Item Master

Compliance System

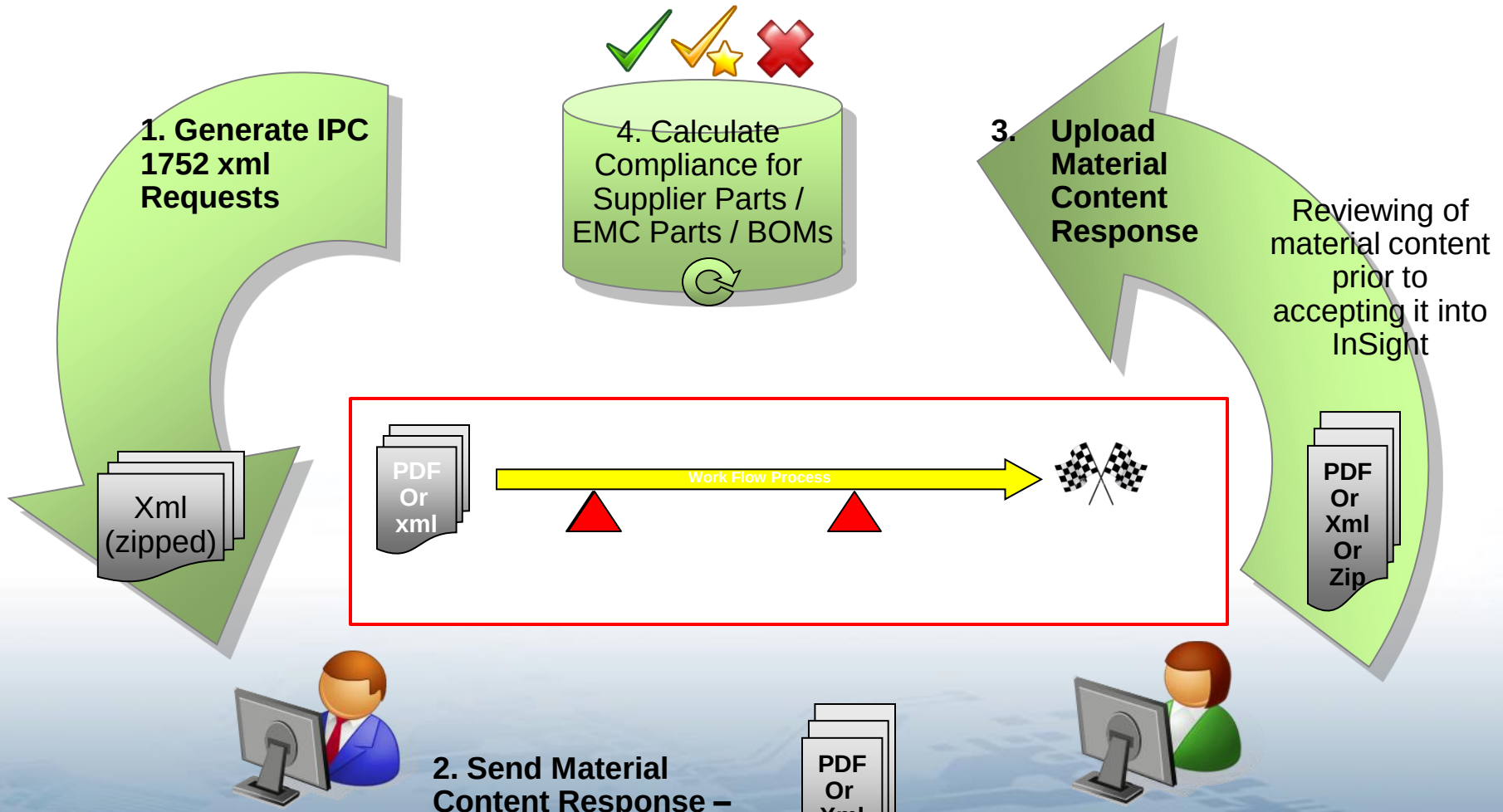
- Establish and track performance standards and targets
- Acquire data and manage supplier performance
- Manage risk and measure performance

IPC-1752

Suppliers



Enabling continuous data acquisition & analysis



Compliance Summary: Key Business Needs

Identify current and future regulation's risks

- Compliance within new part request process
- Request compliance information from suppliers for new parts when created
- Compliance analysis incorporated into change process

Access to the constantly changing Products

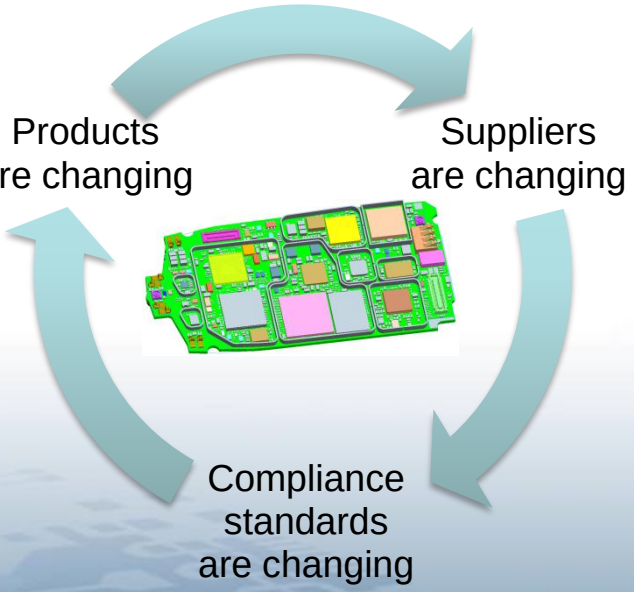
- Compliance analysis on the latest design
- Compare changes in compliance statuses

Understanding impact of Supplier Changes

- Understand impacts to changes in Approved Manufacturer lists

Visibility to design engineers of compliance information

- Searching for parts with compliance values



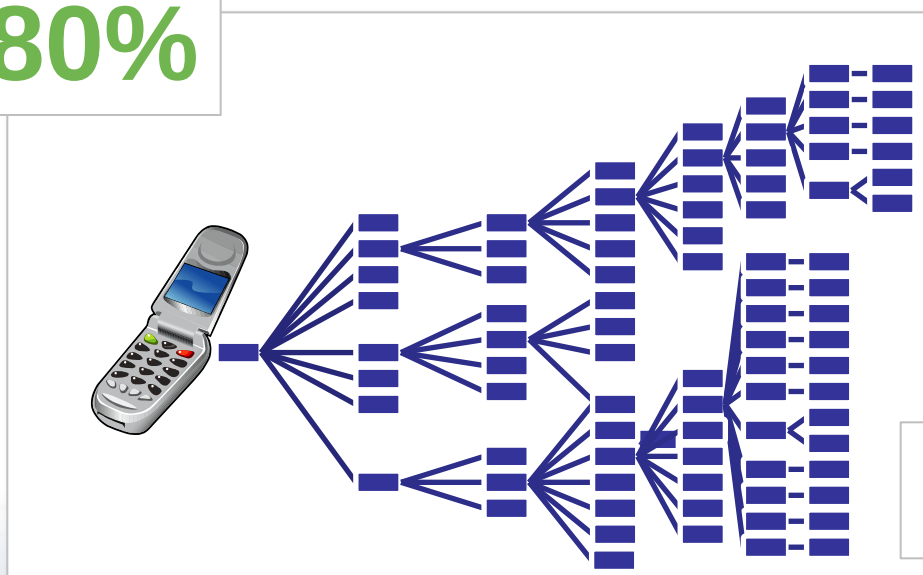
Product Environmental Performance is the next wave

- **Restricted substances**
- **Material footprint**
- **Life Cycle Impacts**

Driver: Product environmental footprint

Products & Supply Chain

80%

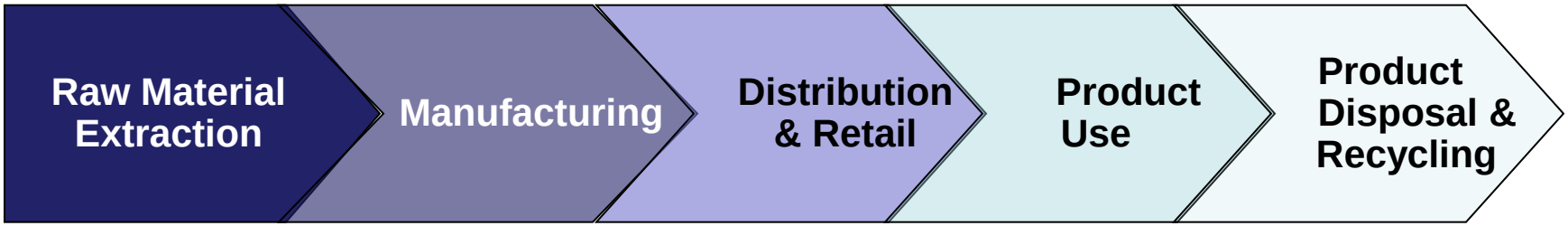


Enterprise

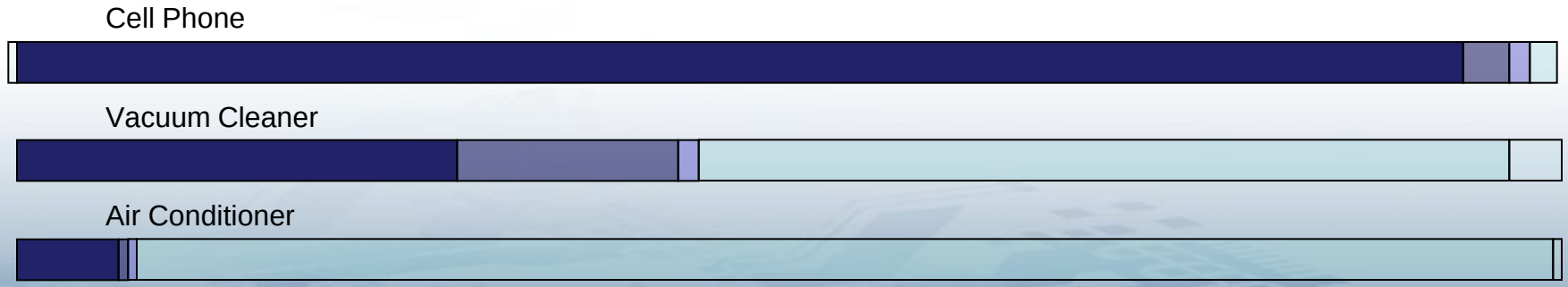
20%

Life Cycle Environmental Impact

Product-related impacts occur throughout a product's life cycle

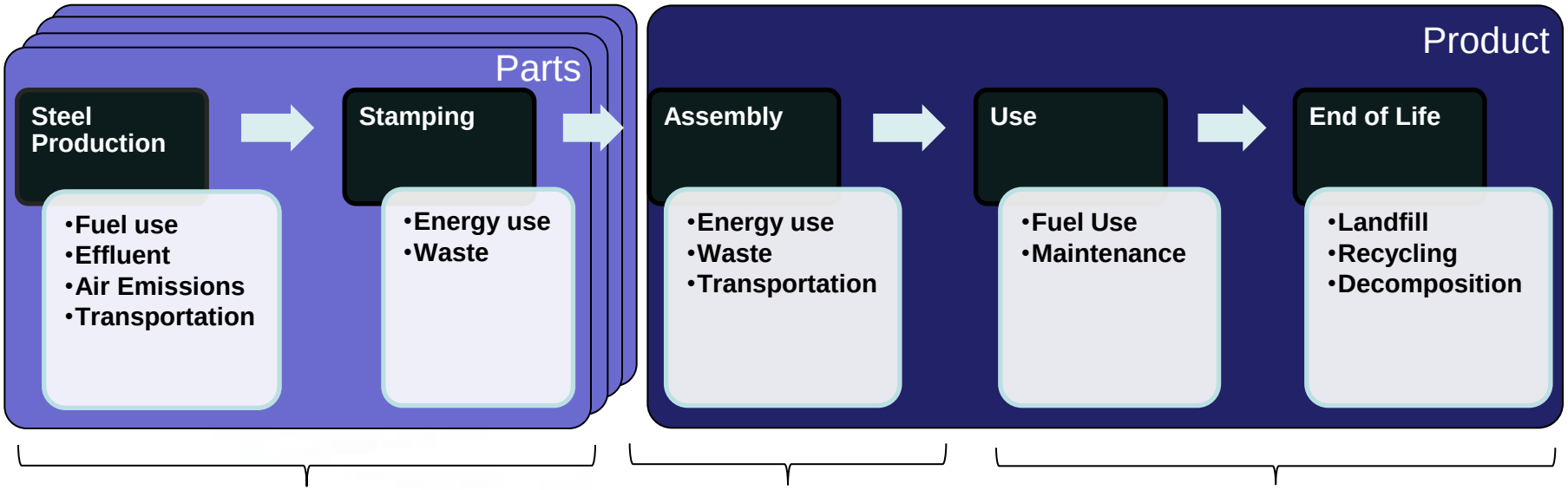


Different types of product have different impact profiles:



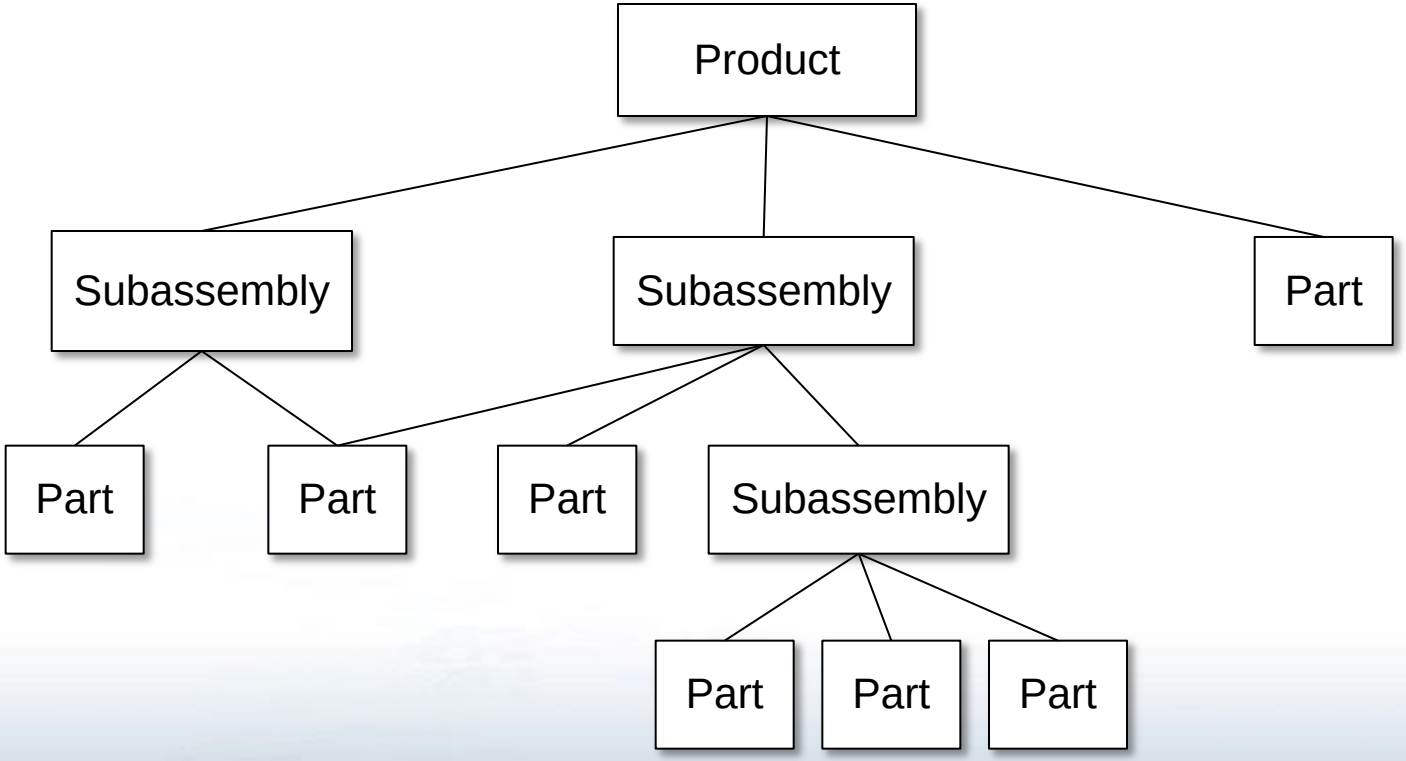
Source: Toshiba

Life Cycle Analysis (LCA)

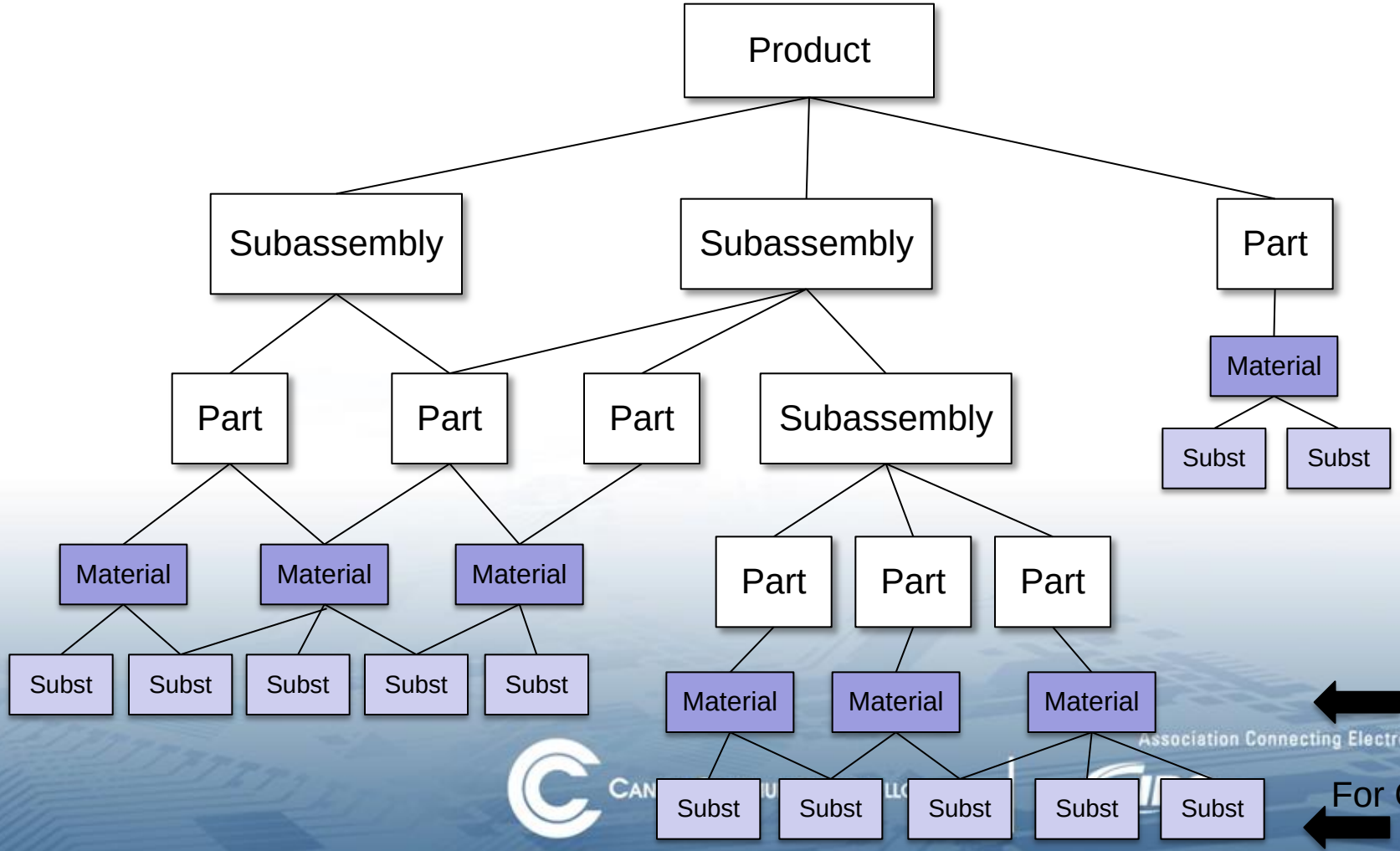


Most life cycle impacts are locked in during product design

Traditional Bill of Material (BOM)



Extended BOM for LCA Modeling and Regulatory Compliance



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Leveraging Compliance Data Management for LCA

The Data Problem

- Manufacturers often don't know what their parts and components are made of
- Material content data is crucial for comparing the relative environmental impacts of purchasing or design decisions
- Difficult to collect and manage data from suppliers

Infrastructure Solution

- Leverage the significant overlap between Compliance and LCA data needs
- Utilize supplier data collection tools developed for Insight to also gather necessary data for LCA models
- Product BOM forms the backbone of every LCA model
- Standard and normalized databases of environmental impact profiles for 1000's of materials and processes

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Using IPC-1752 v2 for Materials & Substances

IPC — ASSOCIATION CONNECTING ELECTRONICS INDUSTRIES®

Material Composition Declaration

This document is a declaration of the substances within the manufacturer listed item. Note: if the item is an assembly with lower level parts, the declaration encompasses all lower level materials for which the manufacturer has engineering responsibility.

Adobe Reader version 7.0.5 is required to complete this declaration.

IPC-1752-2 v1.02
1752-2

IPC Web Site for Information on IPC-1752 Standard
http://www.ipc.org/IPC-175x

Form Type *	Declaration Class *
Request/Reply	Class 6 - RoHS Yes/No, Homogeneous Materials and Mfg Inforn

Requester Information

Lock Request Fields

Company Name *	Company Unique ID	Unique ID Authority	Request Date*	Request Document ID	Respond By Date
Synapsis			2006-03-31		
Contact Name *	**Contact Title**	**Contact Phone ***	**Contact Email ***	**Requester Comments or URL for Additional Information**	
John Doe		215-793-0200	jdoe@synapsis.com		
My supplier ID	The File Type and Destination fields control how the form is submitted by the supplier. Consult your IT staff for configuration.		File Type	Destination - URL or Email Address	
10194			XML		

Item Number *	Item Name	Mfr Item Number *	Mfr Item Name	Mfr Item Version	Manufacturing Site
468850-007-00	Ceramic Capacitor	06035A1R2CAT2A	CAP,CERAMIC,100000PF,20%		

Supplier Information

Company Name *	Company Unique ID	Unique ID Authority	Response Date *	Response Document ID	
AVX	AVX		2006-06-12		
Contact Name *	**Title - Contact**	**Phone - Contact ***	**Email - Contact ***	Duplicate Contact -> Authorized Representative	
Michael Wu		908-478-1000	mwu@yageo.com		
Authorized Representative *	**Title - Representative**	**Phone - Representative ***	**Email - Representative ***	Supplier Comments or URL for Additional Information	
Michael Wu		908-478-1000	mwu@yageo.com		

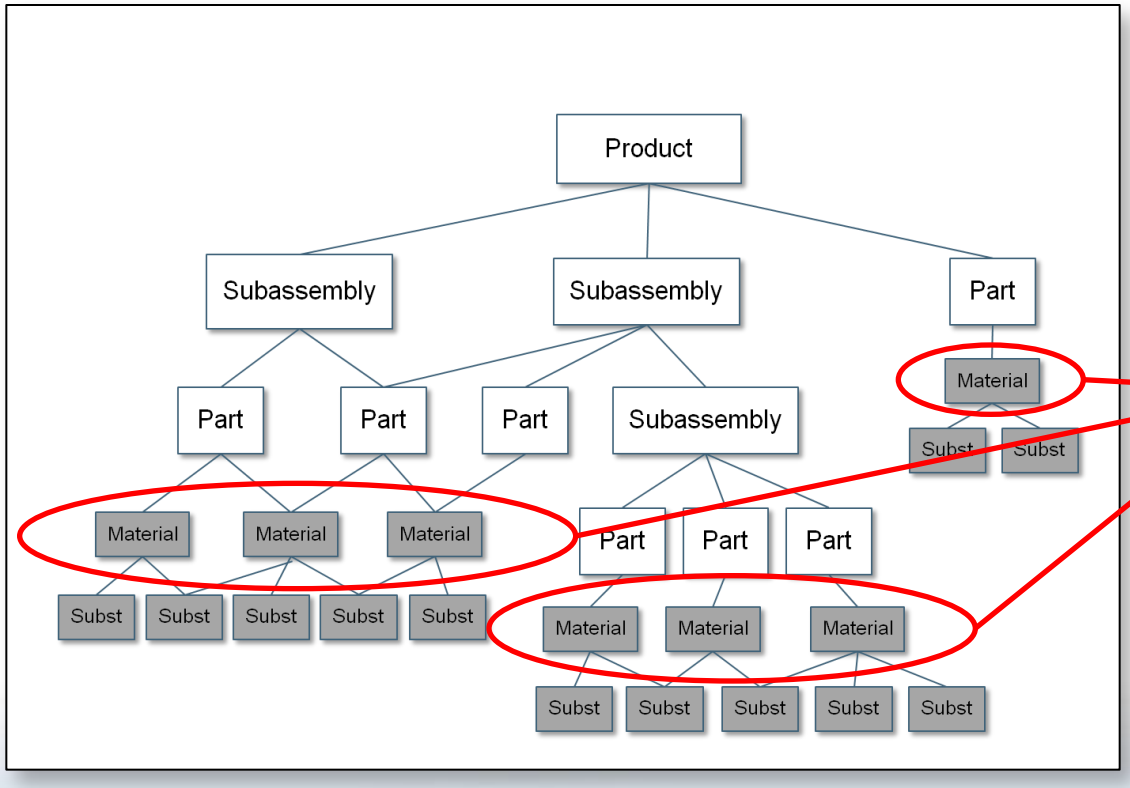
Requester Item Number	Mfr Item Number	Mfr Item Name	Effective Date	Version	Manufacturing Site	Weight	UOM	Unit Type
468850-007-00	06035A1R2CAT2A	CAP,CERAMIC,100000PF,20%	2006-05-01			6	mg	Each
Alternate Recommendation				Alternate Item Comments				

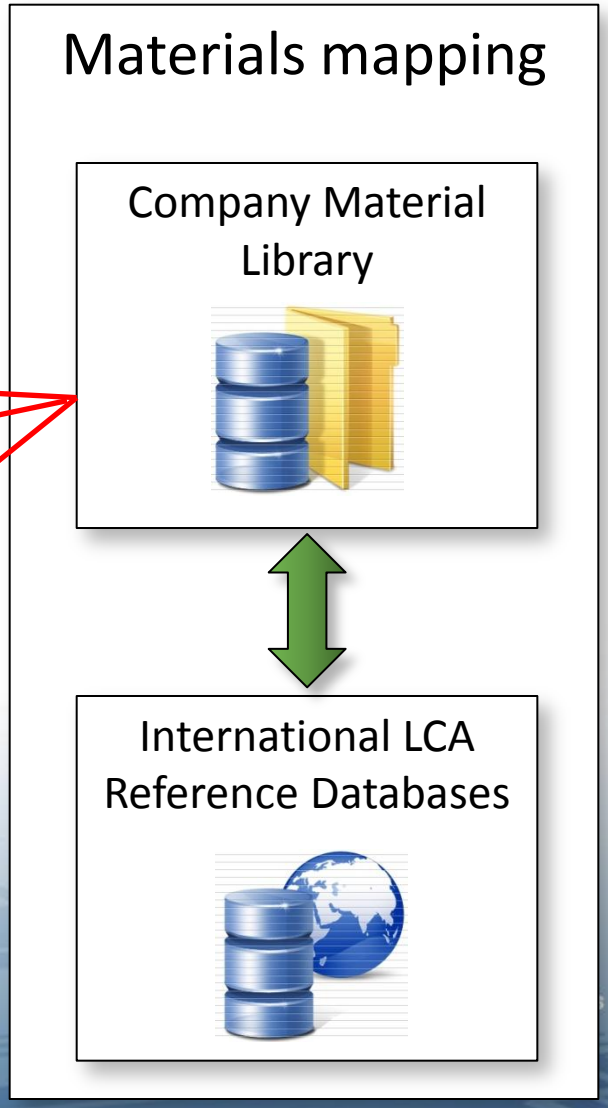
Manufacturing Process Information

Terminal Plating / Grid Array Material	Terminal Base Alloy	J-STD-020 MSL Rating	Peak Process Body Temperature		Max Time at Peak Temperature		Number of Reflow Cycles
Bright Tin (Sn) - fused	Alloy 42	2a		C		seconds	

Comments

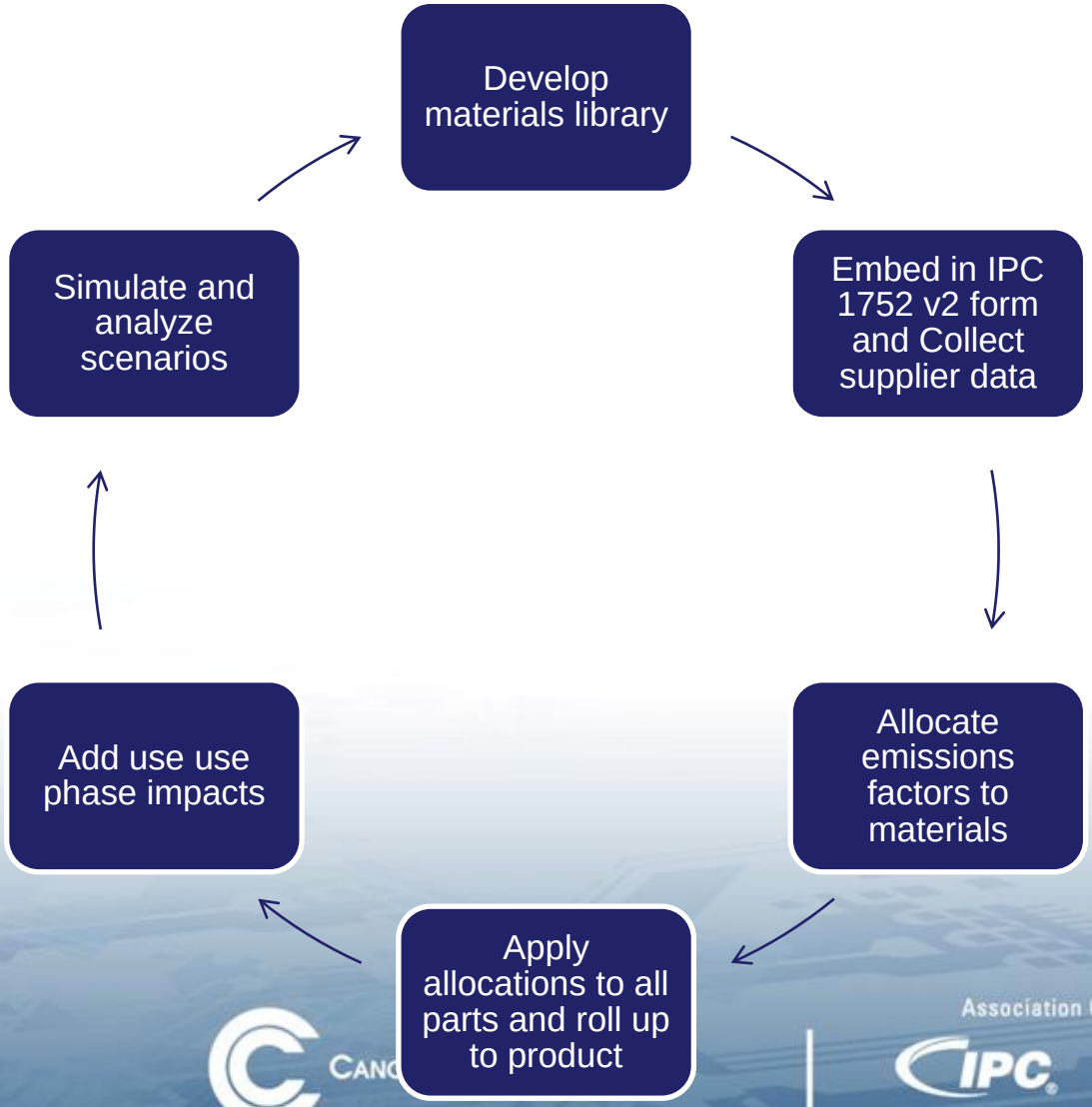
Company Material Library



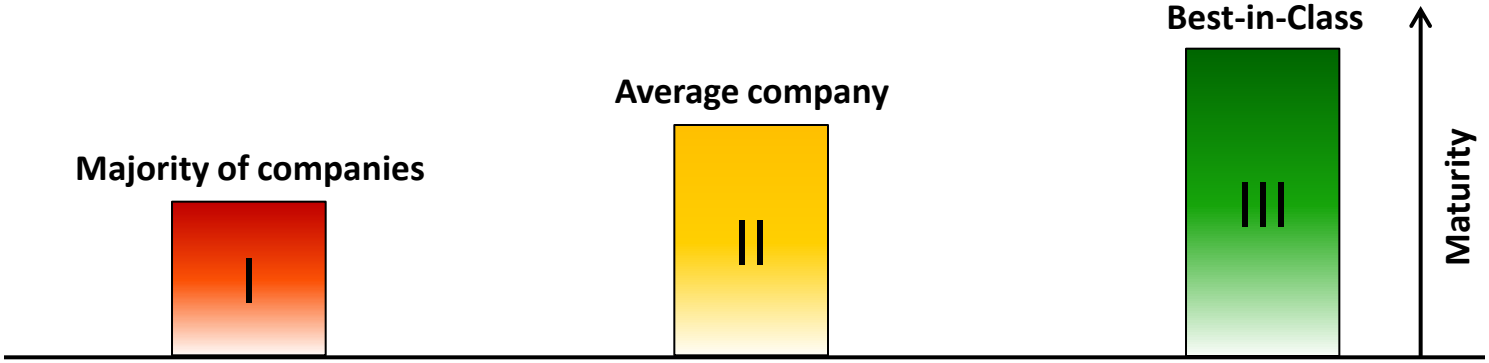


- Company Material Library grows over time
- Results from mapping company materials in library to LCA reference data remain persistent and dynamic
- Scales and automates the mapping of LCA data to company materials in a BOM over time

Workflow for streamlined, scalable LCA



LCA Users Findings – Maturity Model



	Majority of companies	Average company	Best-in-Class
Company Approach/ Characteristics	• Aware of LCA but no work done to date and none planned for the immediate future	• Some LCA work done • LCA functionally silo'ed or outsourced • LCA not integrated into product development process • Reactive – not strategic or risk based	• Defined LCA program in place • Internal, cross functional competency • LCA integrated into the product development process • Strategic and risk based
Data, Tools and Processes	• None	• Spreadsheet tools, static reports • Poor to moderate material content / substance data • Little supplier engagement • LCA results not centrally managed or shared • Little to no primary data	• Software tools, numeric data, well defined metrics • Good material content / substance data • Some supplier engagement • LCA results centrally managed and shared • Leverage primary data where possible

In Closing: Justifying the infrastructure investment

When performing LCA's becomes a customer requirement:

- Typical outsourced LCA for a single product:
  - ~$100k for LCA consultant
  - Months and $100k's of internal resources spent researching data
  - Results are usually stale before report is complete (BOM's change)
  - Data model and report is not designed for reuse in subsequent studies
- Combined compliance / LCA infrastructure advantages:
  - Streamlines data collection into a standard, repeatable process using IPC-1752
  - Vast reduction in internal resource commitments for scaling process
  - Results are as fresh as the latest BOM
  - Data model is designed for reuse and traceability
  - Process and technology allows LCA to be scaled to ALL products

Thank you.

For questions, contact me at:
jvos (at) ptc.com