

STREAMLINED LIFE CYCLE ASSESSMENT

Streamlined L.C.A

- A streamlined LCA is what you would imagine a slimmed down version of a full LCA
- There are many reasons to conduct the streamlined as opposed to a full LCA
- In an ideal world a full LCA would always be conducted
- Experts conclude that 80% of the environmental cost of a product are determined at design and modifications there after have little effect. Therefore the ideal time to conduct an LCA is at the design phase. At this point the characteristics of the product are subject to change and as a result a full LCA is not possible this is where a streamlined LCA comes in.

Streamlined L.C.A

- Techniques that purposely adopt any sort of simplifying approach to life cycle assessments are termed streamlined life cycle assessments
- It is estimated that SLCAS can reveal up to 80% of the main environmental issues in a fraction of the time of a full LCA
- It is important the SLCA has not streamlined away any core information that would be included in a full LCA
industry experts have listed eight possible approaches

Streamlined L.C.A

- Screen for non acceptable elements - e.g. if lead or asbestos present do not proceed
- Limit or eliminate life cycle stages – e.g. only look at the processes within the factory, if upstream activity is counted then the SCLA will be more comprehensive
- Include only selected environmental impacts
- Include only selected inventory linked to above
- Consider only constituents above preset limits
- Limit or eliminate impact analysis
- Use surrogate data
- Use qualitative instead of quantitative data

Streamlined L.C.A

- There are a variety of methods for streamlining the Life Cycle Assessment process. One method for streamlined life cycle assessment, described by pioneers in the field Graedel and Allenby in the book “Industrial Ecology”, consolidates life cycle stages into 5 simple categories and environmental impacts into 5 simple categories.
- This creates a matrix of life cycle impacts and life cycle stages.
- Scores are assigned from 0 to 4 to each part of the matrix to rate how relevant they are (0 being poor and 4 excellent)
- An example of a typical 5 by 5 matrix is on the next slide.
- The example below it, is from a pre-manufacture stage of the life cycle in the material choice impact category (one element)

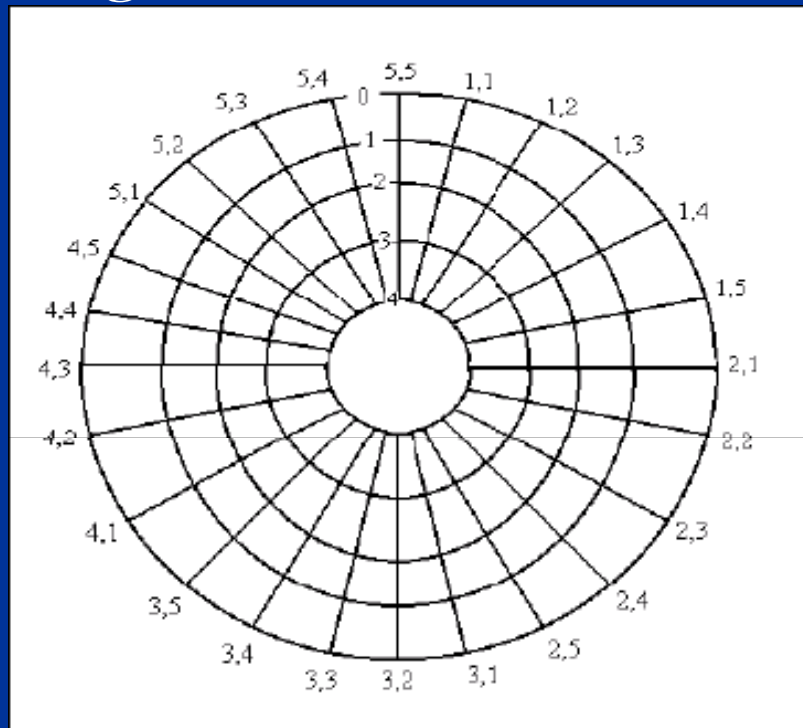
Streamlined L.C.A

Inventory Category/Life Stage	Premanufacture	Product manufacture	Product delivery	Product use	Refurbishment, recycling, disposal
Materials choice					
Energy use					
Solid residues					
Liquid residues					
Gaseous residues					

Score	Condition
0	<p>For the case where supplier components/subsystems are used: No/little information is known about the chemical content in supplied products and components</p> <p>For the case where materials are acquired from suppliers: A scarce material is used where a reasonable alternative is available. (Scarce materials are defined as antimony, beryllium, boron, cobalt, chromium, gold, mercury, platinum, iridium, osmium, palladium, rhodium, rubidium, silver, thorium, and uranium.)</p>
4	No virgin material is used in incoming components or materials.
1, 2, or 3	<p>Is the product designed to minimize the use of scarce materials (as defined above)?</p> <p>Is the product designed to utilize recycled materials or components wherever</p>

Streamlined L.C.A

- Because the scores are somewhat subjective they are often only used to identify areas that deserve attention. A target diagram is used, high (good) scores are plotted near the target, while low scores are shown as off-target.



Streamlined L.C.A

- Advantages / Disadvantages
- Simple and cost effective
- Preserves focus on entire life cycle and all impact categories
- Possible to identify areas of concern
- The primary advantage of a streamlined life cycle assessment is its simplicity. The procedure considers the entire life cycle and considers multiple impact categories; the output of the analysis is the identification of critical areas of concern.
- The major disadvantage of the method is that the assignment of scores can be highly subjective, even arbitrary.