



# Exercise 4b.1: Defining basic steps in a lifecycle assessment

Estimated time requirement: 10 minutes

#### Introduction

Lifecycle Assessments (LCAs) is a framework for assessing the environmental impacts of product systems and decisions from raw material acquisition through the end of life. A simplified lifecycle of a product typically starts with the extraction of raw materials, followed by production, distribution, consumption/use and the end of life. Typical environmental impacts analysed as part of LCAs can include (but are not restricted to) greenhouse gas emissions (e.g. measured in CO2-equivalents), water requirements (e.g. in m³), land use requirements (e.g. in km²) and energy requirements (e.g. in kWh).

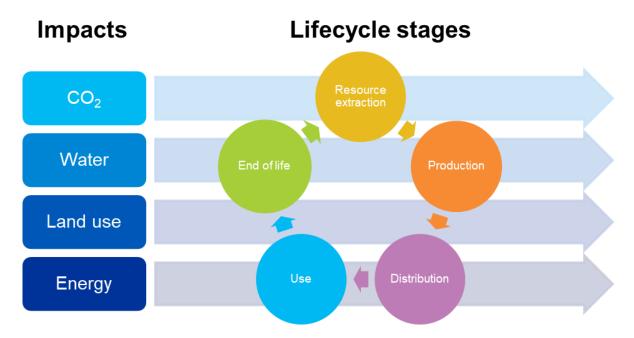


Figure 1: Conceptual framework of a simplified LCA

According to the standard "ISO14044:2006 Environmental management — Lifecycle assessment — Requirements and guidelines", LCAs are conducted in four steps. In step 1, the goal and scope of the LCA are define. In step 2, a lifecycle inventory analysis is conducted. Step 3 comprises the actual lifecycle assessment, followed by interpretation (step 4). Details steps are displayed in the figure below.



#### CE and RE in the Indian Context - Exercise Sheet



### Step 1: Goal definition and scoping

- Clarify purpose and context of assessment
- Define, describe product, process or activity including functional unit
- Identify boundaries and impact categories to be assessed



### Step 2: Lifecycle inventory analysis

- · Identify and quantify system flows
- Examples: energy, water and materials usage and emissions



# Step 4: Interpretation

- Evaluate results of inventory analysis and impact assessment through sensitivity analysis, consistency checks
- Understand uncertainties and assumptions
- Select preferred products, processes and services



## Step 3: Lifecycle impact assessment

- Assess impacts of flows on humans and environment
- Examples: Global warming potential: 1 kg CO<sub>2</sub>
  = 1 kg CO<sub>2</sub>-equivalent whereas 1kg CH<sub>4</sub> = 25 kg CO<sub>2</sub>-equivalent



Figure 2: Steps and activities in a simplfied LCA

#### Task

Please form groups of 2-3 people and examine the template on the next page. Using the example of a comparative LCA for two mobile phones of your choice, please define the activities in steps 1-4 by referring back to the terminology presented earlier (e.g. functional unit, impact categories). Think of fictional examples in each step and capture your thoughts by using the templates displayed in figure 3 below. Note that quantities (e.g. CO2-equivalents) can be entirely fictional and will be discussed with the entire course upon completion. Finally, discuss where you expect the largest impacts to occur.



#### CE and RE in the Indian Context – Exercise Sheet



Step 1: Goal definition and scoping		Step 4: Interpretation
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Step 2: Lifecycle inventory analysis		
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Step 3: Lifecycle impact assessment		

Figure 3: Exercise template