

# LIFE CYCLE ASSESSMENT OF CRUDE PALM OIL

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**L**ife 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 extraction and processing 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 oil (CPO) at the palm oil mill. A typical view of the palm oil mill with the palm oil mill effluent (POME) pond is shown in *Figure 1*. *Figure 2* shows a POME digester tank to trap biogas at a palm oil mill.

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



*Figure 2. A POME digester tank to trap biogas at a palm oil mill.*

reviewed and approved by an external panel of international LCA experts.

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

## OBJECTIVES

- To identify the potential environmental impacts associated with the production of CPO.
- To gauge the greenhouse gas (GHG) emissions from the production of CPO.



*Figure 1. A typical palm oil mill with an effluent pond.*

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- 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 CPO 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 impact 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 palm oil mill.
- Collection of inventory data for the stipulated system boundary to produce a life cycle inventory (LCI).
- Conducting a life cycle impact assessment (LCIA) for the production of CPO.
- Interpretation of LCIA results and suggestion of mitigation measures.
- Calculation of the carbon footprint or GHG emissions associated with the production of CPO.
- 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 palm oil millers.

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