

LIFE CYCLE ASSESSMENT OF CRUDE PALM KERNEL OIL

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Life cycle assessment (LCA) is a tool to evaluate the environmental burdens associated with a product, process or activity by identifying and quantifying the energy and materials used and the wastes released to the environment, to assess the impact of those energy and materials used and released to the environment, and to identify and evaluate opportunities to effect environmental improvements. This assessment includes the entire life cycle of the product, process or activity, encompassing the extraction and processing of raw materials, manufacturing, transportation and distribution, use, reuse, maintenance, recycling and final disposal.

This assessment will identify the potential impacts associated with the production of crude palm kernel oil (CPKO) at the kernel crushing plant. *Figure 1* shows a typical loading ramp for palm kernel at a kernel crushing plant. *Figure 2* shows a series of screw presses to crush the palm kernels.



Figure 1. Loading ramp for palm kernel at a kernel crushing plant.

This assessment is part of a cradle-to-grave LCA study of Malaysian oil palm products from the fresh fruit bunches (FFB) cultivated on mineral soils. The study was conducted following ISO Standards 14040 and 14044, and has been critically reviewed and approved by an external panel of international LCA experts.



Figure 2. A series of screw presses to crush the palm kernels.

MPOB is offering LCA consultation services from cradle-to-grave, starting from the oil palm seedling, FFB, CPO, CPKO, refined palm oil right up to palm biodiesel production.

OBJECTIVES

- To identify the potential environmental impacts associated with the production of CPKO.
- To gauge the greenhouse gas (GHG) emissions from the production of CPKO.
- To suggest mitigation measures to reduce or overcome the environmental hotspots that are identified.
- To contribute to the sustainable development of the oil palm industry by identifying and addressing environmental hotspots.

METHODOLOGY

The system boundary of LCA for the production of CPKO will be set up based on the requirement of the study. The life cycle inventory will be obtained and verified according to the functional unit used. The life cycle impact assessment will be conducted using SimaPro Version 7.1 with the Eco-Indicator 99 methodology.



BENEFITS

- Compliance to regulations related to the trade of climate-sensitive goods.
- LCA is a recognised tool for gaining credibility in sustainable claims.
- Being able to identify the areas that contribute to the environmental impacts which can be overcome by better utilisation of energy and materials that will benefit the industry and enable the industry to remain competitive in the global market.

SERVICES AVAILABLE

- Setting of system boundary and functional unit for the study at the kernel crushing plant.
- Collection of inventory data for the stipulated system boundary to produce a life cycle inventory (LCI).
- Conducting life cycle impact assessment (LCIA) for the production of CPKO.

- Interpretation of LCIA results and suggestions of mitigation measures.
- Calculation of the carbon footprint or GHG emissions associated with the production of CPKO.
- Building your LCA capacity – through a crash course on LCA consisting of a combination of lectures and case studies to get you started on LCA.

WHERE SERVICES ARE OFFERED

In Peninsular Malaysia, Sabah and Sarawak.

COST

Depends on the type of services required.

CLIENTS

Stakeholders – Members of the oil palm industry, specifically the owners of kernel-crushing plants.

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