Life Cycle Assessment (LCA) is a basic building block for the application of environmental management systems, especially for industry. With Malaysia pushing to move its industrial sector from up and mid-stream to the down-stream end of the production line, together with the increasing value placed on environmentally sustainable products, LCA is a critical tool in meeting consumer and market demands.

In a globalized market place, understanding and applying LCA is vital for marketing of products as it forms the basis for labelling. The environmental standard for products and services is developed through the International Organisation of Standards (ISO) Environmental Management System series of standards. The application of LCA is under one of these standards. These standards are reviewed every three years to ensure relevancy to market needs. Application of LCA to Malaysian products have many times been the only reason why they have been acceptable to be supplied and marketed abroad in high-value markets.

Concerns about Climate Change, expressed in Malaysia by the recent unusual cold and extended dry spells, have also increased consumer evaluation of products in terms of their impact to Climate Change. A whole new market has developed for Carbon trading due to these concerns. The next major resource that is viewed to be critical for human survival is water. This workshop intends to inform and prepare the participants for LCA application and to understand the carbon and water footprint measures using the LCA standards.

OBJECTIVE

1) To introduce participants to the fundamentals of Life Cycle Assessment;
2) To demonstrate the steps for implementation;
3) To provide Malaysian case examples; and
4) To introduce the new Carbon and Water Footprint methodologies.

A mixture of teaching and learning techniques shall be applied by experienced LCA practitioners: lectures, problem-solving exercise and participant case scenarios Q&A sessions. Participants are encouraged to bring their case problems for the problem-solving and Q&A sessions.

TARGET AUDIENCE

The target group are professionals who interested in using Life Cycle approach to improving product development and environmental management. They may be from industry, product designers, technology innovators, public sector agencies, academia, environmental and industrial consultants, consumer groups and non-governmental organisations.

The workshop serves as an introduction for starting LCA practitioners and a refresher for existing practitioners with the latest information being provide on the approach and methodologies for the new and forthcoming LCA Footprints.
Dr. Vijaya Subramaniam is attached to the Engineering and Processing Research Division under the Malaysian Palm Oil Board (MPOB). She is currently working as a Senior Research Officer and served as the Leader of the Environment research group under the Energy and Environment Research Unit. Her area of research focuses on the discipline of **Life Cycle Assessment for palm oil and the oil palm industry, water footprint, carbon footprint, sustainability and recovery of residual oil (waste to wealth program)**.

Dr. Vijaya has many publications mainly on life cycle assessment of oil palm industry in Journal of Oil Palm Research, American Journal of Geoscience, American Journal of Environmental Sciences, Palm Oil Engineering Bulletin and International Journal of Life Cycle Assessment. She also has published book chapters for Malaysian Palm Oil Board, Ministry of Plantation Industries and Commodities. She also actively presents papers at national and international proceeding. One of her latest papers entitled "**Water Footprint of the Production of CPO a Cradle to Gate Case Study Using the Water Footprint Network Methodology**" was presented at International Palm Oil Congress PIPOCC 2013 in Kuala Lumpur.

Dr. Chen Sau Soon has been with SIRIM for more than 30 years working as a researcher attached to a number of technology areas covering metalworking, chemical technology and environment and energy. In the field of environmental and energy technology, she has implemented and managed a number of industrial, government and collaborative international R&D projects using **biotechnology** and **physicochemical technology for hazardous waste treatment, wastewater treatment and waste management technologies, environmental and health risk assessment, cleaner technology, life cycle assessment, and renewable energy generation**.

Her latest projects cover sustainable production and consumption approaches, biogas from anaerobic fermentation of organic wastewater, biological deodourisation and photocatalytic treatment, in particular using solar energy for decontamination and disinfection. She is currently leading two projects, one national and another international, to develop carbon footprint labeling in the country. Her latest approved project will look into developing ecodesign of products and processes to address concerns of climate change, resource scarcity and continual degradation of the environment.
ASSOC. PROF. DR. ZAINURA ZAINON NOOR
Chemical Engineering Department,
Faculty of Chemical Engineering,
Universiti Teknologi Malaysia,
(Skudai Campus)

EDUCATION
Bachelor of Engineering (B.E.) in Chemical Engineering and Environmental Engineering from Vanderbilt University, Nashville, TN, USA
Master of Science (MSc.) with Distinction in Clean Technology from Newcastle University, Newcastle upon Tyne, UK
PhD in Chemical Engineering from Newcastle University, Newcastle upon Tyne, UK

Assoc. Prof. Dr. Zainura Zainon Noor is a faculty member at Faculty of Chemical Engineering, Universiti Teknologi Malaysia (UTM) whereby she has been appointed as one of their staffs since 1999. She is a trained chemical/environmental engineer with relevant experiences in green design and processes, life cycle assessment (LCA), carbon footprint, greenhouse gas inventory and projection as well as sustainable development policy implementation.

She has extensive experiences in R&D, project management and is currently leading Green Technology Research Group at one of UTM most dominant center of excellence - Institute of Water Environment and Water Resources Management (IEWRM).

Dr. Zainura is a recognized speaker and has given talks in many seminars and workshops. Since 2009, she has been appointed as the government’s consultant for the study of the Malaysia Environmental Performance Index (EPI). She is also one of the appointed committee members of Green Technology Focus Group (Sustainable Solid Waste) under the Ministry of Green Technology, Energy and Water. Dr. Zainura has been coordinating UTM-DTU International Summer Course on Sustainable Consumption and Production since 2010, a high-impact collaborative program between UTM and Denmark Technical University (DTU). This is an annual program which is now becoming UTM’s signature program which is conducted on annual basis.
**Life Cycle Assessment: What, Why, the Carbon and Water Footprints?**

**PROGRAMME**

**DAY 1: 2ND JULY 2014, WEDNESDAY**

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<tr>
<th>TIME</th>
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| 08:00 AM - 09:00 AM | Registration  
Welcome Address            | Chair, National Mirror Committee on LCA                      |
| 09:00 AM - 10:00 AM | What and Why Life Cycle Assessment       | Dr. Chen, SIRIM Bhd.                                        |
|                 | • The fundamentals                        |                                                             |
|                 | • Benefits                                |                                                             |
|                 | • Marketing products                      |                                                             |
|                 | • Sustainability reporting                |                                                             |
| 10:00 AM - 11:00 AM | The standards for LCA—ISO 14040 series  | Dr. Chen, SIRIM Bhd.                                        |
|                 | • ISO 14044                               |                                                             |
|                 | • ISO 14046                               |                                                             |
|                 | • Footprint Standards                     |                                                             |
| 11:00 AM - 11:30 AM | Coffee Break                             |                                                             |
| 11:30 AM - 01:00 PM | How to do LCA                             | Dr. Chen, SIRIM Bhd.                                        |
|                 | • Application and modeling start up       |                                                             |
|                 | • Inventory                              |                                                             |
|                 | • Impact assessment                      |                                                             |
|                 | • Methodologies                          |                                                             |
|                 | • Critical Review                        |                                                             |
| 01:00 PM - 02:00 PM | Lunch Break                              |                                                             |
| 02:00 PM - 03:00 PM | Case Studies and Examples in Malaysia  | Dr. Chen, SIRIM Bhd.                                        |
|                 | • Industry and research                  |                                                             |
| 03:00 PM - 05:00 PM (refreshment served) | Problem solving and Q&A session  | Dr. Chen, SIRIM  
Dr. Foo, ENSEARCH  
Dr. Zainura, UTM  
Dr. Vijaya, MPOB  
Dr. Sumiani   |
|                 | • Example exercise                       |                                                             |
|                 | • Problem solving exercise               |                                                             |
|                 | • Q&A participant cases                  |                                                             |
| 05:00 PM        | Refreshment                               |                                                             |

**DAY 2: 3RD JULY 2014, THURSDAY**

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<td>08:00 AM - 09:00 AM</td>
<td>Registration</td>
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<tr>
<td>09:00 AM - 10:00 AM</td>
<td>The Carbon Footprint — The standards</td>
<td>Dr. Zainura, UTM</td>
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<td>10:00 AM - 11:00 AM</td>
<td>Models and Methodologies</td>
<td>Dr. Zainura, UTM</td>
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<td>• Global models</td>
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<td>• Global warming potential</td>
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<td>11:00 AM - 11:30 AM</td>
<td>Coffee Break</td>
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<td>11:30 AM - 01:00 PM</td>
<td>Case Study</td>
<td>Dr. Zainura, UTM</td>
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<tr>
<td>01:00 PM - 02:00 PM</td>
<td>Lunch Break</td>
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<tr>
<td>02:00 PM - 03:00 PM</td>
<td>The Water Footprint — Standard development</td>
<td>Dr. Vijaya, MPOB</td>
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<tr>
<td>03:00 PM - 04:00 PM</td>
<td>Models and Methodologies</td>
<td>Dr. Vijaya, MPOB</td>
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<td>• Water Footprint Network</td>
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<td>• LCA approach</td>
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<tr>
<td>04:00 PM - 05:00 PM</td>
<td>Case Study</td>
<td>Dr. Vijaya, MPOB</td>
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<tr>
<td>05:00 PM</td>
<td>Refreshment</td>
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Training Title: Life Cycle Assessment: What, Why, the Carbon & Water Footprints?
Date/Day: 2nd - 3rd July 2014 (Wednesday & Thursday)

Method of Payment:
- [ ] Cash with undertaking Letter
- [ ] Cheque (Payable to ENSEARCH - Standard Chartered ACC NO: 808-1-0003160-7)
- [ ] Online Banking/Cash Deposit (Standard Chartered ACC NO: 808-1-0003160-7)

**Kindly note that, training fee will have to be borne by the organization/participant upon confirmation of registration (submission of registration form) with no exception of absence**

**An undertaking letter is required if the payment is to be made on or after the date of training**

**An invoice shall be issued upon submission of registration form**

**Email / Fax us the cash deposit/online banking slip as proof of payment**