Product System Life Cycle

Designers need to understand that environmental impacts can occur throughout the life cycle of a product.

By including all of the stages in the assessment of a product, designers ensure a comprehensive and accurate assessment of the product’s potential impacts.
Phases in a product’s life cycle

**Raw material extraction**  
Wood from forest, oil from well, metal ore from mine, etc.

**Material processing**  
Wood to paper, oil to plastic, ores to metal alloys, etc.

**Component manufacturing**  
Paper printed, plastic molded, alloys into circuitry, etc.

**Assembly & packaging**  
Product is assembled and packaged with documentation.

**Distribution & purchase**  
Product is distributed and purchased.

**Installation & use**  
Energy and additional materials may be used.

**Maintenance & upgrading**  
Product cleaned, parts replaced or upgraded.

**Transport** (among all phases)  
Via train, truck, car, automobile, sea vessel or airplane.

**Reuse, recycling or composting**  
Product or component reuse or material recycling.

**Incineration or landfilling**  
Product or components are burned or buried in landfill.
Phases in a product’s life cycle

Every phase in the lifecycle can require energy and additional material inputs, as well as give emissions to air, water or soil.

Additionally, the components or the product may be transported between phases or within each phase.
Example:

What are the phases in the life cycle of a glass cup?
Material Extraction

Mining sand and lime from the Earth.
Cleaning raw materials and processing them into glass.
Component Manufacturing

The material is formed into a drinking glass.
Assembly and Packaging
Boxing the drinking glass.
Distribution and Purchase

Distributing and purchasing the glass.
Installation and use
People drink from the glass.
Maintenance and upgrade

Washing and reusing the glass many times.
End-of-Life
Returning the glass for material recycling.
Discussion:

What are the phases in the life cycle of a French fry?
What are the phases in the life cycle of an ink cartridge?

Assume that the cartridge is made from plastic, tin circuitry and ink.
Discussion:

Why should we or should we not model all of the phases in the life cycle of a product?
Okala Practitioner
Integrating Ecological Design

This presentation is part of an educational presentation series that supports teaching from the Okala Practitioner guide.

Okala Practitioner and these presentations were created by the Okala Team to disseminate fact-based knowledge about ecological design to the design disciplines and business.

Unless provided in the presentations, Information sources are found in the Okala Practitioner guide.

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Okala Practitioner is available through amazon.com.

More information and the free Okala Ecodesign Strategy App are found at Okala.net.

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