出國報告（出國類別：國際會議）

出席臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議

服務機關：行政院環境保護署
姓名職稱：潘嘉妤技士、施珮瑜技士
派赴國家：馬來西亞
出國期間：108 年 4 月 22 日至 108 年 4 月 25 日
報告日期：108 年 7 月 9 日

摘要

一、 出國計畫名稱：出席臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議

二、 出國地點：馬來西亞莎阿蘭

三、 出國人員：潘嘉妤技士、施珮瑜技士

四、 出國期間：108 年 4 月 22 日至 108 年 4 月 25 日

五、 出國行程與內容概要

日　期	工 作 內 容 概 要
108.4.22	啟程，出發至馬來西亞莎阿蘭(Shah Alam)。
108.4.23	參加「加強生命週期盤查資料庫及產品第三類環境宣告研討會」，與會報告之國家包括我國、韓國、馬來西亞及泰國，議題包括分享各國的生命週期評估資料庫及碳足跡標籤推廣現況等，並於會後參訪馬來西亞標準與工業研究院，交流馬來西亞環保標章與碳標籤業務推動現況。
108.4.24	參加臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議，討論調和「可食用植物油品類」及「肌膚及毛髮清潔劑」碳足跡產品類別規則，為後續三國碳標籤產品互認作準備。
108.4.25	返程，回到臺北。

六、 行程成果評估及心得建議：

（一） 與韓國及泰國共同發展調和碳足跡產品類別規則，已有初步成果，將持續推動碳標籤產品相互承認事宜：

1、 於 4 月 24 日臺、韓、泰三國碳足跡產品類別規則調和工作小組會議，完成調和「可食用植物油品類(Edible Vegetable Oil)」共通產品類別規則文件內容，後續由韓國統一彙整提供予各國確認定稿；另因韓國無法配合制定「肌膚及毛髮

清潔劑」產品類別規則文件使用階段之能資源情境假設，故暫停執行。

2、 碳足跡產品類別規則調和為全球碳足跡標籤推動的重要突破，可作為未來各國相互承認產品類別規則，乃至相互承認碳足跡標籤的基礎，針對三國碳標籤產品後續互認時程，由三國各自評估執行期程及所需文件，於下次會議進行討論。

3、 三國共通產品類別規則，第四份暫定以包餡糕餅類為主，將於下次會議進行討論。

4、 預計 2019 年 10 月於中國北京舉行 ACFN 大會；臺灣、韓國及泰國工作小組會議，下次將於 2020 年初舉辦。

（二） 因應國際間發展產品宣告趨勢，持續精進環保標章與碳標籤制度，具體落實永續消費與生產理念：

1、 透過參與研討會及工作小組會議，不僅瞭解鄰近國家生命週期評估資料庫、標籤制度近期發展，也將我國的制度以及平台、資料庫建構方式分享給其他國家，擴大我國碳足跡制度的影響力。

2、 對於我國可免費提供計算工具及碳足跡排放係數予廠商使用，馬來西亞表示有索取使用意願。考慮到我國亦有部分大宗物資主要係由馬來西亞進口（如：棕櫚油），或可考慮與其討論資料庫資料交換的可能性。

3、 馬來西亞環保標章與我國環保標章都是全球環保標章網路(Global Ecolabelling Network)會員之一，建議維持此交流管道，促使我國環保標章之資訊交流。

4、 馬來西亞亦積極推廣碳標籤制度，建議可循目前與韓國、泰國碳標籤產品交互承認模式，與馬來西亞討論雙方互相承認碳標籤產品機制。

目次

壹、目的

亞洲碳足跡網絡(Asia Carbon Footprint Network, ACFN)，正式成立於 2011 年，由聯合國亞太經濟社會委員會(The United Nations Economic and Social Commission for Asia and the Pacific, UNESCAP)-東亞和東北亞辦事處與韓國環境產業技術研究院(Korea Environment Industry and Technology Institute, KEITI)共同發起。其宗旨是藉由亞洲碳足跡網絡之整合與建立，作為亞洲各國針對碳足跡相關制度、方法論及係數等資訊交流合作平台，以有效推廣碳標籤產品，達到永續消費與生產之最終目標。我國由國立臺北科技大學環境工程與管理研究所、財團法人工業技術研究院及社團法人台灣環境管理協會代表為亞洲碳足跡網絡組織之會員。

ACFN 自 2013 年起原則每年辦理 1 次年會，為能促使亞太地區之碳標籤調和能有明確且實質之進展，我國與韓國 KEITI、泰國溫室氣體管理機構(Thailand Greenhouse Gas Management Organisation, TGO)代表於 2015 年達成共同進行碳足跡產品類別規則(CFP-PCR)調和分析之共識，並透過三國輪流舉辦工作小組會議，以深入瞭解各國碳足跡相關制度之差異，並發展調和碳足跡產品類別規則，有助於未來各國間碳標籤相互承認。

本次會議第一天由馬來西亞標準與工業研究院(The Standard and Industrial Research Institute of Malaysia, SIRIM)和 ACFN 共同主辦「加強生命週期盤查資料庫及產品第三類環境宣告研討會」，由各國講者分享生命週期評估資料庫以及碳標籤發展等推動情形，第二天辦理「臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議」。

本次出國之主要目的：

一、 參加「臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議」，與韓國及泰國代表針對共通產品類別規則文件「可食用植物油品類」及「肌膚及毛髮清潔劑」進行調和，並討論三國碳標籤產品相互承認事宜。

二、 透過參與研討會及拜訪馬來西亞標準與工業研究院，瞭解會員組織對於生命週期評估資料庫、碳標籤、減碳標籤、產品環境足跡等議題推動情形與經驗，以及相關制度變革與趨勢，作為我國制度精進之參考，並分享我國產品碳足跡計算服務平台與碳係數資料庫建置經驗。

貳、行程及內容摘要

一、 出國計畫名稱：出席臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議

二、 出國人：潘嘉妤技士、施珮瑜技士

三、 出國日期：108 年 4 月 22 日至 108 年 4 月 25 日

四、 出國行程與內容概要：

活動日期	活動內容	活動地點
108 年 4 月 22 日	啟程，出發至馬來西亞莎阿蘭。	
108 年 4 月 23 日	1.參加「加強生命週期盤查資料庫及產品第三類環境宣告研討會」，由我國、韓國、馬來西亞及泰國等講者分享各國生命週期評估資料庫及碳足跡標籤推廣現況。	1.Grand Blue Wave Hotel
	2.參訪馬來西亞標準與工業研究院，交流馬來西亞環保標章與碳標籤業務推動現況。	2.SIRIM QAS International Office
108 年 4 月 24 日	參加「臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議」，討論調和「可食用植物油品類」及「肌膚及毛髮清潔劑」碳足跡產品類別規則。	Grand Blue Wave Hotel
108 年 4 月 25 日	返程，回到臺北。	

參、與會過程與內容

一、 參加「加強生命週期盤查資料庫及產品第三類環境宣告研討會」(Workshop on enhancing LCI database to support environmental product declaration)」（議程如附錄 1）

（一）日期：2018 年 4 月 23 日上午

（二）出席人員：

1. 聯合國 ESCAP 代表 Minkyung Hong
2. 韓國環境產業技術研究院(KEITI)代表 JaeSeok Kim、Shin DaBin 及 Park SunHee
3. 泰國出席人員：
   (1) 泰國溫室氣體管理機構(TGO)代表 Phakamon Supappunt 及 Phuangphan Srithong
   (2) 泰國國家金屬與材料技術中心（National Metal and Materials Technology Centre, MTEC）代表 Wanwisa Thanungkano、Ruthairat Wisansuwannakorn 及 Jantima Samneangngam
4. 馬來西亞出席人員：
   (1) 馬來西亞標準與工業研究院(SIRIM)代表 Wan Mazlina Wan Hussein
   (2) 馬來西亞政府部門、研究機構、大專院校與工業協會代表
5. 我國出席人員：
   (1) 本署管考處代表潘嘉妤技士、施珮瑜技士
   (2) 財團法人工業技術研究院(Industrial Technology Research Institute, ITRI) 代表朱志弘博士
   (3) 社團法人台灣環境管理協會(Taiwan Environmental Management Association, TEMA) 代表吳伋特聘僱問、甘智仁經理

	
研討會現場	各國與會代表合影
	
會議情形	會議情形

（三）研討會主旨：

1. 瞭解各國碳足跡標籤制度變革及現況；

2. 提供建議予馬來西亞建置搖籃到墳墓的碳足跡標籤制度。

（四）議題包含馬來西亞 SIRIM「馬來西亞生命週期資料庫簡介(Malaysia Life Cycle Inventory database)」、臺灣 ITRI「碳足跡計算服務平台簡介」與 TEMA「臺灣碳標籤制度的推廣近況」、泰國 MTEC「針對永續發展目標的生命週期資料庫應用(Life Cycle Inventory Database Application for Sustainable Development Goals)」、泰國 TGO「泰國 TGO 的碳標籤及碳抵換計畫(TGO’s Carbon Label and Carbon Offset Scheme)」、韓國 KEITI「韓國 EPD 發證制度簡介(Environmental Product Declaration Certification System)」。

（五）本次研討會重點摘述如下（依議程順序）：

1. 馬來西亞生命週期資料庫介紹：

(1) 馬來西亞本次報告單位為馬來西亞標準與工業研究院(SIRIM)，為馬來西亞財政部下的組織，負責馬來西亞國家標準的制定與認證。

(2) 馬來西亞目前訂定碳足跡產品類別規則共 15 份，多屬建築業。

(3) 生命週期評估資料庫於 2010 年開始發展，資料庫使用的資料揭露格式為 The International Reference Life Cycle Data System (ILCD)1.1 版本，目前已建置 181 筆資料數據，包含電力業、原物料、製造業及運輸服務等 4 大類別，並仍持續積極與當地企業合作，以拓展資料庫數據及服務範圍。

(4) 生命週期評估資料庫採付費方式，提供 HTML、ILCD 兩種下載格式，每項資料下載價格分別為 225 及 450 馬幣。

2. 我國碳足跡計算服務平台及碳標籤制度推廣近況：

(1) 工研院朱志弘博士分享臺灣碳足跡計算服務平台的操作方式、碳排放係數的建置模式及資料庫的建置與維護經驗。說明我國資料庫透過跨部會合作方式，已建立 799 筆碳排放係數資料，其中以食品業（佔 20%）及化學工業（佔 15%）為大宗。

(2) 台灣環境管理協會甘智仁經理分享臺灣碳足跡制度的發展歷程、申請碳標籤、減碳標籤及建立產品類別規則的制度流程與現況。目前臺灣申請碳標籤產品累計達 794 件、減碳標籤達 24 件、產品類別規則共計 97 份。此外，我國每年會舉辦低碳產品獎勵，在眾多申請減碳標籤的廠商中，遴選減碳成效及宣導碳標籤制度績效優良之廠商給予獎勵。

3. 泰國生命週期資料庫應用、碳標籤及碳抵換計畫：

(1) 泰國本次報告單位為泰國國家金屬與材料技術中心(MTEC)及泰國溫室氣體管理機構(TGO)。MTEC 係屬泰國國家研究中心之機構，由泰國國家科學和技術發展局管理。

(2) 泰國生命週期資料庫自 2005 年開始發展，資料格式為 ILCD 與 ISO/TS 14048，目前資料庫已建置 1,293 件生命週期數據資料，並以農業、基礎

設施及運輸服務類別為大宗。

(3) 泰國已經開始核發碳抵換及碳中和標籤（如下圖）。惟碳抵換標籤僅限於組織申請，而碳中和標籤於組織、產品、活動以及個人等都可以申請。目前已有 29 件產品申請碳中和標籤、54 個組織申請碳抵換標籤及碳中和標籤、43 個活動申請碳中和標籤以及 741 個人申請碳中和標籤，總計溫室氣體減排量為 20 萬 4,990 噸二氧化碳當量。

(4) 目前泰國登記註冊執行盤查作業共有 6 間公司及 81 位顧問師、登記註冊執行驗證作業共有 4 間公司及 47 位查驗人員。

carbon offset	carbon neutral
碳抵換標籤	碳中和標籤

4. 韓國 EPD 發證制度介紹：

(1) 韓國本次報告單位為韓國環境產業技術研究院(KEITI)。

(2) 韓國的產品類別規則分成三類，第一類為一般產品類別規則(Common PCR：General Rule)，包含能源使用及非能源使用（例如：B2B 的產品、服務型）兩面向；第二類為個別型產品的產品類別規則(Individual PCRs)，目前僅有馬桶、固態硬碟、汽車輪胎、洗衣粉及淨水器等五種商品有個別型產品類別規則；第三類為使用階段之情境假設(Using Stage Scenario)，目前僅針對在生命週期評估的使用階段中，需要消耗能源的產品來建置情境假設的文件，目前共有 48 種產品的情境假設，包括汽車、洗衣機、空氣清淨機、電視機及電冰箱等。

(3) 目前韓國取得產品第三類環境宣告的產品共 506 項、取得碳標籤的產品共 2,640 項（碳排放有 2,129 項，低碳產品有 511 項）。

二、 參訪馬來西亞標準與工業研究院

（一）日期：2018 年 4 月 23 日下午

（二）出席人員：

1. 聯合國 ESCAP 代表 Minkyung Hong

2. 韓國環境產業技術研究院代表 JaeSeok Kim、Shin DaBin 及 Park SunHee

3. 泰國出席人員：

(1) 泰國溫室氣體管理機構代表 Phakamon Supappunt 及 Phuangphan Srithong

(2) 泰國國家金屬與材料技術中心代表 Wanwisa Thanungkano、Ruthairat Wisansuwannakorn 及 Jantima Samneangngam

4. 我國出席人員：

(1) 本署管考處代表潘嘉妤技士、施珮瑜技士

(2) 財團法人工業技術研究院代表朱志弘博士

(3) 社團法人台灣環境管理協會代表吳伋特聘僱問、甘智仁經理

（三）參訪內容說明：目前馬來西亞環境標籤的查證及核發皆由 SIRIM QAS 執行，也是該國境內唯一單位，該機構是馬來西亞的第三方查證、檢驗和測試機構。此次參訪會議由產品認證檢驗部總經理 Basori bin Hj. Selamat 主持，並由環保標章部門主管 Adha bin Rahmat 與碳標籤部門主管 Aernida Abdul Kadir 介紹馬來西亞環保標章與碳標籤的業務，交流重點摘述如下：

1. 環保標章

(1)馬來西亞執行環保標章的業務皆由 SIRIM 的各單位所完成，由 SIRIM STS 部門負責訂定所有環保標章標準，SIRIM QAS 負責標章作業的查證及核發作業。

(2)馬來西亞與我國環保標章有效期同為 2 年，目前馬來西亞已制定 92 項標準，且大多為建築業使用之標準，目前馬來西亞境內有許多建築業使用的材料已取得環保標章。

(3)馬來西亞與我國相同，也有政府綠色採購制度，兩國差異在於馬來西亞

政府並未於法律規定政府機關有綠色採購之比例限制，而我國則明確要求政府機關執行綠色採購政策。

2. 碳標籤

(1)馬來西亞執行碳標籤的業務亦由 SIRIM 各單位完成，SIRIM QAS 負責碳標籤的查證及核發作業，產品類別規則則由 SIRIM STS 負責。SIRIM QAS 的查證作業受馬來西亞標準局(Department of Standards Malaysia)監督。

(2)馬來西亞碳標籤制度係依照 ISO 14067 進行盤查計算，與我國碳標籤制度一致。惟在產品類別規則部分稍有不同，SIRIM STS 建置的產品類別規則，一般廠商進行盤查計算時，需要付費下載才可使用。

(3)馬來西亞與我國碳標籤的使用期限同為 3 年。

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>參訪會議現場情形</td><td>我國代表與 SIRIM 總經理合照</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>各國參訪人員合照</td><td>潘嘉妤技士致贈 SIRIM 代表伴手禮</td></tr>
</table>

三、 參加「臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議」（議程如附錄 2）

（一）日期：2018 年 4 月 24 日

（二）出席人員：

1. 聯合國 ESCAP 代表 Minkyung Hong
2. 韓國環境產業技術研究院代表 JaeSeok Kim、Shin DaBin 及 Park SunHee
3. 泰國出席人員：
   (1) 泰國溫室氣體管理機構代表 Phakamon Supappunt 及 Phuangphan Srithong
   (2) 泰國國家金屬與材料技術中心代表 Wanwisa Thanungkano、Ruthairat Wisansuwannakorn 及 Jantima Samneangngam
4. 我國出席人員：
   (1) 本署管考處代表潘嘉妤技士、施珮瑜技士
   (2) 財團法人工業技術研究院代表朱志弘博士
   (3) 社團法人台灣環境管理協會代表吳伋特聘僱問、甘智仁經理

（三）會議討論結果：

1. 「不含酒精飲料(Product Category Rules for Non-alcoholic beverages)」共通產品類別規則：經臺灣、韓國及泰國確認「不含酒精飲料」共通產品類別規則文件定稿內容。
2. 「肌膚及毛髮清潔劑(Product Category Rules for Skin & Hair Cleaning Products)」共通產品類別規則：因韓國確定無法配合制定產品類別規則文件使用階段之能資源情境假設，本項共通產品類別規則文件暫停執行。
3. 「可食用植物油品類(Edible Vegetable Oil)」共通產品類別規則：
   (1) 參考文獻：臺灣新增「非調合粗製食用植物油」產品類別規則及「精緻食用植物油及其調合油」產品類別規則 2 項。
   (2) 使用階段：本階段之情境假設，不包含使用階段碳排放量，且不需要冷藏。

(3) 廢棄處理階段：

A. 本階段之情境假設，廢棄處理階段包括產品在使用後回收或處理相關資訊；包裝材料的處理方法應符合相關法律規定。

B. 各國廢棄處理階段情境假設規定訂於附錄 A。

(4) 確認文件調和內容，後續由韓國彙整定版（如附錄 3）。

4. 針對三國共通產品類別規則，第四份暫定以包餡糕餅類為主，於下次會議進行討論。

5. 後續碳標籤產品互認執行細節

(1) 泰國建議後續標籤互認的時程規劃：7 月確認產品並分享國內認證數據、8 月計算運輸及廢棄階段數據。

(2) 臺灣和泰國未簽署碳標籤技術合作協議，後續合作依據請依兩國信件回復結果辦理。

(3) 各國碳標籤之申請程序，三國同意由申請廠商支付碳標籤互認程序之費用（臺灣查證費用 1,000 USD、韓國及泰國發證費用分別為 50 USD、300 USD）。

6. 下次會議時間

(1) 預計 2019 年 10 月於中國北京舉行 ACFN 大會。

(2) 臺灣、韓國及泰國工作小組會議，下次將於 2020 年初舉辦。

	
工作小組現場討論情形	潘嘉妤技士與韓國代表互贈伴手禮

	
工作小組現場討論情形	施珮瑜技士與泰國代表互贈伴手禮

肆、心得及建議

本次出國參加「加強生命週期盤查資料庫及產品第三類環境宣告研討會」、「臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議」及參訪馬來西亞標準與工業研究院，心得及建議如下：

一、 我國第三類環境標誌目前僅有碳標籤及減碳標籤，未如韓國已完成標籤整合作業，惟歐盟環境足跡標籤之發展趨勢，第三類環境標誌均朝向揭露多項環境衝擊資訊方向發展，而目前歐盟各國在執行環境足跡標籤尚在觀察階段，建議我國先收集國內外環境足跡標籤的執行經驗，後續推出輔導試行計畫，在產品碳足跡標示制度既有之基礎上，發展揭露多項環境衝擊資訊之第三類環境標誌，以協助業者走進國際市場及幫助消費者清楚辨識綠色產品。

二、 參考泰國執行碳管理經驗，從「量化」作業開始，接著完成「減量」，再執行「抵換」，最後達成「中和」的目標。目前臺灣已經建立「量化」及「減量」制度，廠商可參照碳足跡盤查作業制度，申請碳標籤及減碳標籤，為落實完整的碳管理，達成企業零碳目標，建議後續可制定碳抵換機制，並建置碳抵換平台，提供廠商管道，藉由協助廠商執行碳中和計畫，達成我國政府的溫管法賦予的減碳目標。

三、 臺灣、韓國及泰國率先進行 PCR 調和計畫，足以顯見我國的產品碳足跡標示制度於亞洲地區的發展相對成熟，且在亞洲碳足跡網絡中佔有一席之地，建議未來可著重 ACFN 的合作關係，藉由調和工作的進行與他國會員組織建立長久且

密切的夥伴關係，並即時掌握亞洲地區生命週期、碳足跡之最新訊息，以協助國內廠商及政府相關部會即時做好因應策略。

附錄 1

「加強生命週期盤查資料庫及產品第三類環境宣告研討會」議程及會議簡報

PROGRAMME

"WORKSHOP ON ENHANCING LCI DATABASE TO SUPPORT ENVIRONMENTAL PRODUCT DECLARATION"

GRAND BLUEWAVE HOTEL, SHAH ALAM, SELANGOR, MALAYSIA

TUESDAY, 23 APRIL 2019

Introduction

The MYLCID (the Malaysian Life Cycle Database) system was established under the Ninth Malaysian Plan (2005-2010) to support the LCA-based activities at the national level. The LCA-based activities are seen from various business-related applications such as industry's environmental reporting, product green labelling, CFP labelling and so forth.

Ever since the launch of MYLCID in 2010, the growth of the database system to support cleaner production initiatives in Malaysia has been very slow. Although LCA studies and projects undertaken by the higher learning institutions and the research institutions have grown quite significantly over the past decade, nil is being shared in the national LCI database platform.

SIRIM-Environmental Technology Research Centre as the host of the LCI database system for Malaysia is now seeking a cohesive effort from the local industry stakeholders to boost up MYLCID growth. MYLCID is there to be capitalized by the industries, governments, research institutions and universities as users as well as data-owners.

For this engagement session, SIRIM as the Asia Carbon Footprint Network Member (ACFN) since 2017, seeks out for a courtesy assistance from our advanced ACFN member agencies including ITRI, TEMA, KEITI, TGO, to share their experience in implementing its environmental product declaration and making it such a huge success in the concerned countries.

Objectives:

The workshop intends to achieve the following objectives:

1. To populate MYLCID with more LCI results from the mainstream Malaysian research organizations
2. To explore the possibility to expand the coverage of product's environmental labelling opportunities
3. To learn from the ACFN Network Member Agencies' experience and success cases in implementing environmental product declaration

Target Participants

The workshop is a small-scale gathering of minds. A closed invitation will be made to the relevant stakeholders with a targeted number of approx. 30 participants. The stakeholder's representatives are:

- Ministry /Government (MITI, MESTECC, MGTC)
- Research institutions (MPOB, FRIM, MARDI, MRB)

- Universities (UKM, UM, UPM, USM, UTM, UNITEN)
- Industry Association (FMM)
- SIRIM Industrial Research (ETRC)
- SIRIM QAS International Sdn. Bhd.
- SIRIM STS Sdn. Bhd.

Provisional Progamme

TIME	Knowledge-Sharing Session
08:45 am	**Meet & Greet**
9:30 am	**Welcoming Remarks** *SIRIM Industrial Research*
9:45 am	**MYLCID: Development & Supports towards Environmental Performance Assessment** *Environmental Technology Research Centre, SIRIM Industrial Research*
10:15 am	Refreshment
10:45 am	**Life Cycle Inventory Database (LCI DB)** *Dr. Chih-Hung Chu, Researcher, ITRI* *Mr. Leon Kan, Project Manager, TEMA*
11:30 am	**LCI Database Applications for Sustainable Consumption and Production (SCP)** *Ms. Wanwisa Thanungkano, Senior Engineer, NSTDA* **TGO's CFP, Low Carbon and Carbon Neutral Labelling Scheme** *Dr. Pongvipa Lohsomboon, Deputy Executive Director, TGO*
12:15 pm	**KEITI's Environmental Product Declaration (EPD)** *Ms. Dabin Shin, Researcher, KEITI*
1:00 pm	**Lunch & Networking**
3:00 – 5.00 pm	• Consultation Meeting (Only for International Delegates); *Venue:SIRIM QAS International* • Meeting on MYLCID Data Owner and Provider (Only for Invited stakeholders via closed invitations); *Venue:* SIRIM Environmental Technology Research Centre

**Note: The presentation materials will be uploaded into the LCA Malaysia Portal after the event.*

Malaysia Life Cycle Inventory Database (MYLCID)

An Initiative To Support Product Environmental Performance Assessment

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SIRIM's Framework for LCA-related Activities

SIRIM STS Sdn. Bhd.	SIRIM Berhad (ENVIRONMENTAL TECHNOLOGY RESEARCH CENTRE)	SIRIM QAS INTERNATIONAL (PRODUCT CERTIFICATION & INSPECTION DEPT)
• Standardisation Secretariat - Establishment and coordination of WGs - Approval of PCD & PCR - Publication of PCD & PCR - Custodian of PCD & PCR	• Technical resources - Carry out data review and study on comparative data - Drafting of preliminary PCD & PCR documents - Provide carbon footprint analysis - Conduct ecolabelling related lab testing	• Identification of product for the "green market" sectors • Provide independent verification, certification and labelling
Ecolabelling Criteria Development & Management	**Ecolabelling Criteria Drafting & Consultancy**	**Verification & Certification**

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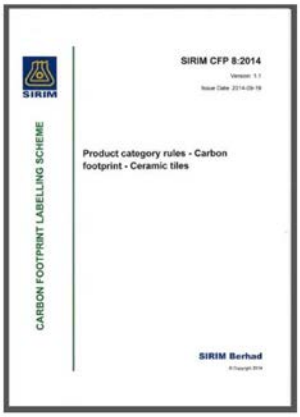
LCA Application in Environmental Communication

Ecolabelling Criteria Documents (Type 1)

SIRIM ECO-LABEL

- 84 criteria documents
- 127 certificates granted
- 80% construction and industrial products

Product Category Rules (for product carbon footprinting)



PRODUCT CO_2 SIRIM

- 15 product category rules
- Only 4 licenses still valid out of nearly 30 initially certified

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Product Category Rules (PCR) for CFP

NO.	SIRIM CARBON FOOTPRINT
1	CFP 1 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - TERMS AND DEFINITIONS** (EFFECTIVE DATE: SEPTEMBER 2014)
2	CFP 2 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - MASONRY UNIT** (EFFECTIVE DATE: SEPTEMBER 2014)
3	CFP 3 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - GYPSUM BOARD** (EFFECTIVE DATE: SEPTEMBER 2014)
4	CFP 4 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - PLUMBING PIPES** (EFFECTIVE DATE: SEPTEMBER 2014)
5	CFP 5 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - SEWERAGE PIPES** (EFFECTIVE DATE: SEPTEMBER 2014)
6	CFP 6 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - ARCHITECTURAL ROOFING TILES** (EFFECTIVE DATE: SEPTEMBER 2014)
7	CFP 7 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - CERAMIC BASIN** (EFFECTIVE DATE: SEPTEMBER 2014)
8	CFP 8 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - CERAMIC TILES** (EFFECTIVE DATE: SEPTEMBER 2014)
9	CFP 9 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - METAL DECKING AND PANELING** (EFFECTIVE DATE: SEPTEMBER 2014)
10	CFP 10 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - REINFORCE STEEL** (EFFECTIVE DATE: SEPTEMBER 2014)
11	CFP 11 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - FIBRE CEMENT CEILING SHEETS** (EFFECTIVE DATE: SEPTEMBER 2014)
12	CFP 12 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - PAINT** (EFFECTIVE DATE: SEPTEMBER 2014)
13	CFP 13 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - ADHESIVE** (EFFECTIVE DATE: SEPTEMBER 2014)
14	CFP 14 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - SOLID BIOFUEL** (EFFECTIVE DATE: 6 DECEMBER 2017)
15	CFP 15 PRODUCT CATEGORY RULES - **CARBON FOOTPRINT - GLUED LAMINATED LUMBER** (EFFECTIVE DATE: 6 DECEMBER 2017)

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LCA & CFP Collaboration Projects

EU's SWITCHAsia: Environmental Declaration for Sustainable Construction & Building Materials, Dec 2012 – Dec 2015

Project Partners:

Pilot projects:

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SIRIM's LCA Initiatives

- 2004: Life Cycle Assessment (LCA)
- 2004: Ecolabelling (Green label) – Product Criteria Document (PCD)
- 2010: Life Cycle Inventory Database (MYLCID)
- 2014: CFP Labelling – Product Category Rules (PCR)
- 2014: In-house Tool for Carbon Footprint Analysis

http://lcamalaysia.sirim.my

https://mylcid.sirim.my

http://karbonkalkulator.com/SIRIMKK/

6

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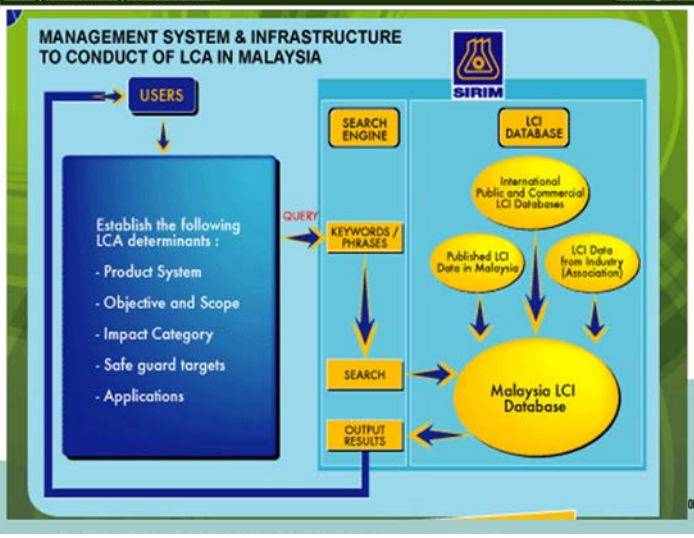
National LCA Database (2006 - 2010)

- **RMk9 (Ninth Malaysia Plan)** –National Life Cycle Inventory Database



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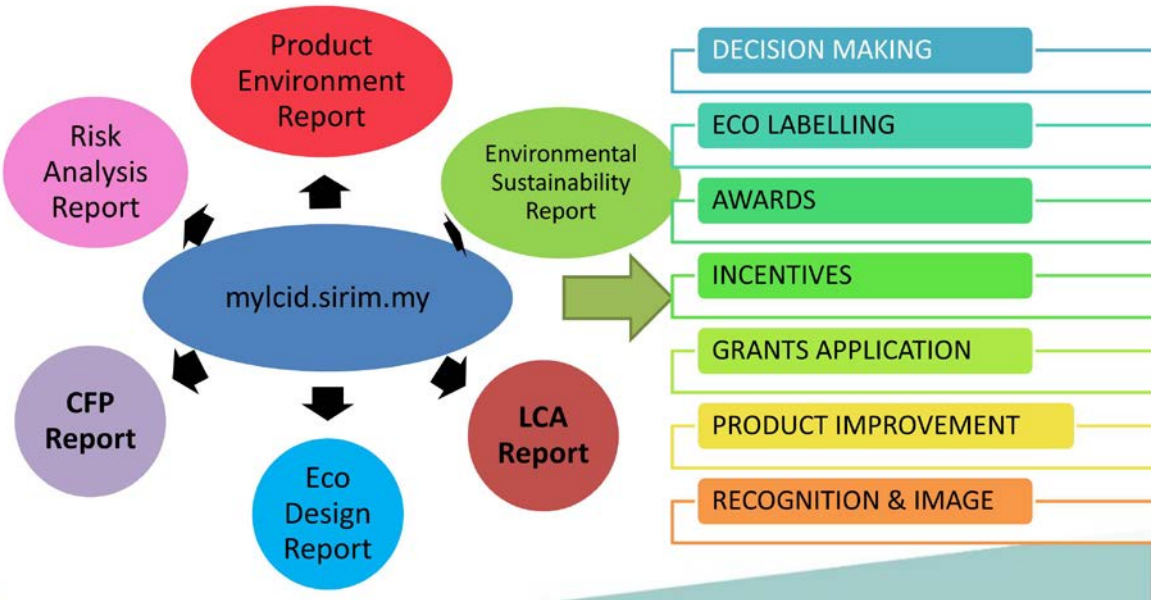
LCI Data Applications



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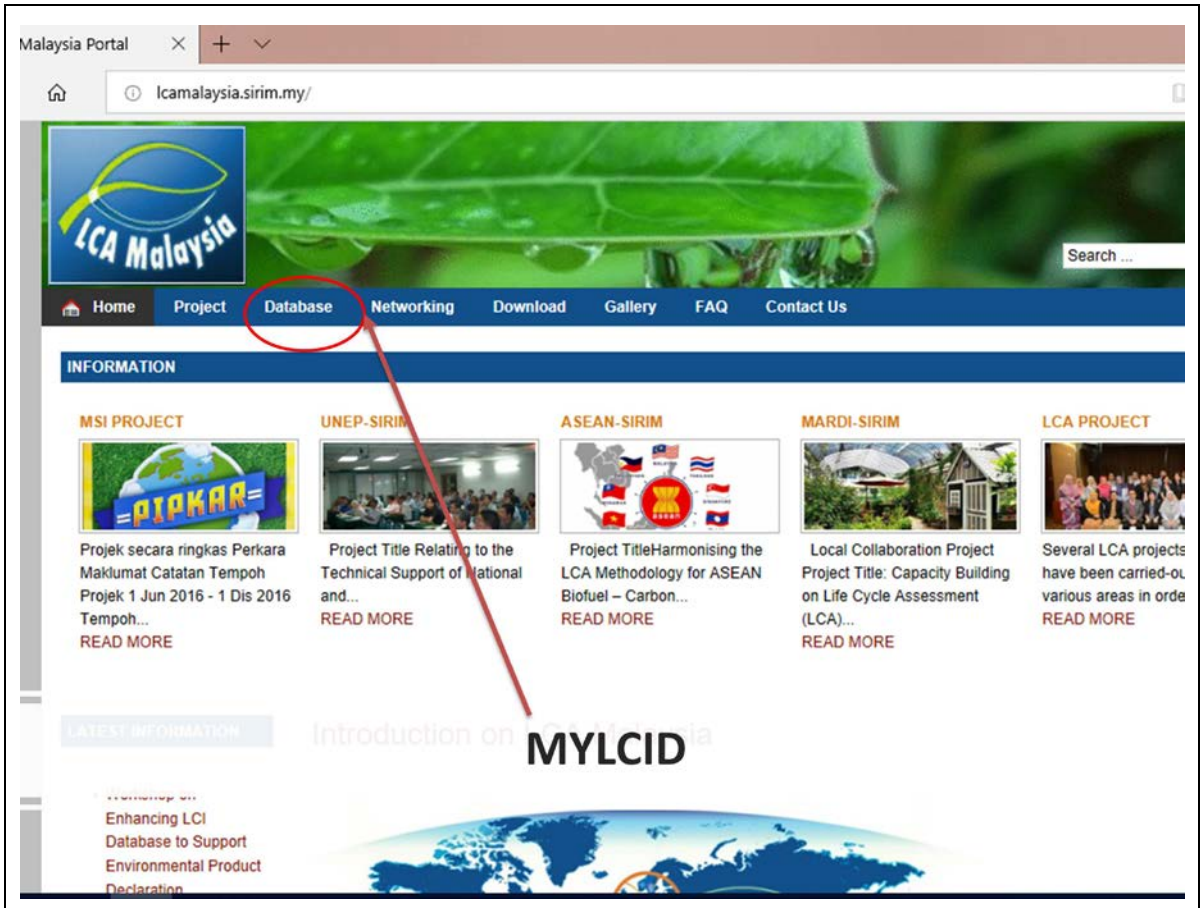
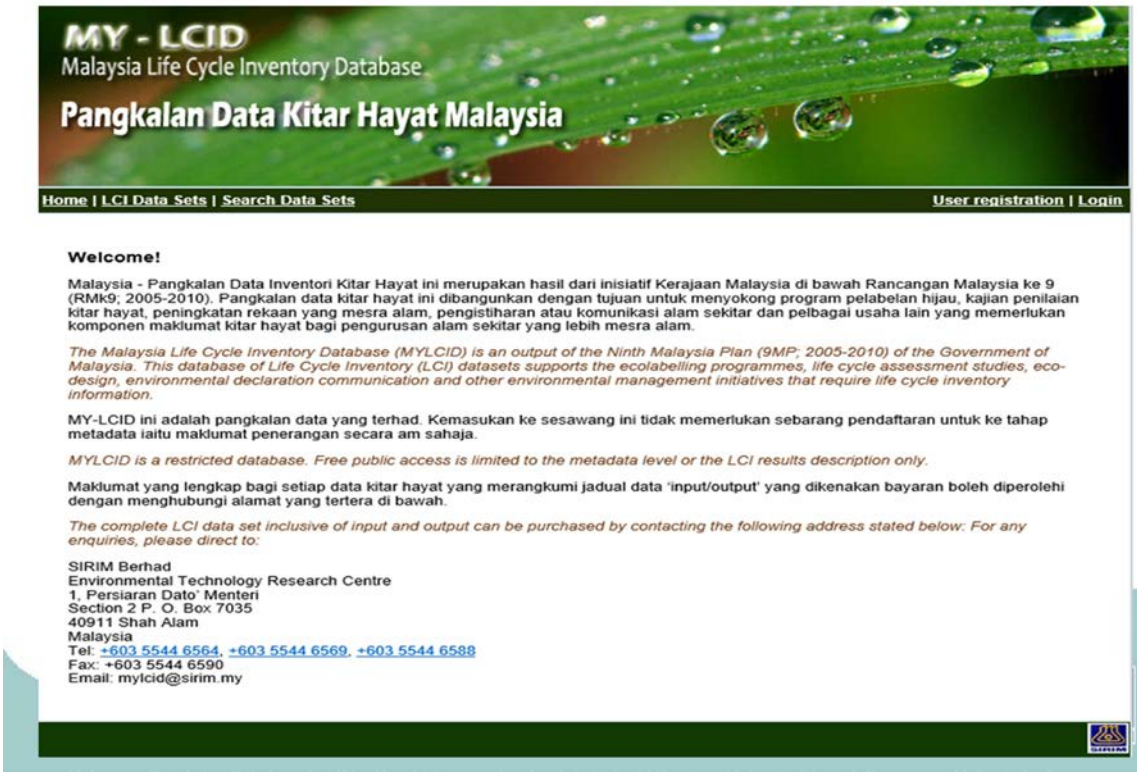


MYLCID Homepage



181 LCI results
(as of Jan 2019)

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MYLCID: Classification of processes

The processes classification comprises two levels of hierarchy: The top level (bold) and the second level (bullet points) of classification.

- **Energy carriers**
  - *Energetic raw materials*
  - *Electricity*
  - *Heat and steam*
  - *Mechanical energy*
  - *Hard coal based energy carriers*
  - *Lignite based energy carriers*
  - *Crude oil based energy carriers*
  - *Nuclear energy carriers*
  - *Other non-renewable energy carriers*
  - *Renewable energy carriers*
- **Materials**
  - *Raw materials*
  - *Metals and semimetals*
  - *Organic chemicals*
  - *Inorganic chemicals*
  - *Glass and ceramics*
  - *Other mineralic materials*
  - *Plastics*
  - *Paper and cardboards*
  - *Water*
  - *Agricultural production means*
  - *Food and renewable raw materials*
  - *Wood*
  - *Other materials*
- **Systems**
  - *Packaging*
  - *Electrics and electronics*
  - *Vehicles*
  - *Other machines*
  - *Construction*
  - *White goods*
  - *Textiles, furnitures and other interiors*
  - *Unspecific parts*
  - *Paints and chemical preparations*
  - *Other systems*
- **Transport services**
  - *Road*
  - *Rail*
  - *Water*
  - *Air*
  - *Other transport*

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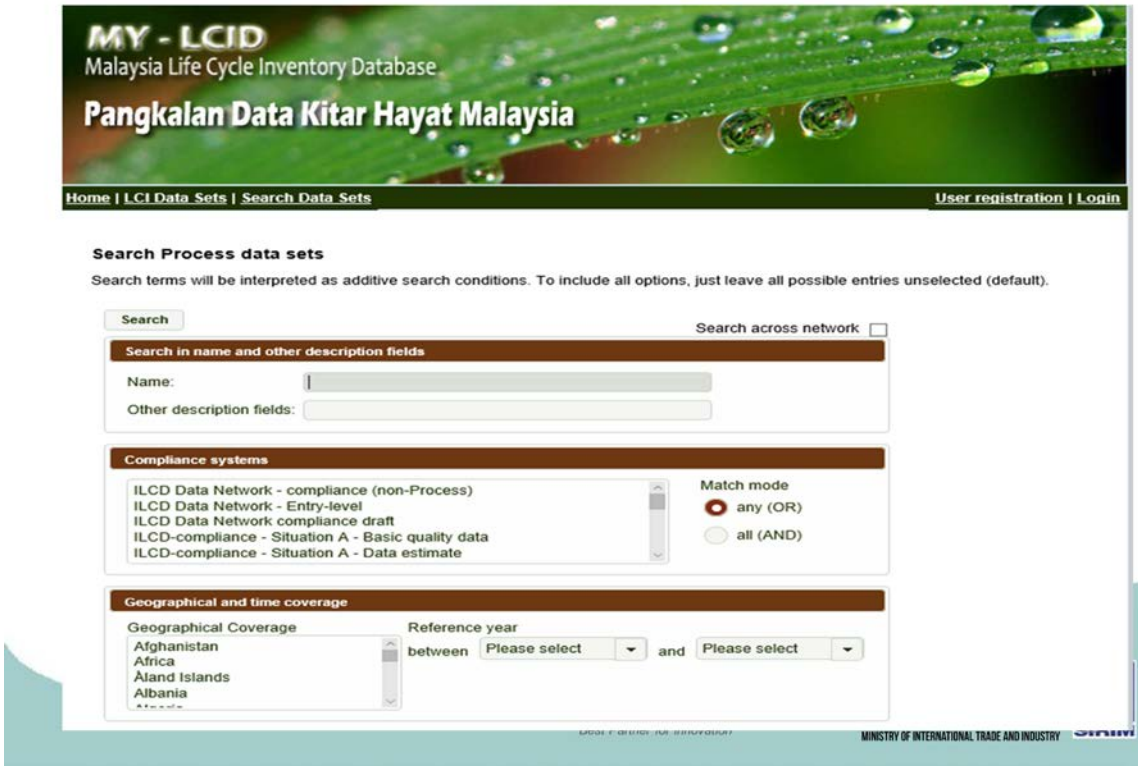
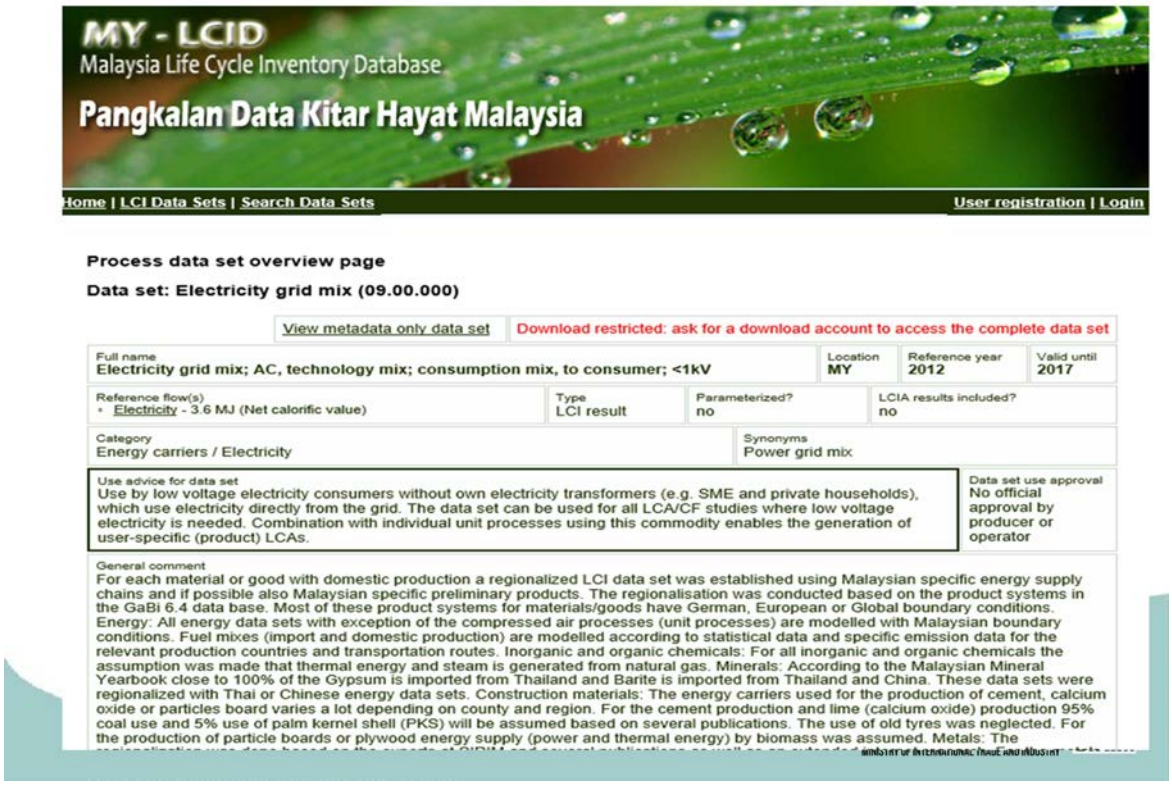
MYLCID: Search datasets



MYLCID: Metadata view



MYLCID: Full view of dataset

Dataset: MY; Electricity grid mix

Process Data set: Electricity grid mix; AC, technology mix; consumption mix, to consumer; <1kV (en) en

Collapse all sections | Go back | Close

Process information

Key Data Set Information	
Location	MY
Geographical representativeness description	The data set represents the country specific situation in Malaysia, focusing on the main technologies, the region specific characteristics and / or import statistics.
Reference year	2012
Name	Base name ; Treatment, standards, routes ; Mix and location types ; Quantitative product or process properties Electricity grid mix; AC, technology mix; consumption mix, to consumer; <1kV
Use advice for data set	Use by low voltage electricity consumers without own electricity transformers (e.g. SME and private households), which use electricity directly from the grid. The data set can be used for all LCA/CF studies where low voltage electricity is needed. Combination with individual unit processes using this commodity enables the generation of user-specific (product) LCAs.
Technical purpose of product or process	Supply of 1 kWh low voltage (<1kV) electricity to final consumers.
Synonyms	Power grid mix
Classification	Class name : Hierarchy level GaBiCategories: Energy carriers / Electricity
General comment on data set	For each material or good with domestic production a regionalized LCI data set was established using Malaysian specific energy supply chains and if possible also Malaysian specific preliminary products. The regionalisation was conducted based on the product systems in the GaBi 6.4 data base. Most of these product systems for materials/goods have German, European or Global boundary conditions. Energy: All energy data sets with exception of the compressed air processes (unit processes) are modelled with Malaysian boundary conditions. Fuel mixes (import and domestic production) are modelled according to statistical data and specific emission data for the relevant production countries and transportation routes. Inorganic and organic chemicals: For all inorganic and organic chemicals the assumption was made that thermal energy and steam is generated from natural gas. Minerals: According to the Malaysian Mineral Yearbook close to 100% of the Gypsum is imported from Thailand and Barite is imported from Thailand and China. These data sets were regionalized with Thai or Chinese energy data sets. Construction materials: The energy carriers used for the production of cement, calcium oxide or particles board varies a lot depending on county and region. For the cement production and lime (calcium oxide) production 95% coal use and 5% use of palm kernel shell (PKS) will be assumed based on several publications. The use of old tyres was neglected. For the production of particle boards or plywood energy supply (power and thermal energy) by biomass was assumed. Metals: The regionalization was done based on the experts at SIRIM and several publications as well as an extended internet research. For the metals gold, zinc, ferro chrome, ferro nickel and primary lead 100% or close to 100% import was found. A real regionalization (production in Malaysia) was not done for these metals, instead an import based on global production and the transport to Malaysia was modelled, resulting in so called consumption mixes. A copper matte process (100% import), a regionalized copper process based on imported copper matte and an additional global copper mix process were generated. Primary aluminium is not produced in Malaysia. The aluminium sheet and profile processes are based on a global primary aluminium mix, the extrusion process and the sheet making processes are regionalized.
Copyright	Yes
Owner of data set	thinkstep
Quantitative reference	
Reference flow(s)	Electricity - 3.6 MJ (Net calorific value)
Time representativeness	
Data set valid until	2017
Time representativeness description	annual average

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MYLCID: Inputs and Outputs Flow

Inputs and Outputs

Inputs

Type of flow	Classification	Flow	Variable	Location	Function type	Mean amount	Resulting amount	Minimum amount	Maximum amount	Uncertainty distribution type	Relative StdDev in %	Data source type	Data derivation type / status	General comment
Elementary flow	Resources / Resources from air / Renewable material resources from air	air				4.66603 kg	4.66603 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Calculated	
Elementary flow	Resources / Resources from ground / Non-renewable element resources from ground	antimony				3.0303E-14 kg	3.0303E-14 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation	
Elementary flow	Resources / Resources from ground / Non-renewable material resources from ground	barium sulfate				2.88277E-15 kg	2.88277E-15 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation	
Elementary flow	Resources / Resources from ground / Non-renewable material resources from ground	baryte				2.16108E-10 kg	2.16108E-10 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation	
Elementary flow	Resources / Resources from ground / Non-renewable material resources from ground	basalt				1.56004E-9 kg	1.56004E-9 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Calculated	
Elementary flow	Resources / Resources from ground / Non-renewable material resources from ground	bauxite				1.42214E-6 kg	1.42214E-6 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation	
Elementary flow	Resources / Resources from	bentonite				3.2875E-5 kg	3.2875E-5 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation	

Best Partner for Innovation

MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY SIRIM

MYLCID: Emissions

Outputs

Type of flow	Classification	Flow	Variable	Location	Function type	Mean amount	Resulting amount	Minimum amount	Maximum amount	Uncertainty distribution type	Relative StdDev in %	Data source type	Data derivation type / status
Product flow	Valuable substances / Energy carrier / Electric power	Electricity				3.6 MJ	3.6 MJ	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to water / Emissions to fresh water	carbofuran				3.36751E-16 kg	3.36751E-16 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Calculated
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon dioxide (biogenic)				0.0189252 kg	0.0189252 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon dioxide				0.803438 kg	0.803438 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon disulfide				1.94995E-19 kg	1.94995E-19 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon monoxide				2.83726E-4 kg	2.83726E-4 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon-14				2.95732E-5 kBq	2.95732E-5 kBq	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	methane (biogenic)				5.70727E-12 kg	5.70727E-12 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Calculated
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	methane				0.00233478 kg	0.00233478 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	methanol				3.86424E-7 kg	3.86424E-7 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Calculated

MYLCID: Full view of dataset

Dataset: MY; Diesel

Process Data set: Diesel at refinery; from crude oil; production mix, at refinery; 50 ppm sulphur (en) en

Collapse all sections | Go back | Close

Process information

Key Data Set Information

Location	MY
Geographical representativeness description	The data set represents the country specific situation in Malaysia, focusing on the main technologies, the region specific characteristics and / or import statistics.
Reference year	2013
Name	Base name ; Treatment, standards, routes ; Mix and location types ; Quantitative product or process properties Diesel at refinery; from crude oil, production mix, at refinery; 50 ppm sulphur
Use advice for data set	The data set can be used for all LCA/CF studies where the specific refinery product is needed. Combination with individual unit processes using this commodity enables the generation of user-specific (product) LCAs.
Technical purpose of product or process	Supply of 1 kg diesel fuel for road, rail, and ship transportation, electricity generation, and other consumers.
Classification	Class name ; Hierarchy level GaBiCategories: Energy carriers / Crude oil based energy carriers
General comment on data set	For each material or good with domestic production a regionalized LCI data set was established using Malaysian specific energy supply chains and if possible also Malaysian specific preliminary products. The regionalisation was conducted based on the product systems in the GaBi 6.4 data base. Most of these product systems for materials/goods have German, European or Global boundary conditions. Energy: All energy data sets with exception of the compressed air processes (unit processes) are modelled with Malaysian boundary conditions. Fuel mixes (import and domestic production) are modelled according to statistical data and specific emission data for the relevant production countries and transportation routes. Inorganic and organic chemicals: For all inorganic and organic chemicals the assumption was made that thermal energy and steam is generated from natural gas. Minerals: According to the Malaysian Mineral Yearbook close to 100% of the Gypsum is imported from Thailand and Barite is imported from Thailand and China. These data sets were regionalized with Thai or Chinese energy data sets. Construction materials: The energy carriers used for the production of cement, calcium oxide or particles board varies a lot depending on county and region. For the cement production and lime (calcium oxide) production 95% coal use and 5% use of palm kernel shell (PKS) will be assumed based on several publications. The use of old tyres was neglected. For the production of particle boards or plywood energy supply (power and thermal energy) by biomass was assumed. Metals: The regionalization was done based on the experts at SIRIM and several publications as well as an extended internet research. For the metals gold, zinc, ferro chrome, ferro nickel and primary lead 100% or close to 100% import was found. A real regionalization (production in Malaysia) was not done for these metals, instead an import based on global production and the transport to Malaysia was modelled, resulting in so called consumption mixes. A copper matte process (100% import), a regionalized copper process based on imported copper matte and an additional global copper mix process were generated. Primary aluminium is not produced in Malaysia. The aluminium sheet and profile processes are based on a global primary aluminium mix, the extrusion process and the sheet making processes are regionalized.
Copyright	Yes
Owner of data set	thinkstep

Quantitative reference

Reference flow(s)	Diesel - 1.0 kg (Mass)

MYLCID: Emissions

Outputs

Type of flow	Classification	Flow	Variable	Location	Function type	Mean amount	Resulting amount	Minimum amount	Maximum amount	Uncertainty distribution type	Relative StdDev in %	Data source type	Data derivation type / status
Product flow	Valuable substances / Energy carrier / Fuels / Crude oil products / Refinery products	Diesel				1.0 kg	1.0 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon dioxide (biogenic)				9.80925E-4 kg	9.80925E-4 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon dioxide				0.23991 kg	0.23991 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon disulfide				5.14252E-20 kg	5.14252E-20 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	carbon monoxide				3.21769E-4 kg	3.21769E-4 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	methane				0.00555651 kg	0.00555651 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation
Elementary flow	Emissions / Emissions to air / Emissions to air, unspecified	methanol				4.00287E-8 kg	4.00287E-8 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Calculated
Elementary flow	Emissions / Emissions to water / Emissions to fresh water	methanol				1.19623E-8 kg	1.19623E-8 kg	0.0	0.0		0.0 %	Mixed primary / secondary	Unknown derivation

MYLCID: Data Ownership

Administrative information	
Commissioner and goal	
Commissioner of data set	SIRIM
Intended applications	This background data set can be used for the generation of user-specific (product) LCAs.
Data generator	
Data set generator / modeller	thinkstep
Data entry by	
Time stamp (last saved)	2015-03-01T07:00:00+08:00
Data set format(s)	ILCD format 1.1
Data entry by	thinkstep
Official approval of data set by producer/operator	No official approval by producer or operator
Publication and ownership	
UUID	a4bc9753-b6dd-4900-ba3a-a1cf63e156bd
Date of last revision	2015-03-01T07:00:00+08:00
Data set version	09.00.000
Workflow and publication status	Data set finalised; entirely published
Unchanged re-publication of	Malaysian Life Cycle Inventory Database
Owner of data set	thinkstep

MYLCID: Data Ownership

Administrative information	
Commissioner and goal	
Commissioner of data set	SIRIM
Project	None
Intended applications	This background data set can be used for the generation of user-specific (product) LCAs in copying and printing sector.
Data generator	
Data set generator / modeller	SIRIM
Data entry by	
Time stamp (last saved)	2018-12-28T11:58:04.000
Data set format(s)	ILCD format 1.1
Data entry by	SIRIM
Official approval of data set by producer/operator	No official approval by producer or operator
Publication and ownership	
UUID	f3a2e40e-97bf-437d-9a95-92d4d1505642
Date of last revision	2018-12-28T11:58:04.000
Data set version	00.00.001
Workflow and publication status	Data set finalised; entirely published
Unchanged re-publication of	Malaysian Life Cycle Inventory Database
Owner of data set	SIRIM

MYLCID: Administration

- Cost to cover for maintenance & administrative processing
  - RM 225 per LCI dataset (html format)
  - RM 450 per LCI dataset (ILCD format)
- Online database granted access
  - 5 working days

MYLCID: Way Forward for Populating Database

- Collaboration with local LCA practitioners and stakeholders
  - As data provider / data owner
- Discussion with potential data providers
  - Afternoon session, 23 April 2019, SIRIM-ETRC

thank you

SIRIM Berhad
(Environmental Technology Research Centre)
Website: www.sirim.my

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Introduction to Carbon Footprint Calculation platform and Database

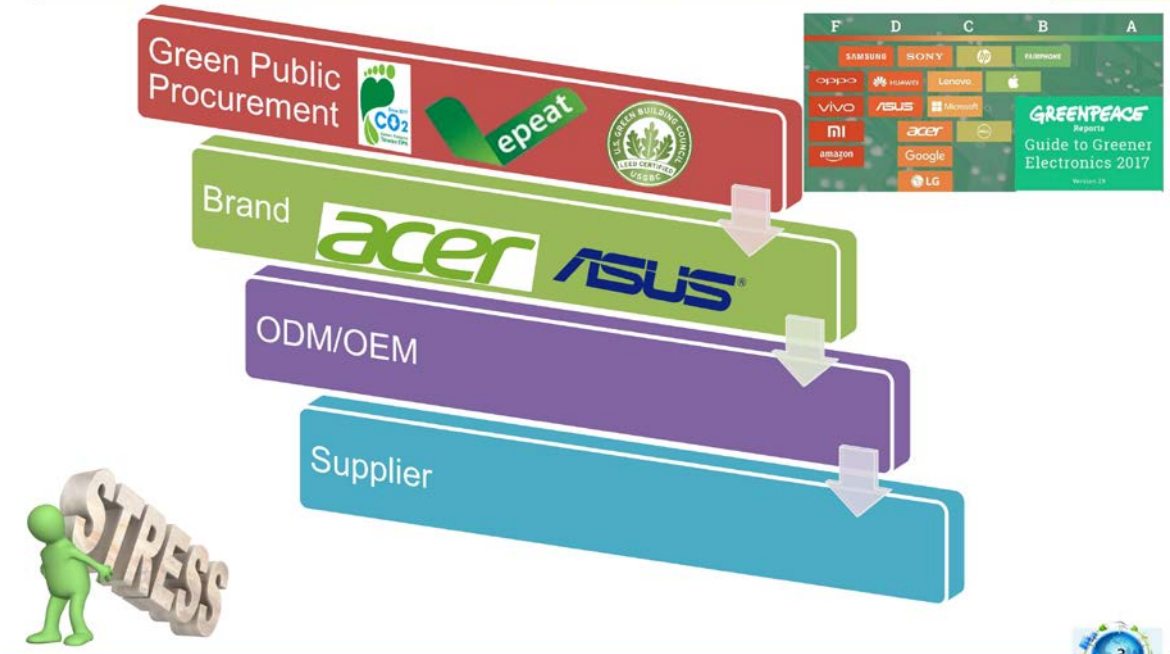
23th,Apr.,2019

Chih-Hung Chu
Project Assistant Manager
Industrial Technology Research Institute, Taiwan

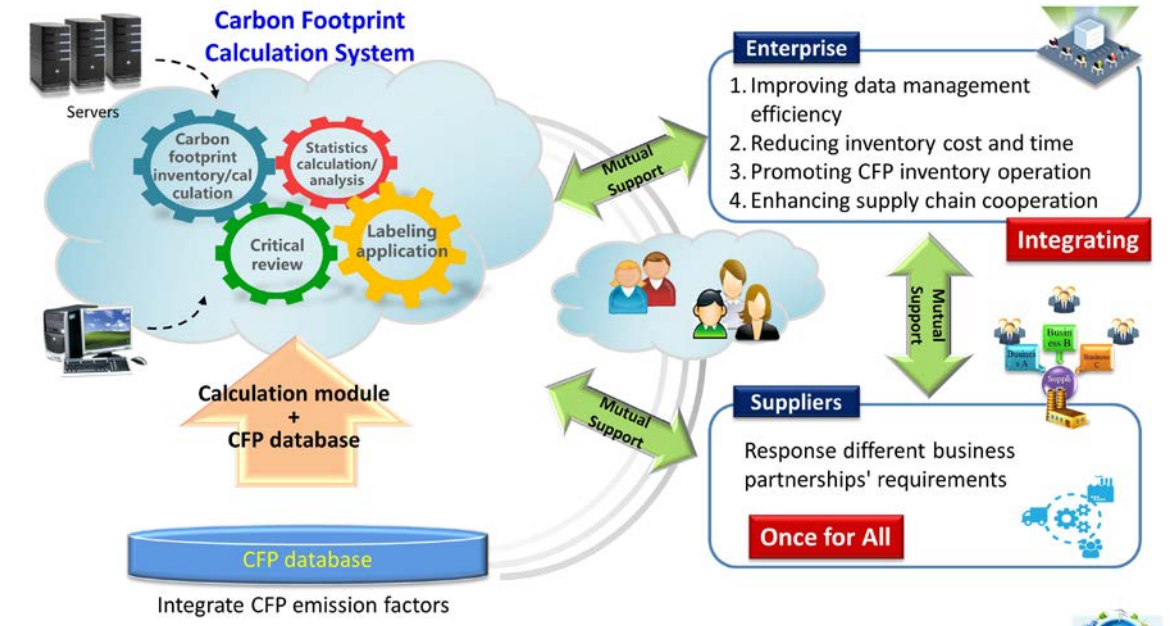
Outline

1. Background
2. Introduction to function modules
3. The CFP database in Taiwan
4. Summary

Background of building up the platform

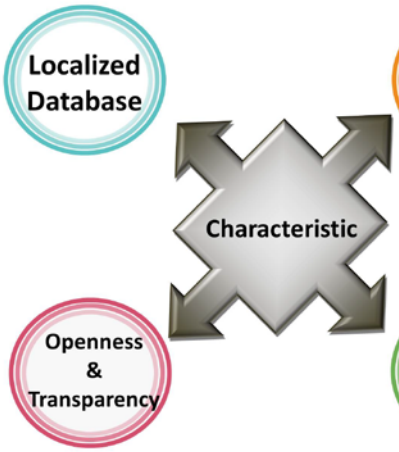


Background of building up the platform



Characteristic of Carbon Footprint Calculation Platform

1. Integrate the carbon footprint emission factor established by different sectors
   - until now, there are **799** datasets covering 20 industries is approved by Taiwan EPA.
2. Establish the benchmarks of carbon emission factors for variety of products in Taiwan.



1. Unifying inventory sheet
2. Confirm the online inventory process and data immediately

1. Using the same database improves the comparability of CFP info.
2. Shorten the schedule of carbon information disclosure

1. Do not need to buy and maintain their own databases and software.
2. Save the time for inventorying afterward.

Promotion of Carbon Footprint Label in Taiwan

Speaker : Leon Kan
E-mail : leon@ema.org.tw
TW-CFP:https://cfp.epa.gov.tw/carbon/defaultPage.aspx

Taiwan Environmental Management Association

2019/04/23

Carbon Footprint Labels in the World

Countries are trying to analyze their products' life cycle carbon footprint
- present data in form of carbon label - to encourage low-carbon consumption.

https://cfp.epa.gov.tw/EN

2009
- Try-out for Taiwan Carbon Footprint Label
- Launch the "Taiwan Carbon Footprint Labels"

2010
- Announcement of Guidelines on calculating carbon footprint for Products and Service"
- Set up web site for Carbon Footprint Label

2013
- 1st Asia Carbon Footprint Network(ACFN) Meeting

2014
- Implementation of Product Carbon Footprint Reduction Label program

2017
- 1st Low Carbon Products Award
- About 10,000 to 300,000 NTD/each company

2

Taiwan's Carbon Footprint Label

The number stands for "carbon footprint": CO2 emission equivalence calculated based on materials & energy consumed during product life cycle.

A heart that loves the nature; CO2 reduction for a "cool" planet; and green consumption for low-carbon society

Green leaf stands for health and environmental friendliness

CO2 Carbon Footprint Taiwan EPA

3

Promotion of Product Carbon Footprint Labeling Scheme

- Established product carbon labeling review committee and relevant regulations
- Accepting Product Carbon Footprint Label application
  - 794 products awarded carbon label (as of March 2019)
- Assisted 39 products in calculating carbon footprints since 2010
- Promotional activities to raise public's awareness

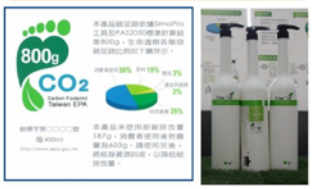
Promotion of Product Carbon Footprint Labeling Scheme

- 39 products from 32 companies applied for product carbon footprint label certification and approved by EPA.
- - bottled water, soft drinks, shampoos, television sets, LCD monitors, laptop computers, wireless hubs and incineration service

Bottled water

Soda drink

Shampoo



5

Development of Product Category Rules for Carbon Footprints

- Taiwan EPA working with 20 manufacturers associations in developing product category rules (PCR) for carbon footprint
- 97 PCRs are available in Taiwan

PCR Name	Version
Fats and Oils to Be Used in Food Processing	1.0
Waste Treatment Services	2.0
Refined edible vegetable oil and its flatting oil	2.0
Processed Food of Aquatic Animals	2.0
Mouse	2.0
Keyboard	2.0
Real Estate Operation Services	2.0
Tea	3.0
Nonstore retailing Services	2.0

6

Development of Product Carbon Footprint Label

Stage	Objective	Strategy
First Stage	■ Verify guidelines and methodologies of product carbon footprint ■ Establish Carbon Footprint Label Scheme	■ Decide on design of Taiwan Carbon Footprint Label ■ Establish carbon footprint label application/issuance system, and Incentive for voluntary carbon footprint labeling
Second Stage	■ Popularize the Carbon Footprint Label of Product ■ Develop the Carbon Footprint Reduction Label (emissions below the baseline value or less)	■ The guideline will follow ISO14067 ■ Building Product Carbon Footprint Database, and develop the Carbon Footprint Reduction Label

130g CO2 Carbon Footprint Taiwan EPA

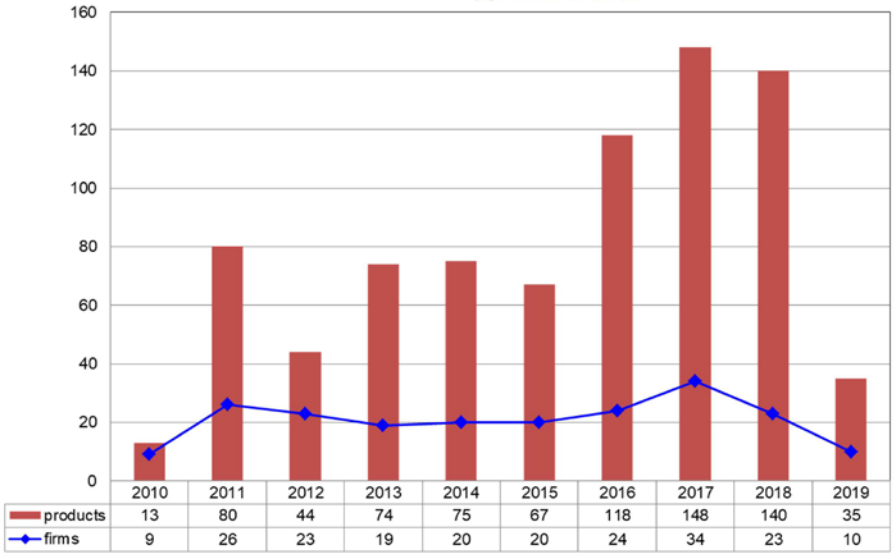
First Stage
The Carbon Footprint Label

CO2 Carbon Footprint Taiwan EPA

Second Stage
The Carbon Footprint Reduction Label

7

Product Carbon Footprint Label Status



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
products	13	80	44	74	75	67	118	148	140	35
firms	9	26	23	19	20	20	24	34	23	10

Soybean Oil

wine

Pacific SOGO Department Stores Retail Services – Tianmu Store

Waste Incinerated Services

- Until March 31, 2019 Taiwan EPA has awarded 208 companies to apply Product Carbon Footprint Label on a total of 794 products.

8

Thanks for your attention

Taiwan Environmental Management Association

9

LCI Database Applications for Sustainable Consumption and Production (SCP)

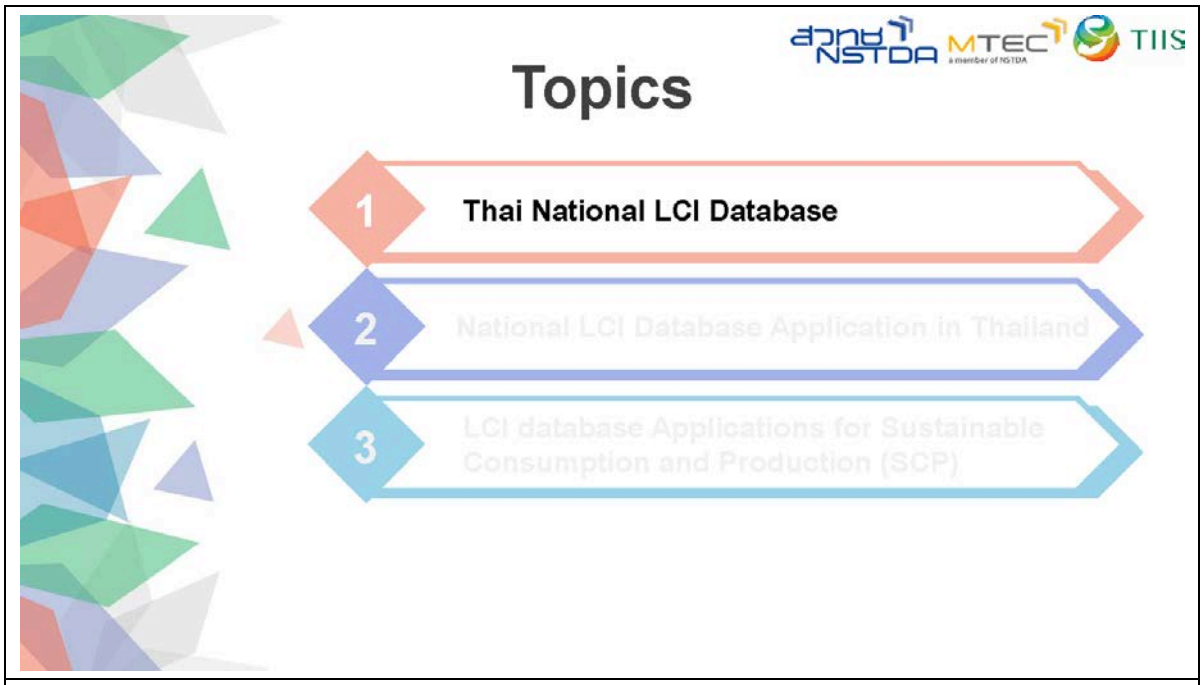
Ms.Wanwisa Thanungkno

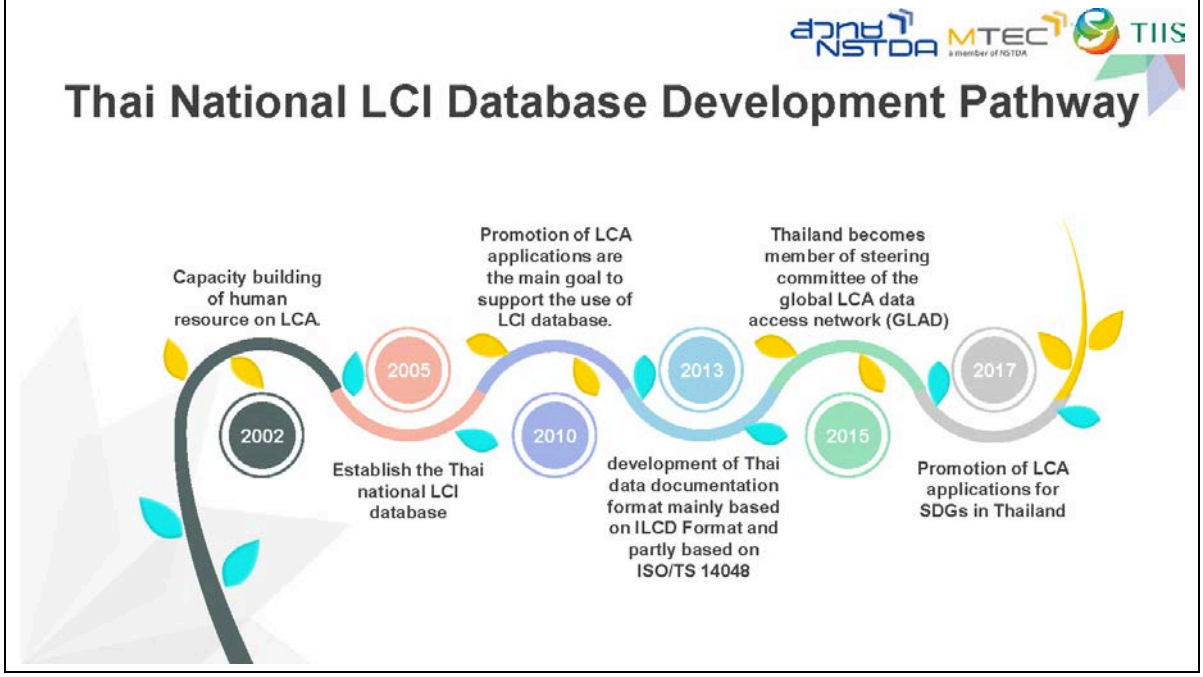
Technology and Informatics Institute for Sustainability (TIIS)
National Metal and Materials Technology Center (MTEC)
National Science and Technology Development Agency (NSTDA)

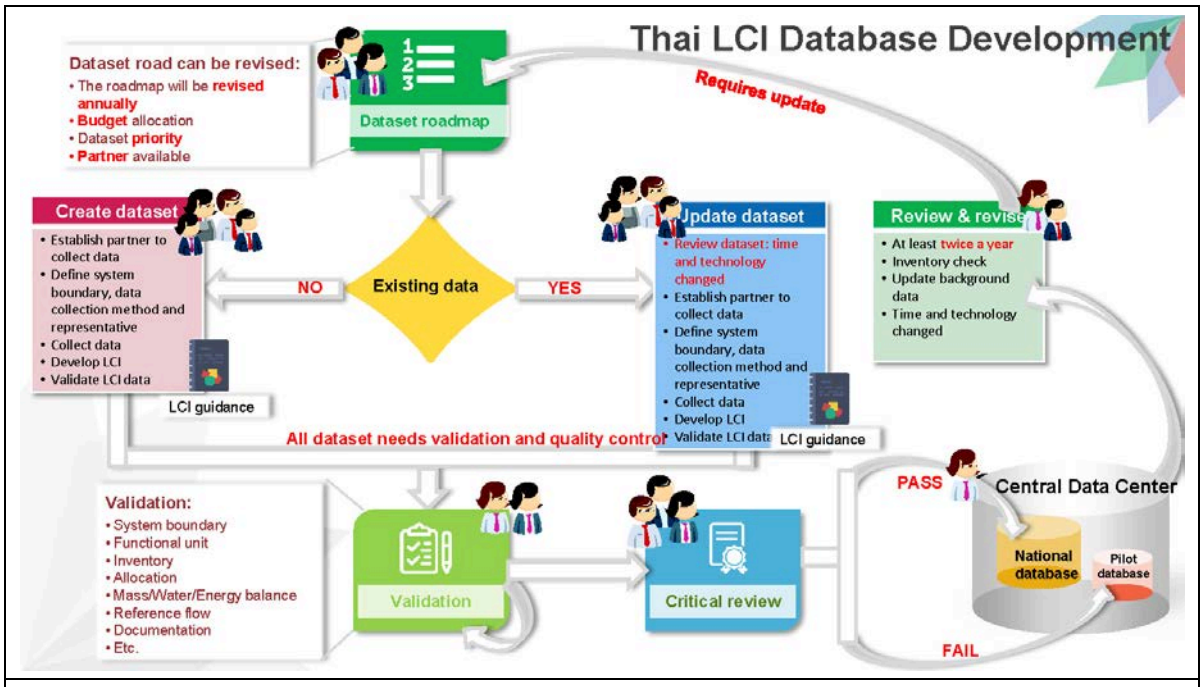
23 April 2019

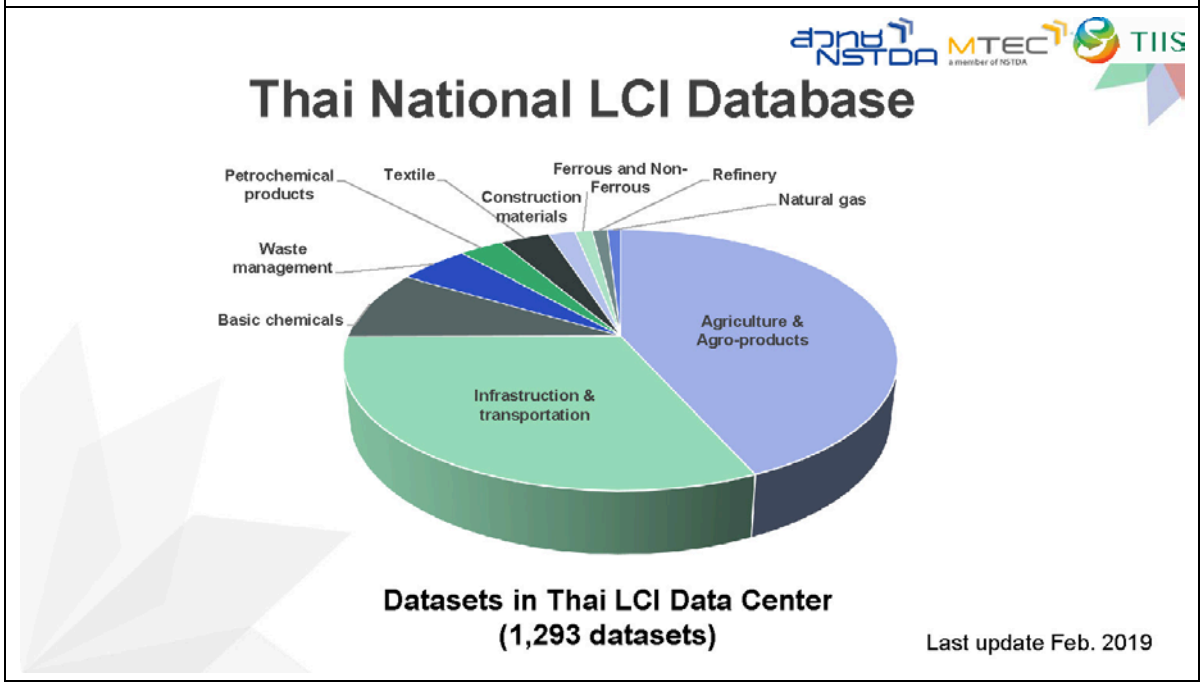
Topics

1. Thai National LCI Database
2. National LCI Database Application in Thailand
3. LCI database Applications for Sustainable Consumption and Production (SCP)


Topics
1
Thai National LCI Database
2
National LCI Database Application in Thailand
3
LCI database Applications for Sustainable Consumption and Production (SCP)


Thai National LCI Database Development Pathway
2002
Capacity building of human resource on LCA.
2005
Establish the Thai national LCI database
2010
Promotion of LCA applications are the main goal to support the use of LCI database.
2013
development of Thai data documentation format mainly based on ILCD Format and partly based on ISO/TS 14048
2015
Thailand becomes member of steering committee of the global LCA data access network (GLAD)
2017
Promotion of LCA applications for SDGs in Thailand

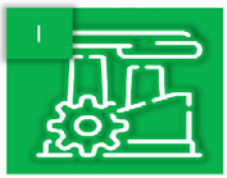

Thai LCI Database Development
Dataset road can be revised:
• The roadmap will be revised annually
• Budget allocation
• Dataset priority
• Partner available
Dataset roadmap
Requires update
Create dataset
• Establish partner to collect data
• Define system boundary, data collection method and representative
• Collect data
• Develop LCI
• Validate LCI data
LCI guidance
NO
Existing data
YES
Update dataset
• Review dataset: time and technology changed
• Establish partner to collect data
• Define system boundary, data collection method and representative
• Collect data
• Develop LCI
• Validate LCI data
LCI guidance
Review & revise
• At least twice a year
• Inventory check
• Update background data
• Time and technology changed
All dataset needs validation and quality control
Validation:
• System boundary
• Functional unit
• Inventory
• Allocation
• Mass/Water/Energy balance
• Reference flow
• Documentation
• Etc.
Validation
Critical review
PASS
Central Data Center
National database
Pilot database
FAIL


NSTDA
MTEC
a member of NSTDA
TIIS
Thai National LCI Database
Petrochemical products
Textile
Construction materials
Ferrous and Non-Ferrous
Refinery
Natural gas
Waste management
Basic chemicals
Agriculture & Agro-products
Infrastruction & transportation
Datasets in Thai LCI Data Center
(1,293 datasets)
Last update Feb. 2019

Topics

1. Thai National LCI Database
2. **National LCI Database Application in Thailand**
3. LCI database Applications for Sustainable Consumption and Production (SCP)

The uses of LCA



Industry and other commercial enterprises

National governments and local, national and inter-go vernmental regulative bodies

NGOs, such as consumer organizations and environmental groups

Consumers, including governments as consumers

LCI/LCA is an essential element to support multidisciplinary applications

Topics

1. Thai National LCI Database
2. National LCI Database Application in Thailand
3. LCI database Applications for Sustainable Consumption and Production (SCP)

Sustainable Consumption and Production Roadmap 2017-2036 (SCP Roadmap - Thailand)

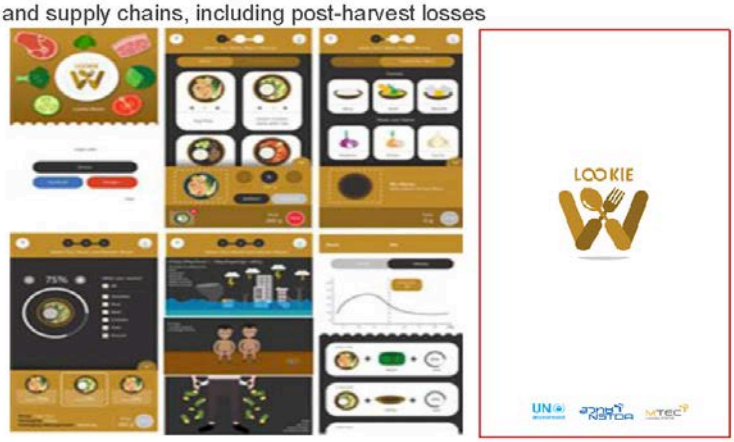
Vision	Mission	Target

• Thailand becomes one of leaders of sustainable production and consumption in ASEAN under Sufficiency Economy Philosophy and driven by the integration of social innovation by the year 2036.	• Change production patterns of all sectors in all areas to sustainable production.
	• Adjust behaviors of people and government agencies at all levels to achieve sustainable consumption patterns.
	• Drive innovation and knowledge-based society to support sustainable production and consumption
		• Production base
		  ○ Industry
		  ○ Agriculture
		  ○ Service/Tourism
		• Consumption base
		  ○ Green public procurement
		  ○ City
		  ○ Awareness/ Education

LCI database Applications for Sustainable Consumption and Production (SCP)

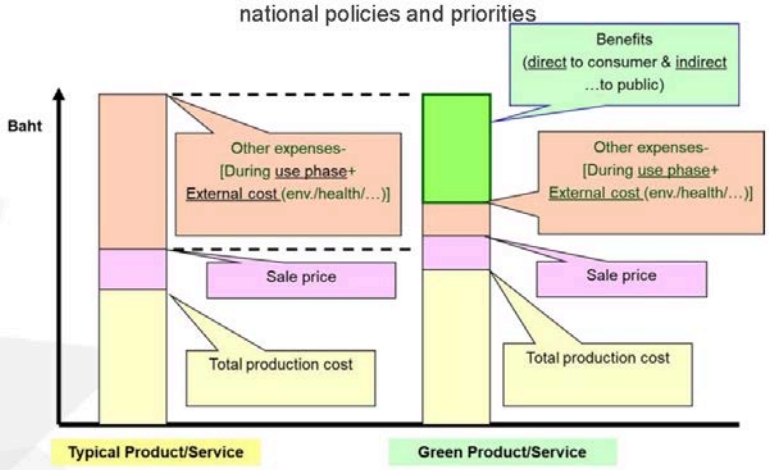
Target 12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses

"Lookie Waste": Mobile App for reducing food waste



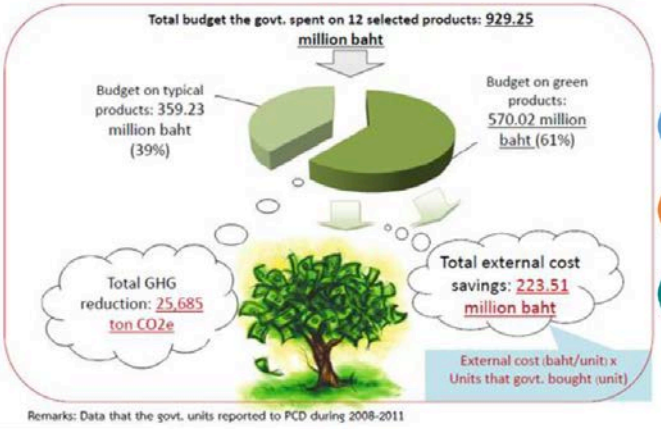
LCI database Applications for Sustainable Consumption and Production (SCP)

Target 12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities



LCI database Applications for Sustainable Consumption and Production (SCP)

Target 12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities



GPP Promotion Plan

- 2008: 1st GPP Promotion Plan (2008-2011) for the Central Government
- 2012: 2nd GPP Promotion Plan (2012-2016) for further promote GPP to all levels of government, central to local
- 2017: 3rd GPP Promotion Plan (2017-2021) for further promote GPP to Private sector


THANK YOU FOR YOUR KIND ATTENTION
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Technology and Informatics Institute for Sustainability (TIIS)
National Metal and Materials Technology Center (MTEC)
National Science and Technology Development Agency (NSTDA)

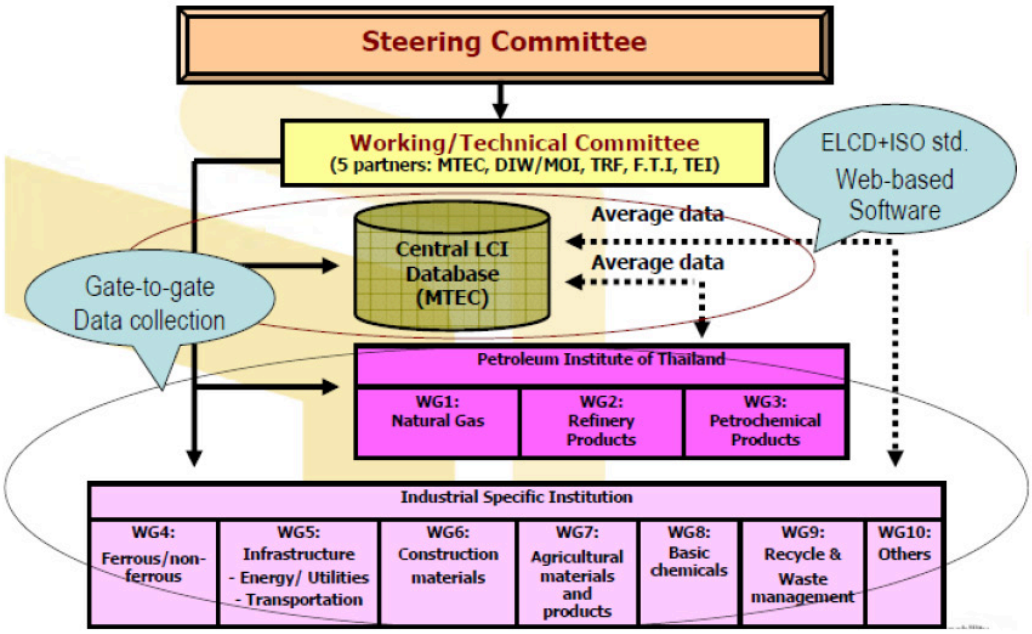
TGO's Carbon Footprint, Carbon Footprint Reduction and Carbon Neutral in Thailand

Phakamon Supappunt,
Program Manager of Carbon Business Office at Thailand Greenhouse Gas Management Organization

Thailand Greenhouse Gas Management Organization (Public Organization) (TGO)

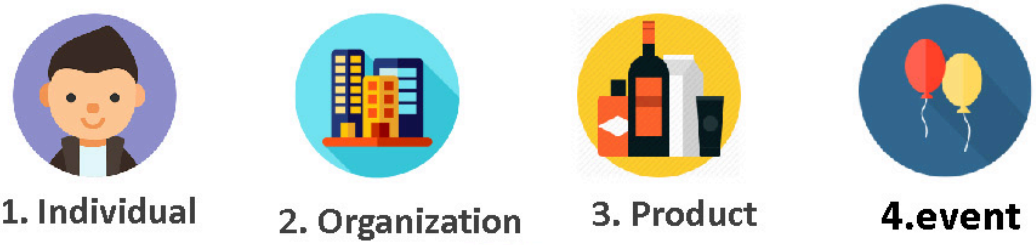
- **Thailand Greenhouse Gas Management Organization (Public Organization), or TGO,** under the Ministry of Natural Resources and Environment of Thailand, is an autonomous governmental organization with the specific purpose of being an implementing agency working on greenhouse gas (GHG) emission reduction in Thailand.
- The Thai Cabinet's resolution approved the establishment of TGO as public organization in accordance with the law on May 15 B.E. 2550
- TGO has been established with a vision to garner effective management of greenhouse gas emissions to support economy, environmental conservation and society.

Life Cycle Inventory Database developed by MTEC



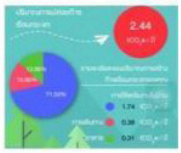
Ref: Mungcharoen, T. National LCA Project – Thailand

LCI DB for GHG measurement

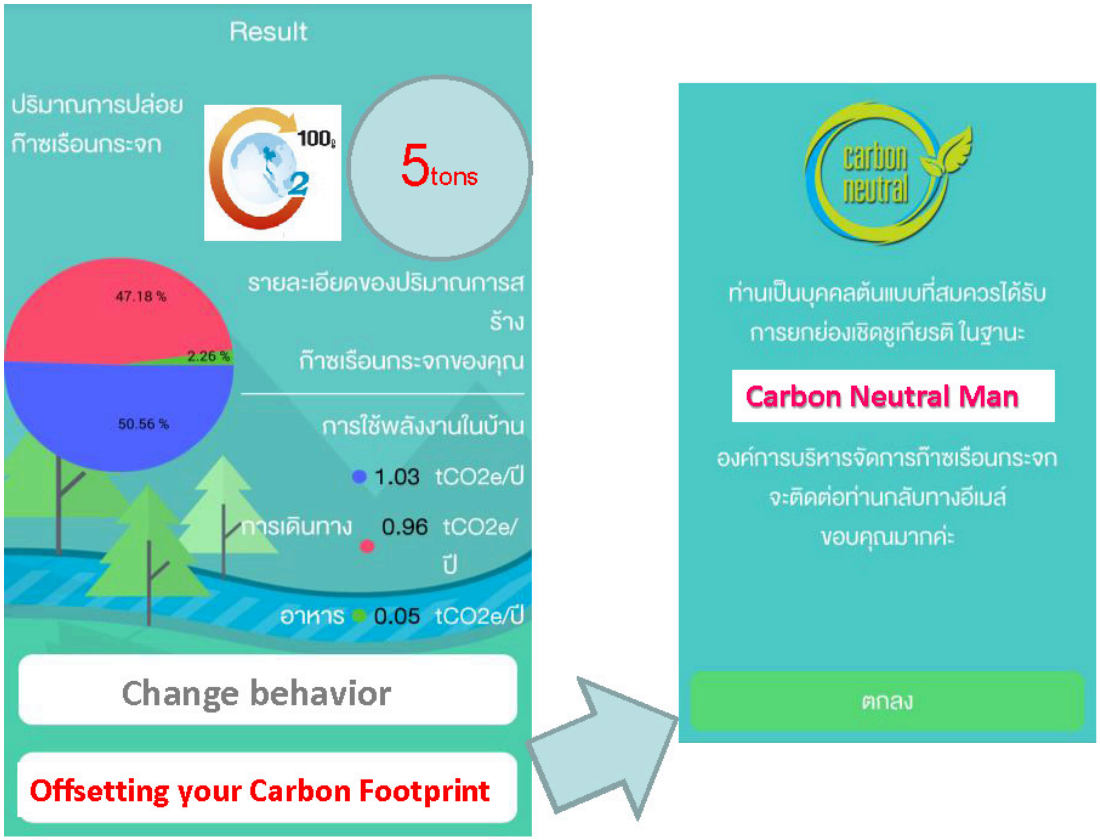


To quantify the GHG emission and set its reduction target

Individual CF



Individual CF Calculation



Carbon Footprint of Products : CFP

อบก TGO

MTEC
a member of NSTDA

- TGO and MTEC (National Metal and Material Technology Center of Thailand) launched the **"Carbon Footprint of Products"** Project in Thailand in 2009.

- Objectives: To promote the use of a carbon footprint on Thai products; which could increase the competitiveness of Thai industries for meeting the global trend market and to provides GHG emission of products to consumers.

The National Guidance on CF Calculation for Products

References

- ISO 14040
- ISO 14044
- ISO 14067
- ISO 14025
- PAS 2050
- Japanese Guideline

available to download at
http://thaicarbonlabel.tgo.or.th/

CO_2 emission factor for CFP calculation

- National LCI database,
- Thesis and research which has peer reviews/publication,
- LCA software
- IPCC

CFP products :2,940 products /541 companies (1/04/2019)

Carbon Footprint of Product >> Carbon Footprint Reduction (CFR)

- TGO launched the "Carbon Footprint Reduction in 2014, to demonstrate an achievement in reduction the product's carbon footprint through its life cycle.
  - Achieving in reduction of its present year carbon footprint when compare to its base year's carbon footprint which shall not less than 2% or
  - Achieving in reduction of its carbon footprint which shall lower or equal to the benchmarking threshold of each product category set by TGO

CFR : 546 products
(reduced GHG 2,978,193 tCO_2)

The reasons why manufacturers are interested to have the CF label

- **We found that manufacturers want the CFP logo for**
  - **Response to the Corporate Social Responsibility (CSR) program**
  - **Identify GHG emissions hotspots in their supply chain leading to emissions reductions and cost savings**
  - **Want to increase their export competitiveness**
  - **CFP label was requested by customers in other countries**
  - **Same product by other manufacturers has CFP certified**

Carbon Footprint for Organization

TGO and MTEC launched the "Carbon Footprint for Organization in 2010.

- Aimed business to evaluate the amount of GHG by the activities of the organization.

- Identify causes of greenhouse gas emissions, and find ways to reduce greenhouse gas emission.
- Report GHG data to public.

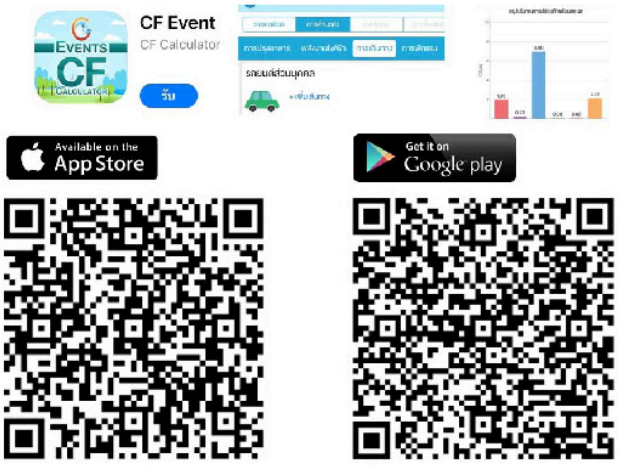
The National Guidance on Carbon Footprint Calculation for Organizations

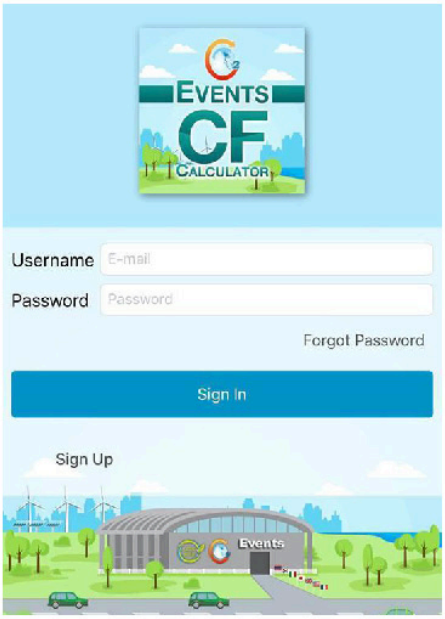
- Scope
- Normative reference
- Terms and definitions
- GHG source, unit
  - GWP
  - Time period
  - Unit of analysis
  - Supporting data
  - Etc.
- Methodology framework
- Calculate method
- Etc.

Certified Organization: 352 (1/4/2019)

Carbon Footprint of Event : CFE

Event CF Calculation





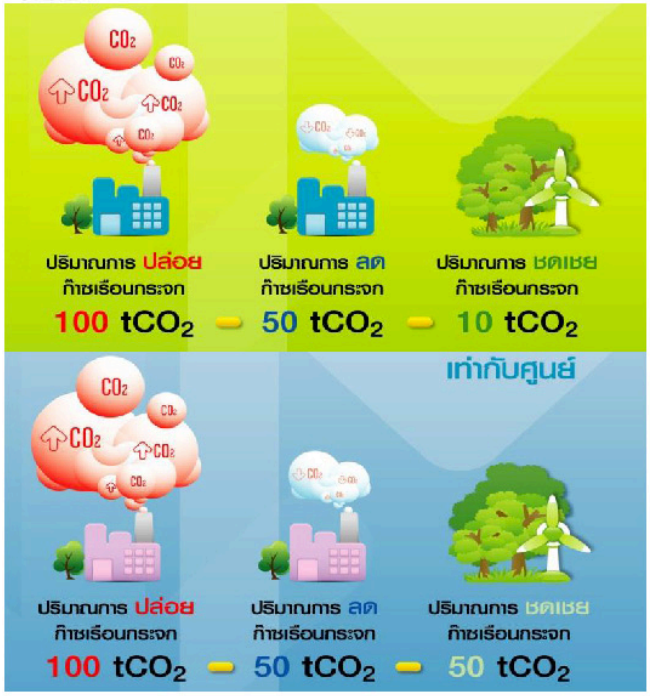
3 scopes for Event Calculation

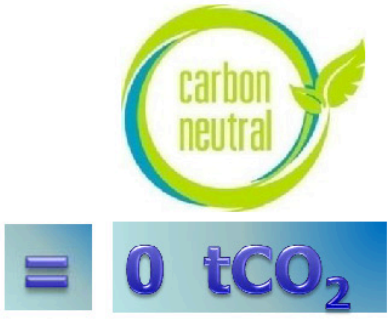
Scope 1 : Direct GHG Emissions	Scope 2 : Energy Indirect GHG Emissions	Scope 3 : Other Indirect GHG Emissions
LPG used in cooking (kg)	**Electricity** (kWh)	**Travel** (pkm/L)
		Hotel (room/night)
		Document (kg)
		Waste (kg)

Carbon Footprint >>> Carbon Offset

- Thailand Carbon Offsetting Program (TCOP)
  - To reduce domestic GHG emissions through certified carbon credits to offset GHG emissions from organizational, product life cycles, event, individual.
  - To support the domestic voluntary carbon market and encourage project development for reducing GHG emissions in the private sector, local governments and in other sectors.

Principle of Carbon Offset





The carbon offset/neutral Label

carbon offset **For organization**

carbon neutral **For individual, product, events, organization**

Carbon Neutral Man : 741 persons

Thailand Greenhouse Gas Management Organization

Carbon Neutral Certificate

presented to

Ms. Kularb Kimsri

for offsetting

5.91 tons of CO_2 Emissions

from Project: Thanawat wastewater treatment and biogas utilization project

Serial number: 1777-73850436-73850440-VCU-009-MER-TH-13-408-28032006-31122006-0

By participating in this carbon offsetting program, you are contributing to the fight against global warming and supporting greenhouse gases reduction projects in Thailand and enable Thailand's transition to a low-carbon future.

Mrs.Prasertsuk Chanarnarn

Deputy Executive Director, Acting Executive Director

Thailand Greenhouse Gas Management Organization (Public Organization)

March 24, 2013

Carbon Neutral Product : 29 Products

Sunflower Oil, Soybean Oil 55 products

Sunflower Oil, 1/2 liter (100,800 bottles) Soybean Oil, 1 liter in (684,000 bottles)

Example of Carbon Offset/Carbon Neutral Organizaion

กลต

krungsri

SET
ตลาดหลักทรัพย์แห่งประเทศไทย

ธนาคารแห่งประเทศไทย
BANK OF THAILAND

KASIKORNTHAI

Bangkok Bank
ธนาคารกรุงเทพ

SCB
ไทยพาณิชย์

Carbon Neutral Events

KhoKhew10 # Very first ZERO-CARBON RACE

10 Mar 2019 @KhaoKheow Zoo, Chonburi, Thailand

วิ่งสร้างเมือง RUN for BETTER CITY

C asean Sustainable Development Forum & Transforming Asia Pacific

Thailand MICE Forum 2018

ASAI Brand Launch 2018

MAI FORUM 2018

SET Social Impact Day 2018

Wonderfruit Festival 2017

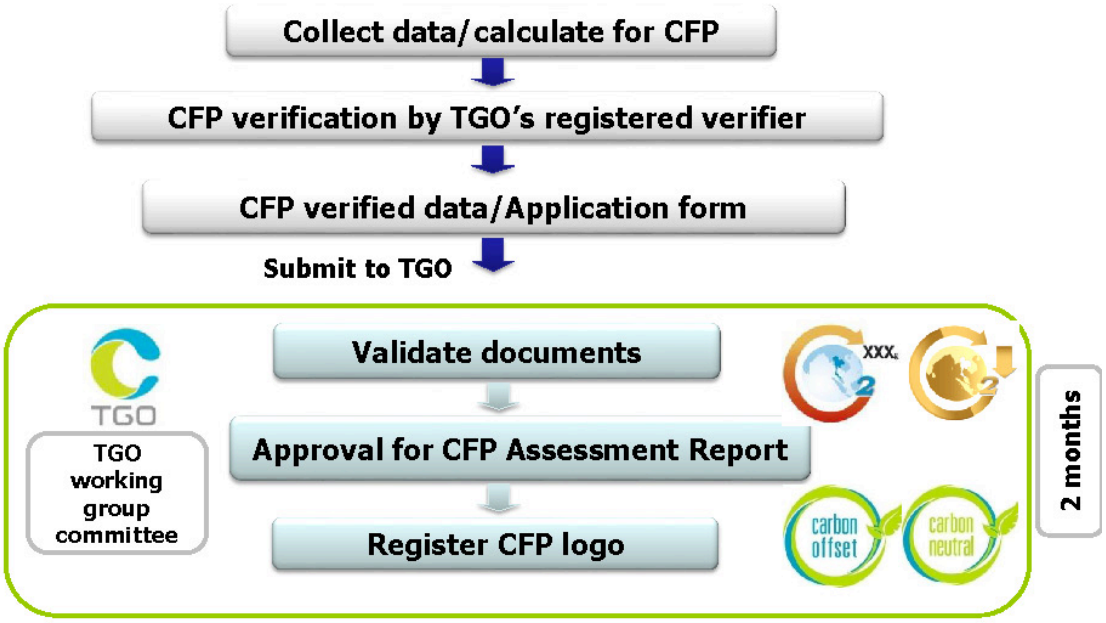
ESTEE LAUDER event @Siam Paragon

Current Status

- Carbon Neutral Product : 29
- Carbon Neutral/Offset Organization : 54
- Carbon Neutral Event : 43
- Individual : 741

GHG Reduction : 204,990 ton CO_2e

Registration Procedure



Human Resource for CFP/CFR

– capacity building for our verifiers and consultants

- registered consultants
  - 81 persons
  - 6 entities
- registered verifiers
  - 47 persons
  - 4 entities

http://thaicarbonlabel.tgo.or.th

Thank you!

Thailand Greenhouse Gas Management Organization (Public Organization)

Government Complex Building B, 9th Floor, 210 Chaengwattana Road, Bangkok 10210

Tel. 02 141 9829; 092 245 6545

phakamon@tgo.or.th

Republic of Korea's Environmental Product Declaration(EPD)

2019. 4. 23.

KEITI

Contents

1. Introduction of KEITI

Korea Environmental Industry & Technology Institute

KEITI

1.1 Introduction of KEITI

◈ **KEITI?**

a quasi-government organization affiliated with the Ministry of Environment(MoE))

2. Overview of EPD

Environmental Product Declaration

KEITI

2.1 Overview of EPD

◈ The concept of EPD

: Measuring and displaying information about environmental impacts generated during the lifecycle of a product (including service)

※ According to ISO 14025

◈ The lifecycle of products

Raw material acquisition | Production | Distribution | Use | Disposal

◈ Environmental impacts?

2.2 Environment impacts

7

Resource Footprint Impact on development and consumption such as minerals and fossil fuels	**Carbon Footprint** Impact on climate change caused by greenhouse gas emitted into the air	**Ozone Depletion** Impact on ozone layer in the stratosphere caused by ozone depleting substances emitted into the air such as Freon gas	**Acidification** Impact on human activities and ecosystem caused by acidification material(NOx, SOx) in the air with melting by rainwater
Eutrophication Impact on eco-system caused by the excessive concentration of organic substances (nitrogen and phosphorous) in air, water and soil	**Photochemical Smog** Impact on human body and eco-system caused by pollutants on the ground surface generated through active materials from human activities reacting to light	**Water Footprint** Impact on water resources, such as water quality and quantity, caused by human's activity like agriculture, industry etc.	**Low Carbon Product?**

※ Redefined through reference to Guideline for the EPD and overseas impact assessment methodologies, such as CML and ReCiPe

2.3 Carbon footprint certification

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Step 1

CO2 Carbon Footprint 000g KOREA

Certification of carbon emission

2009~

Step 2

CO2 Carbon Footprint 000g KOREA ★ Low Carbon ★

Certification of low carbon emission

2011~

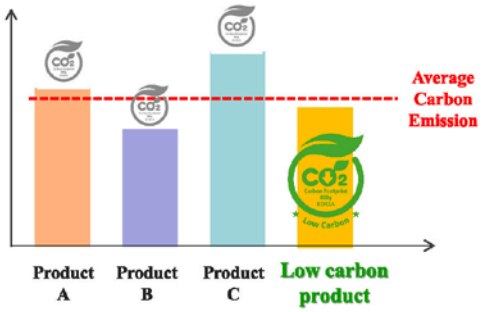
2.3 Certification of Low carbon products

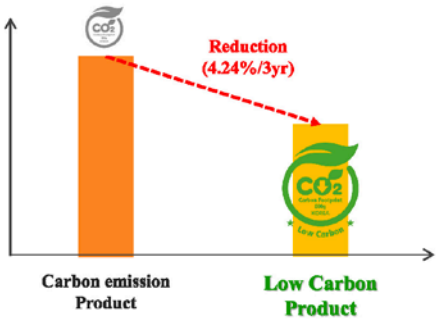
If the products received a carbon emission certification meet the specified criteria, these can get the certification of low carbon products.

◈ Criteria

1. Base on carbon emission level:
Certification based on average carbon emission from products of the same category

2. Base on carbon reduction rates:
Certification based on the national greenhouse gas reduction goal of government
(4.24%/3 years)





※ By Dec. 31, 2020, products satisfying only one of the criteria can also be certified

3. EPD certification system

Process, Certification Products and so on

KEITI

3.1 Legal Ground

11

- **Act : Environmental Technology and Industry Support Act**
- **Presidential Decree : Enforcement Decree of the Environmental Technology and Industry Support Act**
- **Minister of Environment Rule : Enforcement regulation of the Environmental Technology and Industry Support Act**
- **Ministry of Environment Notification**
  - Product Category Rules of Environmental Product Declaration
  - EPD Certification Verifier Qualification Criteria
  - EPD Certification Fee

3.2 Product category rules(PCRs)

12

- **Common PCRs : General rule**
  - **Energy using Product PCR**
  - **Energy non-using Product PCR**
    : Non-durable and durable product, production material(B2B product), Service
- **Individual PCRs :** PCR that reflects the characteristics of a particular product
  - **5 individual PCRs**
    : Toilet Bowl, Solid state drive, Automobile tires, Laundry detergent, Water Purifier
- **Using stage scenario :** Scenario of use stage of energy use product
  - **48 scenarios**
    : Motor vehicles, Household washing machine, Air cleaner, Television, Electric refrigerator, Microwave and multi-functional microwave, Mobile phone, Surveillance camera, etc.

3.3 EPD certification System

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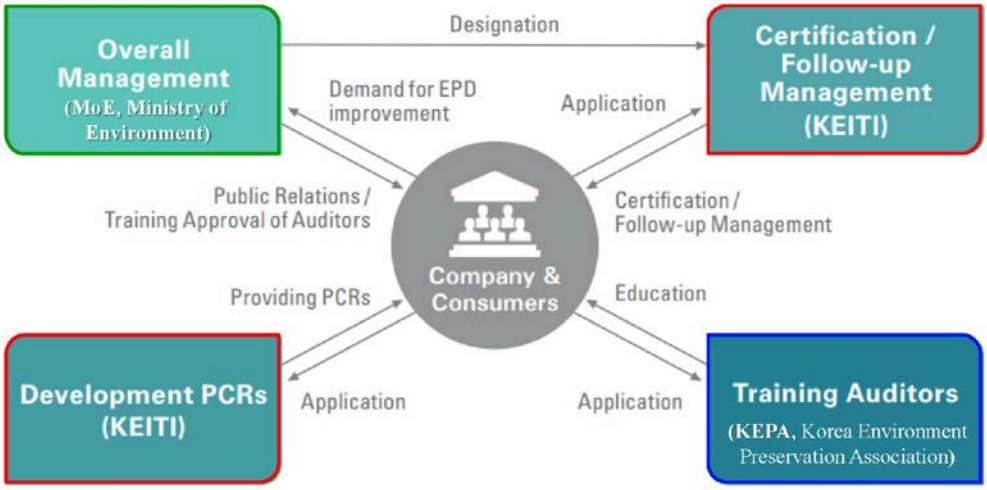
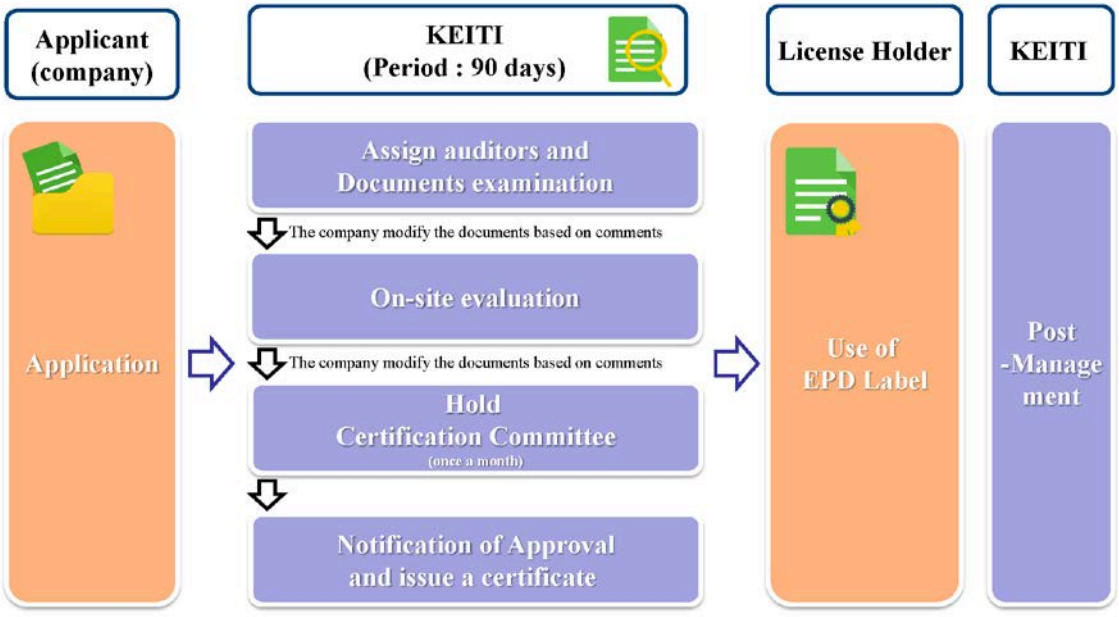
◈ Operational system



3.3 EPD certification System

14



3.4 EPD certification products

◈ 3,156 products (~March. 2019)

- EPD(7 impacts): 506 products
- Carbon Footprint: 2,640 products
  (Carbon Emission: 2,129 products / Low Carbon Product: 511 products)

	2015	2016	2017	2018	2019 (~March)
Products	2,267	2,570	2,823	3,068	3,156
EPD	344	346	375	454	506
Water Footprint	-	-	10	-	-
Carbon Footprint	1,923	2,224	2,438	2,604	2,640
Carbon Emission(Step 1)	1,571	1,819	1,978	2,108	2,129
Low Carbon(Step 2)	352	405	460	496	511

3.4 EPD certification products

3.4 EPD certification products

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3.5 EPD Logo

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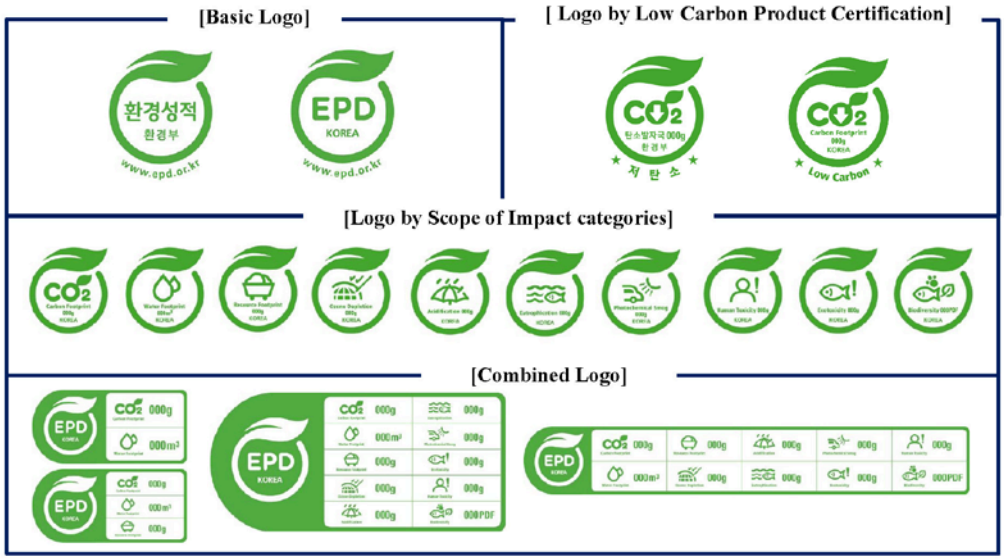
- **Developing logo by scope of impact categories, low carbon product certification and combination**



4. Supports on EPD certification

KEITI

4.1 Additional points for green building certification

◈ Green Building Certification(CBC)?

GBC certifies environmental performances of buildings

	Best	Excellent	High-quality	General
Grade	G-SEED ★★★★	G-SEED ★★★	G-SEED ★★	G-SEED ★

※ Target: Public building with a floor space of 3,000 or more, etc.

◈ Giving additional points to green building certification assessment

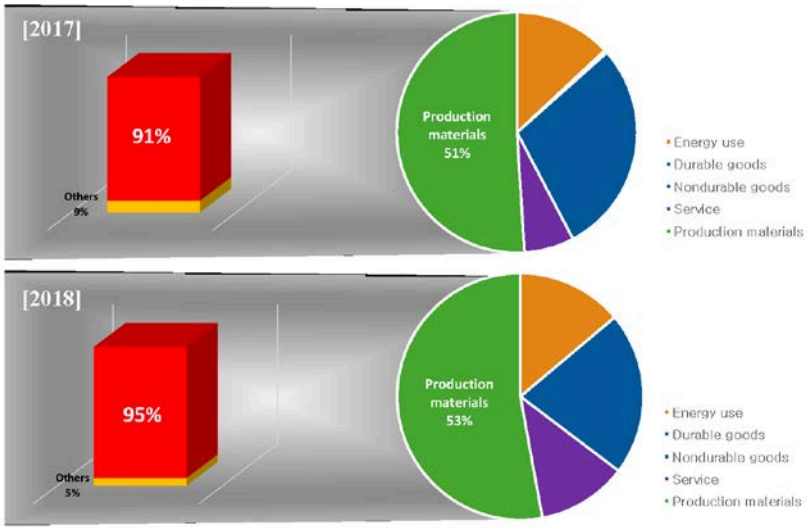
Give additional points when EPD certified building materials are used

Evaluation Criteria	Certification Item	Allocated Points
3. Materials and resources	3.1 Use of EPD products	1.6 ~ 4
	3.2 Use of low-carbon materials(0.4~1.0)	0.8 ~ 2

4.1 Additional points for green building certification

◈ **Certification ratio of construction materials among production materials**

36%(2015) → 47%(2016)→ 91%(2017)→ 95%(2018)



4.2 Promoting sale with green card

◈ **Green Card?** Relesed by the MoE and KEITI in 2011 to support green lifestyle and green consumption.

Green Card Benefits
Eco Money when purchasing eco-friendly products and EPD certificated products (up to 24%)
Using public transportation (bus, subway, KTX, express bus)
- Up to 10,000 points a month
Up to 100,000 points for energy saving
Using public facilities (tourism, culture, sports)
- Discount including free admission to 933 facilities across the country
5% accumulation for automatic payment of living expenses
5% accumulation for online businesses
KRW 2,000 discount on claim for online movie ticket booking
10% discount on claim for coffee
5% discount on claim for used automobile parts (scheduled)

- Green Credit Card users are rewarded with points that are converted into cash or can be donated to environmental funds
- Point accumulation when people purchase EPD certificated products(3%) and a low carbon product(5%) through government offices, local governments and businesses by using credit cards and point system

4.3 Certification support for SMEs

1. The fee reduction for Small and Medium sized Enterprises(SMEs)

- Apply to exemption from overhead expenses(be reduced by approx. 50%)
- Alleviate the burden of certification cost

2. Supporting a consulting fee (2012~)

- Provide financial support for the consulting fee
- Status: 60 products from 31 companies (2018)

3. Supporting regarding a cost for use of logo(2016~)

- Promote logo's using and improve P.R. effect by supporting logo manufacturing cost

4.4 Promotional activities

◈ Publishing and Distributing leaflets, information book and USB to promote

[Information Book on Certified Products]

[Carbon Footprint P.R. Leaflet]

[Carbon Footprint USB]

[Promotional Article in September Issue of Best Baby]

4.4 Promotional activities

◈ Operating permanent exhibition halls (2013~, 18 spots)

- Exhibition of EPD certified products (food and beverage, household items), educational programs

[Green Future Science Hall, Gimcheon (2015)]

[Gulponuri Climate Change Experience Center, Bupyeong (2016)]

[Climate Change Education and Experience Center, Yongin(2017)]

◈ Participating in domestic and international events, operating P.R. booths

- EPD booth at "ECO-EXPO Korea"

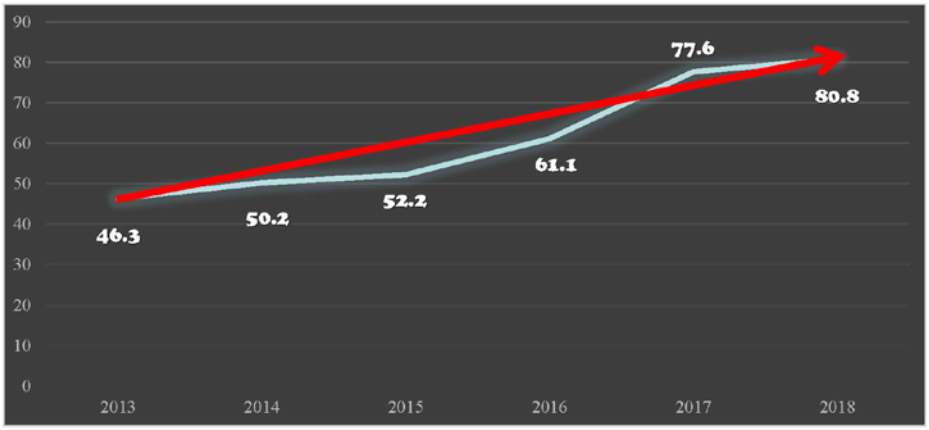
[EPD booth, EXPO Gimhae (2016)]

[EPD booth, EXPO Gimhae (2018)]

4.5 EPD Certification Recognition

- **Public Recognition Increasing Each Year**:

  80.8% of survey respondents said they know our system in 2018



[Carbon Footprint Recognition by Year]

4.6 Conclusion

Achieving Sustainable society
through production and consumption
of eco-friendly products

Terima Kasih

Thank you

附錄 2

「臺、韓、泰三國碳足跡產品類別規則(CFP-PCR)調和工作小組會議」議程

ASIA CARBON FOOTPRINT NETWORK

WORKING GROUP MEETING ON PRODUCT CATEGORY RULES (PCRS)

Wednesday, 24 April 2019, Grand BlueWave Hotel (tbc), Shah Alam, Selangor, Malaysia

"*Common Product Carbon Footprinting Framework for Asia*" was developed and produced in partnership with the Carbon Trust of the United Kingdom in 2016 to promote a standardized methodology for carbon footprinting in Asia.[1]Based on the recommendations gained from the research project, a pilot project on harmonization of product category was launched in 2016 and subsequent working group meetings were organized from 2016 and 2018. Through 5 working group meetings and subsequent discussions, the project compared and analyzed product category rules and came up with specific recommendations to enable alignments based on the discussions gained from the comparison. In this regard, the upcoming working group meeting is expected to achieve the following objectives:

- Finalize technical specifications to move toward mutual/multiple recognition for non-alcoholic beverages
- Finalize pending issues for the targeted PCRs: Skin and Hair Cleaning Products and Vegetable Oils

Provisional Programme

Time	Working Group Meeting on Product Category Rules (PCRs)
9:00 -09:15	Opening: Overview on the progress
09:15- 12:00	• Review and finalize technical specifications for the pilot project on Mutual Recognition for Non- alcoholic beverages - Selection of target item(s) and manufacturer(s) - Discussion on the reporting documents & charging fees - Development of the timeline and related plans - Other issues
12:00-13:00	Lunch Break
13:00-14:30	• *(Continued)*Review and finalize technical specifications for the pilot project on Mutual Recognition for Non- alcoholic beverages - Selection of target item(s) and manufacturer(s) - Discussion on the reporting documents & charging fees - Development of the timeline and related plans - Other related issues
14:30-15:00	• Tea/Coffee Break
15:00-17:00	• Discussions on the pending issues for the PCR of Skin and Hair Cleaning Products and PCR of Vegetable Oils with detailed follow-up plans

[1] Available at http://acfnetwork.net/wp-content/uploads/2017/10/Common-PCF-Framework-for-Asia_final.pdf

List of participants

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United Nations ESCAP	Ms. Minkyung Carrie Hong Research Associate East and North-East Asia Office E-mail: hong6@un.org

附錄 3

「可食用植物油品類」碳足跡產品類別規則

NY_KEITI_181019

[PCR KTT 2018-02]

Product Category Rules for Edible Vegetable Oils

0. General Introduction

This PCR is developed as a part of activities to share experiences and achievements of each system and promote deeper understanding and cooperation among Korea, Taiwan and Thailand, which are successfully operating carbon labeling schemes in Asian region.

The three countries are respected the independence and uniqueness of its respective carbon labeling schemes and the parties are able to utilize this PCR for the mutual development and international application.

0.1 This PCR is based on existing PCR developed by each country.

0.2 This PCR may be used for mutual recognition between the three countries, in which case the regulations and procedures established by the relevant shall be applied.

1. Definition of the product group/ Scope

This PCR applies to edible vegetable oils listed products corresponding to the following CPC codes (Ver.2.1). It includes crude and refined (but not chemically modified) products.

UN CPC 216 Vegetable oils

1.1 Functional unit or declared unit

The declared unit is unit packaged product or sales unit.

1.2 Specification of the product

Information related to product characteristic shall be provided.

(e.g.) product name, product capacity (weight or volume), packaging material (bottle, can, carton, etc), refrigerated storage

2. References

There are existing PCR documents developed by each country. The documents, in whole or in part, are normatively referenced and indispensable for the application of this guideline. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including all amendments) applies.

- (Korea) National Guideline for the Environmental Product Declaration (Notification of Ministry of Environment, Republic of Korea)
- (Taiwan) Guidelines for the Development, Reference and Revision of Product

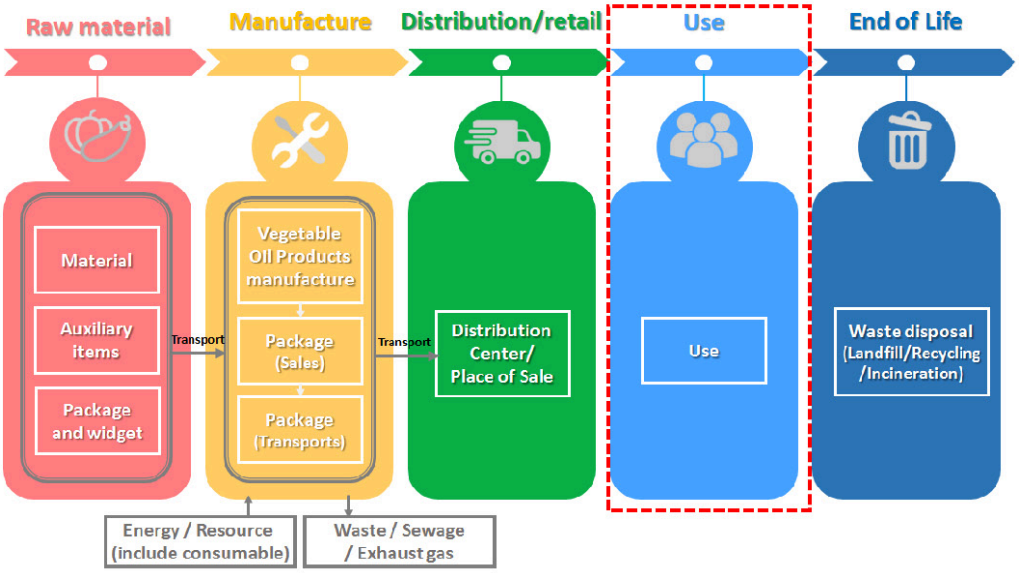
Category Rules for Carbon Footprints of Products

- (Thailand) The National Guideline on Product Carbon Footprinting and Thai National Product Category Rules for Soybean Oils

3. System boundary

System boundary for vegetable oil products includes pre-manufacturing phase, manufacturing phase, distribution/retail phase, use phase, and end-of-life phase.

Figure 1: Presentation of general system boundary



3.1 Raw material acquisition phase

"Raw material acquisition phase" comprises cradle-to-gate information on the production of raw materials and packaging materials for the product.

Such as: Production of ingredients used in the product
Production of semi-product
Production of primary, secondary, and tertiary packing materials
Transport from production site of raw materials and packaging materials to manufacturing site

The requirements and transport scenarios specified in the reference as mentioned in Chapter 2 are followed.

3.2 Manufacturing phase

"Manufacturing phase" comprises gate-to-gate information on the product production and handling of processes-related emissions and waste. This phase includes processes related to the production of the product.

Such as: Extraction processes

Packaging processes (e.g. filling, labeling...)
Waste treatment of waste generated during manufacturing

3.3 Distribution/retail phase

"Distribution/retail phase" comprises quantitative information on transport of product from manufacturing site to distribution platform. The requirements and transportation scenarios specified in the reference as mentioned in Chapter 2 are followed.

3.4 Use phase

Use phase emissions are not included. No refrigeration is required.

3.5 End-of-life phase

"End-of-life phase" comprises quantitative information on recycling or handling of product after use. Treatment methods for packing materials are in accordance with relevant laws and regulations.

End-of-life scenarios for the geographical area are specified in **Annex A.**

4. Data collection and data quality

One year of data shall be collected and be representative of the product.
Primary data (also referred to as site-specific data) shall be taken precedence.
The requirements specified in the reference as mentioned in Chapter 2 are followed.

4.1 Cut-off criteria

Using cut-off criteria depends on each country scheme but it should not give the perceptions of hiding information, but rather to facilitate the data collection for users. It is assumed that the defined cut-off criteria in the reference as mentioned in Chapter 2 ensure the representativeness of the collected data.

4.2 Allocation

If allocation is necessary, it should be performed with the most suitable parameters. The criteria for the allocation shall be in accordance with the reference as mentioned in Chapter 2.

5. CFP calculation

The details shall be as specified in the reference as mentioned in Chapter 2 are followed.

6. Displaying the CFP result

The requirements specified in the reference as mentioned in Chapter 2 are followed.

7. Changes in this PCR document

[PCR KTT 2018-01] 2018-05-17, Original version published.

[Annex A] End-of-life scenario

This annex provides country-specific end-of-life scenarios to assist in calculating GHG emissions for waste associated with the product.

B.1 Republic of Korea

a) As for products, parts or raw ancillary materials, the recycling ratio shall be calculated under the "Mandatory Recycling Ratio depending on each product and packing material", specified in Article 17.1 of the「Act on the Promotion of Saving and Recycling of Resources」.

b) As for electrical and electronic products, the "mandatory recycling by product group" specified in Article 16.3 of the「Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles」shall be applied.

c) The amount of substances of landfill, incineration and recycling identified by a) and b) should be determined depending on the ratio of landfill, incineration and recycling per material specified by the 'separate disposal of recyclable resources' of domestic wastes that the Ministry of Environment announced in the "National waste generation & treatment status".

d) As for substances not subject to recycling items or materials identified by a) and b), or substances not specified as recyclable by a) and b), the amount of landfill, incineration and recycling should be determined depending on the rates of landfill, incineration and recycling per material specified in the 'integrated disposal by volume-rate (waste) disposal system' of domestic wastes that the Ministry of Environment announced in the "National waste generation & treatment status".

e) All greenhouse gas such as refrigerants contained in product packages and products are considered to be discharged at the stage of disposal. However, if a system to recollect all or part of the greenhouse gas (such as refrigerants contained in products) is established and it is deemed desirable to recognize such performance, clear evidence data that proves as much should be offered.

f) As for statistical data concerning wastes applicable from a) to d), the head of an organization shall make notifications based on relevant data.

B.2 Taiwan

a) The process of clearing and transporting to the designated disposal site the unwanted materials used in the packing of a product (if taking recycling system into consideration) should be included in the calculation of Carbon Footprint.

b) No primary activity data is required in the waste disposal stage. Incineration or landfill of all waste items related to the product should be ascertained, except those for recycling (as the raw materials for other products). Please refer to the official website

of Recycling Fund Management Board (https://recycle.epa.gov.tw/en/index.html) for the recycling items and recycling rate.

c) The secondary data in the waste disposal stage depends on the actual situation. It is prior to adopt the carbon emission factor on the Carbon Footprint Calculation Platform (http://cfp-calculate.tw/cfpc/webpage/loginpage.aspx). Thereafter, databank of life cycle assessment or reference to public credibility is taken into account.

B.3 Thailand

a) waste disposal:

The GHG emissions from the final waste disposal phase shall be included in the full carbon footprinting (B2C) case as landfill scenarios but excluded for the partial carbon footprinting (B2B) case. For recyclable materials, the GHG emissions shall be calculated as follows;

$$EEoL = \Sigma [(1-RR,i) \times Ed,i] + EtW$$

Where -

EEoL = emissions factor of the final waste disposal phase of product

RR,i = recycle ratio of material i (table 1)

Ed,I = emissions factor of the final waste disposal phase of material i

EtW = emissions factor of waste transportation

Table 1: recycle ratio of industrial waste

Type	Recycle ratio (%)
Paper	59
Plastic	38
Rubber	25

Source: Pollution Control Department (2013)

The GHG emissions of products in the final disposal phase that are transferred to another system (e.g. methane recovery from landfill) shall be taken into account.

If primary data cannot be collected, then secondary data can be used that shall be based on the IPCC Guideline for National Greenhouse Gas Inventories – Volume 5: Waste (see Table 2), on waste disposal in a shallow landfill. For waste types other than those included in Table 1 of the IPCC Guidelines, and wastes that have carbon content, the GHG emission factor of 2.32 tCO2 per ton of waste shall be used. In case of wastes with no carbon content, the GHG emissions shall be zero. For on-site waste treatment, the GHG emissions shall be based on the actual practice of waste disposal.

In the case of products that are disposed by another system, such as infectious waste rubber gloves, the GHG emissions shall be calculated from its incineration or actual treatment.

In the case that the methane emitted from the landfill is flared, the reduction of GHG emissions must be taken into account.

Table 2: GHG emissions from a shallow landfill (IPCC, 2006)

Waste type	GHG emissions (tCO2e per ton of waste)
Paper	2.93
Fabric	2.00
Food	2.53
Wood	3.33
Garden wastes (i.e. leaves, grass)	3.27
Paper diaper	4.00
Rubber and leather	3.13

Source: 2006 IPCC Guidelines for National Greenhouse Gas Inventories – Volume 5: Waste

The transport of waste to a landfill site shall be based on the following scenario: Transportation by 10-wheel, 16-ton truck through a distance of 40 km; 100% loading on trip to landfill and empty return.

附錄 4

公務期間國外人士個人資料彙整表

外賓姓名	單位及職稱	國別	專長領域	會晤日期	聯絡電話	電子郵件	我方接洽者姓名職稱	交流內容	備註
Minkyung Hong (Carrie)	United Nations/ESCAP East and North-East Asia Office / Research Associtate	Korea	生命週期評估資料庫、產品類別規則	2019.04.23~24	+82-(0)32-458-6605	Hong6@un.org	施珮瑜/薦任技士、潘嘉妤/薦任技士	產品類別規則調合	
JaeSeok KIM	Korea Environmental Industry and Technology Institute (KEITI)/ Team Leader	Korea	第三類環境宣告、生命週期評估資料庫、產品類別規則	2019.04.23~24	+82-2-22841566	kimjs@keiti.re.kr	施珮瑜/薦任技士、潘嘉妤/薦任技士	產品類別規則調合	
Shin DaBin	Korea Environmental Industry and Technology Institute (KEITI)/ Associate Researcher	Korea	第三類環境宣告、生命週期評估資料庫、產品類別規則	2019.04.23~24	+82-2-22841587	daisy@keiti.re.kr	施珮瑜/薦任技士、潘嘉妤/薦任技士	產品類別規則調合	

外賓姓名	單位及職稱	國別	專長領域	會晤 日期	聯絡電話	電子郵件	我方接洽者 姓名職稱	交流內容	備註
Park SunHee	Korea Environmental Industry and Technology Institute (KEITI)/ Researcher	Korea	第三類環境宣告、生命週期評估資料庫、產品類別規則	2019.04.23~24	+82-2-22841585	sunny@keiti.re.kr	施珮瑜/薦任技士、潘嘉妤/薦任技士	產品類別規則調合	
Phakamon Supappunt	Thailand Greenhouse Gas Management Organization (TGO)/ Manager	Thailand	碳足跡、溫室氣體產品類別規則	2019.04.23~24	+66-02-1419829	phakamon@tgo.or.th	施珮瑜/薦任技士、潘嘉妤/薦任技士	產品類別規則調合	
Phuangphan Srithong	Thailand Greenhouse Gas Management Organization (TGO)/ Manager	Thailand	碳足跡、溫室氣體產品類別規則	2019.04.23~24	+66-02-1419879	phuangphan@tgo.or.th	施珮瑜/薦任技士、潘嘉妤/薦任技士	產品類別規則調合	
Wanwisa Thanungkano	Thailand National Metal and	Thailand	生命週期評估資料庫	2019.04.23~24	+66-2564650ext.4856	wanwisat@mtec.or.th	施珮瑜/薦任技士、潘嘉妤/薦任技士	生命週期評估資料庫資訊交流	

外賓姓名	單位及職稱	國別	專長領域	會晤 日期	聯絡電話	電子郵件	我方接洽者 姓名職稱	交流內容	備註
	Materials Technology Center(MTEC)/Senior Engineer								
Ruthairat Wisansuwannakorn	Thailand National Metal and Materials Technology Center(MTEC)/ Researcher	Thailand	生命週期評估資料庫	2019.04.23~24	+66-2564650 0 ext.4061	ruthairw@mtec.or.th	施珮瑜/薦任技士、潘嘉妤/薦任技士	生命週期評估資料庫資訊交流	
Jantima Samneangngam	Thailand National Metal and Materials Technology Center(MTEC)/ Researcher	Thailand	生命週期評估資料庫	2019.04.23~24	+66-2564650 0 ext.4075	jantimau@mtec.or.th	施珮瑜/薦任技士、潘嘉妤/薦任技士	生命週期評估資料庫資訊交流	
Wan Mazlina Wan Hussein	SIRIM QAS INTERNATIONAL SDN. BHD.	Malaysia	生命週期評估資料庫	2019.04.23	+603-5544-6569	wmazlina@sirim.my	施珮瑜/薦任技士、潘嘉妤/薦任技士	生命週期評估資料庫資訊交流	

外賓姓名	單位及職稱	國別	專長領域	會晤 日期	聯絡電話	電子郵件	我方接洽者 姓名職稱	交流內容	備註
	Environmental Technology Research Centre, Environment Management Section/Head								
Tn. Hj. Basori Hj.Selamat	SIRIM QAS INTERNATIONAL SDN. BHD. Product Certification & Inspection Department /Senior General Manager	Malaysia	管理系統、碳足跡查證、環保標章稽核	2019.04.23	+603-5544-5820	Basori@sirim.my	施珮瑜/薦任技士、潘嘉妤/薦任技士	業務交流	
Md. Adha bin Rahmat	SIRIM QAS INTERNATIONAL SDN. BHD. Product	Malaysia	環保標章	2019.04.23	+603-5544-6480	adha@sirim.my	施珮瑜/薦任技士、潘嘉妤/薦任技士	業務交流	

外賓姓名	單位及職稱	國別	專長領域	會晤 日期	聯絡電話	電子郵件	我方接洽者 姓名職稱	交流內容	備註
	Certification & Inspection /Department Head								
Aernida Abdul Kadir	SIRIM QAS INTERNATIONAL SDN. BHD. Product Certification & Inspection Department/ Senior Auditor	Malaysia	碳足跡第三方查證	2019.04.23	+603-5544-6431	aernida@sirim.my	施珮瑜/薦任技士、 潘嘉妤/薦任技士	業務交流	