



International Electronics Manufacturing Initiative

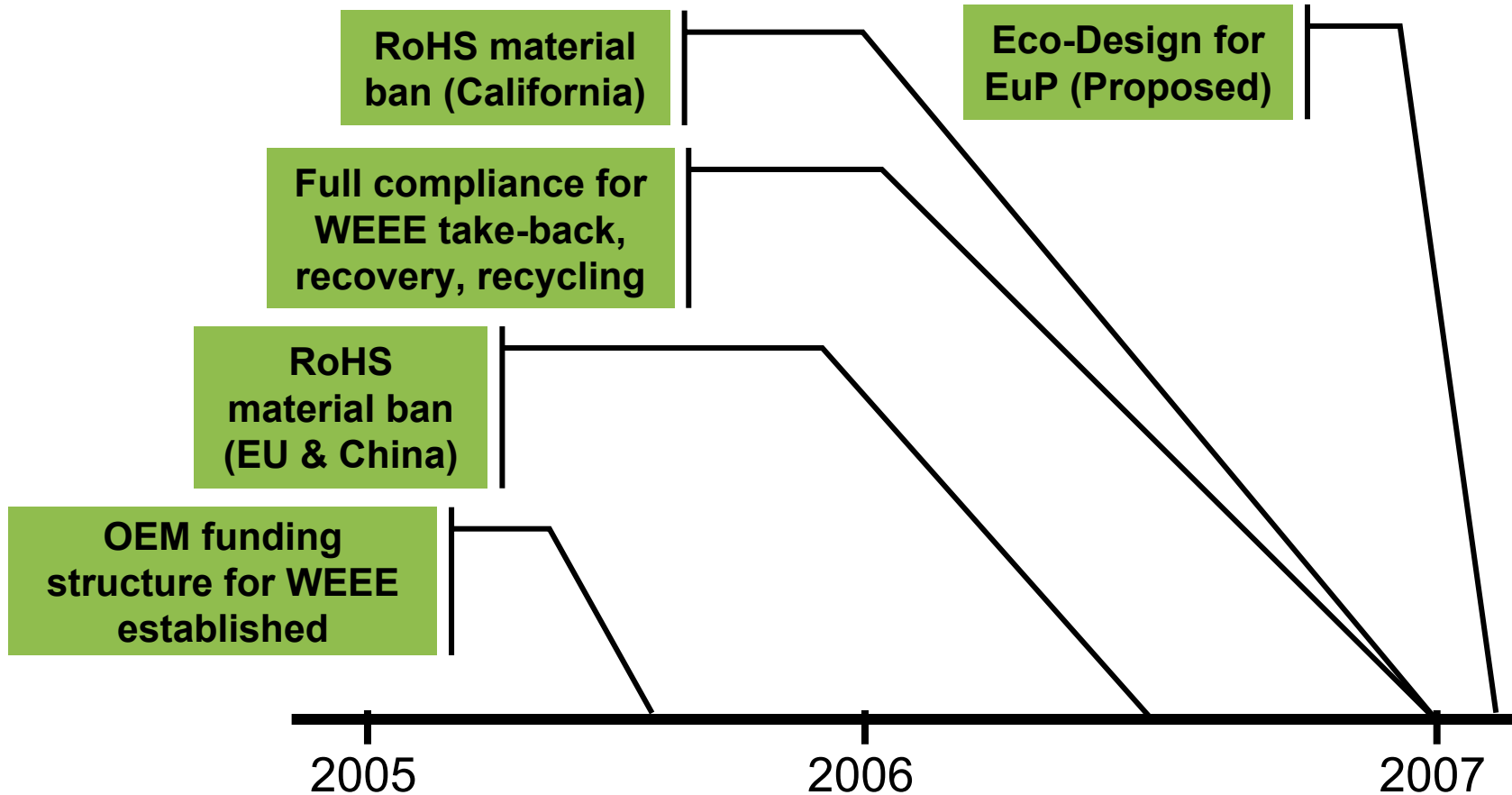
**Roadmap to Compliance:  
The Role of Electronic Data Exchange  
in Supporting the European Union  
RoHS and WEEE Directives**



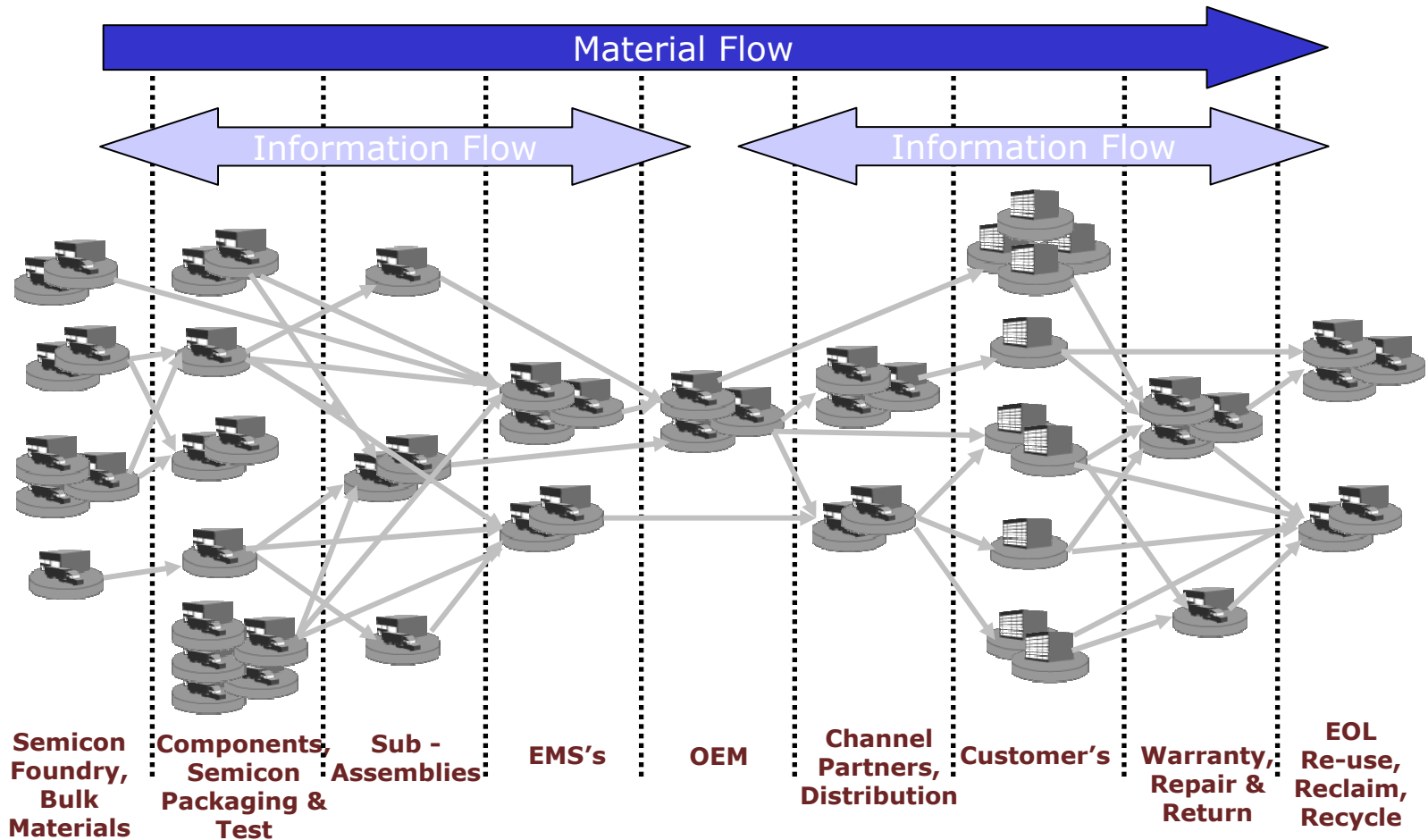
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- **Challenges and Requirements**
- **Roles Within the Supply Chain**
- **Data Standards Activities and Exchange Mechanisms**
- **Component Manufacturers – Steps Towards Compliance**
- **Conclusions**

- New EU environmental regulations require Material Composition Declarations
  - **Every board, component, sub-assembly and bulk material must have material composition information available to prove compliance and support producer due diligence**
  - **OEMs and each element in their supply chain must assume liability for accurate data collection, aggregation and reporting**
- Results of non-compliance
  - **Goods impounded**
  - **Lose rights to sell into the entire EU (25 countries)**
  - **Potential permanent loss of market share**
  - **Reportable material event under Sarbanes-Oxley Act Section 409**
  - **Fines, media coverage, etc.**
- EU is ALREADY enforcing parts of the standard – other jurisdictions to follow – China, Japan, US



***New products with a 16 month design/NPI cycle will need to support RoHS compliance March 2005!***



***Achieving compliance requires collection and compilation of information that spans multiple processes and tiers of the value chain.***

- UK DTI RoHS Guidance
  - **OEM Producers will “self declare”**
  - **Definition of “homogeneous material” for reporting**
  - **Producers subject to audit - 30 days to provide “due diligence” technical documentation; 4 year retention**
  - **Products subject to analytical lab testing for validation**
- RoHS Exemptions
  - **Exemptions are either at the product or component level**
  - **19 exemptions currently defined**
  - **Additional 22 under review**
- WEEE Implications
  - **Some components or products under RoHS exemptions will likely require declaration as “hazardous waste” under WEEE**
  - **Producers will be required to provide reports indicating their performance against collection and recycling targets**

- **3Q 2004 iNEMI Survey**
  - Every commodity has at least one supplier claiming to be currently capable of meeting RoHS compliance
  - All other suppliers scheduled to be RoHS compliant by Q3'05
- **Recent Distributor Survey**
  - Component manufacturers are resisting changing part numbers when they move to RoHS compliant finishes, but OEMs and EMS providers are requiring it
  - 30% of suppliers are still indicating that they will not change
- **Demand for RoHS compliant parts will increase as the deadline approaches**
  - ensuring compliance and component supply will be absolutely critical to a company's revenue from the EU in 2006
- **Key element in managing compliance will be establishing liability across the multiple tiers of the supply chain**
  - audit trail for information collected that can be legally attributed to a supplier and referenced to the part numbers (and potentially lot numbers or date codes) used in production

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- **An effective material composition declaration strategy demands a clear understanding of what role your company plays in the electronics industry value**
- **We will segment the value chain elements into three categories:**
  - **OEM/Producer**
  - **EMS/CM**
  - **Component/Sub-part supplier**
- **Each of these plays a different role, with distinct responsibilities and requirements**

- **The European Union directives define “producer” primarily in terms of branding**
- **RoHS Related Requirements:**
  - **The producer is the primary element in the value chain that is directly and legally responsible to EU state regulators to ensure that their products are compliant**
  - **The onus is on the producer to ensure that all of the components and materials that are used in the manufacture of their equipment are compliant, even if the actual manufacturing is performed by a third party (EMS/CM).**
- **The United Kingdom has developed RoHS guidance that indicates that their approach will be one of “self-declaration,” whereby products placed on the U.K. market after July 1, 2006 will be assumed to be compliant**
  - **Under this system, producers would be expected to be prepared to submit technical documentation demonstrating compliance upon request of the enforcement authority**
  - **Testing procedures and standards are currently being defined that will be used to support the physical testing of products for compliance**

- **The Electronic Manufacturing Service provider/Contract Manufacturer sector is, as usual, stuck between a rock and a hard place**
  - Although not legally responsible to EU regulators, their OEM customers will turn to them to help ensure compliance
- **RoHS Related Requirements:**
  - Customers will request technical documentation from EMSs to support their compliance due diligence
  - Currently, these requests take many forms, and may be at the product, part/component or bulk material level
- **Liability is established with the EMSs through the information that they provide and through the contractual terms of the contracts and purchase orders from their customers**
  - The fact that there are currently no standardized formats for compliance requests/responses means that EMSs are faced with increased costs to support the mostly manual processes required

- **Category spans a large range of parts, materials and suppliers**
  - These are the building blocks that are used to create the products (defined by BOM and AVL/AML)
  - Some bulk materials, such as solder paste, are not typically defined on the BoM, but will need to be accounted for
- **RoHS Related Requirements:**
  - The data provided by these suppliers will form the foundation of a producer's RoHS compliance program, whether the information is provided to OEMs or EMSs
  - Requests for compliance data received by suppliers are even more varied than those received by the EMSs
- **The variety of formats and request types make it very difficult for suppliers to provide information**
  - For any procured part, the supplier will be responsible to provide compliance information for the entire content, including any sub-parts that they procure from their suppliers
  - As with the EMSs, liability is established with the component suppliers through the information that they provide and through the contractual terms of the contracts and purchase orders from their customers

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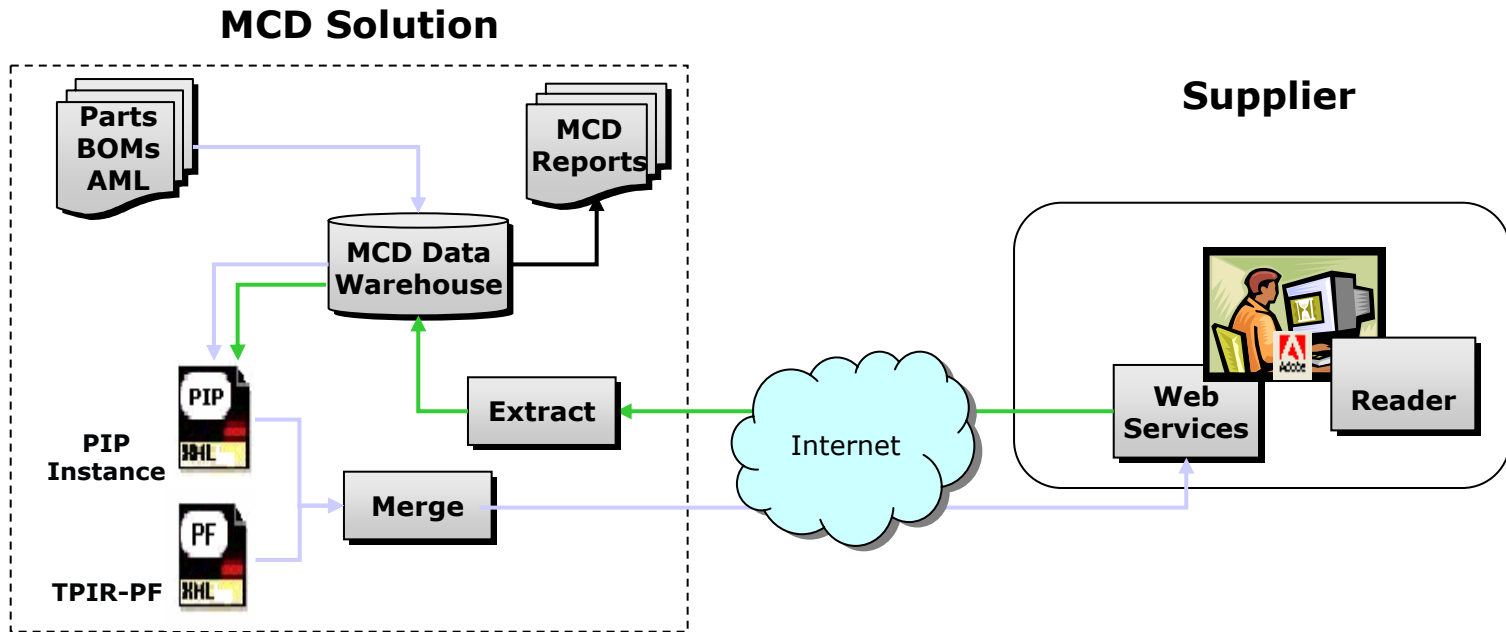
- **IEC 3/750/DPAS (DRAFT)** defines the high level requirements for materials declarations
- **Joint Industry Guide (JIG)** defines the specifics of what needs to be reported
- **Proposed IPC-1752 data standard** will provide an electronic data model and standardized forms that would support both electronic exchange and human input
  - **IPC-1752** would be aligned with RosettaNet 2A10 and 2A13 PIPs for B2B
- **IEC Test Methods (DRAFT)** would provide analytical validation standards

- **iNEMI Material Declaration project is recommending that the industry embrace 3 levels**
  - **RoHS Component Level Compliance** – a yes/no declaration that indicates whether a component meets RoHS compliance requirements, and allows for specification of any RoHS exemptions that are applicable
  - **JIG Material Disclosure (Levels A & B)** – in addition to above, provides detail on JIG Level A and B materials, at the homogeneous level, including substance mass and ppm concentration levels
  - **JIG Material Disclosure (Levels A, B and C)** – in addition to above, includes the option to add additional “materials of interest”, as well as manufacturing information

- **The iNEMI Material Composition Data Exchange team is working with the newly created IPC-1752 Committee**
  - **develop a standard data model to support all three levels of disclosure**
  - **develop PDF-based forms for request-response, and supplier self-declaration**
- **The data model and XML structure are being aligned with RosettaNet 2A10 and 2A13 PIPs**
  - **PDF-forms correspond to those defined under the RosettaNet Auto-Enablement program (RAE) to ensure interoperability and full support for automated B2B data exchange**

# MCD Solution – Logical Flow

(using RosettaNet Automated Enablement, or RAE)



- Forms are designed so that they may be completed using the free Adobe Acrobat Reader, either by manual data entry or by data upload, can be saved locally, and be submitted electronically back to the requester
- Each form will be based on an underlying XML schema, which in turn is represented by a UML model, which will enforce entries to conform to the schema requirements, ensuring a higher level of data quality
- XML data can be extracted by the requester upon form receipt to automate the data transfer into internal systems

The form validates data as entered

## MCD Form

Data entered on the form is reflected as *validated* XML PIP data

### PIP Data

```
<?xml:stylesheet type="text/xsl" href="PIPs.xsl" />
<sdcr:DocumentHeader>
  <sdcr:PurchaseOrder schemaVersion="1.0">
    <sdcr:AccountClassification schemaVersion="1.0">
      <sdcr:AccountClassificationAgency>R02etalet</sdcr:AccountClassificationAgency>
      <sdcr:AccountClassificationAgencyList schemaVersion="1.0">
        <sdcr:AccountClassificationAgencyListEntry>
          <sdcr:AccountClassificationAgencyListEntryAgency>R02etalet</sdcr:AccountClassificationAgencyListEntryAgency>
          <sdcr:AccountClassificationAgencyListEntryAgencyList>
            <sdcr:AccountClassificationAgencyListEntryAgencyListAgency>R02etalet</sdcr:AccountClassificationAgencyListEntryAgencyListAgency>
          </sdcr:AccountClassificationAgencyListEntryAgencyList>
        </sdcr:AccountClassificationAgencyListEntry>
      </sdcr:AccountClassificationAgencyList>
    </sdcr:AccountClassification>
    <sdcr:AccountName-String>sdcr:AccountName</sdcr:AccountName-String>
    <sdcr:AccountNumber-String>sdcr:AccountNum</sdcr:AccountNumber-String>
    <sdcr:BillTo schemaVersion="1.0">
      <sdcr:SpecificIdentifierPartner schemaVersion="1.0">
        <sdcr:ContactInformation schemaVersion="1.0">
          <sdcr:Contact-String>sdcr:Contact</sdcr:Contact-String>
          <sdcr:Email-String>sdcr:Email</sdcr:Email-String>
          <sdcr:Fax-String>sdcr:Fax</sdcr:Fax-String>
        </sdcr:ContactInformation>
      </sdcr:SpecificIdentifierPartner>
    </sdcr:BillTo>
  </sdcr:PurchaseOrder>
</sdcr:DocumentHeader>
```

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- Information from component manufacturers forms the building blocks for an understanding of product level compliance
  - **It is critical for component manufacturers to understand their markets and customers requirements**
  - **Some OEMs will take advantage of exemptions for lead-in-solder**
- Component manufacturers should be prepared to provide information for the most stringent disclosure requirements
  - **In most cases, this would be Level 3 reporting, up to and including full disclosure**
  - **If the data is established and maintained to support full disclosure, any of the lower levels of reporting can also be easily supported**
  - **At a minimum, component manufacturers should be prepared to provide information on explicit levels of JIG Level A & B substances**

- 1. Have you defined your Compliance Risk Management Strategy?**
  - What components are affected, in what markets, at what time?
  - What are your customer's requirements?
  - What are your liabilities?
  - How will you manage accountability and liability with your suppliers?
- 2. What is your strategy for identifying changes in RoHS/Lead-free compliance?**
  - Will you change part numbers, or identify material change by lot or date code?
  - How will you communicate this strategy to your customers?
  - Will you continue to provide Sn-Pb compatible parts as well?
- 3. Have you defined what substances and level of Content Disclosure you will support?**
  - Draft Material Composition Declaration Joint Industry Guide (JIG) – developed by EIA/EICTA/JGPSSI
  - Global Automotive Declarable Substance List (GADSL)
  - iNEMI/IPC Levels 1, 2 and 3

## 4. Have you defined Data Formats?

- Excel spreadsheets (customized, JGPSSI, Compliance Connect)
- RosettaNet 2A10/2A13 PIPs
- IPC 1752 (Proposed): xml based MCD data format supporting multiple levels of declaration, with associated pdf-based forms

## 5. How will you Transfer Data?

- Web portals
- Email
- RosettaNet RNIF, Web services...

## 6. Will you support B2B exchange with Customers?

- Web services or RosettaNet B2B Gateways and network to support automated data exchange

## 7. What do you need for MCD Tools/Applications?

- Provide for data input, aggregation, component level roll-up, analytics, report/declaration generation

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- **There are differences in requirements based on the role in the supply chain, but there are also many common threads and common issues**
- **By establishing a clear methodology, your company can support customer requirements within the timelines required**
  - **Ensure your company has a well defined compliance program and multi-functional team in place, with CPO and CIO visibility**
  - **Answer the 7 questions:**
    1. **Have you defined your Compliance Risk Management Strategy?**
    2. **What is your strategy for identifying changes in RoHS/Lead-free compliance?**
    3. **Have you defined what substances and level of Content Disclosure you will support?**
    4. **Have you defined Data Formats?**
    5. **How will you transfer data?**
    6. **Will you support B2B exchange with Trading Partners?**
    7. **What do you need for MCD Tools/Applications?**
  - **Analyze your product and supplier portfolio to determine risk levels**
  - **Get involved in standards activities**
  - **Understand that this will be an ongoing business requirement**