



Life Cycle Assessment

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For government purchasers

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Responsible Purchasing Attributes

- Air quality
- Climate change
- Energy efficiency
- Natural resource consumption
- Packaging efficiency
- Product longevity
- Product miles
- Product take-back
- Recyclable
- Recycled content
- Renewable resources
- Sustainable labor practices
- Toxic chemical reduction
- Water efficiency

Benefits of Using Life Cycle Assessment

- Reduces public exposure to toxins in the environment.
- Reduces greenhouse gas emissions over the life cycle of the product.
- Reduces solid waste.

Life cycle assessment (LCA) prevents shifting environmental costs from the user to other points in the product life cycle. It enables product designers to reduce waste up front and save money throughout the life cycle of the product.

LCA is a way to assess the environmental aspects and potential impacts and costs associated with a product, process, or service. Institutional purchasers can use the results to assess products from inception to the end-of-life. This is sometimes called “cradle to grave.”

LCA starts with the product’s design. This includes extracting and transporting the raw material, and manufacturing, packaging, and transporting the product. It ends where the product is returned to the earth. Most LCAs review the toxins, energy use, greenhouse gas emissions, and amount of solid waste generated over the entire life of the product or service. Looking at the entire cycle avoids shifting problems from one place in the cycle to another.

LCAs allow purchasers to compare life cycles of like products to determine which have the lowest human and environment health impacts. Purchasers can use LCAs to assess design options for the same product, such as steel versus composites in cars.

LCA Software

Academic research institutions usually develop LCAs. It generally takes two to three years to develop a LCA for a product. Data collected from these studies is entered into software programs that are available to institutional purchasers.

The software allows the user to compare the data for similar products from different manufacturers. Purchasers can use the results of LCAs when writing bid specifications.

LCA software is often challenging to use because different manufacturers often use different commodity codes. The [North American Product Classification System](#) is developing a comprehensive set of codes for Canada, the U.S., and Mexico, but it is not yet complete nor used by all of industry.

[The U.S. Environmental Protection Agency](#) provides many LCA resources on their web site. The International Standards Organization's [Environmental Management Standard ISO 14040](#) has an International Standard on Life Cycle Assessment.

LCA tools have not been evaluated for social equity until recently. Developers will likely add more socio-economic factors as they refine the tools over the next few years. Meanwhile, purchasers should use independent third-party standards that assess products, processes, and services over their environmental life cycles.

Life Cycle Costs

[RCW 43.19.1911](#) requires purchasers to look at the **life cycle cost** of a product when considering bids for purchase, manufacture, or lease, or in determining lowest responsible bidder. The goal is to find the lowest **total** cost to the state for a product or service that complies with all other specifications.

The life cycle cost of a product or service refers to the sum of all recurring and one-time (non-recurring) costs over the full life span, or a specified period, of a good, service, structure, or system. It includes purchase price, installation cost, operating costs, and maintenance and upgrade costs. It also considers the remaining residual or salvage value at the end of a product’s ownership or useful life. The life cycle cost is determined from a **life cycle assessment**.

Environmentally Preferable Purchasing

The Department of Ecology offers tools and resources to make environmentally preferable purchasing easier.

Find out about environmentally preferable products, standards and certifications, law and directives, and more at our website:

www.ecy.wa.gov/beyondwaste/epp.html

Contact:

Karin Kraft
kakr461@ecy.wa.gov

Resources

[American Center for Life Cycle Assessment](#)

[McDonough Braungart C2C Product Design](#)

[National Institute of Standards and Technology BEES](#)

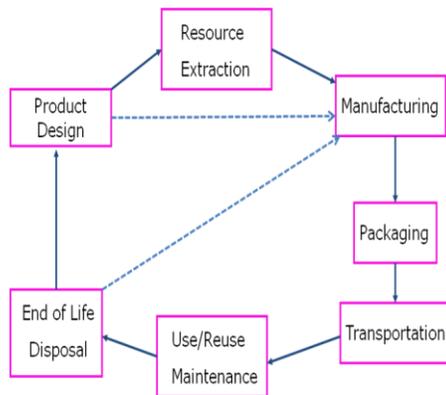
[Pharos Wiki](#)

[United Nations Environment Programme \(UNEP\) Life Cycle Approaches: The road from analysis to practice](#)

[U.S. Environmental Protection Agency](#)

LCA and Product Design

The design phase of the product’s life cycle is the most important. It is in the design phase that most reductions can be made in toxins and greenhouse gas emissions. In addition, products can be designed for easy disassembly and recycling to reduce waste at the end of life.



Economic Benefits to Human and Environmental Health

Purchasers can demonstrate numerous economic benefits using LCA. Low initial purchase prices can result in higher costs over the long term. Using LCA, purchasers can determine more accurate cost avoidances, which can result in significant long-term savings. Benefits include reducing:

- energy and water use
- greenhouse gas emissions and associated costs
- landfill costs
- hazardous chemical training, handling, regulation, and waste disposal costs
- health care costs and absenteeism

In Summary

Life cycle assessment and life cycle costing are useful in evaluating the true costs of products to an organization. While the LCA tools may currently be somewhat difficult to use, estimates over a product’s life cycle help purchasers make the best choices. Products manufactured within the state tend to preserve state jobs, decrease transportation miles, and decrease greenhouse gas emissions.

Laws and Directives

<p>RCW 43.19.1911 Life Cycle Costing</p>	<p>(9) In determining "lowest responsible bidder", in addition to price, the following elements shall be given consideration: That in considering bids for purchase, manufacture, or lease, and in determining the "lowest responsible bidder," whenever there is reason to believe that applying the "life cycle costing" technique to bid evaluation would result in lowest total cost to the state, first consideration shall be given by state purchasing activities to the bid with the lowest life cycle cost which complies with specifications.</p>
<p>Executive Order 02-03: Sustainable Practices by State Agencies</p>	<p>Directs state agencies to modify their buying practices with goals to minimize energy use, shift to non-toxic materials, and expand markets for environmentally preferable products.</p>
<p>Executive Order 04-01: Reducing PBTs</p>	<p>Directs the state phase out of the purchase of goods with persistent bioaccumulative toxic (PBT) materials.</p>

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