U.S. EPA
Design for the Environment Program

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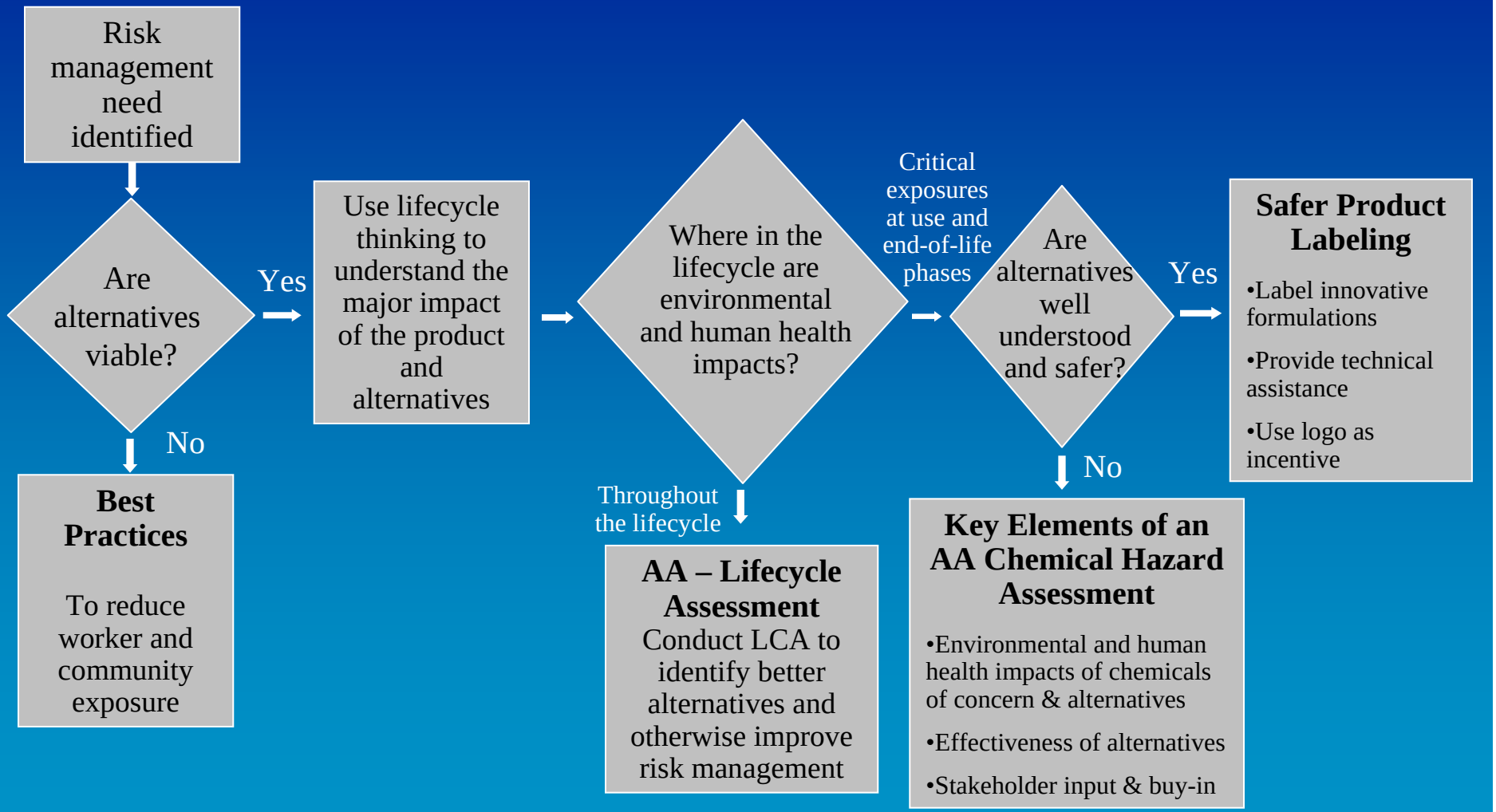
DfE Program History

DfE Program Began	1992
Printed Wiring Board (PWB) Partnership	1995-2001
Screen Printing, Lithography, and Flexography Printing Partnerships	1994-2003
Garment and Textile Care Partnership	1996-2003
Safer Product Labeling Program	1997-Current
Best Practices for Auto Refinishing	1997-Current
LCD vs. CRT monitors LCA	1998-2001
<u>Alternatives Assessments</u>	
Lead-Free Solder for Printed Circuit Boards LCA	2002-2005
Furniture Flame Retardants Alternatives Assessment	2003-2006
Flame Retardants in Printed Circuit Boards	2007-Current
Phthalates, decaBDE, BPA	2010

What DfE is About

- Goals
  - Safer Products
  - Safer chemical ingredients is focus
  - Life cycle impacts are considered
  - Protecting Consumers – Especially Children
- Central Elements
  - OPPT technical tools and expertise
  - Multi-stakeholder participation
- Results
  - Industry partners reduced more than 500 million pounds of chemicals of concern last year

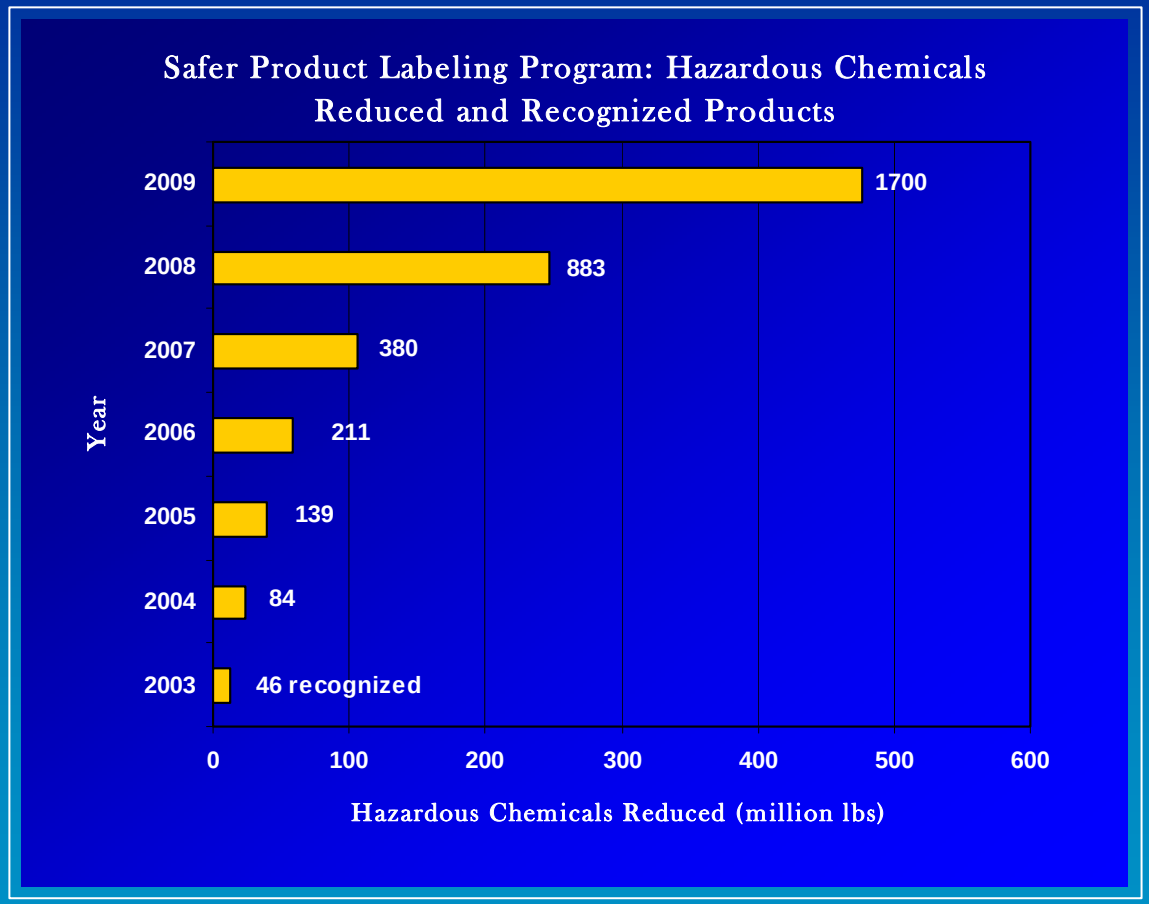
Decision Logic for DfE Approaches



DfE Safer Product Labeling

Current Sectors:

- Cleaning products
- Holding tank treatments
- Bioremediation products
- Deicers
- Industrial coatings
- Inks
- Field paint
- Tire balancing liquid



Safer Product Labeling

1) Review <u>every</u> ingredient by functional use class
   - To promote green chemistry
   - To understand toxicity
     - Lists
     - Literature
     - Analogous chemicals – SAR
2) Review formulation as a whole
   - Synergistic effects
   - pH
   - Performance testing
3) Partnership Agreement

Seven Key Principles

- **DfE uses seven principles to ensure the value and usefulness of chemicals considered in an alternatives assessment**
- **Alternatives should:**
  - Be commercially available, or likely to become available
  - Be technologically feasible
  - Deliver the same or better value in cost and performance
  - Have potential for improved health and environmental profile
  - Consider economic and social factors
  - Have potential to result in lasting change
  - Interest stakeholders

DfE and Alternatives Assessments

- Previously completed alternatives assessments:
  - Lead-Free Solder for Printed Circuit Boards LCA
  - Furniture Flame Retardants Alternatives Assessment
  - Flame Retardants in Printed Circuit Boards

- Alternatives assessments as Action Plan tool
  - Action Plan targets specific uses
  - Identify and evaluate alternatives for that specific use

EPA Chemical Action Plans

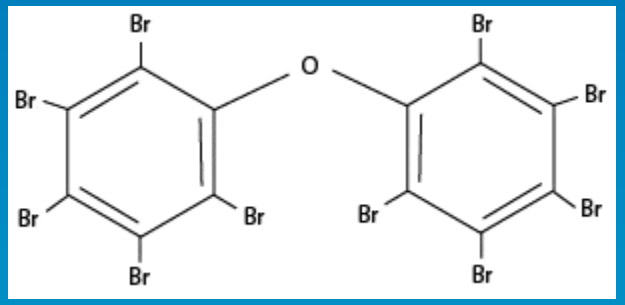
- Chemicals for which action plans have been prepared:
  - Bisphenol A (BPA)
  - Phthalates
  - Perfluorinated chemicals (PFCs)
  - Penta, octa, and decabromodiphenyl ethers (PBDEs)
  - Short-chain chlorinated paraffins
- Chemicals currently in the action plan development process:
  - Benzidine dyes
  - Diisocyantes
  - Hexabromocyclododecane (HBCD)
  - Nonylphenol and nonylphenol ethoxylates (NP/NPE)
  - Siloxanes

EPA Chemical Action Plans

- Of these action plan chemicals, DfE plans to conduct chemical alternatives assessments for the following:
  - Bisphenol A (BPA)
  - Decabromodiphenyl ether (decaBDE)
  - Phthalates
  - More?

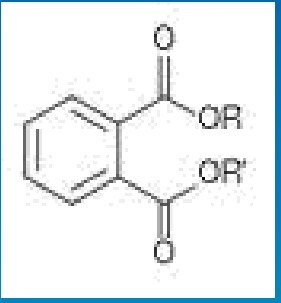
decaBDE Alternatives in Flame Retardants

- Will build on existing work on decaBDE
  - Plastics e.g., electronic enclosures
  - Textiles
- Kick-off in summer 2010
- Likely stakeholders:
  - Chemical manufacturers
  - Product manufacturers (throughout the supply chain)
  - NGOs
  - Government agencies
  - Academics
  - End users
  - Waste and recycling companies



Phthalates Alternatives

- Evaluation of 8 phthalates and alternatives
  - dibutyl phthalate (DBP)
  - diisobutyl phthalate (DIBP)
  - butyl benzyl phthalate (BBP)
  - di-n-pentyl phthalate (DnPP)
  - di (2-ethylhexyl) phthalate (DEHP)
  - di-n-octyl phthalate (DnOP)
  - diisononyl phthalate (DINP)
  - diisodecyl phthalate (DIDP)
- Functional uses are complex and varied
- Will build on existing work on phthlalates
- Case studies will explore how alternatives can be used
- Kick-off likely in fall 2010



Thank you!

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