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Life Cycle Assessment (LCA) Teaching Guide

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Value of LCA:

- Facilitates wise choices for product designers, manufacturers and purchasers
- Helps further sustainable material use through scientific rigor
- Supports selection of materials using holistic comparison process
- Advances sustainable product design & improvement
- Establishes priorities for investments in product improvement & technology

1. **LCA Defined:** Holistic process evaluating in detail a product's environmental attributes and impacts over all product stages: resource extraction to end of life / reuse.

2. Critical LCA Elements are:

- Product Criteria Rules - set rules of what inputs are to be captured for each category type - the roadmap for a product LCA, including statement of assumptions and uncertainties. An example is what is the expected life of a product and how is this conclusion reached?
- Life Cycle Inventory (LCI) - inventory of data on all exchanges a product has with the environment over its entire life cycle- the nuts and bolts of an LCA. LCI is collected data bases by a limited number of Specialty LCI Firms and used by LCA professionals.
- Life Cycle Impact Assessment – The results of converting mass weight data into environmental impacts of a given product used to assess its environmental performance. Data are consistent across all materials due to an agreed upon unit measure of weight.

3. Product Criteria Rules to use in the LCA Evaluation of any Product:

- Define functional unit(s) such as pounds per square foot.
- Choose and describe system boundaries. E.g., establish weighted average energy usage for selected raw materials such as steel from multiple North American suppliers.
- Choose cut-off criteria. E.g., for evaluating raw formed steel, weighted average energy usage would not include de minimis energy for weld points.