

The word "DELPHI" in a bold, black, sans-serif font. The background of the slide features a light blue gradient with a pixelated pattern on the left and a complex digital graphic on the right. The digital graphic includes binary code (0s and 1s) and a glowing, circular, tunnel-like structure with hexagonal patterns on the floor, suggesting a high-tech or data-driven environment.

DELPHI

Design for the Environment Program

Green Chemistry & Commerce Council Meeting
NSF Ann Arbor, Michigan
May 9-11, 2012

Outline

- ◆ Delphi Overview
- ◆ IMDS / GADSL a Suppliers Perspective
- ◆ Delphi's Design for the Environment Process
- ◆ *df* EH&S Benefits & Challenges



Delphi is a Global Supplier

Major Technical Centers



Auburn Hills, MI; USA



Bascharage, Lux.



Krakow, Poland



Juarez, Mexico



São Paulo, Brazil



Bangalore, India



Shanghai, China

15 Technical Centers ■ 11 Countries ■ 17,000 Scientists & Engineers
114 Manufacturing Sites ■ 30 Countries ■ 104,000 Employees

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Delphi Products



Electrical/Electronic Architecture

- Electrical/Electronic Distribution Systems
- Connection Systems

Wiring Harness Assembly
Electrical Centers
Connection Systems



Electronics & Safety

- Electronic Controls
- Infotainment & Driver Interface
- Navigation System

- Active Safety Systems
- Audio Systems
- Body and Security Electronics and Systems
- Communication Systems



Powertrain Systems

- Gasoline Engine Management Systems
- Diesel Engine Management Systems

- Fuel Handling Systems,
- Evaporative Emissions Systems
- Transmission Management Systems



Thermal Systems

- Thermal Automotive
- Thermal Residential and Commercial Heat Exchangers

- Condensers
- Radiators
- Fan Modules
- HVAC Modules



Product & Service Solutions

- Diesel
- Independent Aftermarket
- Original Equipment Service

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Diverse Customer Base

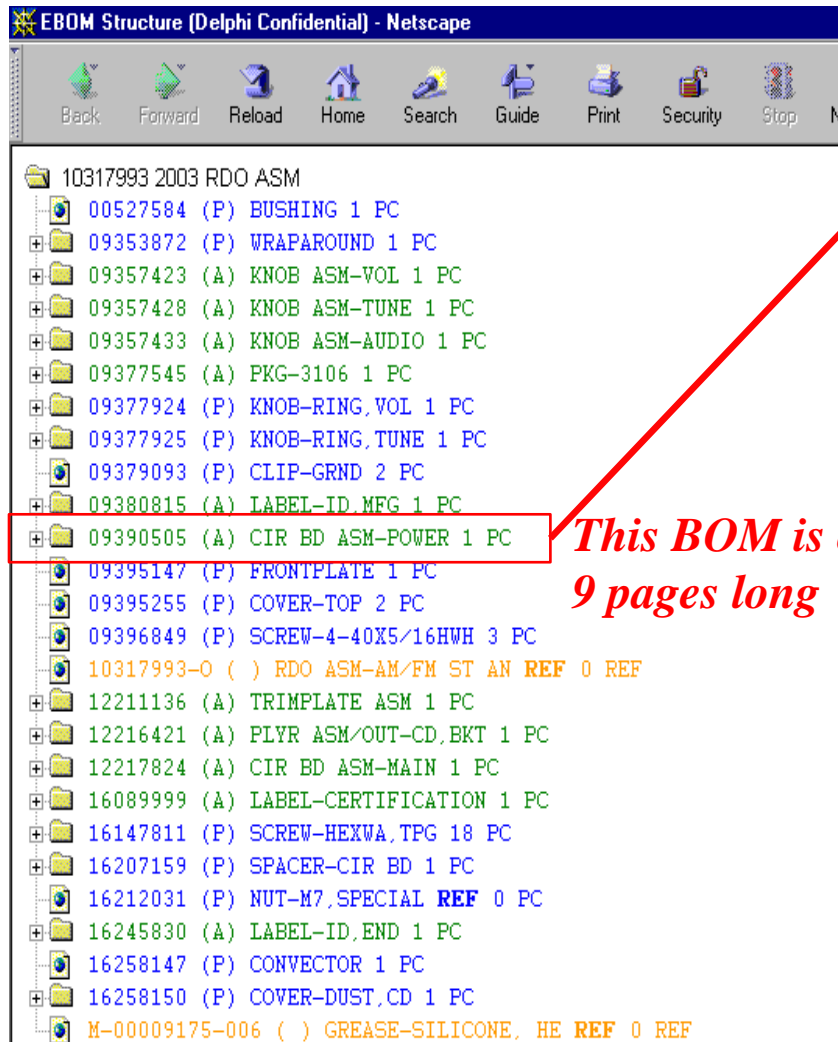


IMDS / GADSL a Supplier's Perspective

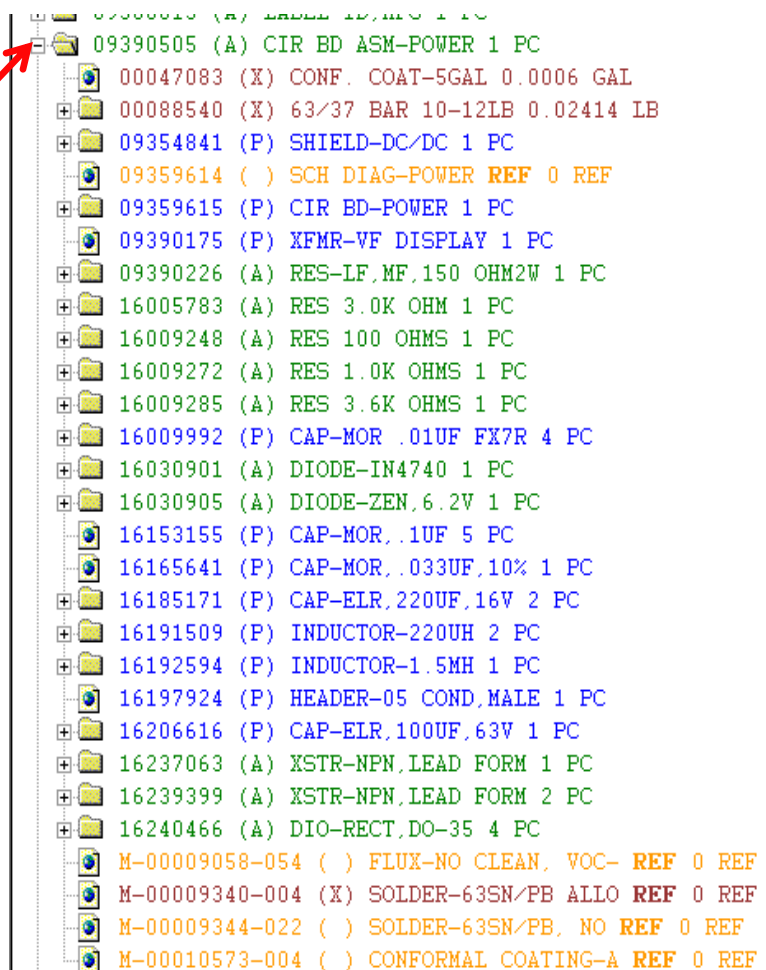
Supplier's perspective on IMDS / GADSL

- ◆ Vehicles are a complex collection of components, technologies and materials
- ◆ Many tiers to the supply chain feeding OEMs
- ◆ A Tier 1 supplier's biggest issue is their ability to gather information from the supply chain. Customer data requests should be sensitive to the need for a common format and the ability to aggregate lower tier supplier data.
- ◆ Farther into supply chain you travel, solicited suppliers % of sales to Auto Sector diminished – influence diminished

Suppliers perspective on IMDS / GADSL



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9 pages long*



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Suppliers Perspective on IMDS / GADSL

GADSL single most important accomplishment towards fulfilling auto sector need to identify substances of concern

Before GADSL



Tier 2 Supplier A
Tier 2 Supplier B
Tier 2 Supplier C
Tier 2 Supplier ...

Tier 3 Supplier A
Tier 3 Supplier B
Tier 3 Supplier C
Tier 3 Supplier ...

Tier n Supplier ...

Raw Material Suppliers

After GADSL



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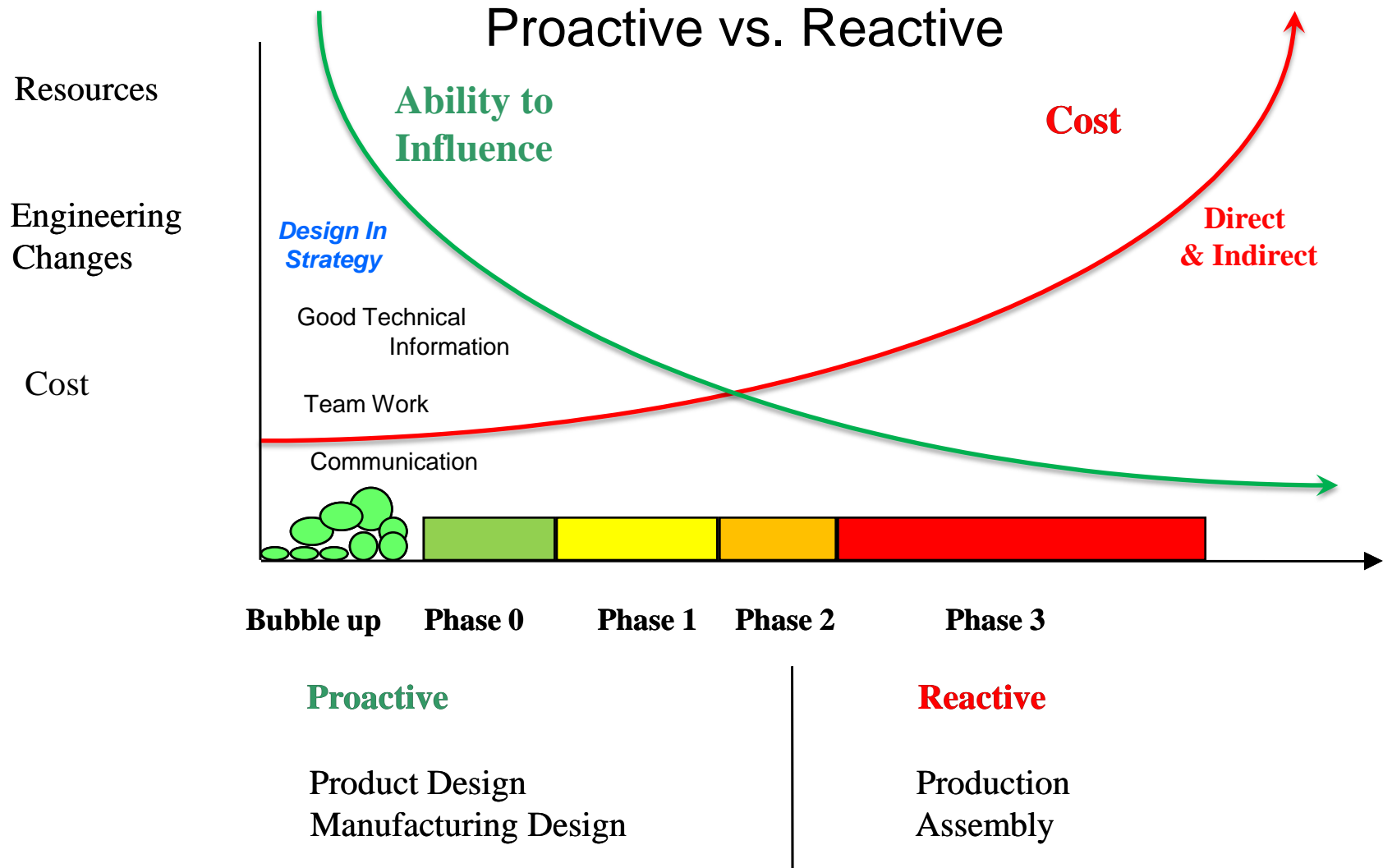
Suppliers Perspective on IMDS / GADSL

- ◆ CLEPA / AIAG / Japia members strictly support the GADSL approach and use this harmonized list as the base for material data reporting along the supply chain.
- ◆ We prefer IMDS reporting to other customer specific formats because:
 - over 89,000 companies representing the worldwide automotive industry are utilizing IMDS
 - Avoids redundant/duplicate data entry at lower supplier tiers
 - Best practices and data format recommendations are established between supplier groups (including Chemical Suppliers) and OEM partners

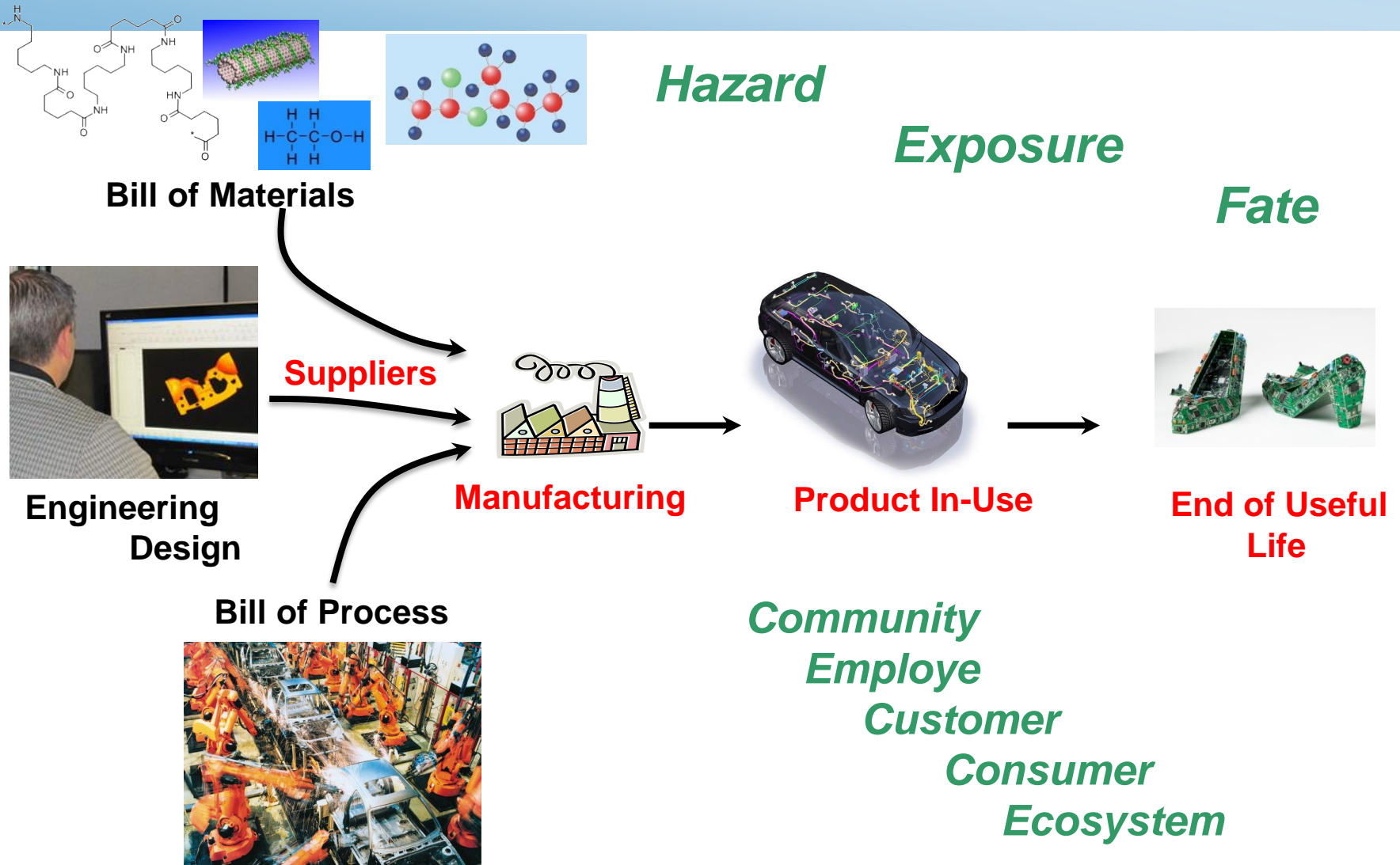


Delphi's Design for the Environment Process

Design In Strategy



Delphi's Design for the Environment Process

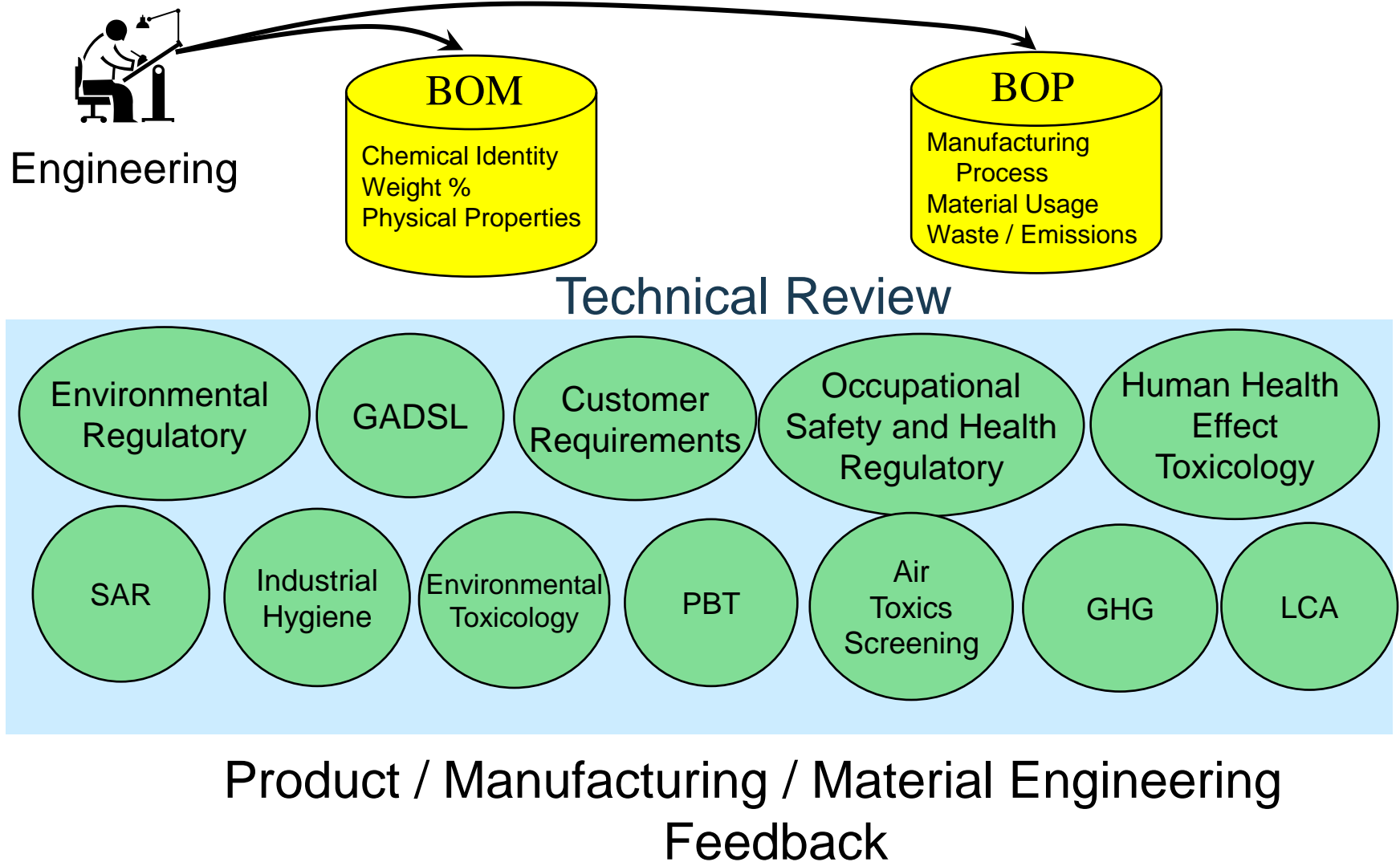


Delphi's Design for the Environment Process

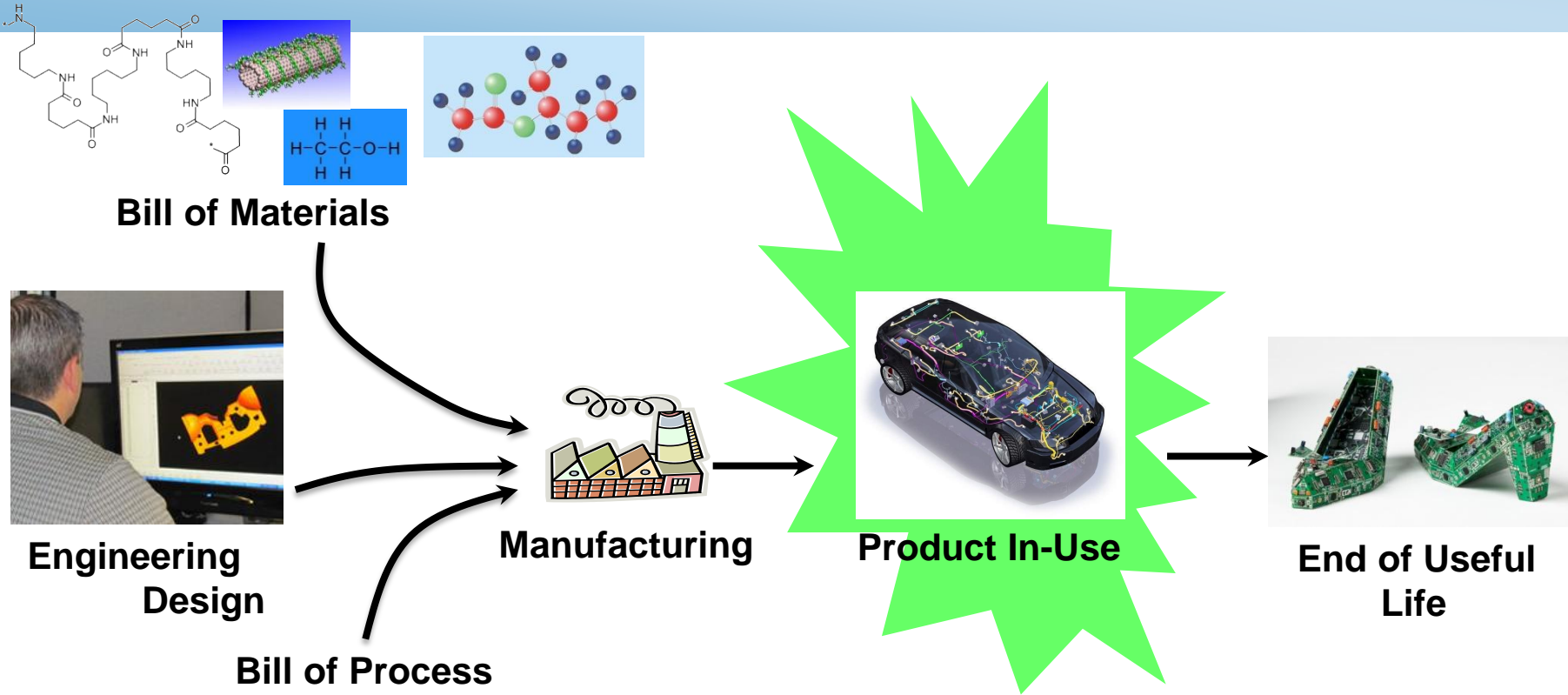
Key Ingredients

- ◆ Integration into Product Development Process
 - ADP, BOM, BOP info
- ◆ Divisional Alignment of Resources
 - Divisional & Regional - dfEH&S Engineer
 - Technical center and site engagement
- ◆ Continuous Improvement – metrics
- ◆ Leveraged Technical Expertise

Delphi's Design for the Environment Process



Product Life Cycle Benefits



Improved Vehicle Performance

- Increased MPG
- Reduced Tail Pipe Emissions

Delphi Green Product Solutions

- ◆ **Fuel Economy and Performance Technologies**
 - Cylinder Deactivation System
 - Two-step Valve Train with Dual Independent Cam Phasers
 - Brushless Fuel Pump Modules
- ◆ **Reman ECM/PCM**
- ◆ **Universal Reflash Tool**
- ◆ **Alternative Fuel Systems/Components**
 - Fuel System for Dimethyl Ether
- ◆ **Evaporative Emissions Canisters**
- ◆ **Diesel Fuel Injection Systems and After-treatment**
- ◆ **Gasoline Direct Injection**
- ◆ **Next Generation Energy Efficient A/C**
- ◆ **HVAC Compressors**
- ◆ **HVAC Systems for Alternative Refrigerants**
- ◆ **Diagnostic Systems**



- ◆ **Electric HVAC Systems**
- ◆ **Hybrid and Electric Vehicle Technologies**
- ◆ **Power Conversion Products**
- ◆ **High Voltage Battery Pack System**
- ◆ **Ammonia, Planar Oxygen & Battery IVT Sensors**
- ◆ **Electronics Packaging**
- ◆ **Halogen-free Cable**
- ◆ **Aluminum Cable**
- ◆ **Miniaturization**
- ◆ **Navigation**
- ◆ **Ultra Light Radio**

Green.

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Delphi *df* EH&S Benefits & Challenges

Benefits

- ◆ Proactive vs. Reactive
- ◆ Reduce Risk
- ◆ Reduce Cost
- ◆ Competitive advantage

Challenges

- ◆ Supplier Disclosure
- ◆ Regulatory / Scientific Finding Surveillance
- ◆ Engineering Engagement
- ◆ Scientific Data Availability



Thank You