

LIFE CYCLE ASSESSMENT (LCA) OF REFINED PALM OIL

TAN YEW AI; HALIMAH MUHAMAD; ZULKIFLI HASHIM; VIJAYA SUBRAMANIAM; PUAH CHEW WEI and CHOO YUEN MAY



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The production of refined palm oil (RPO) is central to the issue of sustainable development of the palm oil industry. It is imperative to consider the ecological effects of the production and use of refined palm oil to show the environmental performance of the palm oil refining sector.

A life-cycle assessment (LCA) enables a detailed evaluation of the environmental performance of the palm oil refining sector as it is a tool to measure the environmental aspects and potential impacts related to the refining process. LCA compiles an inventory of the inflows (material/resource and energy) and outflows (solid waste, gaseous and liquid emissions), evaluates the potential environment impacts associated with these flows, and then interprets the results to provide for informed decisions on improvements to the environmental performance.

MPOB has recently completed a cradle-to-grave LCA study of Malaysian oil palm products, including palm biodiesel, from the crop grown on mineral soils. The study was conducted following ISO Standards 14040 and 14044, and one of the subsystems investigated was the production of RPO. With the completion of this study and with an LCA report which was critically reviewed and approved by an external panel of international LCA experts, MPOB now possesses unique Malaysian databases on the cultivation of oil palm, milling of fresh fruit bunches (FFB), refining of crude palm oil (CPO), fractionation of RPO, and the production of palm biodiesel.

MPOB offers LCA consulting services to stakeholders of the oil palm industry. The aim is to contribute to the sustainable development of the palm oil industry by identifying and addressing environmentally sensitive issues using the life cycle approach.



Figure 1. Crude palm oil delivered to the mill is processed to produce refined palm oil.

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Malaysian Palm Oil Board, Ministry of Plantation Industries and Commodities, Malaysia
P. O. Box 10620, 50720 Kuala Lumpur, Malaysia. Tel: 03-8769 4400 Fax: 03-8925 9446 Website: www.mpo.gov.my



OBJECTIVES

- An evaluation of the environmental impact from producing refined palm oil from crude palm oil.
- Addressing the environmental consequences based on the refining process, *e.g.* greenhouse gas (GHG) emissions, energy and resource used.

BENEFITS

- Compliance to regulations related to the trade of environment-sensitive goods.
- Market advantage for environmentally preferred products.
- Meeting a key element for gaining credibility in sustainability claims.

TYPES

- Project-based LCA consultation – A standard LCA project involving planning (setting goal/s and scope, system boundary, functional unit), executing, checking, reporting, improvement analysis, and implementing mitigation options to reduce environmental impact.
- Streamlined LCA services – A product-oriented consultation to identify the areas of prioritisation within your organisation in order to come up with a qualitative LCA of your product, process or service for the most important environmental aspects, and

subsequently to generate possible mitigation options for improvement of its environmental performance.

- Building your LCA capacity – A crash course on LCA consisting of a combination of lectures and case studies to get you started on LCA.

METHODOLOGY

The life cycle inventory (LCI) will be quantified using inflows and outflows built using the SimaPro Version 7.0 LCA software. The Eco-indicator 99 methodology will be used for the life cycle impact assessment (LCIA). The impact categories considered in this methodology include carcinogens, respiratory organics and inorganics, climate change, ionising radiation, ozone depletion, ecotoxicity, acidification/eutrophication, land use, minerals and fossil fuels. All LCA studies are carried out following ISO 14040/14044 requirements.

WHERE SERVICES ARE OFFERED

In Peninsular Malaysia, Sabah and Sarawak.

COST

Depends on the type of services required.

CLIENTS

Stakeholders associated with the palm oil refining sector, including the manufacture of products derived from refined palm oil, *e.g.* cooking oil, margarine and shortening, and palm-based soap.

For more information, kindly contact:

Director-General
MPOB
P. O. Box 10620
50720 Kuala Lumpur, Malaysia.
Tel: 03-8769 4400
Fax: 03-8925 9446
www.mpob.gov.my