

Software Tools and Information Exchange Standards

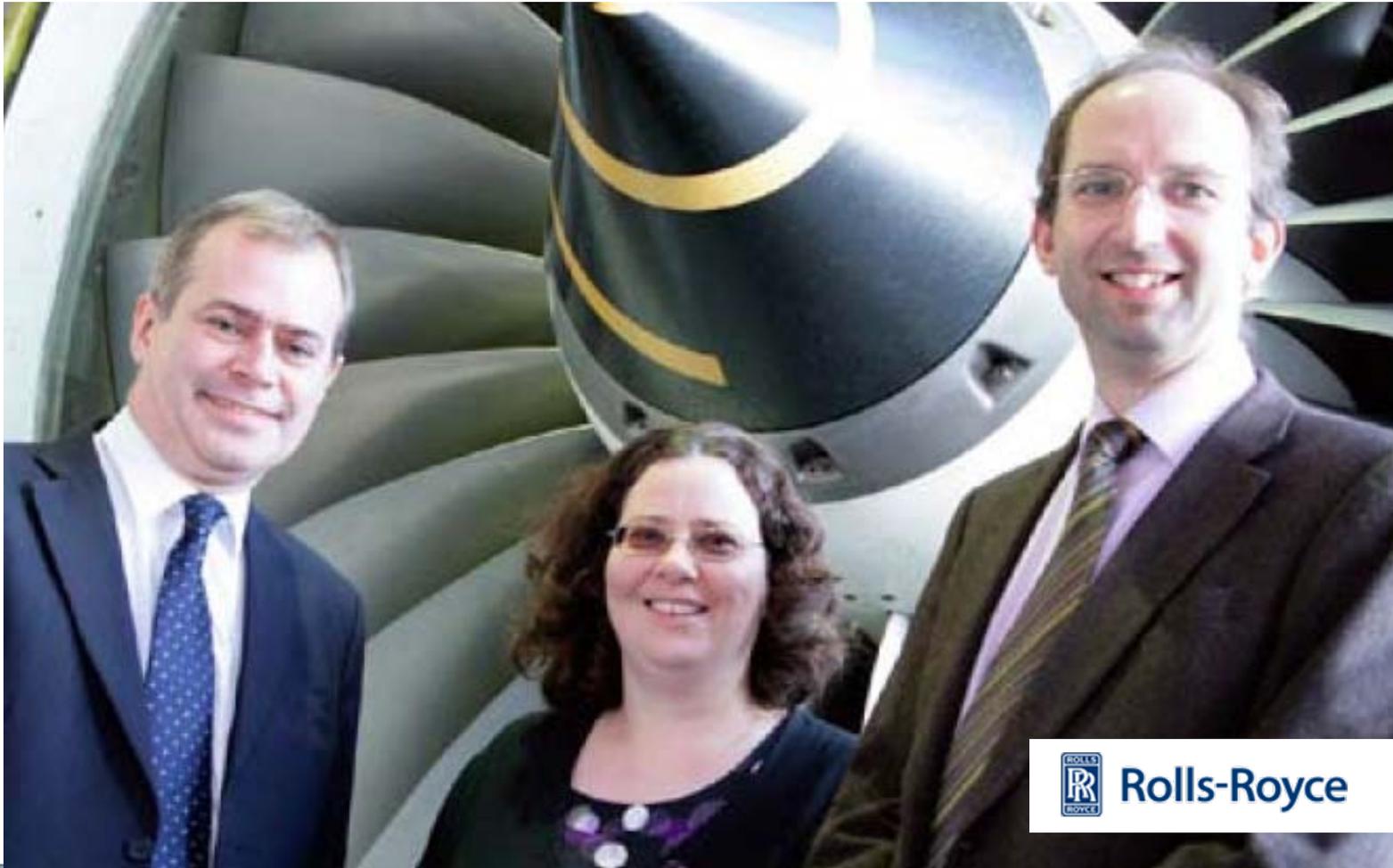
NIST Workshop on Sustainable Manufacturing: Metrics, Standards, and Infrastructure (13-15 October 2009)

John Fox, Director, Product and Market Strategy, PTC

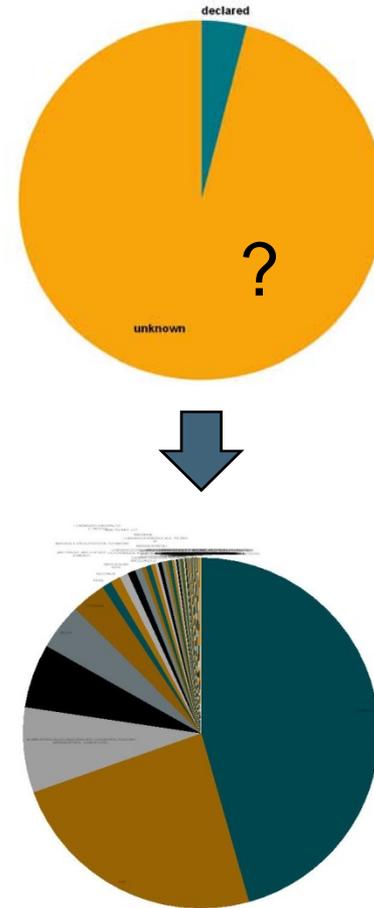
The \$50 million cage nut



The Challenge: Managing 3,500 sources of risk



Answering the question: What's in a disc drive?



Select customers



An escalating trend



The task of getting and staying compliant is increasingly complex.

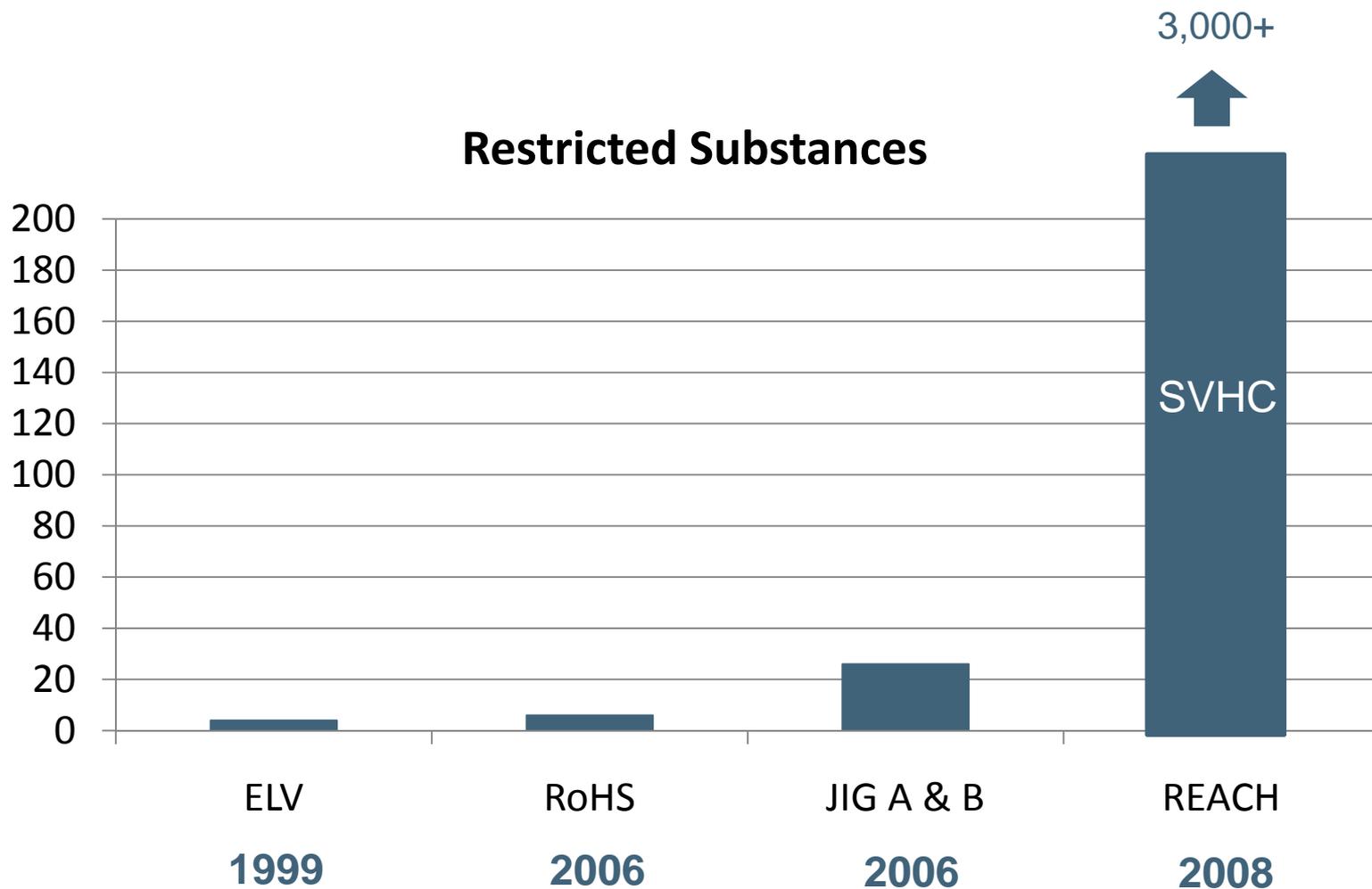


Compliance is becoming more costly and labor-intensive.



It's becoming more difficult to manage compliance accurately – Greater risk of failures.

More restricted substances and industries in scope

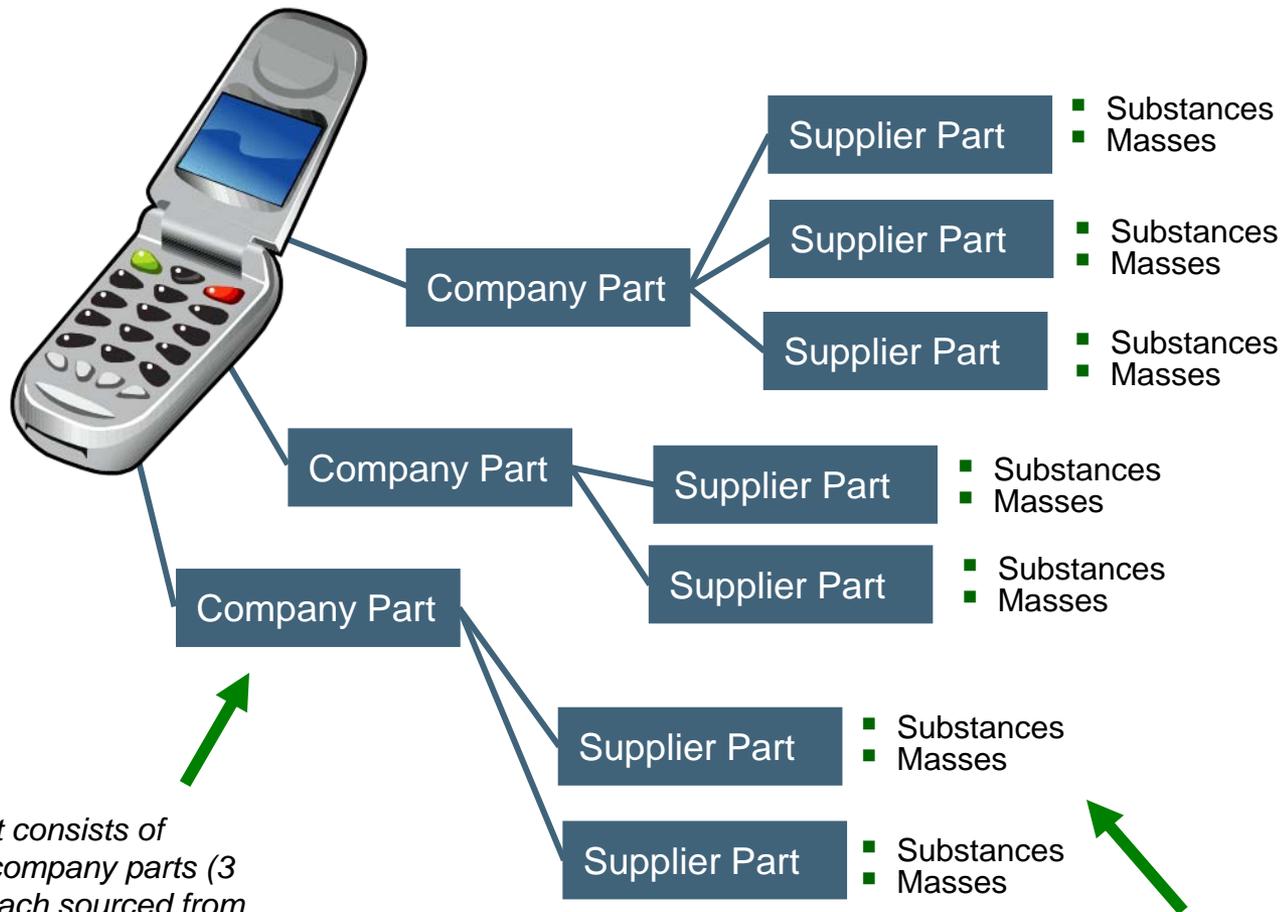


A supply chain management and bookkeeping nightmare

Compliance Standard

- Substances
- Thresholds
- Exemptions

A single product may need to comply with multiple environmental standards.



A product consists of multiple company parts (3 shown) each sourced from one or more suppliers.

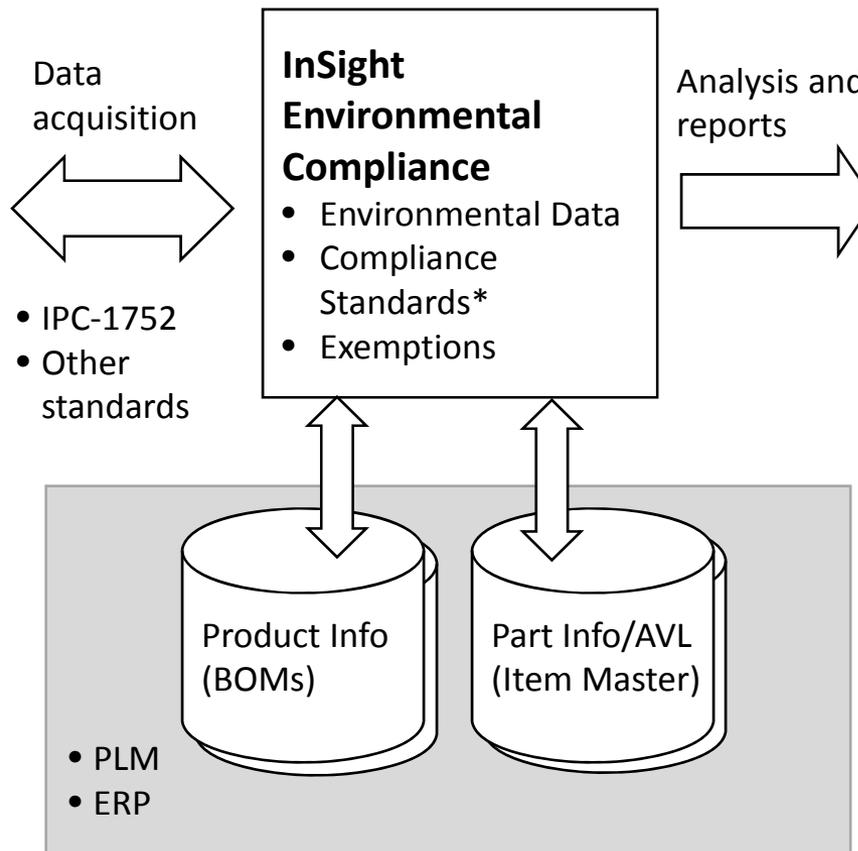
Each supplier part may have a different chemical makeup, which will impact compliance

InSight™ Environmental Compliance™

Get the data



Analyze and manage the data



Share the data



*Supported compliance standards include EU RoHS, China RoHS, WEEE, ELV, REACH and more

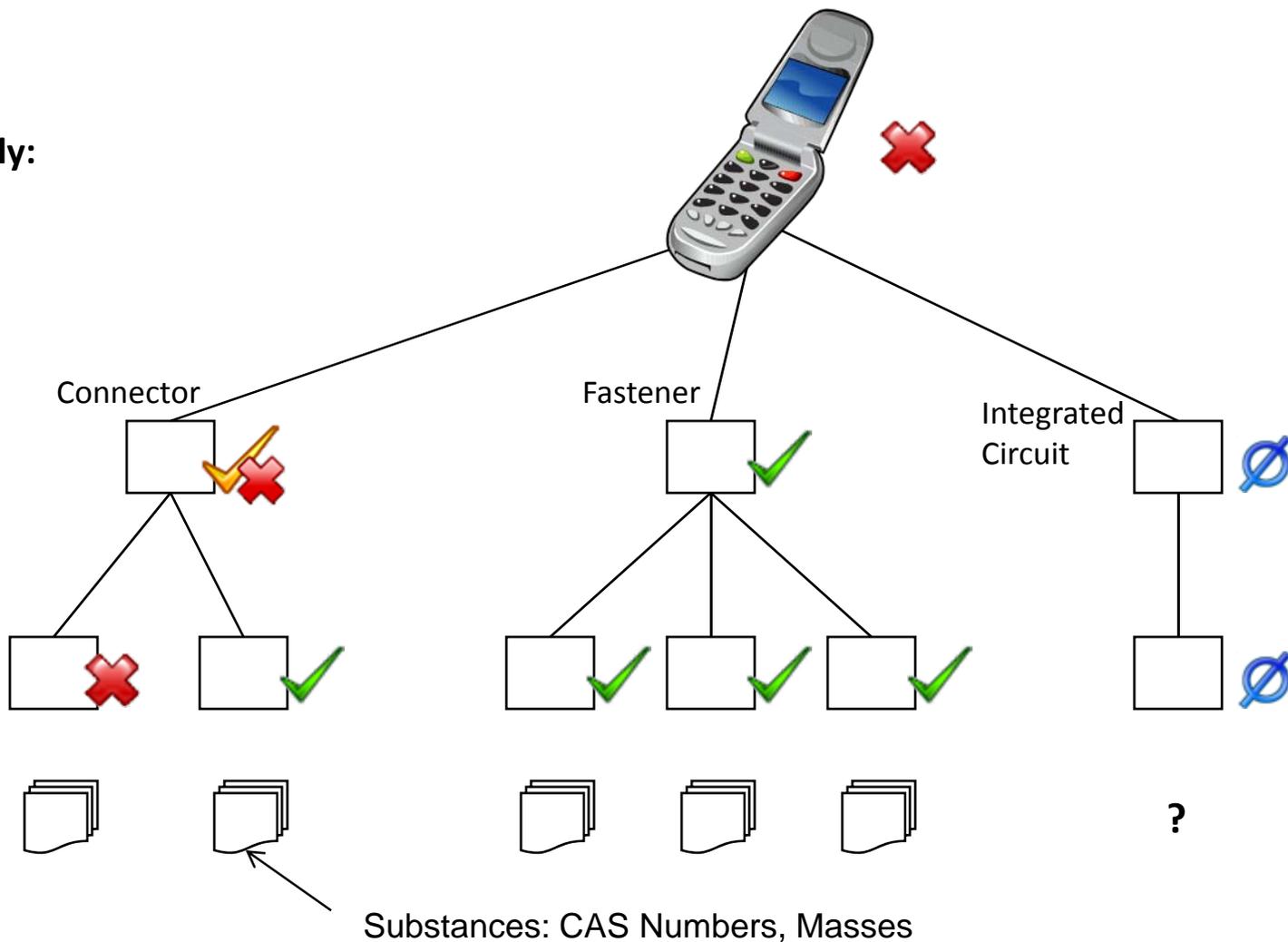
Product data model

Product/Sub-assembly:

Company Parts:

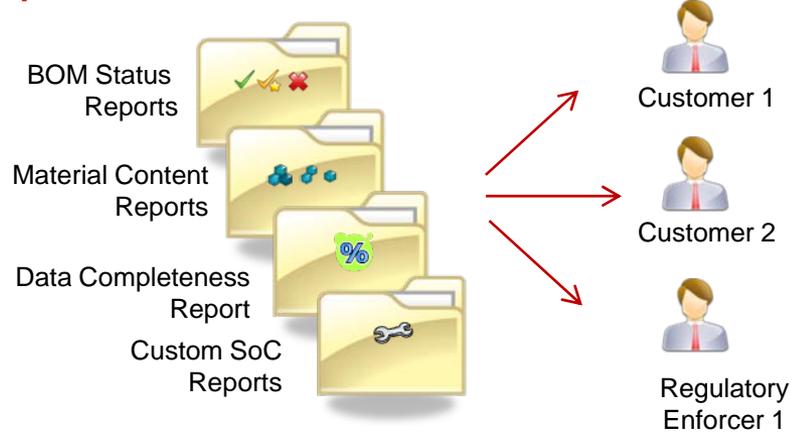
Supplier Parts:

Environmental Data:



Generate accurate reports that demonstrate compliance

Reports



Audit trail / historical record

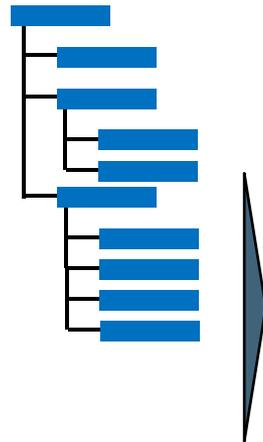
Compliance	Material Declaration	Requests	Lead Free	RoHS Roadmap	Document	Comments
1	REACH	B	SUSPECT SVHC	✓	Active	Exemption Earliest Expiry Date
1	REACH	B	SVHC	✓	true	
1	JIG	101	A	✗	true	
1	ROHS	C	CONSUMER	✗	true	
1	ROHS	C	INFRASTRUCTURE	✗	true	
1	ROHS	C	SERVER	✗	true	
2	JIG	101	A	✗	false	
2	REACH	B	SUSPECT SVHC	✗	false	
2	REACH	B	SVHC	✓	false	
2	ROHS	C	CONSUMER	✗	false	
2	ROHS	C	INFRASTRUCTURE	✗	false	
2	ROHS	C	SERVER	✗	false	
1	JIG	101	A	✗	false	
1	REACH	B	SUSPECT SVHC	✓	false	
1	REACH	B	SVHC	✓	false	
1	ROHS	C	INFRASTRUCTURE	✗	false	
1	ROHS	C	SERVER	✗	false	
1	ROHS	C	CONSUMER	✗	false	

Year 3
 Supplier declares
 Year 2
 Regulatory body expires exemption
 Year 1
 Supplier declares

Identify sources of risk early in the lifecycle and ahead of regulations



Identify risks in early BoM → Establish performance targets as part of gate process

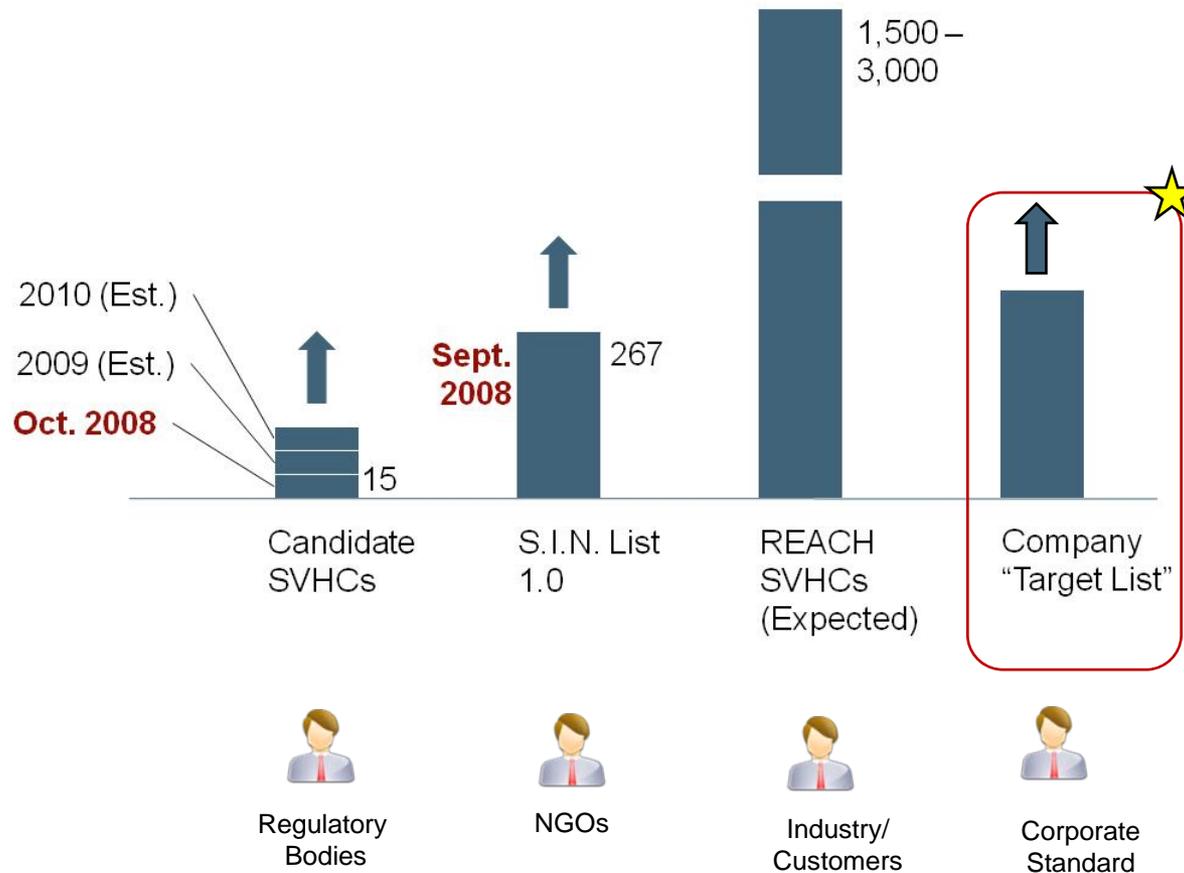


Dashboards

Supplier	Supplier ID	Part Owner	Request Status	Reported	Disclosure	ROHS(C)	ROHS(I)	JIG A	REACH SVHC	REACH SUSPECT SVHC
AVX	10194	bgreen	Open		🟡	🟢	🟢	🟢	🟢	🟢
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	PTRFA502	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	🟡	🔴	🔴	🔴	🟢	🟢
ATHEL CORP	118235	bgreen	Completed	07/17/2006 00:00:00	🟡	🟢	🟢	🟢	🟢	🔴
ATHEL CORP	118235	bgreen	Completed	07/17/2006 00:00:00	🟡	🟢	🟢	🟢	🔴	🔴
SKYWORKS SOLUTIONS LTD	423B00932	bgreen	Not Requested	07/14/2008 00:00:00	🟡	🟡	🟡	🔴	🔴	🔴

Track performance relative to current and future standards

Capture and manage multiple, evolving regulations

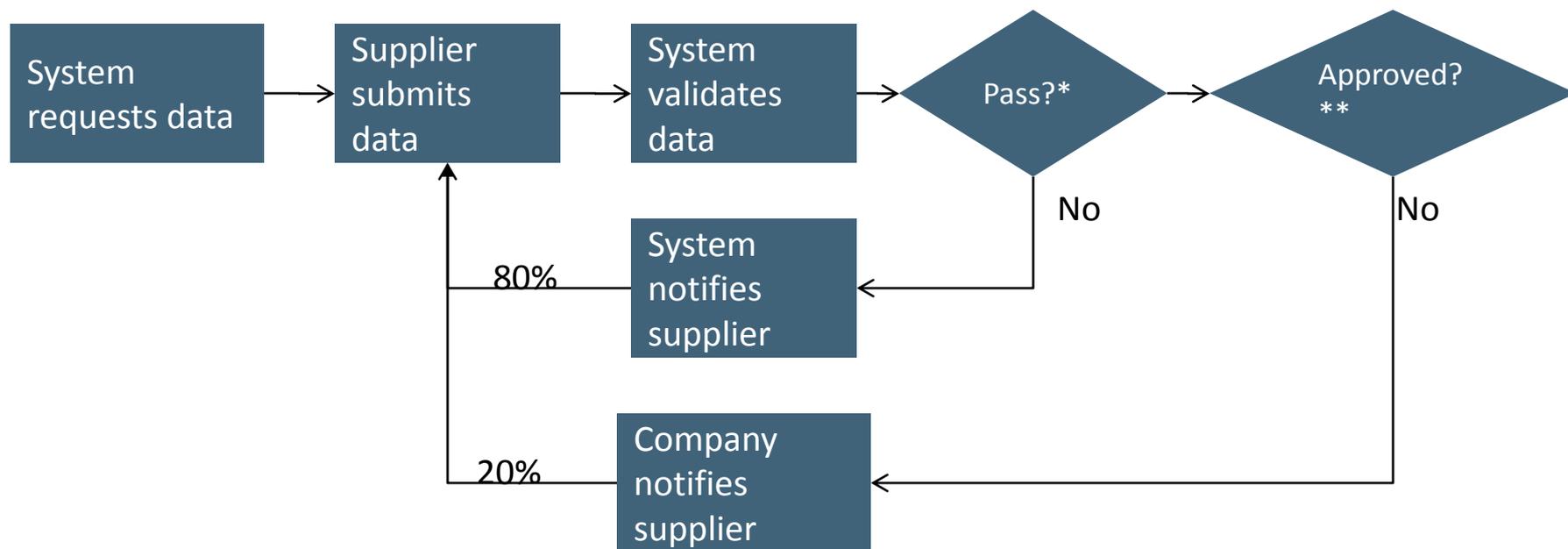


Provide meaningful information to all stakeholders

Supplier	Supplier ID	Part Owner	Request Status	Reported	Disclosure	ROHS(C)	ROHS(I)	JIG A	REACH SVHC	REACH SUSPECT SVHC
AVX	10194	bgreen	Open							
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						
A	A	bgreen	Not Requested							
A	A	bgreen	Not Requested							
A	A	bgreen	Not Requested							
SUPA	SID101	bgreen	Overdue							
ATEMEL CORP	118235	bgreen	Completed							
ATEMEL CORP	118235	bgreen	Completed							
SKYWORKS SOLUTIONS LTD	423800932	bgreen	Not Requested							

Part Number	Part Mass	UOM	Pre-Consumer Recycled (%)	Post-Consumer Recycled (%)	Tolerance
SKY77329-15	0.136	G			0
Subpart Name					
CONDUCTIVE EPOXY	CONDUCTIVE FILLER		N/A		
Supplier					
AG					
Substance					
EPOXY					
Class/Category					
DUMMY MATERIAL CLASSIFICATION					
CAS Number	Mass	%			
7440-22-4	0.001	100			
Other Substances					
2-BUTOXYETHYL ACETATE	112-07-2	0	21.667		
DIMETHYLSULPHAMOYL-CHLORIDE	13360-57-1	0	1.667		
FORMALDEHYDE, OLIGOMERIC REACTION PRODUCTS WITH 1-CHLORO-2,3-EPOXYPROPANE AND PHENOL	9003-36-5	0	33.333		
OXIRANE, ((4-(1,1-DIMETHYLETHYL)PHENOXY)METHYL)	3101-60-8	0	21.667		
PHENOL-FORMALDEHYD HARZ	9003-35-4	0	21.667		
DIE_GAAS					
GAAS DIE					
Supplier					
N/A					
Substance					
ALUMINIUMPULVER (NICHT STABILISIERT)					
CAS Number	Mass	%			
7429-90-5	0	0.08			
Other Substances					
ARSENIC	7440-38-2	0	40.53		

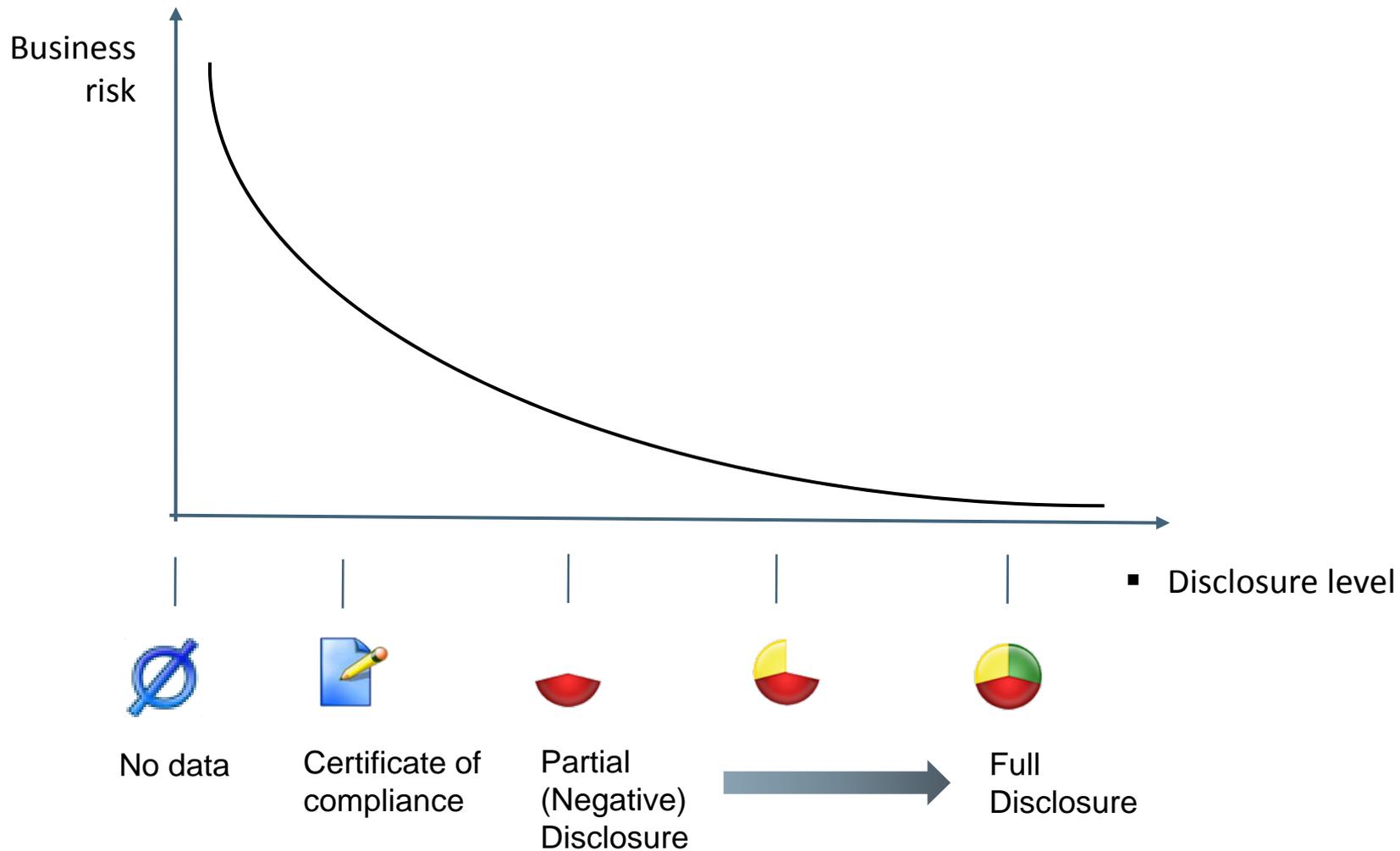
Streamline and automate the data collection and validation process



*Required fields, fields add correctly, etc.

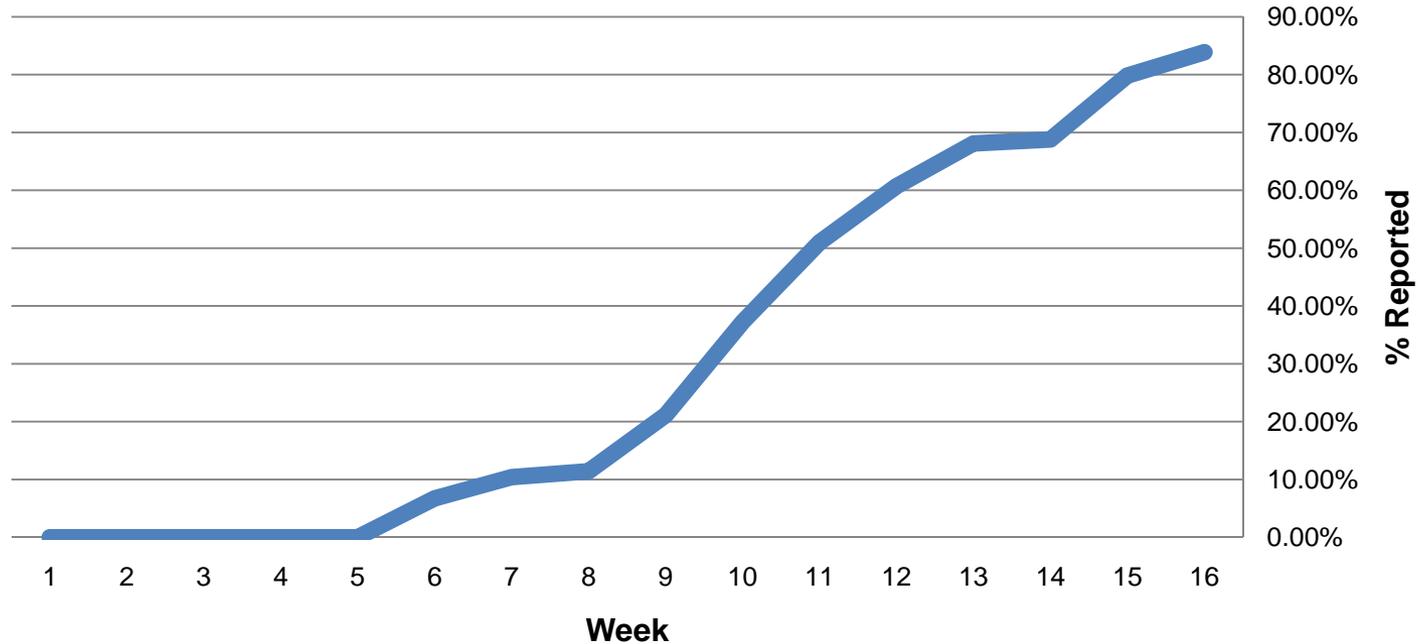
** Show old vs. new. Manual review or automated

Progressive disclosure – balance risk and cost



Improve data collection

% Supplier Parts Reported*



*Results achieved by an InSight Environmental Compliance customer collecting full disclosure data

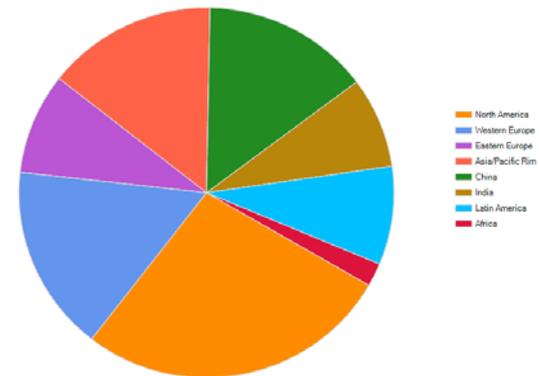
Environmental Compliance Survey – conducted in July 2009

Tech-Clarity gathered and analyzed 331 responses

The responding companies were a good representation of the manufacturing industries, including

- High tech and Electronics (51%),
- Consumer Products (33%),
- Aerospace and Defense (26%),
- Automotive and Transportation (22%),
- Machinery and Industrial (26%),
- others.

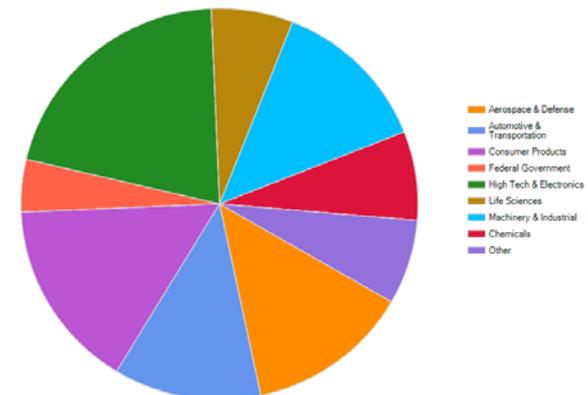
In which of the following geographies does your company have significant operations? (Check all that apply)



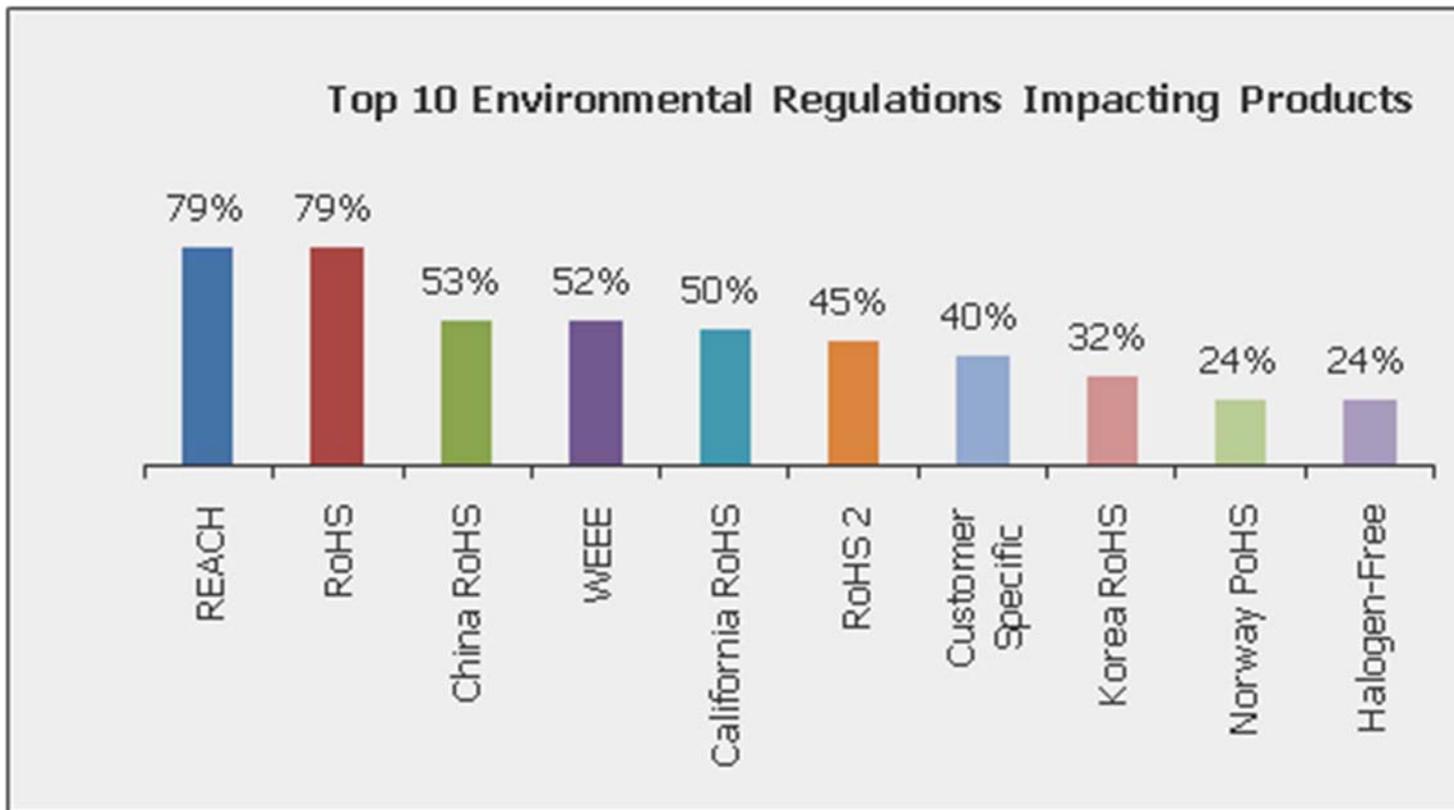
Companies doing business globally, in...

- North America (88%)
- Western Europe (53%)
- Asia-Pacific regions (44%),
- Latin America (27%)
- Eastern Europe (25%).
- Africa (8%)..

In what industries does your company compete? (Check all that apply)



Top regulations of concern

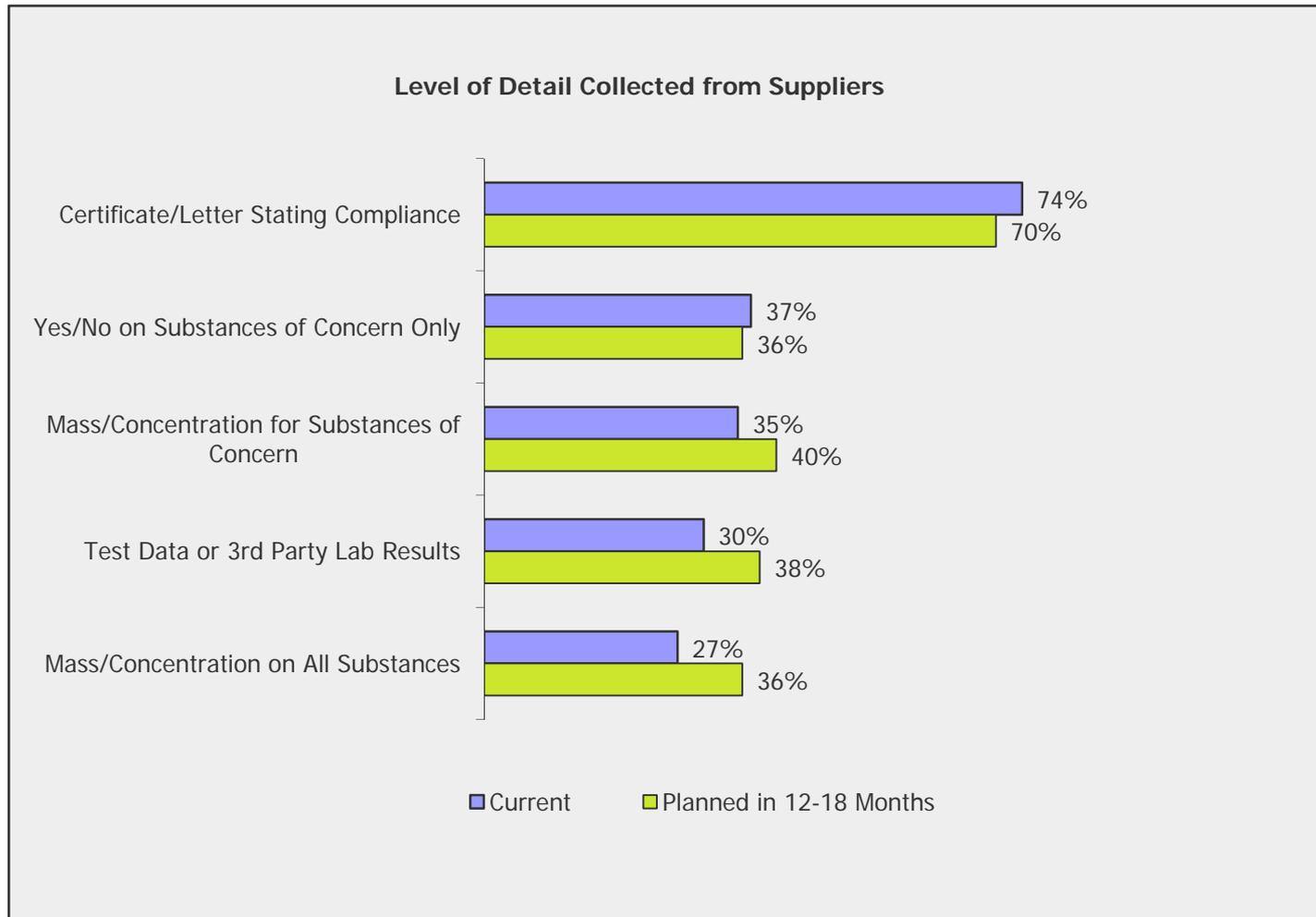


Top environmental compliance challenges

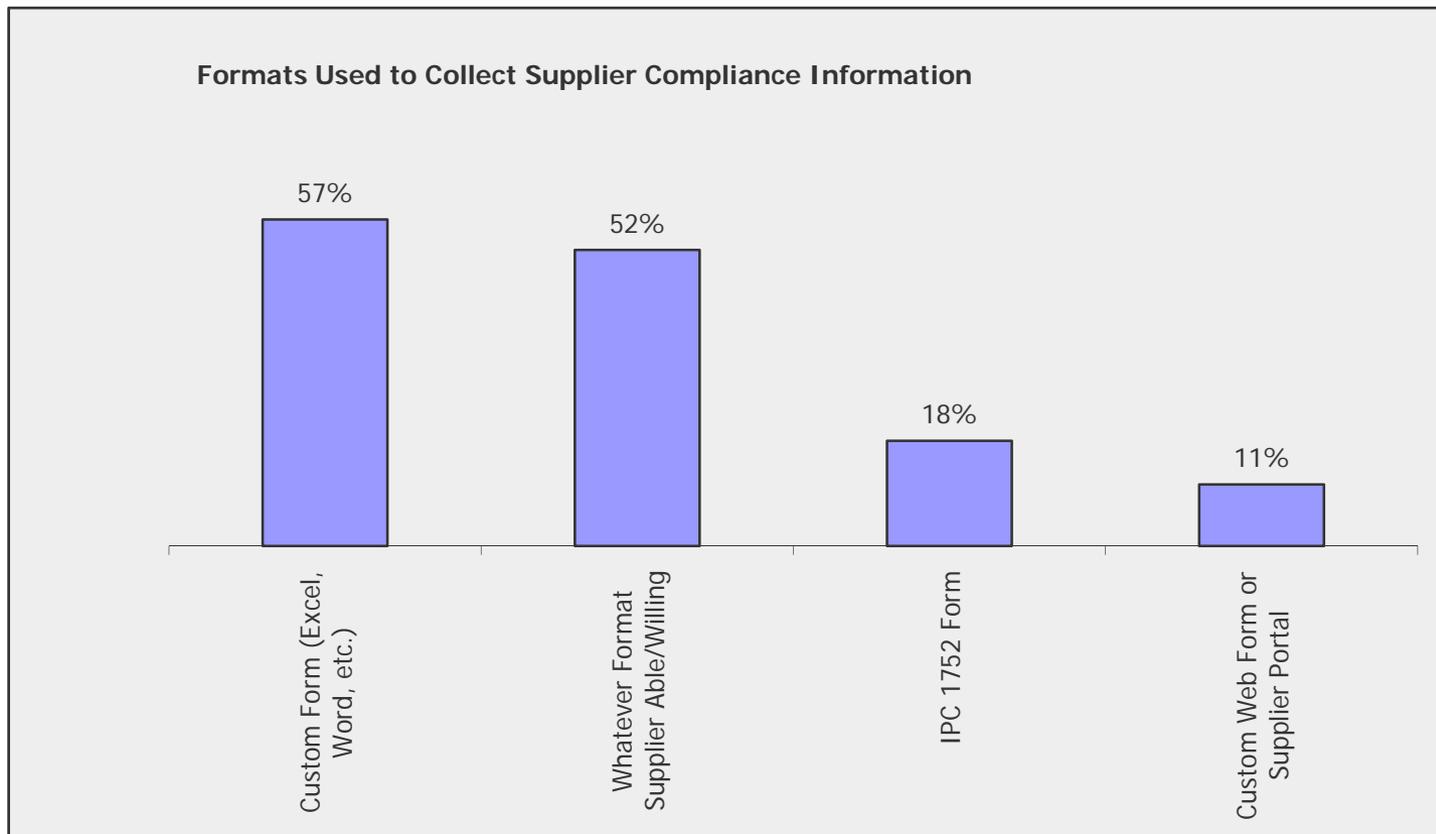


“The work hasn’t gone away, but our resource pool has gotten smaller”

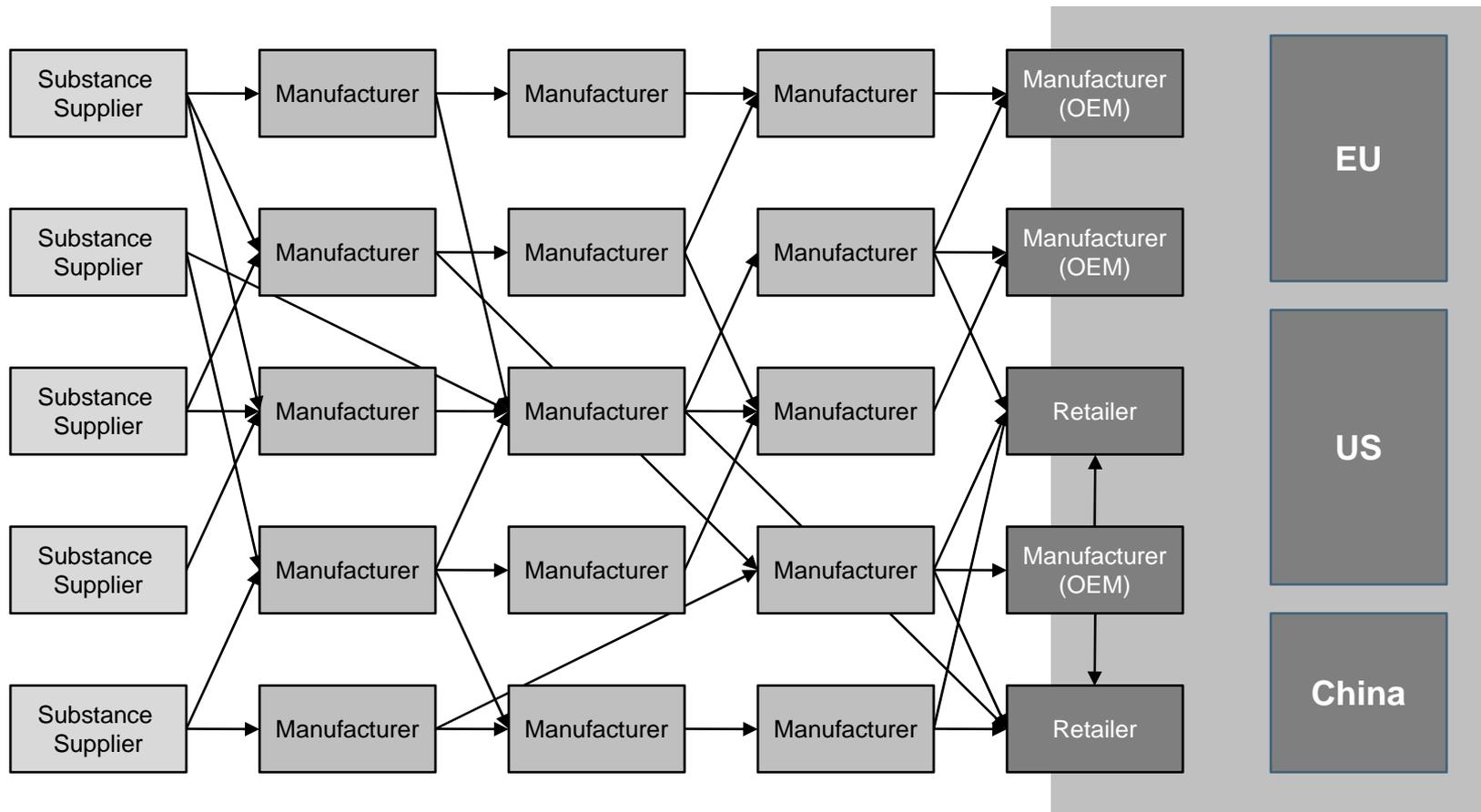
What type of supporting data is captured and tracked?



What format is used to capture data?



Increasing burden on industry – massive duplication of effort, custom forms, repeated supplier surveys. Info exchange standards are needed



Recommendations / Lessons learned

Look for software that:

- Performs both reporting and forward-looking risk assessments
- Tracks part, product, and enterprise performance
- Makes complex data meaningful to enable better decision making
- Enables you to capture, validate and maintain environmental data from disparate sources
- Is interoperable with all your BOM management systems. Does not require investment in a specific PLM or ERP system

Information exchange standards:

- Are needed to help avoid massive duplication of effort
- Are needed to facilitate exchange of new information
- Should be regulation/requirement agnostic.
- Should not be confused with databases and tools

Thank you!

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Learn more about InSight Environmental Compliance software: www.ptc.com/go/insightec