Unit 4: Life Cycle Assessment

Session 2:
An Overview of Life Cycle Assessment

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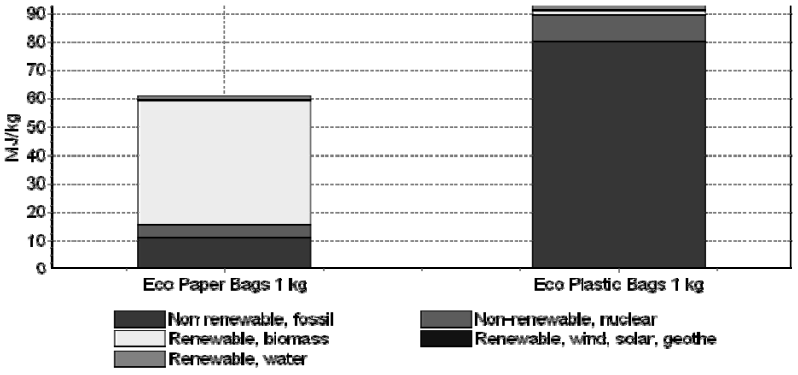
How would you make a engineering decision based on indirect costs?

Example:

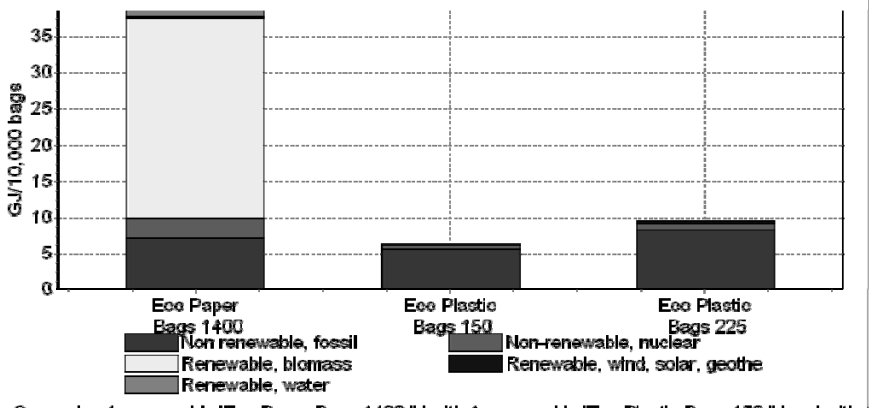
Comparing Grocery Sacks

Comparing Paper and Plastic:
Comparing Unit Production Energy



What about product design?

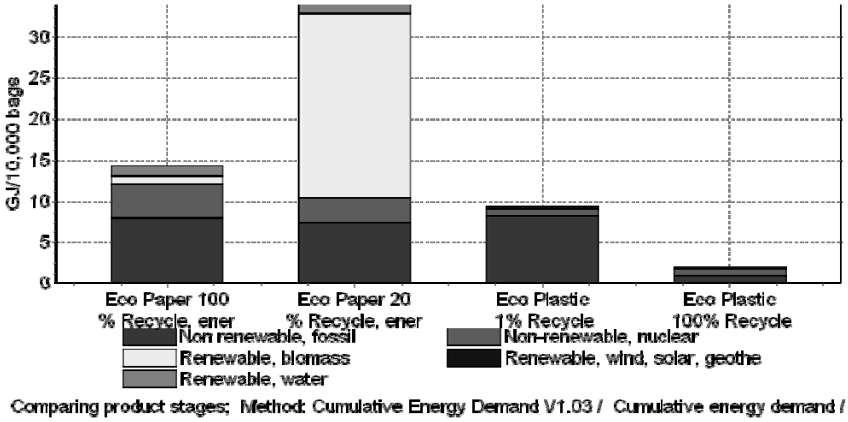
Comparing Paper and Plastic:
Production Energy of a Single Bag



Comparing 1 p assembly 'Eco Paper Bags 1400 lb' with 1 p assembly 'Eco Plastic Bags 150 lb' and with

What happens to the bag after production?

Comparing Paper and Plastic:
Comparing Unit Production Energy with Recovery

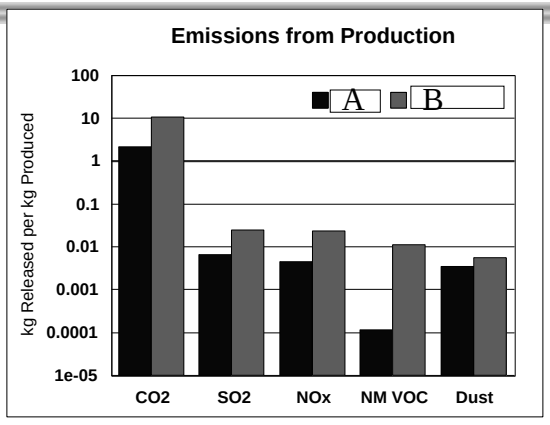


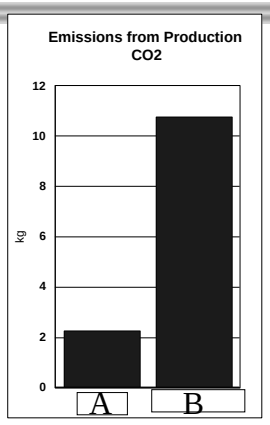
Materials Substitution:
Making Better Materials Choices

Which Material would you Choose?

Material A		Material B	
CO2	2 kg / kg	CO2	11 kg / kg
SO2	0.008	SO2	0.4
NOx	0.007	NOx	0.3

Which would you choose?





Why does B advertise itself as Environmental?

What is Life-cycle Assessment?

- **SETAC Definition:**

  "The life cycle assessment is an objective process to evaluate the environmental burdens associated with a product, process, or activity by identifying and quantifying energy and materials usage and environmental releases, to assess the impact of those… and to evaluate and implement opportunities to effect environmental improvements…"

LCA: Methodology

- **Goal & Scope Definition**
  - **What is the unit of analysis?**
  - **What materials, processes, or products are to be considered?**
- **Inventory Analysis**
  - **Identify & quantify**
    - Energy inflows
    - Material inflows
    - Releases
- **Impact Analysis**
  - **Relating inventory to impact on world**