E.R.A. LCA Solution

Developed by SIPL

USER MANUAL FOR LCA TEMPLATE

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ABOUT SIPL PVT LTD.

SIPL Pvt Ltd is an established and reputed firm in the sustainability domain. We provide consultancy services to policy and decision-makers of the Indian government and corporate industries across all verticals. We offer access to the world's best sustainability software, coupled with accurate Indian and global databases, as well as expertise in the field of life cycle assessment and other sustainable services.

SIPL Pvt Ltd has commercial partnerships with PRé Sustainability, a leading sustainability consulting firm based in the Netherlands. Since 1990, PRé Sustainability has been at the forefront of life cycle assessment (LCA) development, pioneering cutting-edge techniques, software, and consulting. Their flagship product, SimaPro, is the most popular LCA program in the world.

Our experience in India includes work in the oil and gas, mining, cement and construction, food processing, fertilizer and chemical industries, pharmaceuticals, energy generation, cable & transformers, plastics and many more. We have very close association with many research organizations, academic institutions, and consulting firms across India & Middle East.

INTRODUCTION

The purpose of this document is to explain to the end-users of the E.R.A. LCA template how to use it. This document provides help to get general information on the data requirements and how to use the template to collect primary data.

DEFINITIONS

- **LCA:** LCA is a systematic technique for assessing how a process, product, or service will affect the environment over each stage of its whole life cycle.
- **Inventory analysis:** The inventory analysis phase of life cycle assessment (LCA) involves gathering and evaluating data to quantify inputs (like energy and raw materials) and outputs (like waste and emissions) related to each step of the manufacturing cycle. It produces the baseline data that is needed in subsequent impact calculations.
- **Baseline data:** The initial set of data collected for a system, process, or product is known as baseline data. It's used as a point of comparison or to track changes in environmental performance over time.
- **System Boundary:** The activities, processes, and life cycle stages that are part of an LCA research are defined by the system boundary. e.g., Cradle to Gate, Cradle to Grave etc.
- **Upstream Data:** In the life cycle, upstream data describes the inputs and actions that occur prior to the core activity that is being analyzed.
- **Core Data:** Core data describes the direct processes or activities within the manufacturing that are central to the product or service being analyzed.
- **Downstream Data:** Downstream data describes the processes and impacts that occur after the core process, typically associated with product distribution, usage, and end-of-life treatment.
- **Impact category:** Environmental effects resulting from life cycle inventory results are grouped into impact categories in life cycle impact assessments (LCIA). Example: Global warming potential (climate change).
- **LCIA Methodology:** Inventory data will be converted into appropriate environmental impacts using the LCIA method. It involves Characterization, Normalization, & Weighting (optional).
- **CML Method:** It's an impact assessment method that was developed by CML (Center of Environmental Science of Leiden University) and includes a set of impact categories and characterization methods for the impact assessment step.
- **Hotspot:** This approach allows you to determine which key operations or raw materials have the greatest impact over the span of the product life cycle.

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India-Centric Data Construction sector

SIPL'S EXPERTISE IN THE CONSTRUCTION SECTOR

- SIPL has various clients in the construction sector from Germany, Saudi Arabia, Dubai, Abu Dhabi, and India. And has executed over 600 LCAs & 545+ EPDs across various industrial verticals, including the construction sector.

SIPL has created process models for

- Mining Data: Extraction of coal, iron ore, aluminium ore, limestone, crude and natural gas.
- Metal Treatment Data: BOF, EAF and Aluminium Smelting
- Petroleum Data: Refining of crude for production of Diesel, Petrol, PVC etc.
- Electricity Data: Production of electricity from coal, hydel, wind, PV cell etc.
- Glass Data: Float Glass, Tinted Glass, Mirror etc.
- Pigments, Binders, Solvents, & Additives etc.

GENERAL INFORMATION

The "**E.R.A**" stands for "**E**conomical, **R**apid, and **A**ccurate." The LCA process is claimed to be costly, time-consuming, and reliant on an extensive amount of precise data. All three of those issues have been tried to be addressed by SIPL's current solution, "E.R.A. LCA".

PROCEDURE

SIPL has process models of all the product groups mentioned above in SimaPro. These models are results of decades of experience in LCA modeling of over 600 products.

1. Complete Purchase Process via E.R.A. LCA Solution Webpage. (link)
2. After completion of the purchase process, a product-specific questionnaire will be sent to the client. The questionnaire requires information about the organization, the manufacturing process, and the product that will be included in the LCA report. The system boundary considered during the study would be **Cradle to Gate**.
3. The information gathered from the filled questionnaire will be entered into the process model for a particular product, and the results will be computed using the CML baseline method.
4. Final Report: Hotspot analysis will also be carried out. In the LCA report, product and organization details are also provided.

Note: SIPL has Indian-centric data for various construction products; for that reason, the organization/client needs to share only manufacturing-related data for the LCA study; this makes the whole LCA procedure very quick with accuracy.

USER SUPPORT

Organizations/clients could contact us via the mail ID given below for both technical & non-technical issues.

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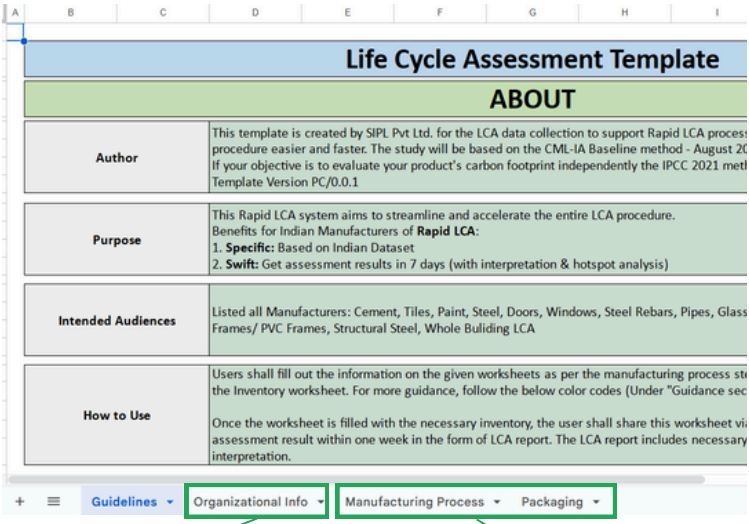
GET STARTED

The designed LCA data collection template or questionnaire is very easy to work with. The client needs to add the production-related info in this questionnaire following all the instructions.



Life Cycle Assessment Template

ABOUT

Author	This template is created by SIPL Pvt Ltd. for the LCA data collection to support Rapid LCA proces procedure easier and faster. The study will be based on the CML-IA Baseline method - August 20 If your objective is to evaluate your product's carbon footprint independently the IPCC 2021 meth Template Version PC/0.0.1
Purpose	This Rapid LCA system aims to streamline and accelerate the entire LCA procedure. Benefits for Indian Manufacturers of **Rapid LCA**: 1. **Specific:** Based on Indian Dataset 2. **Swift:** Get assessment results in 7 days (with interpretation & hotspot analysis)
Intended Audiences	Listed all Manufacturers: Cement, Tiles, Paint, Steel, Doors, Windows, Steel Rebars, Pipes, Glass Frames/ PVC Frames, Structural Steel, Whole Buliding LCA
How to Use	Users shall fill out the information on the given worksheets as per the manufacturing process st the Inventory worksheet. For more guidance, follow the below color codes (Under "Guidance sec Once the worksheet is filled with the necessary inventory, the user shall share this worksheet vi assessment result within one week in the form of LCA report. The LCA report includes necessary interpretation.

Guidelines | Organizational Info | Manufacturing Process | Packaging

Fill out all the necessary details under this section. It asks info about the organization, product details, and its manufacturing details; these are important during the preparation of the final LCA report.

These two sections are most important for assessment. Fill out all the info carefully because based on your provided data, the whole assessment will carry out. It asks for raw material consumption data, energy consumption data, and onsite waste-related data.

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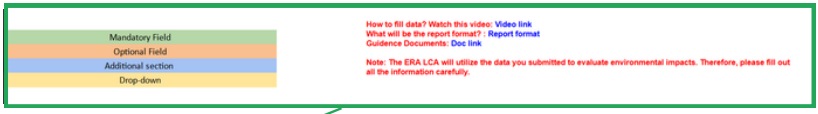
General Info:

Life Cycle Assessment Template	
ABOUT	
Author	This template is created by SIPL Pvt Ltd. for the LCA data collection to support ERA LCA process. This sheet helps to make the whole LCA procedure easier and faster. The study will be based on the CML-IA Baseline method - August 2016 (version 4.7) and/or ReCiPe method - 2016 v1.1. If your objective is to evaluate your product's carbon footprint independently the IPCC 2021 method will be applied. Template Version PC/0.0.1
Purpose	This ERA LCA system aims to streamline and accelerate the entire LCA procedure. Benefits for Indian Manufacturers of **ERA LCA**: 1. **Specific**: Based on Indian Dataset 2. **Swift**: Get assessment results in 7 days (with interpretation & hotspot analysis)
Intended Audiences	Listed all Manufacturers: Cement, Tiles, Paint, Steel, Doors, Windows, Steel Rebars, Pipes, Glass, Gypsum/ Plaster board, Laminates, Façade, Al Frames/ PVC Frames, Structural Steel, Whole Building LCA
How to Use	Users shall fill out the information on the given worksheets as per the manufacturing process steps. Then, relevant data points should be filled in on the inventory worksheet. For more guidance, follow the below color codes (Under "Guidance section") Once the worksheet is filled with the necessary inventory, the user shall share this worksheet via the following mail. The user will get the final assessment result within one week in the form of LCA report. The LCA report includes necessary details, LCA results, hotspot analysis and interpretation.
Guidance for Data Collection	Mandatory Field Optional Field Additional section Drop-down How to fill data? Watch this video: **Video link** What will be the report format? : **Report PDF** Guidance Documents: **Doc link** Note: The ERA LCA will utilize the data you submitted to evaluate environmental impacts. Therefore, please fill out all the information carefully.
Tips	For data collection, you can involve multiple experts from your manufacturing premises, for example, the purchase or sourcing department for transportation-related details, a production specialist (R&D expert, operation expert, production engineer, etc.), and the EHS head for environmental info. For more tips please visit this doc: **Doc link**
Disclaimer	(a) The process modeled in this template does not reflect any real technology and is for demonstrative purposes & for data collection only. The ERA LCA will utilize the data you submitted to evaluate environmental impact. Therefore, please fill out all the information carefully. (b) SIPL does not undertake any obligation to Customers, such as an obligation to provide support regarding data collection, filling data gaps and the use of LCA report. (c) The data shared by the customer through the template will also be mentioned in the report as an annexure.



Please go through the filled color code guidelines.

Organizational Info:

Data Required:
Organization Details
Designated Employee Details
Product Details
Product Manufacturing Process details & Diagram

Basic Product Details	
Product Code	
Product Name	XYZ Synthetic Enamel
What is your product category?	*Solvent-Based Paint*
	Synthetic Enamel - White
Product images	
Basic Description About Product	

Fill out each piece of information because that would be required for assessment & final report preparation.

Product Manufacturing Process Diagram

Add product manufacturing process details and paste the product manufacturing diagram.

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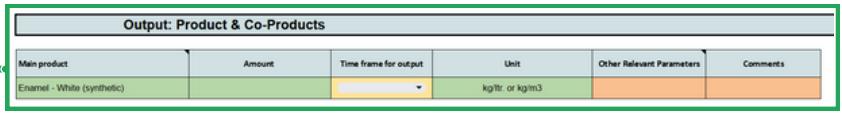
Manufacturing Process:

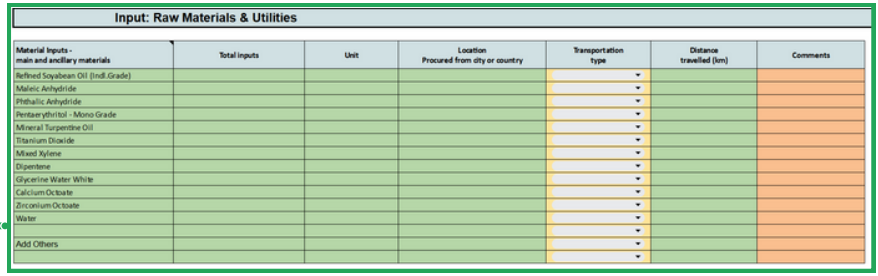
Data Required:
Output of the process: Product & Co-products
Input of the process: Raw materials, Energy & Utilities, Transportation
Details about on-site waste generation: Wastewater, Solid & Hazardous waste



Output: Product & Co-Products

Main product	Amount	Time frame for output	Unit	Other Relevant Parameters	Comments
Enamel - White (synthetic)			kg/ltr. or kg/m3		

Add data as per product manufacturing process.
Please set your production output data as per time frame given in the sheet.
If possible then provide information on the other parameters like Density, active constituent, moisture content (not necessary)



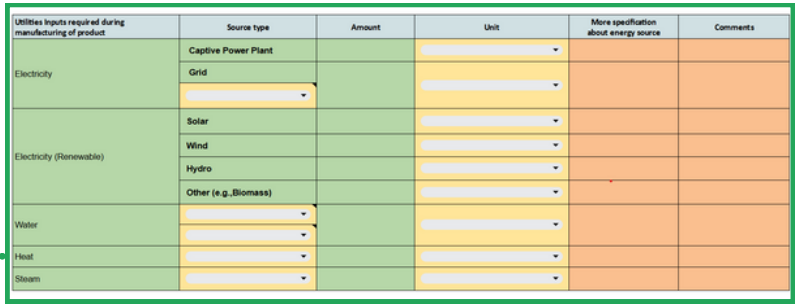
Input: Raw Materials & Utilities

Material Inputs - main and ancillary materials	Total inputs	Unit	Location Procured from city or country	Transportation type	Distance travelled (km)	Comments
Refined Soyabean Oil (Indl.Grade)						
Maleic Anhydride						
Phthalic Anhydride						
Pentaerythritol - Mono Grade						
Mineral Turpentine Oil						
Titanium Dioxide						
Mixed Xylene						
Dipentene						
Glycerine Water White						
Calcium Octoate						
Zirconium Octoate						
Water						
Add Others						

Now this section is for inputs. How much input is required? Fill out this section as per the declared unit of the product. However, to make this section easier, we provided the pre-filled raw material that is generally used to manufacture selected products. The organization can edit this section as per their manufacturing process.

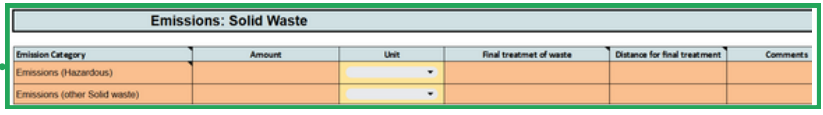
Manufacturing Process:

Data Required:
Output of the process: Product & Co-products
Input of the process: Raw materials, Energy & Utilities, Transportation
Details about on-site waste generation: Wastewater, Solid & Hazardous waste



Utilities Inputs required during manufacturing of product	Source type	Amount	Unit	More specification about energy source	Comments
Electricity	Captive Power Plant				
	Grid				
Electricity (Renewable)	Solar				
	Wind				
	Hydro				
	Other (e.g.,Biomass)				
Water					
Heat					
Steam					

Fill out this section as per the declared unit of the product.
Filled energy & utility section product-specific, not for the whole unit plant, which includes multiple product manufacturing facilities. e.g.,
if the product is paint, then to manufacture 100 kg of white synthetic solvent-based paint, the required energy could be 10 kWh.



Emissions: Solid Waste

Emission Category	Amount	Unit	Final treatmet of waste	Distance for final treatment	Comments
Emissions (Hazardous)					
Emissions (other Solid waste)					

Now this section is for emissions. How much waste is generated to manufacture the product? Fill out this section as per the declared unit of the product. The organization can edit this section as per their manufacturing process. Please provide selected single product-specific waste generation, and don't forget to consider the production time frame selected above in the output section & Unit.

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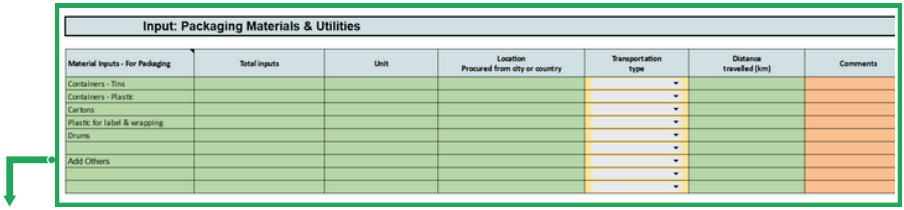
Packaging Process:

Data Required:
Packaging details for product as per declared unit.
Input of the process: Packaging raw materials, Energy & Utilities, Transportation



Input: Packaging Materials & Utilities

Material Inputs - For Packaging	Total inputs	Unit	Location Procured from city or country	Transportation type	Distance travelled (km)	Comments
Containers - Tins						
Containers - Plastic						
Cartons						
Plastic for label & wrapping						
Drums						
Add Others						

Fill out this section as per the declared unit of the product. However, to make this section easier, we provided the pre-filled raw material that is generally used in packaging for selected products. The organization can edit this section as per their packaging process. And similarly, fill the energy & utility section.

SIPL
Sustainability

Economical
Rapid
Accurate
LCA SOLUTION

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