Lifecycle and Cost-Benefit Analysis of Managing Leftover Latex Paint

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Why study waste paint

- Waste paint is a top concern based on its high volume in the waste stream, subsequent costs to manage, and potential for increased reduction, recovery, reuse, and recycling.

Paint Product Stewardship Initiative

- National dialogue on leftover paint management
- Includes government officials, paint manufacturers, retailers, paint recyclers, painting contractors, and other key stakeholders
- October 6, 2004 – a voluntary Memorandum of Understanding was signed including 11 projects, one of which was the Life Cycle and Cost Benefit Analysis of Managing Leftover Latex Paint.
- Detailed information on the initiative can be found at http://www.productstewardship.us/

Overall perspective

- The primary goal of the dialogue is to develop an agreement for a nationally coordinated leftover paint management system that will result in:
  - reduced leftover paint,
  - decreasing the improper disposal of leftover paint,
  - the efficient collection, reuse, and recycling of leftover paint,
  - increased markets for products made from leftover paint,
  - attaining the highest value possible for recycled paint,
  - improving container collection and recycling, and
  - a sustainable financing system to cover any resulting end-of-life management costs for past and future products.

Industry Perspective

- Key project for industry – answer a critical question – ultimately does it make socioeconomic sense to recycle leftover latex paint?
- Industry believes this fundamental question must be answered before solutions are developed for latex

LCA/CBA Project

- Lifecycle Cost/Benefit Analysis
  - Project started March 2006
  - Final ~December 2006
- Results will be used in conjunction with the other PPSI projects in the development of a nationally coordinated system for the management of leftover paint

LCA/CBA

- Lifecycle Assessment - Cost/Benefit Analysis
  - compile the environmental and economic benefits and impacts of methods for managing leftover latex paint
- Focus on latex (not oil-based)
- Two Scenarios\Various Methods
  - Consumer Based
    - Reuse
    - Dry/stabilize and dispose
  - Collection Based
    - Reuse
    - Recycle via consolidation (reblended paint)
    - Recycle via reprocessing (recycled content paint)
    - Dry/stabilize and dispose

Some key issues

- Fraction of waste paint that is recyclable and cost of paint collection to be used in model
- How to model health impact affects of the application of recycled paint and drying of leftover paint
- What virgin paint off-set credits to assume
- What are the viable markets for recycled paint - how to account for this in the model?

Broad Cost Categories

To consumers (e.g., transportation, time, cost of recycled paint)

To environment (e.g., burdens from transportation, collection, facilities, paint management, recycled paint production and use)

To government (e.g., collection, transportation, solid waste facility costs)

To industry (e.g., foregone profits [reuse], production/distribution of recycled paint product)

Broad **Benefit** Categories

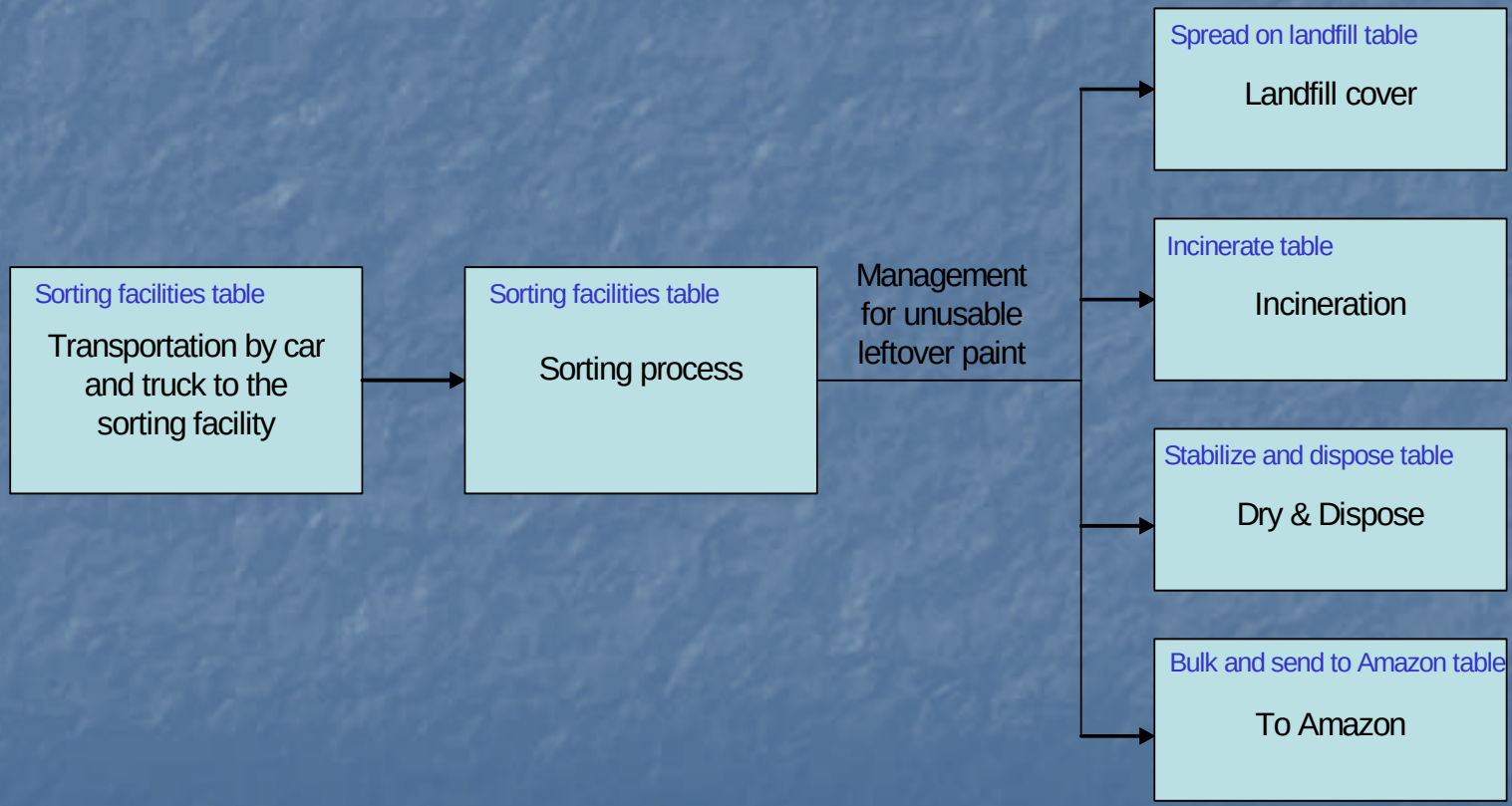
To consumers (e.g., reused/recycled paint, avoided travel/purchase of virgin paint)

To environment (e.g., avoided production and use burdens of virgin paint if/when displaced by reused/recycled paint)

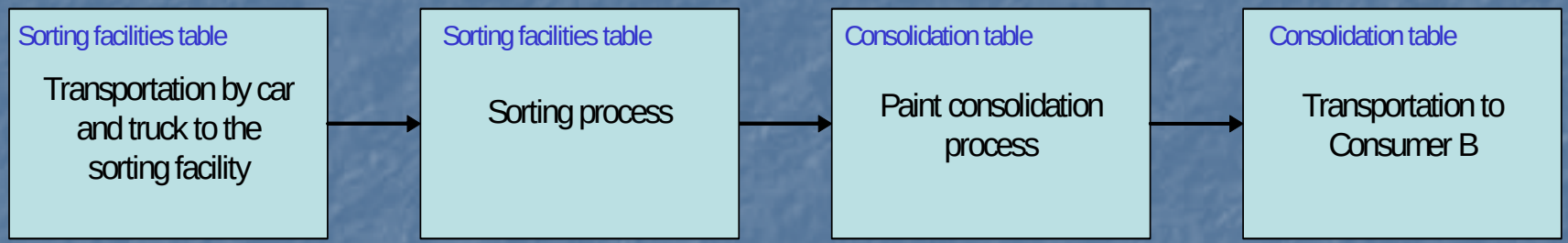
To government (e.g., sale of recoverable materials)

To industry (e.g., revenues from sale of recycled paint)

Management by disposal -Method 6



Consolidation- Method 4



Minus virgin offset

impact potentials (TRACI + 3)

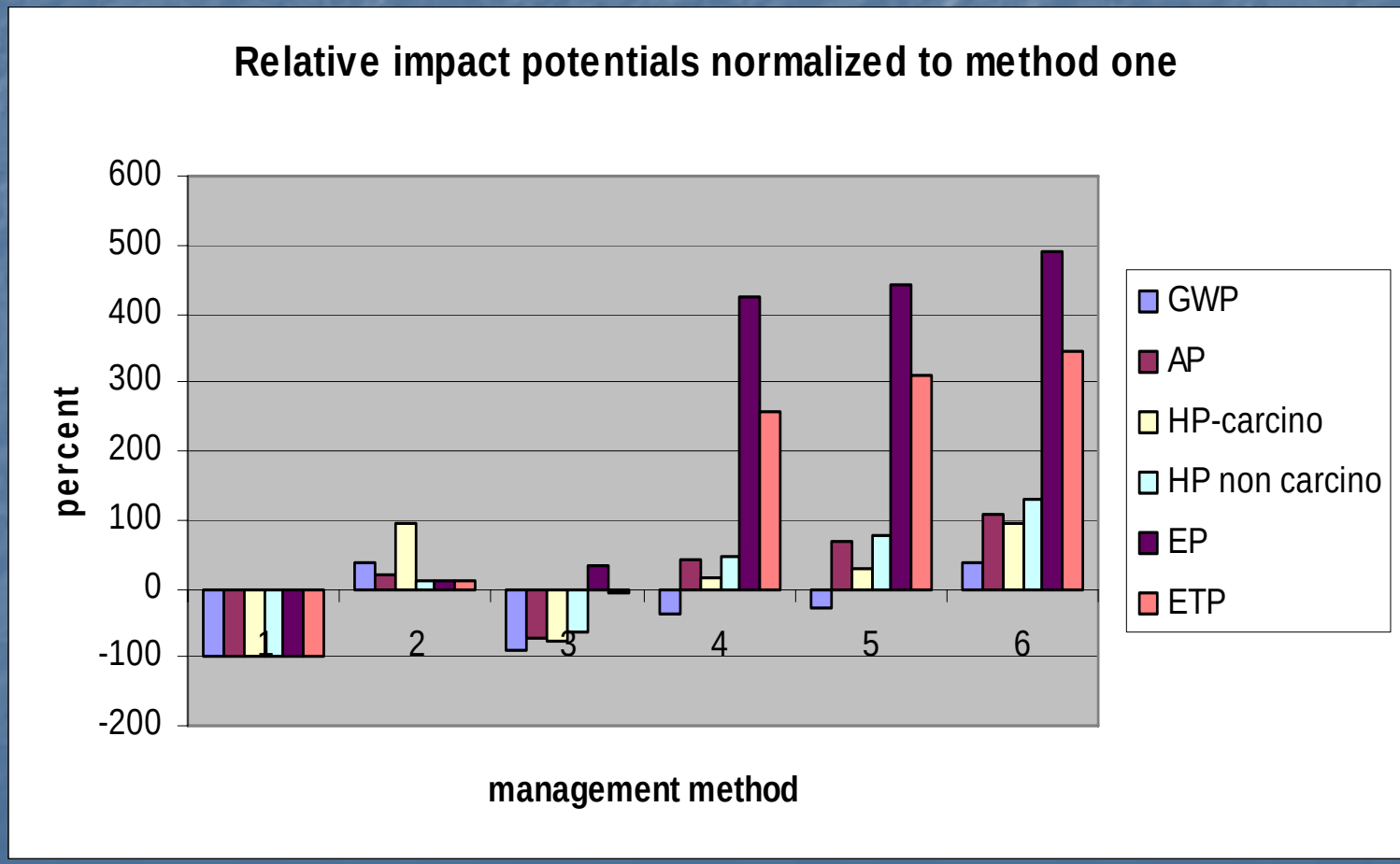
- Ozone depletion, CFC 11
- Global warming, kg CO2
- Acidification, H+ mole
- Eutrophication, nitrogen
- Photochemical smog, NOx
- Human health cancer, benzene
- Human health noncancer, toluene
- Human health criteria (air), PM 2.5
- Ecotoxicity, 2,4-D
- Fossil fuel use, surplus MJ
- Water use, liters
- Total mineral extraction, MJ surplus
- Total energy requirements, MJ
- Total VOC releases, kg

Selected results- pure methods

per 1000 gal latex paint managed

	Method					
	1	2	3	4	5	6
GWP	-5513	1960	-5080	-2078	-1696	2084
AP	-1946	400	-1400	853	1313	2100
HP-carcin	-3.42	3.22	-2.61	0.51	0.93	3.26
HP non carcin	-49000	5440	-31600	21716	36872	63117
EP	-0.38	0.04	0.12	1.62	1.68	1.87
ETP	-502	59	-23	1299	1547	1732
Smog	-4	444	7	40	40	257

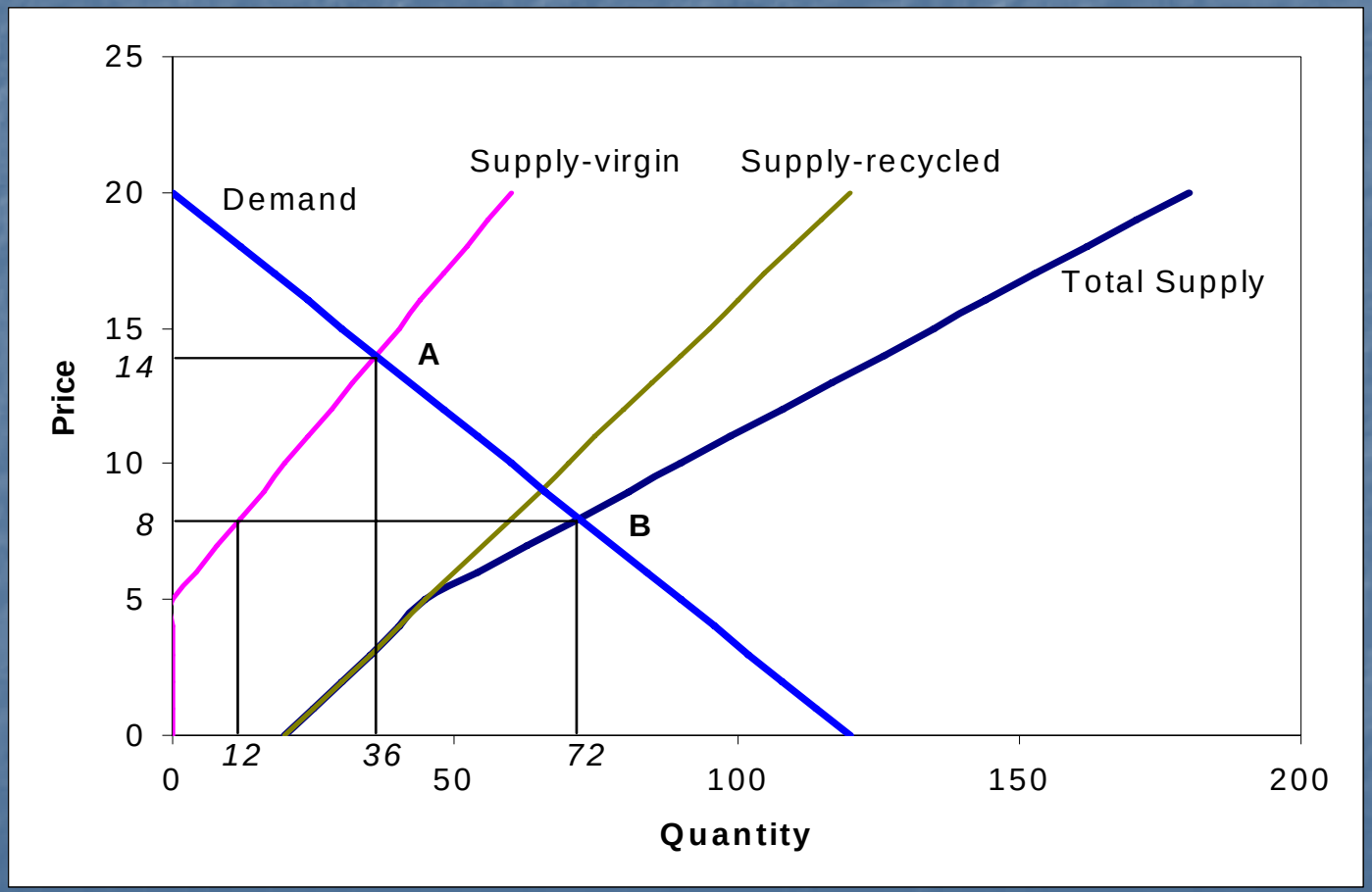
LCA impact potential results



CBA

- Developed to be consistent with LCA assumptions
  - Each household in the United States generates 0.33 gallons per year of leftover latex paint
  - Sixty percent of the total leftover paint generated is latex
- Includes costs outside LCA (eg, value of consumers time, value of storage space, outreach/education, etc)

Supply/Demand



conclusions

- Plan to create a tool that incorporates the pure methods to provide realistic scenarios
  - Not all collected paint will be recyclable
  - Methods may not be available in some locales
  - Regions could use the tool to find most effective combination of methods

- Follow the initiative at http://www.productstewardship.us