

Homework 3

1. Economic drivers are an important reason why companies may implement EcoDesign, DfE, or Extended Produce Responsibility. Let's say your company makes a power supply that it sells to customers that incorporate your product into theirs. You sell 5,000,000 of these per year at an average price of \$10 each.

You evaluate your product and determine that you are currently using 1.5 pounds of virgin aluminum for every unit you produce. You determine that with a little re-engineering, you can "lightweight" the product, using only 1.25 lbs per unit. This will improve you fuel mileage in your shipping fleet by 10%. On average, you can ship 500 units per truck, and the average truck transportation distance is 1,000 miles. Your trucks get 10 miles per gallon. Every gallon of fuel you use generates 13 pounds of carbon dioxide.

In addition, you determine you can switch to recycled aluminum.

- a) What will the dollar impact be on the total environmental costs of your aluminum use from these changes? Refer to the table in slide 4 of the EcoDesign class notes for the total environmental cost of materials. (1 pt)

- b) How many tons of CO₂ emissions will this lightweighting effort reduce? (1 pt)

2. Below are the pictures of some everyday products. Look at how they are designed, and for each one of these, indicate at least: 2 design elements that could be improved re. the environmental impact of these products and what strategies/changes you would make to minimize such impacts. (3 pts, 1 pt ea.)

A) Traditional vacuum cleaner:



B) Conventional cosmetics & Toiletries:



C) iPod:



| | What could be improved? | How (possible strategies/changes)? |
|------------------------|-------------------------|------------------------------------|
| Vacuum cleaner | | |
| Cosmetics & toiletries | | |
| iPod | | |