

Agenda

- Course Evaluations
- The Afghan Music Project
- Sustainable Design
- Product Development @ Apple

Sustainable Design

Scary Facts

- American industry generates more than 800 million tons of solid waste every year [EPA]
- 50% of the world's original forest cover has been depleted [WorldwatchInstitute]
- The wealthiest 16% of the world's population consumes 80% of the world's natural resources [CNN]
- With the current population of 6.5 billion, at the current world growth rate of 1.4%/year, the population will reach 1.49×10^{14} in 722 years, which is equal to the number of square meters of land area on the earth.

Sustainable Design

Sustainable design is the art of designing physical objects to comply with the principles of economic, social, and ecological sustainability. It ranges from the microcosm of designing small objects for everyday use, through to the macrocosm of designing buildings, cities, and the earth's physical surface.

Meeting the needs of the present generation without compromising the ability of future generations to meet their needs.

Waste, Emissions and Pollutants

- Air
 - NOx -> Acid Rain
 - COx -> Global Warming
- Water
 - Herbicides/Pesticides
 - Metals (Mercury, Lead)
- Land
 - Soil erosion



**Waste is a HUGE problem,
but it is not the ENTIRE story**

THE PROVOCATIVE NATIONAL BESTSELLER

The Ecology of Commerce

A Declaration of Sustainability



Paul Hawken

AUTHOR OF *GROWING A BUSINESS* AND *THE NEXT ECONOMY*

"A daring, urgent vision of a kind of 21st century Canaan that Hawken yet believes we can reach." —*San Francisco Chronicle*

Remaking the Way We Make Things

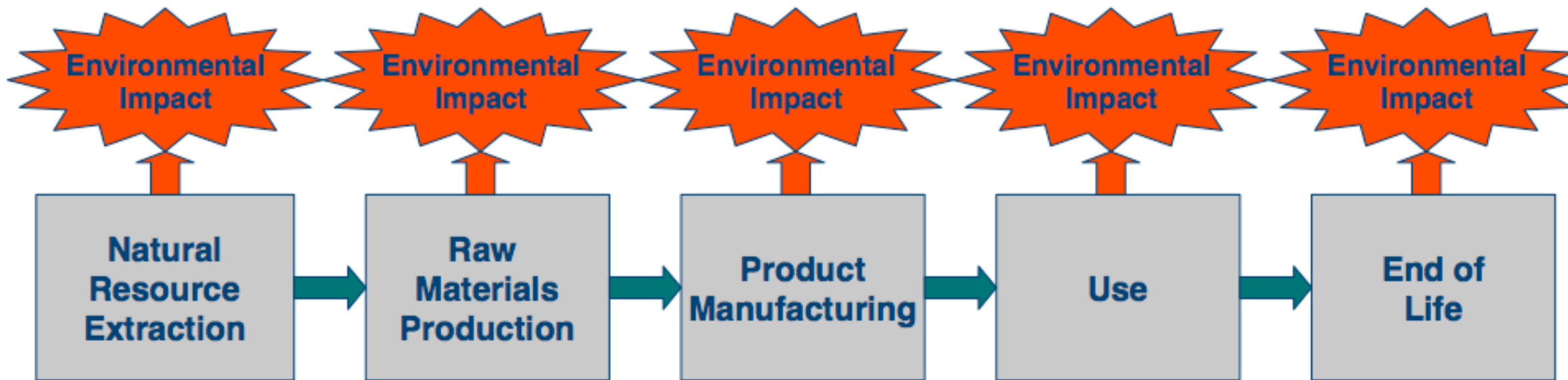
concept that goes hand in hand with the notion of a technical nutrient: the concept of a **product of service**. "Products," products contain a **technical nutrient**—nutrients—cars, televisions, carpeting, computers, and refrigerators) would effectively go back into the technical nutrient into for a **defined user period**—say, ten thousand hours of its current life, and then they fit it with the product or are simply early to upgrade to a newer version, the manufacturer, and universal complex materials as food for new products. The consumers would receive the services they need, television and development retain ownership of the materials themselves. In order for such a scenario of **service** be **upcycled** rather than recycled—to retain high quality in a closed-loop, instead of by "consumers," plastic computer case, for example, will continually circulate as a sturdy plastic computer these products television high-quality product, like a car part or a medical device—instead of being downcycled a product's if backriars and flowerpots. A **technical nutrient** is a material nutrient that is designed to go its would recycle but would own ownership industrial metabolism from which it came. This scenario to be practical, however, using that able, products and the technical nutrients of them, but for products contain nutrients to be. In this scenario, consumers would pay for the services they need, instead of the products themselves. They would be paying for complex materials used—to retain high quality in a closed-loop's. When they finish using its complex materials as food for new products, the consumers would receive the services they need for as the materials themselves, to be used with a new product. This scenario is a concept that

Garage

William McDonough & Michael Braungart

**Sustainability is a LIFE CYCLE issue,
not just a WASTE issue**

The Product Life Cycle



Inputs

Materials

Energy

Life
Cycle
Stage

Outputs

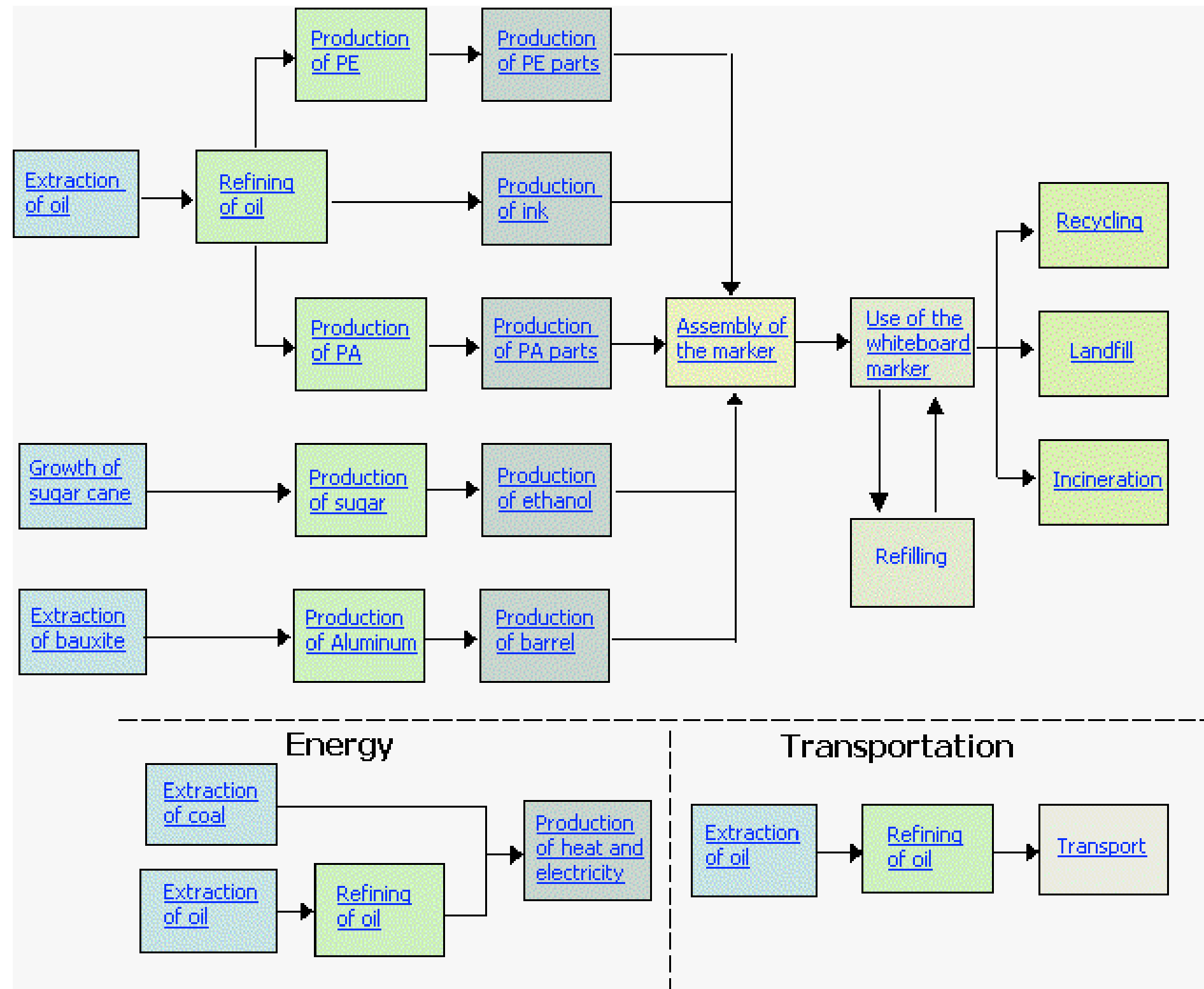
Materials/Products

Solid Waste

Airborne Emissions

Waterborne Emissions

Life Cycle Diagram of a Whiteboard Marker



**Who makes the inputs into your product? How
do they do it?**

Ceramic vs Plastic Cups



Ceramic Mugs vs Plastic Cups

- Energy Use: Using glasses in place of disposable PET plastic cups reduced energy use by 98 percent based on 1 million beverages served in glasses, including environmental impacts of manufacturing, using and washing glasses.
- Water Pollution and Usage: Both ceramic and glass reduced water pollution by 99 percent.
- Solid Waste: Ceramic reusables reduced solid waste by 86 percent.
- http://www.environmentaldefense.org/documents/523_starbucks.pdf

Economic Footprint Analysis

- Ecological footprint analysis approximates the amount of ecologically productive land and sea area it takes to sustain a population, manufacture a product, or undertake certain activities, by accounting the use of energy, food, water, building material and other consumables.
- <http://www.carbonfootprint.com/calculator.html>
- According to calculations of the ecological footprint, the ecological pressure of a US resident is 13 times that of a resident of India and 52 times that of a Somalian resident.

The Re-Designers



"Respect for all materials"



Triple Bottom Line

- The triple bottom line captures an expanded spectrum of values and criteria for measuring organizational (and societal) success - economic, environmental and social. For some a commitment to Corporate Social Responsibility brings with it a need to institute triple bottom line reporting.
- While all businesses have a conventional bottom line to measure their fiscal performance—financial profit or loss—enterprises which seek a second bottom line look to measure their performance in terms of positive social impact.

Current Initiatives: Agenda 21

- Agenda 21 is a programme of the United Nations (UN) related to sustainable development. It is a comprehensive blueprint of action to be taken globally, nationally and locally by organisations of the UN, governments, and major groups in every area in which humans impact on the environment. The number 21 refers to the 21st century.

Paper or Plastic?

