

Incorporating Costs in LCA

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Why?

- \$ = metric of business decision makers

How?

- Environmental accounting



Environmental Accounting

is the

- Identification
- Compilation
- Analysis
- Use
- Reporting of environmental information



Environmental Accounting Includes



Materials Accounting

e.g.,

- ❖ toxic materials use
- ❖ wastewater generation rates
- ❖ natural resource use

Cost Accounting

e.g.,

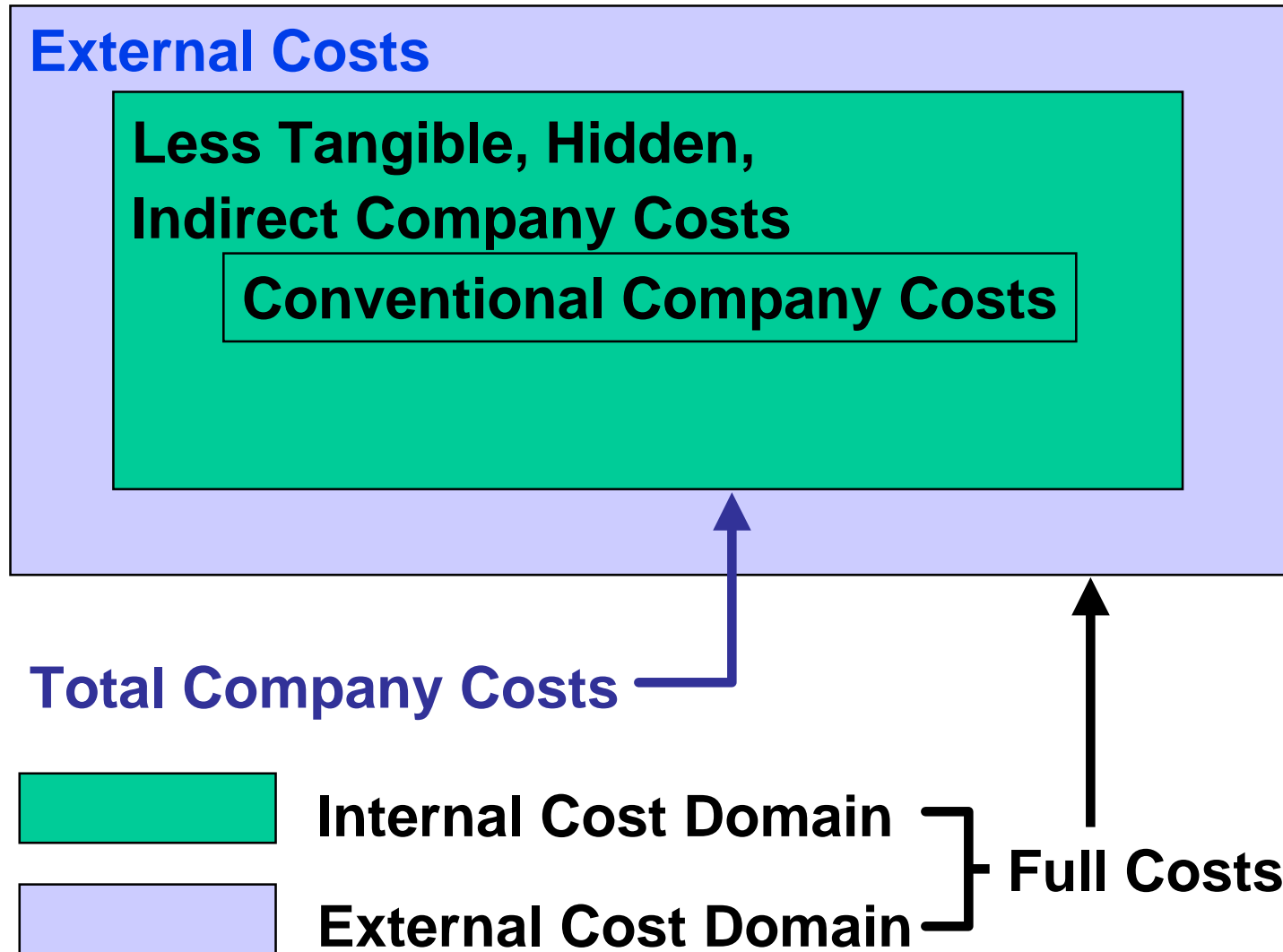
- ❖ hazardous waste disposal costs
- ❖ regulatory compliance costs
- ❖ site clean-up costs

LCA-- A Materials Accounting Application

LCAs analyze the environmental impacts of a product through its life cycle including:

- ◆ raw material extraction
- ◆ manufacturing and fabrication
- ◆ distribution
- ◆ use/reuse and disposal

Cost Boundaries



Conventional Company Costs

- Equipment
(Planning, Equipment, Installation)
- Direct Materials
(Raw Materials, Catalysts, Solvents)
- Utilities
(Electricity, Fuel, Water, Steam, Sewerage)
- Direct Labor
(Operating, Supervision, Clerical)
- Waste Management
(Treatment, Hauling, Disposal)

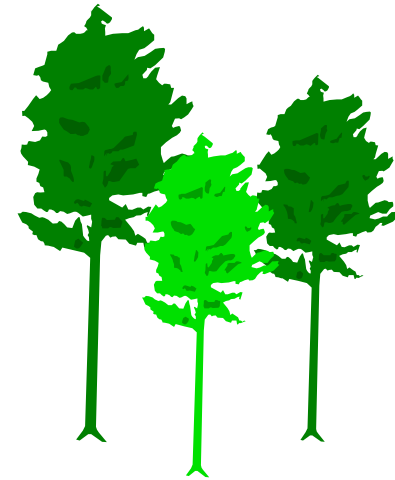


Less Tangible Costs

- Liability (Superfund, Personal Injury, Property Damage)
- Future Regulatory Compliance Costs (e.g., CAA Amendments, CO₂)
- Value Of Marketable Emission Credits (e.g., SO_x, NO_x)
- Green Product Sales (e.g., Chlorine-Free Paper)
- Employee Safety And Health Compensation
- Production Capacity Due To Emission Limits
- Corporate Image/Market Share

External Costs

- Natural Resource Depletion
- Human Health Impacts
- Buildings/Infrastructure Impacts
- Crop Impacts
- Wetlands
- Biodiversity
- Climate Change



Example -- PWB Firm

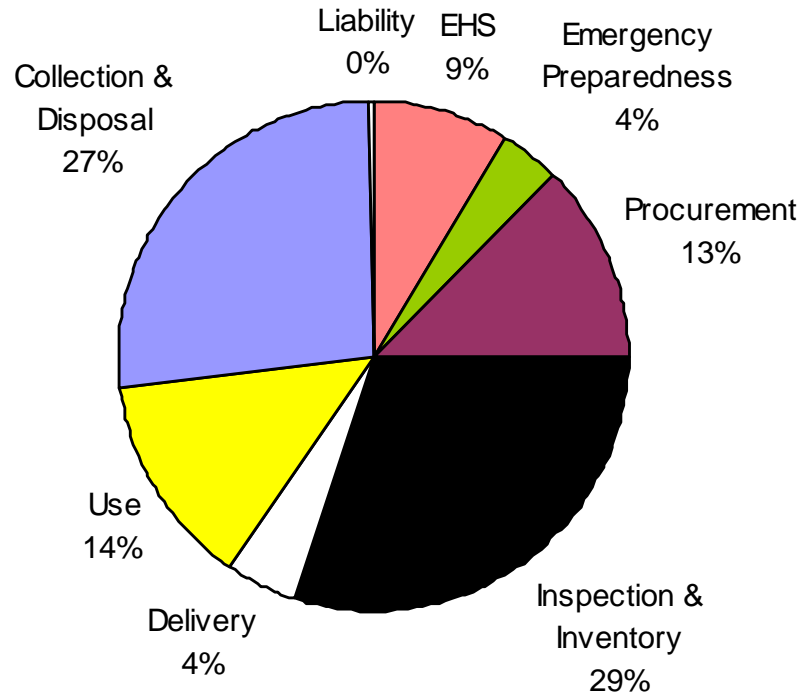
- New technology would:
 - ❖ eliminate chemicals (39,500 lbs/year)
 - ❖ reduce water use (2,129,000 gal/year)
 - ❖ cost \$843K
 - ❖ payback period = 2.3 years

BUT ...

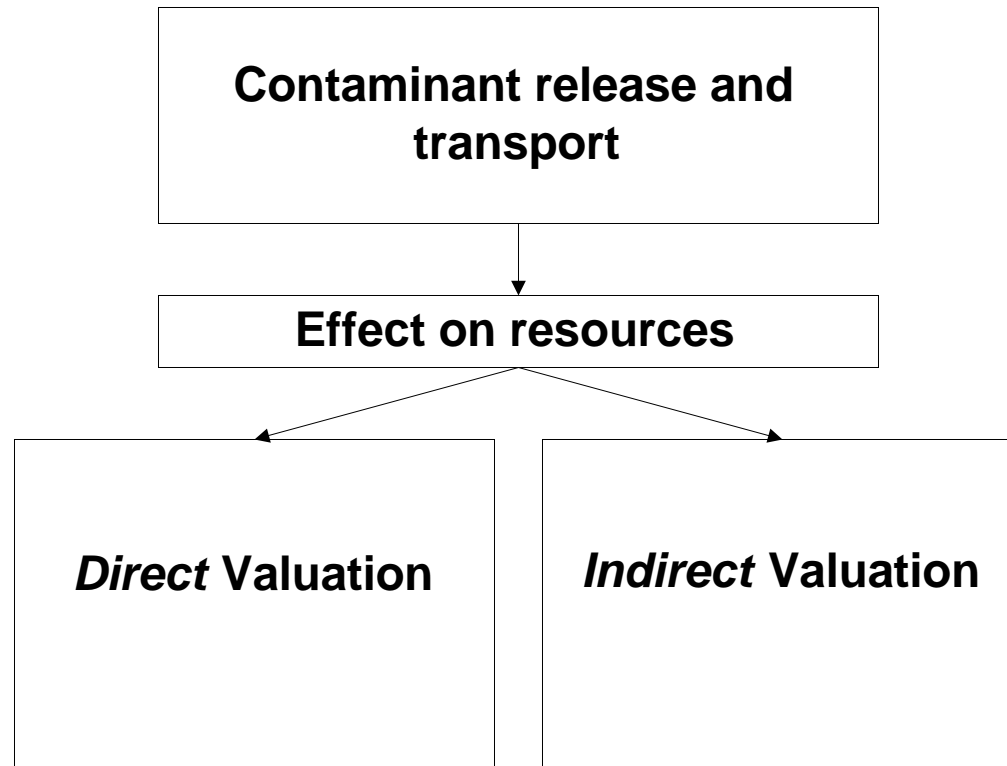
Costs/savings Omitted

- Reduced labor costs
 - Regulatory costs eliminated
 - Wastewater treatment costs reduced
- ❖ Payback period = 1.8 years

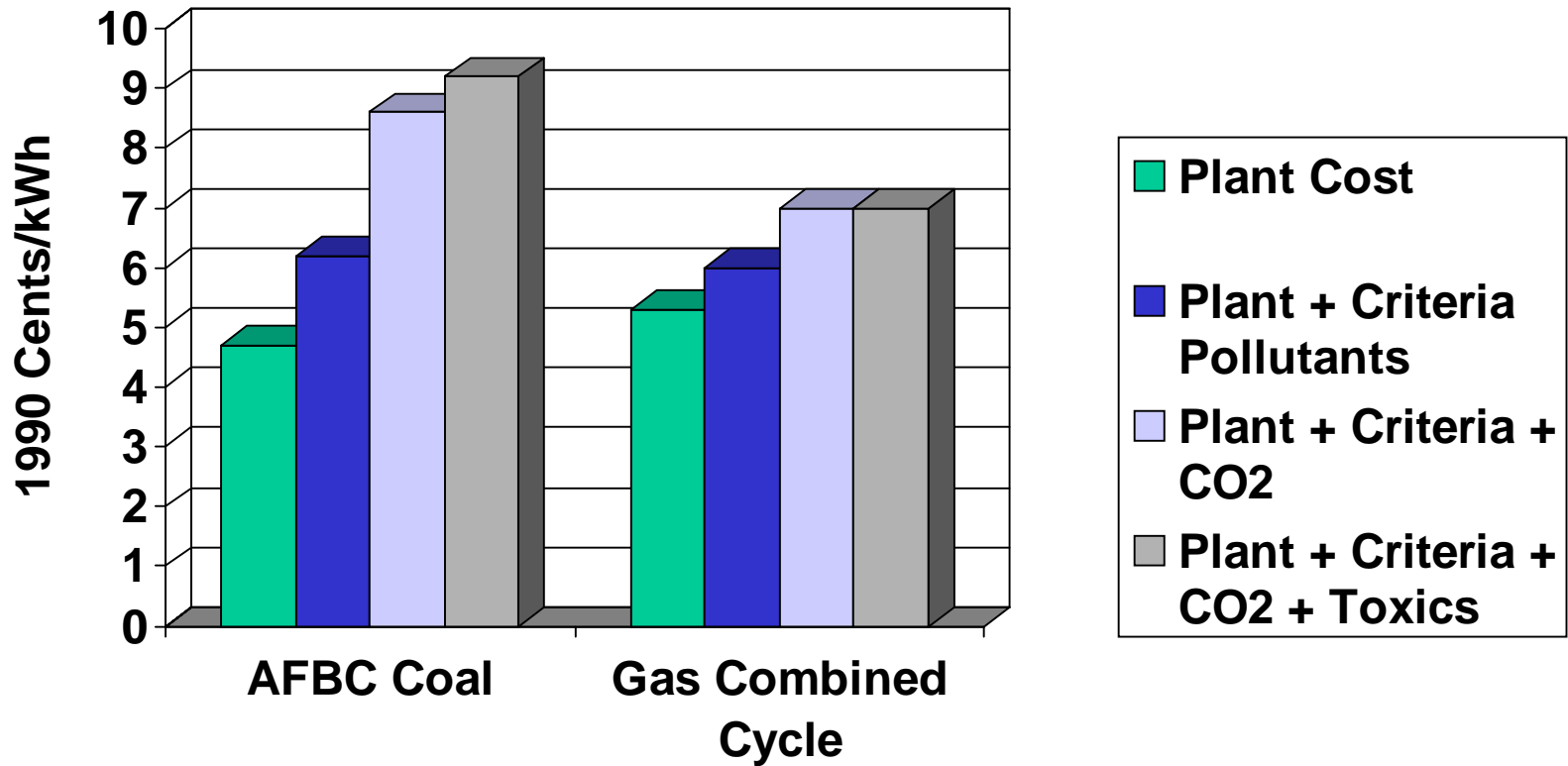
Chemical Management Costs



Damage Function Approach



New Resource Costs



“Companies must shift their attention to include the opportunity costs of pollution -- wasted resources, wasted effort, and diminished product value to the customer.”

“Resource inefficiencies are most obvious . . . in the form of incomplete material utilization and poor process controls which result in unnecessary waste, defects, and stored materials . . . but there are also many other hidden costs buried in the life cycle of the product.”

“Ultimately, this enhanced resource productivity makes companies more competitive, not less.”

Michael Porter and Claes van der Linde
“Green and Competitive: Ending the Stalemate.”
Harvard Business Review, Sept./Oct., 1995

Summary

- ◆ Environmental accounting includes material and cost accounting
- ◆ LCA, as a material accounting tool, can identify opportunities for reducing material inputs and waste
- ◆ ECA, as a cost accounting tool, helps prioritize those opportunities