

參加「OECD 永續物質管理全球論壇」出國報告

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壹、前言

經濟合作暨發展組織(OECD)秘書處於2008年4月7日「永續物質管理研討會(SMM)」曾邀請本署出席，並於會中報告我國廢棄物減量及資源回收成果。會後，由於我國的報告引起許多國家注意及興趣，OECD主辦單位表示將邀請我國參加2010年在比利時舉辦的【永續物質管理】全球論壇(Global Forum)。OECD SMM總監(Principal Administrator) Dr. Henrik Harjula 及部分國家代表也表示願意在隔年(2009年)，來台參加我國所主辦的研討會，並提供意見、分享經驗。

隔年(2009年)Henrik Harjula 博士即應邀於9月14日來台參加「2009年永續物質管理國際研討會」，同時應邀來台的還有瑞典環保署官員 Cecilia Mattsson 女士、美國環保署官員 Angela Leith 女士、及日本東京大學平尾雅彥教授等4位專家學者分別就各國推動【永續物質管理】的經驗及成果發表演說，並與國內相關產業、政府、學術、研究單位進行座談與經驗分享。我國不但與OECD主管及其會員國代表維持良好關係，在資源回收及廢棄物管理上的成就也給外賓留下深刻印象。

今年OECD【全球論壇】的行程早在兩年前已排定，我國與OECD也一直持續交換出席論壇事宜，然而今年初突然傳出中共出面干預，隨後OECD也來信表示由於中共的關係，OECD秘書長辦公室(Office of Secretary General)要求主辦單位【環境與經濟整合處】(Environment and Economy Integration Division)不得發邀請函給我國。最後，經由我們持續與主辦單位溝通，極力爭

取，OECD 最後在大會前 21 天終於同意邀請我國參加論壇，並擔任第四小組的評論委員(panelist)，對 OECD 委託研究之專題 Policy Research on SMM Implementation 提供我國的經驗及看法，並報告我國廢棄物管理現況而中共也因此沒有出席本次論壇。

本次大會由 OECD Environment Directorate 和比利時 Public Waste Agency of Flanders (OVAM) 共同主辦（大會邀請函如附件一），於 2010 年 10 月 25 日至 27 日在比利時麥哈倫舉行，大會主席、評論員、及報告者則於 24 日在當地舉行【會前會】。我國因應邀擔任評論委員，也應邀參加了【會前會】。

貳、行程及內容：

十月二十二日啟程，搭長榮航空公司班機經倫敦轉機，二十三日抵達布魯塞爾，二十四日參加會前會及歡迎晚宴，二十五日至二十七日參加大會，二十八日前往布魯塞爾拜會我國駐歐盟代表李永樂大使，隨後返國。

參、大會過程：

1. 本次國際經濟合作發展組織(OECD)【永續物質管理】全球論壇於 2010 年 10 月 25 至 27 日，在比利時麥哈倫舉行，共有來自聯合國、歐盟、OECD 會員國及非會員國代表 186 人參加。
2. 大會共分四個主題，分別是：
 - a. Good SMM Practices in Priority Materials,

- b. Innovative SMM Practices in the Private Sectors, Governments and NGOs,
- c. Putting SMM into a Broader Perspective,
- d. Policies for Implementing SMM.

我國應邀參加第四主題的評論委員(panelist)，對 OECD 委託 Five Winds International 顧問公司研究之專題 Policy Research on SMM Implementation 提供我國的經驗及看法，並報告我國廢棄物管理現況。

3. 大會除了表訂三日議程外，還有 24 日的會前會、每日中午及傍晚有由 OECD、歐盟及聯合國代表組成的小組會議，28 及 29 日有 OECD 會員國代表會議。我國因為不是這些國際組織的會員國，除了因為應邀上台報告得以參加 24 日的會前會及三天的正式大會外，其餘會議都無法參與。然而，多數與會代表積極任事的態度令人感佩。

肆、大會討論重點整理：

1. 過去一百年，物質需求快速增加，導致物種減少、氣候暖化、資源匱乏、水及自然資源過度開發，因而對物質永續管理的迫切性比以往更甚。雖然開發中國家對廢棄物管理仍有許多進步的空間，但一些先進國家的廢棄物管理仍然無法將經濟成長與環境衝擊脫鉤，要達到【永續物質管理】，大家都有努力的空間。

2. 物質生命週期的研究有助於界定物質及其產品在各個階段對環境的衝擊，當這種關係明確後，將有助於我們減少在資源開採、利用上對環境的負面影響。
3. **【永續物質管理】**的重點是提升系統的物質流動和相關的生命週期影響，根據需求效率、成本效益以及社會接受性，來達到**【永續物質管理】**的四項主要原則： a:使用最好的科學、工程、商業和管理的方法，保護自然資源。 b:從物質生命週期觀點達到永續性，設計對環境衝擊較少的產品、爭取人類健康福祉，並注意每個物質生命週期環節的安全管理與永續性。 c: 建制完善政策以促進經濟、環境和社會的持續性。 d: 提升民眾道德責任並鼓勵民眾積極地參與。
4. **【永續物質管理】**是一個較新穎的方法，雖然有許多國家提出類似的政策，例如：日本的物質循環社會、歐盟可持續的消費與生產等政策，可是因時間不長所以沒有太多記錄與資料，雖然可以提供他國經驗，但成功與否仍有待時間的考驗。
5. **【永續物質管理】**需要各種方案、政策、措施去實施，首先要先了解**【永續物質管理】**系統，因此需要收集各方面的數據，例如：各種觀點和意見、發展的技術方法、全球性的物質流動等等，目

前的問題是現有的措施沒有良好的數據儲存，所以在資料的收集、管理、更新上，有許多工作要做。

6. 【永續物質管理】不管是上游原物料的管理、中間產品的管理、還是下游廢棄物的管理，都會增加政府部門、一般業界的負擔。雖然可持續性的社會可以減少不必要的能源、資源及成本的浪費，可是當民眾看不到、摸不到、感受不到的時候，如何使民眾有意願去改變就變得很重要了。【永續物質管理】的複雜性及困難度，並不是短時間能完成，也無法在短時間看出成效，決策者不能整合國內外、產官學的力量，設計出適合自己國家的政策，被所有相關利益者所接受，是【永續物質管理】能否成功的關鍵。時下決策者最常使用的方法包括稅收、罰款、獎勵、教育等，可是如何搭配，以發揮最大的效力，仍得看決策者的能力。
7. 【永續物質管理】應該結合工業界、政府單位、消費者、非政府組織、及國際組織才能發揮功效，它不是單線作業，也沒有一套系統能夠適合每一種組織、每一種環境（No one-size-fits-all solutions），每個國家，每個地區，每個產業，都須要依據個別獨特性質，因地制宜、因時制宜、因事制宜，發展出各自系統。
8. 【永續物質管理】的政策實施，需有一定的範圍。研究表示，【永續物質管理】政策在物質生命週期上發揮了影響力，但政策的要

點應該是轉向非”廢棄”的方式，並把重點放在上游廠商，政策在未來的方向應該更加多元，並把生命週期重點放在本質上（例如，永續消費和生產等）。

9. 由於目前全球科技進步、交通發達，各項產品幾乎都是跨國界的運輸與販賣，因此，如何做到真正顧及產品的生命週期與回收，是非常具有挑戰性的。為了達到環境整體永續經營的目標，全球各國組織單位必須共同關注這項議題，並針對相關議題訂定有助於改善目前經濟與資源的互相影響，從各種不同角度提出有效的建議並提出完整且縝密的政策。
10. 2007 年各國開始有系統的針對各項物質永續管理政策與 OECD 中定義的 SSM 做評估與比較，並開始針對各生產線上的相關利益者進行管制或補助，包括供應商、生產商、零售商、消費者、回收和處置等。由於提高生產力並降低了成本，因此【永續物質管理】已被許多跨國企業接受。OECD 於 2008 年召開研討會，檢核並整合各地實施【永續物質管理】的作法並討論出一個大方向，改善各國永續發展所遇到的問題。
11. 全球資源分為三個系統，生態系統、工業系統與社會系統，針對人口不斷增長和經濟成長將造成更大生產量的需求與可能增加的相關廢物流，需要制定一個可找到永續利用資源的平衡點，以達

到以下目標：1. 減少物質總生產量，鼓勵使用替代物質或替代技術。2. 減少資源消耗的需求，減少消費者需求產品和服務。3. 減少造成不利影響之物質流並實行有害物質的回收系統。而整個系統的物質流循環政策包括天然資源的政策、產品生命週期的政策以及廢物管理的政策等全面控制。另外還包括管理方面(限制使用的法規處置辦法等)、經濟方面(獎勵或限制環境花費)和訊息化方面(提高材料使用的警覺性與注意事項)。

12. 為減少物質總生產量，在市場上可採取綠色採購與生態標籤政策，在商品上確實說明特性，使生產者承擔環境責任並協助消費者了解其購買產品之永續特性；而延伸生產者責任政策可確保產品的回收與最終處置。
13. 歐盟目前已訂出一全面性的框架，但當政策決定的同時也可能影響了對其他能源、資源的消耗，因此各國需要耗費相當多心思制定政策，及各種不同觀點，並與各不同機構達到共識後才制訂出。經濟成長和生活品質的提高是勢必的，如何完整了解全球資源、流動與工業發展和環境保護的關係，以達到一個平衡點，使全球資源永續發展是全球都需要且正在努力的目標之一。
14. 目前全球都漸漸認知到可持續材料管理(【永續物質管理】)的概念，而 OECD 和許多國際組織已認知到若繼續延續目前全球經濟成

長的模式，將可能導致物料消耗跟廢棄物量的增加，而違反天然資源的保護與全球永續發展的目標。OECD 舉辦了一系列的研討會，讓世界各國了解並關心此議題。為了使經濟增長與天然資源關係脫鉤，世界各國漸漸開始採取減少廢棄物的政策，而 OECD 廢棄物預防與回收工作小組（*Working Group on Waste Prevention and Recycling* WGWPR）也基於【永續物質管理】的概念，舉行了一系列研討會來探討政策走向，並鼓勵符合成本效益，減少材料運送所造成相關的環境負擔。

五、結論與建議

1. 中共當局一向對我國參加國際活動百般阻擾，今年更一度迫使 OECD 拒絕我國參與今年的全球論壇，雖然經過積極爭取，OECD 終於在大會前 21 天，寄來邀請函，邀請我國參與大會，報告我國環保工作，並擔任專題研究報告之評論員。面對快速崛起的中共強權，我們所憑藉的除了與 OECD 當局及其會員國代表所建立的友誼，就是國人在環保工作，包括廢棄物管理及資源回收上的努力，所建立的成果。藉由參與一些國際重要組織的大會，不但可以提高我國在國際社會的能見度，了解國際社會最新動態，更可以提升我國向上的原動力。

2. 參加會議者，除了各國代表，有許多是各國環境部門的主管包括廢棄物管理司長、處長級官員，歐盟代表、聯合國環境署代表，以及各會員國掌握決策方向、經驗豐富的官員及代表。如果能夠在適當的機會邀請他們來台演講、訪問，不但可以拓展我國的環保外交、加強國際聯繫，更可以從這些人豐富的經驗中獲得實質的幫助。
3. 在此次會議中遇見一些曾經來台訪問過的貴賓，訪台的經驗給他們留下美好深刻的印象，但是許多人當時來台，都是由承辦顧問公司具名出函邀請，對本署的印象，僅局限於一些有接觸的同仁。建議日後邀請國外政府官員或貴賓時，除非對方有特別考量，應由本署長官具名邀請，可以實質上建立起官方與官方的關係，及正式溝通管道。
4. 我國在廢棄物管理、減量、再利用及資源回收方面，是許多國家羨慕與學習的對象。日後，我們參加國際研討會，除了收集資料，當把握機會，主動向國際社會介紹我國在環保工作上的努力與成果，並與與會國家代表有適當互動和交流。如果能夠事前妥為準備，邀集顧問公司，推演議程，如果不能上台報告也應參與討論，準備議題陳述意見或發問。最好由署內同仁站在第一線，主動發言，因此事先準備很重要。

5. 雖然我國在廢棄物管理、減量、再利用及資源回收方面有著傲人的成就，但是要達到【永續】的目的，我們必須與世界其他國家一起努力，隨時吸收先進國家的經驗，精進我國法規及政策。目前適逢我國【廢棄物清理法】及【資源回收再利用法】兩法合一修法階段，應將【永續物質管理】的精神融入，將使我國法規政策更臻完美。

陸、洪榮勳博士於論壇發表的簡報



Chinese Taipei Report

Harvey J. Houg, Ph.D., PE, CIH

October 26, 2010

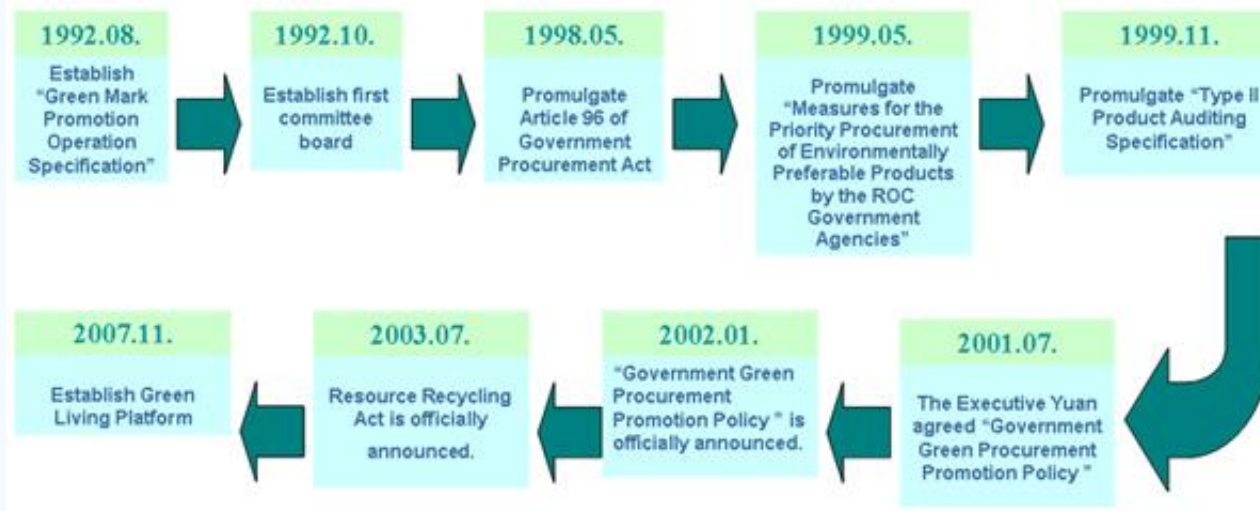
SMM and what it means to Taiwan(1)

1. Lack of natural resources



SMM and what it means to Taiwan(2)

2. Strive for a better life under heavy environmental burdens.



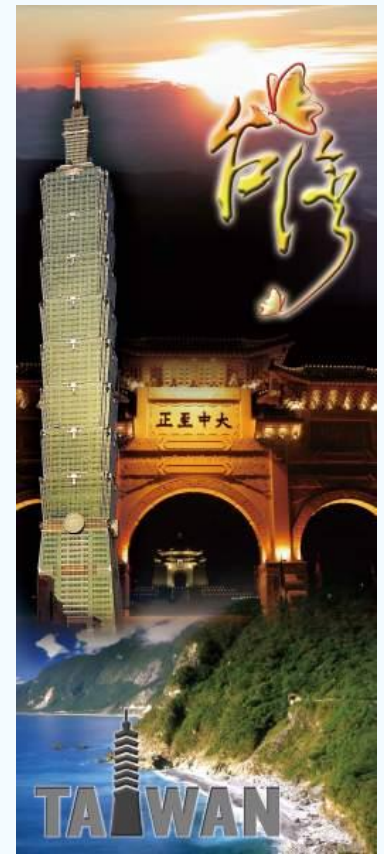
Green Mark promotion in Taiwan


SMM and what it means to Taiwan(3)

3. Demonstrate willingness to share environmental responsibilities with Global Village.



Sport-wear from Recycled PET



- 
- Traditionally, governments have focused on managing wastes as a means of managing the impact of material on the environment.









1. System Instrument

- An electronic tracking system was established to trace industrial hazardous waste flow and monitor its impact to the environment.

Industrial Waste Control

Strategy

- - Each Role Plays in the Waste

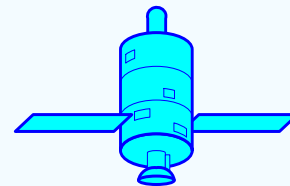
Treatment Must Apply for Permit and Report Specific Data Items



事業廢棄物管理

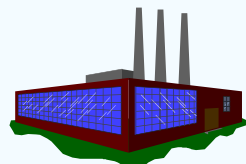
■ 加強事業廢棄物管理 (GPS)

清運過程監控

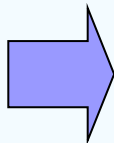


衛星

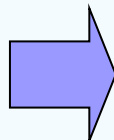
GPS



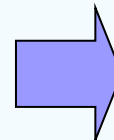
廢棄物產源



清除者



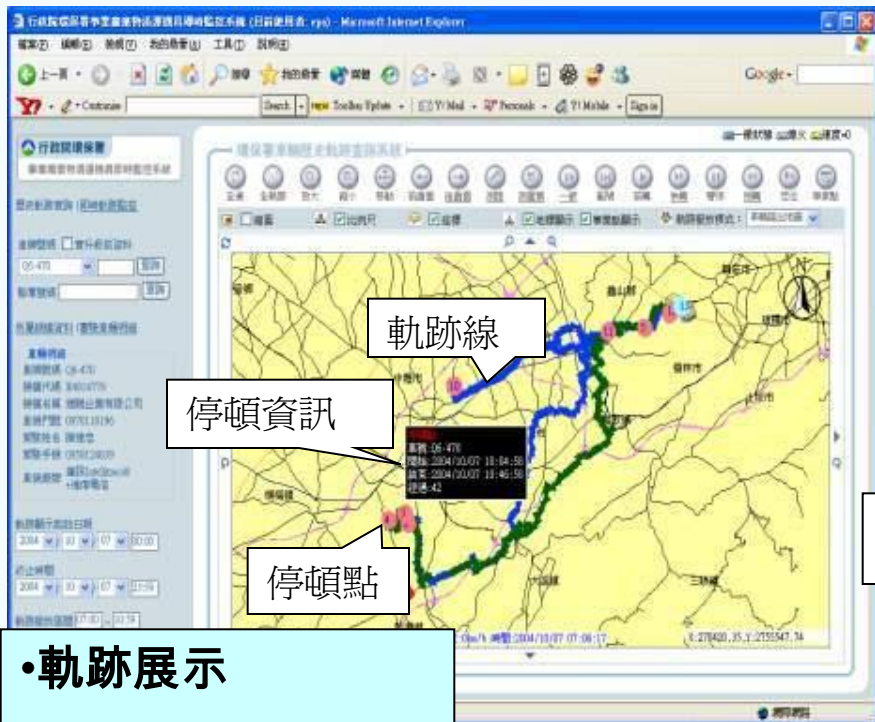
處理者



最終處置場

即時監控追蹤系統應用架構

歷史軌跡查詢：繪製車行軌跡並套疊電子地圖



- 軌跡展示
- 條碼刷取記錄
- 停頓點繪製
- 行動資訊展示
- 軌跡資料播放

點位資料調閱：
以列表方式查詢軌跡、停頓點、條碼記錄

軌跡起訖點

起訖位置

停頓位置

停頓點

條碼刷取記錄、是否到達聯單的產源/處理機構

項目	時間	位
起點	2006/10/12 08:33	台南縣永康市
終點		0 0
停頓點		

開始停頓	結束停頓	停頓時間	位置	經緯度
2006/10/12 09:11:00	2006/10/12 09:21:00	10	台南市安南區海佃路二段	120.19133,23.0256
2006/10/12 09:01:00	2006/10/12 09:06:30	5	台南市北區文賢路	120.19378,23.0132
2006/10/12 18:04:30	2006/10/12 08:36:00	872	台南縣永康市	120.23552,23.0097
2006/10/12 15:26:00	2006/10/13 07:49:00	983	台南縣永康市	120.23617,23.0092
2006/10/12 11:08:00	2006/10/12 11:15:00	7	台南縣鹽水鎮	120.26572,23.3216
2006/10/12 11:37:30	2006/10/12 11:53:00	16	台南縣新營市	120.31263,23.3097
2006/10/12 11:54:00	2006/10/12 12:10:00	16	台南縣新營市	120.31284,23.3095
2006/10/12 11:30:30	2006/10/12 11:36:00	6	台南縣新營市	120.31287,23.3096
2006/10/12	2006/10/12		高雄市	

條碼刷取資料	掃描時間	條碼	內
2006/10/12 09:33:00	2006/10/12 09:33:00	抵達產源	產源管編:D32A1480
2006/10/12 10:28:30	2006/10/12 10:28:30	抵達產源	產源管編:R02001
2006/10/12 11:14:30	2006/10/12 11:14:30	抵達產源	產源管編:R85005
2006/10/12 11:45:30	2006/10/12 11:45:30	抵達產源	產源管編:R84008
2006/10/12 13:45:30	2006/10/12 13:45:30	抵達處理機構	處理機構管編:E5606549 120.362917 22.5165
2006/10/12 13:45:30	2006/10/12 13:45:30	抵達處理機構	處理機構管編:E5606549 120.362917 22.5165
2006/10/12 13:45:30	2006/10/12 13:45:30	抵達處理機構	處理機構管編:E5606549 120.362917 22.5165
2006/10/12 13:46:00	2006/10/12 13:46:00	抵達處理機構	處理機構管編:E5606549 120.362983 22.51635

軌跡資料	時間	經度	緯度
2006/10/12 08:33:00	120.235367	23.0097	
2006/10/12 08:33:30	120.235383	23.009767	250 0 4 開
2006/10/12			

即時監控追蹤系統應用架構

即時點位監控：展示目前所有行駛中車輛之即時點位，並提供特定車輛之自動追蹤

- 車輛定位
- 車輛追蹤
- 轄區內所有車輛位置顯示
- 禁行點分析: 今日與歷史查詢

行政院環保署 環境保護局 車輛即時監控系統 (目前使用者: eps) - Microsoft Internet Explorer

定義即時時間範圍

即時車輛列表

即時車輛位置

設定追蹤車輛

IPS04- 禁行區即時警示- 進入禁行區車輛查詢

禁行區: 1- 三峯區南港橋, 2- 三峯區保安橋, 3- 福尾潭區保安橋水塔

日期範圍: [查詢]

車號	車牌號碼	車型	車牌	ICMP車牌	禁行區進入時間	禁行區離開時間	車行區名稱	車行區地址	車行區電話
371-GW	F0720092-全泰洋	貨引式	李以部	0982098849	2007/9/20 07:49:41	2007/9/20 08:30:09	二仁溪非法定廢棄物-台灣縣仁德鄉瓦南橋	二仁溪非法定廢棄物-台灣縣仁德鄉瓦南橋	05-2314501
800-G00	F1090047-漢源有限公司	樣式鋼筋式附拖吊	林景龍	0910736588	2007/9/20 10:46:30	2007/9/20 10:46:30	二仁溪非法定廢棄物-台灣縣仁德鄉瓦南橋	二仁溪非法定廢棄物-台灣縣仁德鄉瓦南橋	05-2314501

IPS03- 禁行區即時警示- 今日進入禁行區車輛

車號	車牌號碼	車型	車牌	ICMP車牌	禁行區進入時間	禁行區離開時間	車行區名稱	車行區地址	車行區電話
002-G00	R8100060-全泰洋	樣式鋼筋式附拖吊	李以部	06-2314501	2007/9/20 08:53:48	2007/9/20 09:13:55	三峯區保安橋	二仁溪非法定廢棄物	05-2314501
371-GW	F0720092-全泰洋	貨引式	李以部	0982098849	2007/9/20 07:49:41	2007/9/20 08:04:41	台灣縣南港橋	二仁溪非法定廢棄物-台灣縣仁德鄉瓦南橋	05-2314501
371-GW	F0720092-全泰洋	貨引式	李以部	0982098849	2007/9/20 08:04:41	2007/9/20 08:13:41	台灣縣南港橋	二仁溪非法定廢棄物-台灣縣仁德鄉瓦南橋	05-2314501
371-GW	F0720092-全泰洋	貨引式	李以部	0982098849	2007/9/20 08:04:41	2007/9/20 08:20:41	台灣縣南港橋	二仁溪非法定廢棄物-台灣縣仁德鄉瓦南橋	05-2314501
371-GW	F0720092-全泰洋	貨引式	李以部	0982098849	2007/9/20 08:20:41	2007/9/20 08:28:41	台灣縣南港橋	二仁溪非法定廢棄物-台灣縣仁德鄉瓦南橋	05-2314501

Consequence

- It was originally set to manage the waste flow and eliminate illegal dumping. Consequently, it also promote the recycling of industrial waste to over 75%.
- Database collected annually through on-line reporting, including 16 million tones of general industrial waste and 1 million tones of hazardous waste, are providing useful information for material flow analysis.

2. Policy Instrument

- The most effective SMM related policy.
- EPR

Four-in-One Recycling System



(A) Community residents
Establish Community-based Recycling organization.

(D) Recycling Fund

- Establish effective implementation programs.
- Funding Source.



(B) Recycling Company
Collect and recycle recyclables from household, communities and municipalities.

(C) Local Government

1. Assort & Categorize.
2. Revenues of selling recyclables feeds back to participants and recycling infrastructure.
3. 30% of the revenue feeds back to communities.

Mandatory Recycling Category

1.鐵容器
Iron container



2.鋁容器
Aluminum container



3.玻璃容器
Glass container



4.紙容器
Paper container



5.塑膠類
Plastic container



6.農藥廢容器
Pesticide container



7.乾電池
General batteries



8.機動車輛
Automobiles\Motorcycles



9.輪胎
Tires



10.鉛蓄電池
Car batteries

11.潤滑油
Lubricants

12.資訊物品
Electronics IT products



13.電子電器
Household appliances



14.照明光源
Light bulbs



The Mandatory Recycling Item



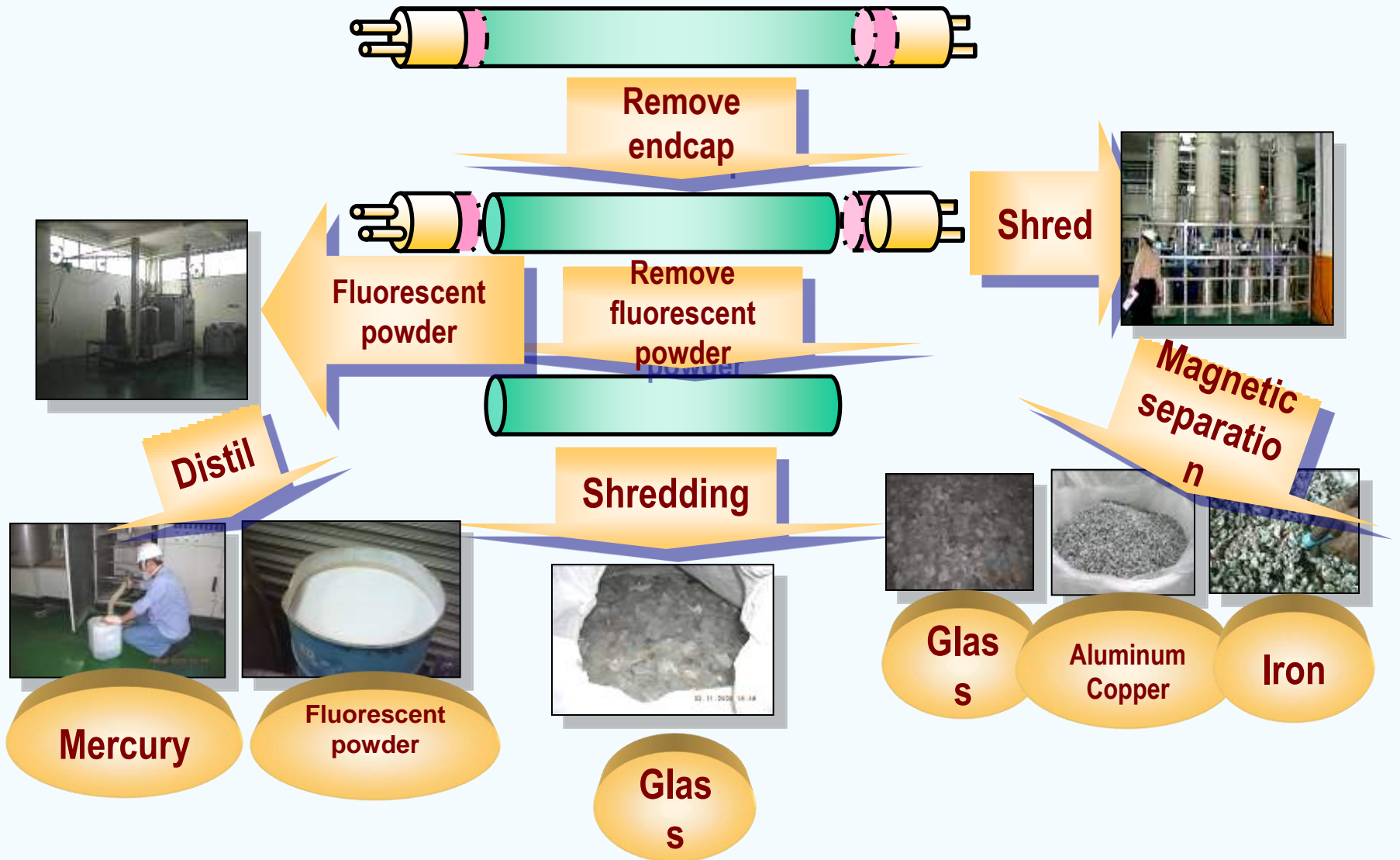
公告應回收廢棄物項目		List of Due Recyclable Waste Category			
類別 Category	公告項目 Due Items	類別 Category	公告項目 Due Items		
類 別 廢 棄 物 類 Container	1 (1) 廢鐵容器 Iron container	物 品 類 Commodities	7 (14) 廢乾電池 General batteries		
	2 (2) 廢鋁容器 Aluminum container		8 (15) 廢汽車 Automobiles (16) 廢機車 Motorcycles		
	3 (3) 廢玻璃容器 Glass container		9 (17) 廢輪胎 Tires		
	4 (4) 廢紙箔包、紙盒包 Aseptic cartons, Paper cartons (5) 廢紙餐具 Paper tableware		10 (18) 廢鉛蓄電池 lead-acid batteries		
			11 (19) 廢潤滑油 Lubricants		
	5 (6) 廢塑膠容器 Plastic container (7) PET (8) PVC (9) PE (10) PS發泡 PS Foam (11) PS未發泡 PS Non-foam (12) 其他塑膠 Other plastic		12 (20) 廢資訊物品 Electronics IT objects (21) 廢筆記型電腦 Notebook (22) 廢機殼 Case (23) 廢主機板 Motherboard (24) 廢硬式磁碟機 Hard disk (25) 廢印表機 Printer (26) 廢電源器 Power supply (27) 廢鍵盤 Keyboard		
				13 (28) 廢電子電器 Household appliances (29) 廢電視機 Television (30) 廢洗衣機 Washing machine (31) 廢電冰箱 Refrigerators (32) 廢冷暖氣機 Air conditioners (33) 廢電風扇 Fans	
					6 (13) 農藥廢容器 Pesticide container

Chung Tai Resource Co.,Ltd.

■ Recycling for the Glass Resources



Chung Tai Resource Co.,Ltd.



Super Textile Co.,Ltd.

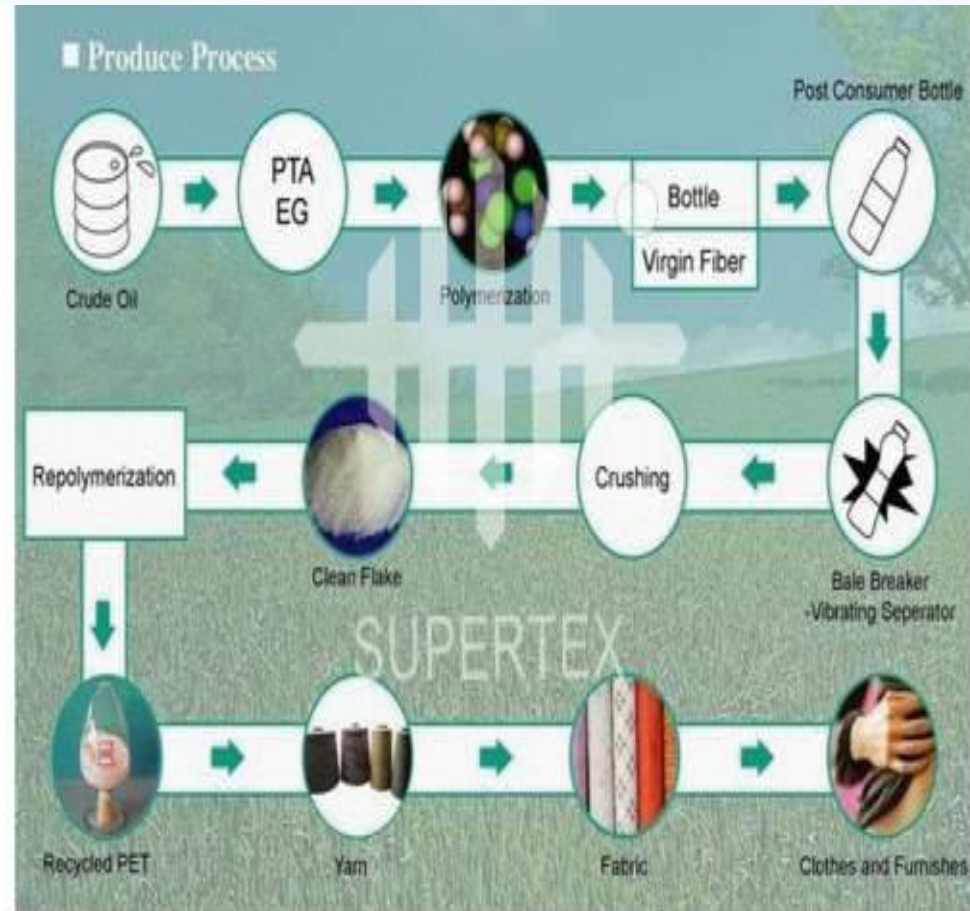
Recycle PET Bottle Eco Fabric



回收寶特瓶再生
環保布
Recycled PET Bottle
Eco Fabric

- 100%寶特瓶回收再利用。
- 品質等同原造纖維。
- 可後處理達到各種機能性要求。

100% Recycled PET Bottle.
Stable quality comparable to
virgin products.
Eco Fabric can go with various
finishes to meet different
functional requirements.



Super Textile Co.,Ltd. (Field Trip 3)

■ Recycle PET Bottle Eco Fabric



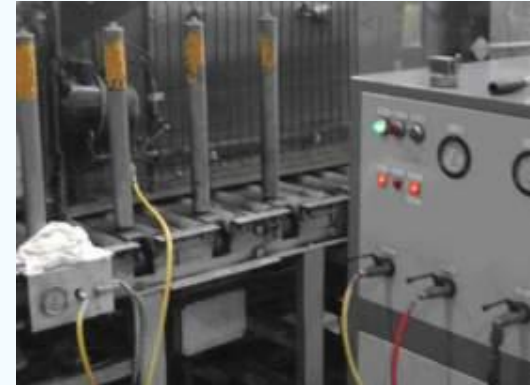
Refrigerator Recycling



Placed on disassembly line



Removing the door



Extracting the refrigerant




Sent into crushing machine



Collecting sorted scrapes

Automobiles Recycling



- 
- As of 2009, resource recycling rate increased from 5.88% (1998) to 45.5% (2009).



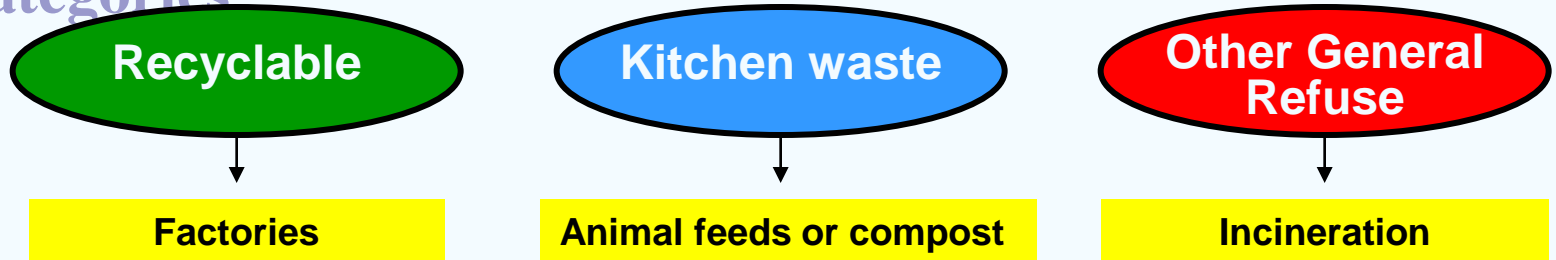
3. Regulation Instrument

- Mandatory Separation

Mandatory Garbage Separation

分3類・好OK 

- The public are required to separate garbage into 3 categories



- **Enforcement:**
 - Warnings for the first violation
 - A penalty of NT\$ 1,200 imposed for second violation
- **Achievements: 2009 V.S. 2004, before the separation policy**
 - MSW collected dropped by 27.96%.
 - Recyclables collected increased by 76.32%.
 - Kitchen waste collected increased by 141.08%.



Kitchen Waste Recycle



Kitchen Waste Compost Plant (Taipei County)

Waste Reduction

➤ Waste Minimization

- Restriction on the Use of Plastic Shopping Bags and Disposable Tableware (2002.07)
- Restriction of Excessive Packaging (2006.07)

➤ Toxicity Minimization

- Restriction of mercury-containing dry cell batteries (2006.12)
- Restriction of the Import and Sale of Mercury Thermometers (2008.07)

Waste Reduction

➤ Restricted Use Of Plastic Shopping Bags And Disposable Tableware

■ Disposable tableware

- ✓ Plastic disposable tablewares are banned.
- ✓ Disposable tableware of any kind cannot be provided in government agencies (2006.07) and schools (2006.09)



Waste Reduction

- Restricted Use of Plastic Shopping Bags and Disposable Tableware
 - Yearly uses of plastic shopping bags are reduced by 2 billion pieces, a reduction of **58%**
 - Yearly uses of plastic disposable tableware are also reduced by 2 billion pieces, a reduction of **86%**
 - Counting in paper substitutes, annual MSW volume is reduced by **1,440,400** tons



Waste Reduction

➤ Excessive Packaging Restriction Results of Restriction

■ Change of Packaging Design



Bulky Waste Reuse

Bicycle



before repair



after repair

Bulky Waste Reuse

Furniture



before repair




after repair

Further Reduction

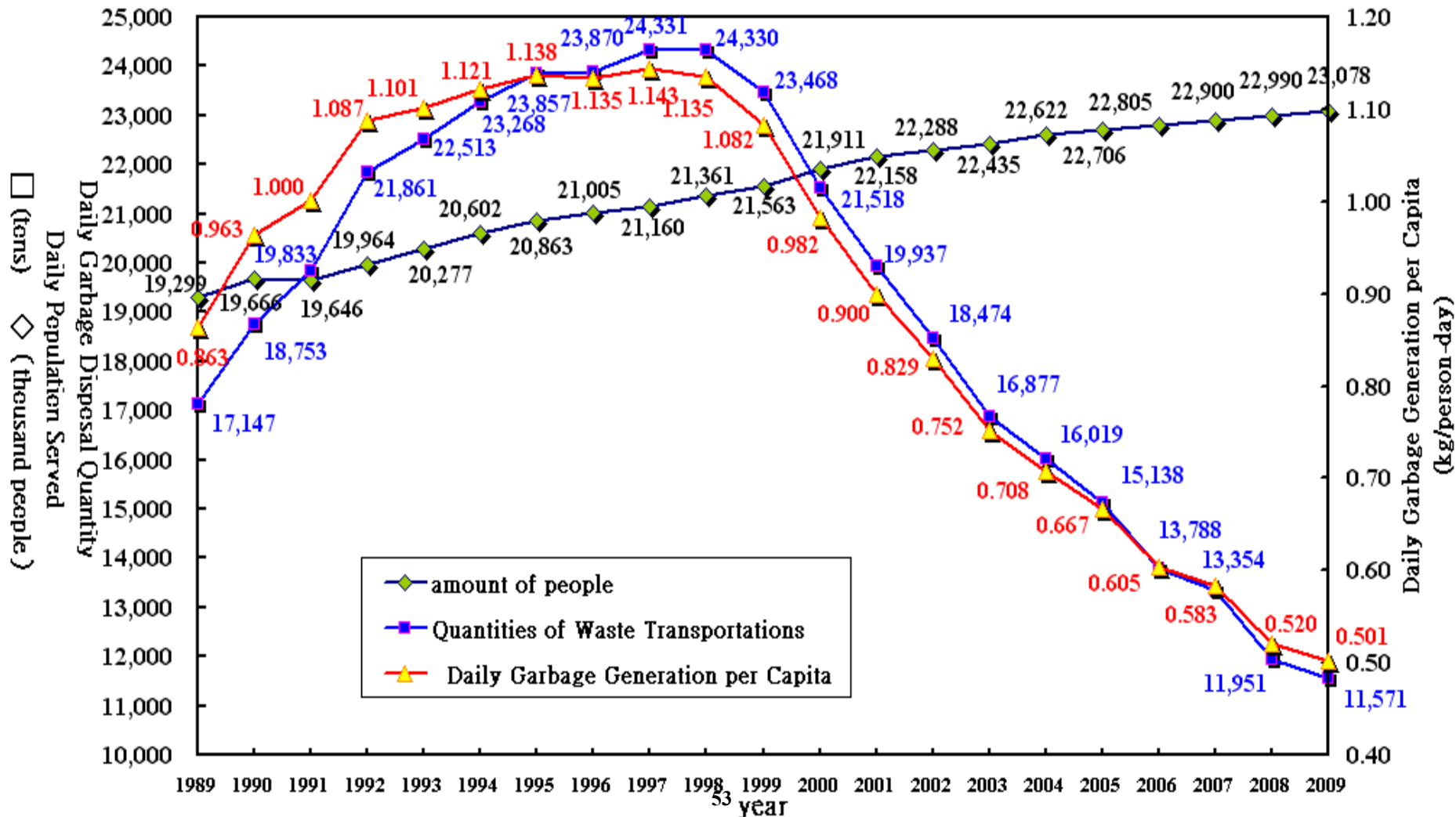
Per-Bag Trash Collection Fee in Taipei City

- Principle : pay as you throw
- Measure : Per-Bag Trash Collection Fee (0.45 NT\$/L)
- Results :
 - Waste volume 67% down
 - Recycling volume 44% up



- 
- As of 2009, daily garbage generation rate was 0.5 kg per capita, dropped from the highest record in 1998 (1.14 kg/c/d).

Daily Garbage



Conclusion(1)

Taiwan endeavors to implement SMM-related policies to achieve the following goals:

1. Developing clean technology

The scope of clean technology includes saving raw material and energy, detoxification, waste and discharge minimization, and process modification. life cycle analysis to assess and recycling/treatment technology.

2. Implementing Dematerialization

Implementation of dematerialization policies via Integrated Product Policy (IPP), Extended Producer's Responsibility (EPR), and servicing, in addition to waste management by source reduction, recycling, and reuse.

3. Promoting SMM in the industry by partnership platforms

The government participates and promotes the idea of SMM in the way of partnership, helping the industrial sector to meet the goal of material conservation and waste reduction.

Conclusion(2)

4. Reducing environmental impact and constructing a resource-recycling-based society

Advocate green design, green manufacturing and green procurement; implement source reduction, resource recycle/reuse; utilize resources effectively to achieve the society sustainability.

5. Promoting SMM together with all government agencies

Identify the responsibilities and duties of participating agencies, facilitate cross-departmental cooperation in order to accomplish the goal of SMM.

6. Participating and devoting as a global

Exchange experiences about setting SMM into action with fellow countries through international conferences and seminars; offer our contributions and make our efforts more effectively.

Thank you!



柒、「OECD 永續物質管理全球論壇」結論簡報

Summary of the chair

Global Forum on Sustainable Materials Management
Mechelen, 25 - 27.10.2010

Why more attention for materials management?

- Unprecedented growth in materials use during past 100 years
- unsustainable use of materials leads to
 - loss of biodiversity, climate change, resource depletion, overexploitation of land and water
- materials are becoming critical for our economies
 - growing scarcity (due to depletion or limited sink capacity)
 - volatile and unpredictable prices
- social impacts of materials use
- sense of urgency is emerging
- SMM is the key for lower footprints

Large potential for improved material recovery

- **There are still low hanging fruits in many countries,**
 - large potential for diverting waste from landfills
 - large potential for stepping up recycling
 - large potential for more environmentally sound waste management
- **This can be realized by making use of well known and proven waste management policies**
- **developing economies need support in the form of expertise and for building up the necessary infrastructure**

Optimised waste management will not suffice

- Even countries that have well advanced waste management policies in place do not succeed in decoupling environmental impact from economic growth to a sustainable level
- example: soaring demands for aluminium and critical metals will lead to more mining of primary metals even at high recycling rates
- drastic increase in resource efficiency is needed, that is not outpaced by rising consumption
- stronger focus on upstream measures

Key principles for SMM

- Preserve natural capital
- design and manage materials from a life cycle perspective
- use the full suite of policy instruments
- engage all stakeholders

Importance of life cycle thinking

- A life cycle approach gives new insights to policy makers
 - identification of priorities, based on material flows and associated impacts
 - connections between actions in different phases of the life cycle become clear
 - relation between economic issues and environmental performance becomes clear
 - identification of possible measures for reducing the environmental impact along the life cycle
 - identification of trade offs and benefits

Translate SMM into concrete actions

- **SMM is a shared responsibility between**
 - industry
 - national governments
 - consumers
 - international organisations
 - NGO's
- **SMM is not one-dimensional, no one-size-fits-all solutions**

Better data and exchange of information

- Need for filling gaps in data on material flows and their environmental, social and economic impacts
- need for more consistency in data gathering
- need for more transparency and traceability so that governments and actors in the chain can make better decisions
- better dissemination of best practices among industry sectors and among countries
- need for more insight in economic processes and how they relate to environmental impacts

Integration of different policies

■ New policy questions

- from waste management/end of pipe to management of material/product cycles or value chain)

■ make connections between

- environment policy and its different compartments
- energy policy
- economic policy
- innovation policy
- trade policy
- industrial policy
- development cooperation policies
- human rights policies

■ wide variety of policy instruments



Use different ways of governance and explore new roles

- **act as a regulator**
 - prohibitions, standards, internalisation of externalities, remove harmful subsidies...
- **set the example**
 - green public procurement
- **act as a facilitator**
 - bring together stakeholders along the chain, make covenants
 - stimulate innovation and manage transition
 - develop supporting tools (such as good data for ecodesign)
- **act as a guide**
 - set right indicators and targets/objectives with stakeholders
- **no one size fits all / carrot and stick game**

Develop visions for the future

- What will the world look like in 2050?
- What role do we see for the different actors?
 - governments
 - producers
 - consumers
- what kind of economy and quality of life do we want?
 - limitless growth? green growth? enhanced growth?
 - steady-state economy?
 - how is wealth distributed?
 - beyond GDP?
- Scenario building

Foster system innovation

■ Develop new business models

- green supply chains
- find low impact substitutes for materials/goods/services
- design not only products but the complete material cycle or value chain in which they circulate and rethink the way they are marketed
- shift to “life cycle” managers
- how make business out of selling less

■ develop new consumption/life-style models

- be creative about fulfilling need for high quality of life
- enable consumers to make informed choices
- mainstream sustainable consumption behaviour via price signals and choice editing



Role for the OECD

- **Fill gaps between knowledge and policy**
 - identify good practices and cases
 - develop policy toolkits that work
- **make the economic case**
- **build awareness**
- **work on internalisation of externalities**
- **make connections between different resources (raw materials, water, land, climate, ecosystems...)**
- **integrate SMM in economic policy**
- **work out a focused action plan / roadmap**

Establish more connections between OECD SMM work and other initiatives

- Establish links with other OECD communities working on subjects related to SMM
- integrate SMM in OECD green growth strategy
- learn from and feed into related international initiatives
 - UNEP Resource panel
 - Marrakech proces on SCP and CSD
 - UNEP/SETAC Life Cycle Initiative

捌、「OECD 永續物質管理全球論壇」活動照片



國際經濟合作發展組織(OECD)永續物質管理全球論壇於2010年10月25至27日，在比利時麥哈倫舉行，共有來自聯合國、歐盟、OECD會員國及非會員國代表186人參加。



行政院環境保護署
Environmental Protection Administration
Executive Yuan, R.O.C.



本署洪顧問應邀以 **Chinese Taipei Report** 報告我國環保工作的成果。



行政院環境保護署
Environmental Protection Administration
Executive Yuan, R.O.C.



本署洪顧問(前排右一)應邀參加評論委員(panelist)對OECD委託研究之專題
Policy Research on SMM Implementation提供我國的經驗及看法。



行政院環境保護署
Environmental Protection Administration
Executive Yuan, R.O.C.



主辦單位OECD環境與經濟處長Anthony Cox。



行政院環境保護署
Environmental Protection Administration
Executive Yuan, R.O.C.



愛沙尼亞環境部廢棄物管理司長 Peeter Eek.



行政院環境保護署
Environmental Protection Administration
Executive Yuan, R.O.C.



拜會我國駐歐盟代表林永樂大使。



行政院環境保護署
Environmental Protection Administration
Executive Yuan, R.O.C.

附件一

大會邀請函

Head of Division

ENVIRONMENT DIRECTORATE

Environment and Economy Integration Division

Paris, 4 October 2010

Dear Dr. Harvey Houg,

On behalf of the OECD Environment Directorate and the Public Waste Agency of Flanders (OVAM), I am pleased to invite you to the Global Forum on Sustainable Materials Management, which will be hosted by Belgium in Mechelen from 25 to 27 October 2010. Please, find enclosed the agenda of the Forum.

You are invited as a panellist in Session 4 on the policies for implementing SMM. Please note that Mr. Jim Fava (Five Winds International - Author of the paper on "Policies for Implementing SMM") will act as a moderator in this session.

As you know, panellists have an important role to play and we thank you for accepting this responsibility. To stimulate the discussion after the presentation of the paper synthesising main outcomes of the three policy-oriented studies, panel members representing different view points (governments from OECD and non OECD, industry) will briefly provide their insights on the related topic and field questions from the audience or others panellist. To assist in this dialogue, panel members are requested to prepare a one page summary of their experience with the implementation of SMM policies to be sent to the secretariat. This paper might be later included in the proceeding of the workshop.

We would like to ask that you also send a short curriculum vitae so that the session chair may introduce you before your presentation.

Please note that presenters and panellists will be invited to a dinner on Sunday evening (24 October) to discuss the organisation of the sessions. You will receive later further detail on practical arrangements.

Ms. Soizick de Tilly (soizick.detilly@oecd.org) and Mr. Peter Börkey (peter.borkey@oecd.org) are available, should you need any assistance.

Additional information on this SMM global forum is available on: <http://www.oecd.org/environment/gfenv>

We are looking forward to your active participation in this Global Forum.

Yours sincerely,



Anthony Cox
Head of Division ENV/EEI



Henny De Baets
Administrator-General OVAM

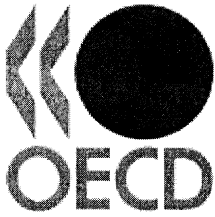
To: Dr. Harvey Houg
Advisor, Environmental Protection Administration
83, Zhonghua Rd. Sec. 1, Zhongzheng District, Taipei City 100, Chinese Taipei
(by email harvey@epa.gov.tw)

enc: Agenda

cc : Ms. de Tilly and Mr. Börkey, Administrators, Environment and Economy Integration Division, OECD

附件二

大會議程



TOGETHER WE
MAKE TOMORROW
MORE BEAUTIFUL



AGENDA

**OECD GLOBAL FORUM ON
ENVIRONMENT**

Focusing on

**SUSTAINABLE MATERIALS
MANAGEMENT**

Hosted by the Public Waste Agency of Flanders (OVAM)

25-27 October 2010

Lamot Conference Centre, Mechelen, Belgium

OECD GLOBAL FORUM ON ENVIRONMENT

Focusing on

Sustainable Materials Management

25-27 October 2010

Mechelen, Belgium

CONTEXT

The past two centuries have seen unprecedented growth in human population and economic well-being. This growth has been fed by equally unprecedented material resource consumption and its associated negative environmental impacts. Economic and trade integration among countries has enlarged the size of markets, allowed greater specialisation and mobility in production, increased the role of multinational enterprises and led to an overall increase in international flows in raw materials and manufactured goods.

Making sure that material resources are managed sustainably and used efficiently through their life-cycle is vital to economic growth, environmental quality and sustainable development. It would also help reduce the negative environmental impacts associated with the production, consumption and end-of-life management of material resources -- a concern that has long been on the policy agenda of OECD countries. A shift from "end-of-life" thinking towards a more integrated life-cycle approach is therefore needed.

The OECD Environmental Strategy for the 1st Decade of the 21st Century, adopted by Environment Ministers in May 2001, clearly outlined the need for governments to look for integrated management solutions which link resource use and prevention of waste into a coherent policy approach, such as the one embodied in the Sustainable Materials Management (SMM) paradigm. Policy integration is also most likely to be improved by a structured "partnership" approach, involving all actors in the materials life-cycle (especially business, NGOs, and consumers).

This challenge also has a *global* scope. The growing interdependence of countries and economies and globalisation of trade in materials and goods associated with increasing negative environmental impacts necessitate an approach that would take global effects directly into account.

SCOPE AND OBJECTIVES

In line with the need to shift towards more integrated “life-cycle” approaches, the WGWPR has refocused much of its waste management work towards an SMM perspective. In particular, two Workshops dealing with SMM have been held:

- The first one in Seoul in 2005, whose objective was to take stock of what exists to date in relation to this new concept, define the concept and explore the potential elements of SMM.
- The second one in Tel Aviv in 2008, whose objective was to learn about SMM experiences from governments, the private sector and NGOs. Existing methodologies to assess material use in terms of its potential impacts on the environment, benefits to society and value for the economy, were also analysed.

The outcomes of both workshops, as well as a survey carried out among OECD governments and several “stocktaking” reports and case studies, have laid the basis for the completion of this in-depth and multi-faceted study of the SMM paradigm. Time has now come to propose concrete steps and measures to put SMM into practice or to extend it to new areas.

This will be achieved through a Global Forum on Environment (GFENV), focusing on Sustainable Materials Management, with the following objectives:

- To draw conclusions from the results of three policy-oriented reports (on target setting, policy principles, and policy instruments), as well as from the results of four case studies (on aluminium, critical metals, wood fibres and plastics);
- To learn from new examples of “innovative SMM practices” from the private sector, governments and NGOs (particularly those involving “systems” innovations);
- To link the discussions to the OECD Green Growth Strategy and implementation of the OECD Council Recommendation on Resource Productivity [C(2008)40] and the 2008 G8 Kobe 3R Action Plan; and
- To discuss possible “policies for implementing SMM” and to delineate the form of possible actions to be taken (Council Recommendation, report on policy options, compilation of best practices, etc.).

TARGET AUDIENCE AND MAIN CONTRIBUTORS

Participation is open to OECD countries, to delegates from invited non-member economies and to other invited experts. The UN Resource Panel, as well as key representatives from the business and NGO communities, are also invited, and expected to play key roles.

Additional information:

There is a possibility for poster presentations at the premises of the Global Forum, to illustrate some practical examples of SMM implementation by the private sector.

AGENDA

Monday 25 October 2010



9:00 – 10:00: Registration

Opening Session – Background for the Workshop

10:00-11:00

- Welcome by **Henny de Baets**, Administrator General of the Public Waste Agency of Flanders (OVAM) and by **Simon Upton**, OECD Environment Director.
- Context and objectives of the Global Forum by the Chair, **Victor Dries**, Head of the Strategic Unit of OVAM.
- Keynote speech by **Joseph Fiksel**, Executive Director of the Centre for Resilience of the Ohio State University, who will present the SMM paradigm, its advantages and disadvantages and possible avenues to put it into action, followed by discussion.

Session 1:

Good SMM Practices in Priority Materials

11:00-13:00

Objective:

To discuss and draw conclusions from the results of four case studies (aluminium, critical metals, wood fibres and plastics) which analyse these priority materials at all stages of their life-cycle, from extraction of materials, processing of raw materials, to the recovery and reprocessing of recycled products.

The case studies are exploring good SMM practices and focussing on those parts of the life-cycle where opportunities exist for optimising policy interventions.

Moderator: John Atherton, International Council on Mining and Metals (ICMM)

Rapporteur: Raimund Bleischwitz, Wuppertal Institute

11:00-12:00

Presentation of four case studies on priority materials (15min for each presentation followed by 5min for questions and answers):

- ✓ **Rob Sinclair**, Natural Resources Canada for critical metals
- ✓ **Kate Johnson**, US Geological Survey for aluminium
- ✓ **Deanna Lizas**, ICF International for wood fibres
- ✓ **Ingo Sartorius**, PlasticsEurope Deutschland for plastics

12:00-12:30



Coffee

12:30-13:30

John Atherton will present his summary on the findings of the four case studies and moderate the panel discussion including:

- ✓ **Mike Levy**, American Chemistry Council (private sector perspective)
- ✓ **Derry Allen**, US EPA (OECD government perspective)
- ✓ **Raimund Bleischwitz**, Wuppertal Institute (NGO perspective)
- ✓ **Jason Potts**, International Institute for Sustainable Development (IISD) (NGO perspective).

This will be followed by a discussion with the floor. The Chair will summarise the discussion.



13:30-14:30

Lunch

Session 2:

Innovative SMM Practices in the Private Sector, Governments and NGOs

14:30-18:00

Objective:

This Session will build on the momentum created at the 2nd SMM Workshop in Tel Aviv, in 2008, which reviewed SMM experiences in industry, government, and NGOs. This proved to be a very valuable “stocktaking” initiative – an initiative that is worth repeating at the 2010 GFENV.

While some “front-runners” have already made impressive progress on SMM, much remains to be done in industry as a whole. SMM initiatives carried out to date by “front-

runners” show that better management of materials and resources are accompanied by cost reductions and increased revenues – because consumers are also demanding more environmentally friendly products, associated with sustainable management of materials over their whole life-cycle.

This Session will therefore explore new examples of “good and innovative SMM practices” from the private sector, governments and NGOs (particularly those involving “systems” innovations), focusing on particular aspects of SMM such as greening the supply chain, closing the loop, eco-design, or innovative business models.

Moderator: Jason Potts, International Institute for Sustainable Development (IISD)

Rapporteur: Chris Peterson, Five Winds International

14:30-15:30

Presentation of innovative SMM practices in the private sector (15min for each presentation followed by 5min for questions and answers):

- ✓ **Frédéric Rabain**, Peugeot (example from the automobile industry)
- ✓ **Tammy Ayers**, Steelcase (example from the office furniture industry)
- ✓ **Frans Beckers**, Van Gansewinkel (example from the waste processing and energy sector)

15:30-16:30

Presentation of innovative SMM practices in governments and NGOs (15min for each presentation followed by 5min for questions and answers):

- ✓ **Anne Johnson**, Sustainable Packaging Coalition in US (NGO perspective)
- ✓ **Dorah Nteo**, Department of Environmental Affairs, Republic of South-Africa (a non-OECD government perspective)
- ✓ **Art Dewulf**, University of Wageningen, Netherlands (OECD government perspective)

16:30-17:00



Coffee

17:00-18:00

Wrap up of Session 2 by the Chair, followed by a general discussion.

END OF DAY 1

18:00-19:00

The Secretariat, the moderators and the rapporteurs of Sessions 1 and 2 will prepare a draft summary of the 1st day discussions.

19:00

Dinner hosted by OVAM at the Conference Centre



Tuesday 26 October 2010

Session 3:

Putting SMM into a Broader Perspective

09:30-12:30

Objective:

Several international initiatives exist, such as the OECD Council Recommendation on Resource Productivity [C(2008)40], the Declaration on Green Growth by OECD ministers in June 2009 and the Kobe 3Rs Action Plan. Work is also carried out on concepts whose objectives are close to, or complementary to, SMM strategies, for instance on Eco-efficiency, Sustainable Consumption and Production, etc. At this Session the linkages between all these initiatives/work areas will be explored to see how they could be articulated and how to optimise their complementarities. More specifically, it is expected to find how and to which extent SMM policies could contribute to these other existing policy initiatives.

Moderator: Werner Bosmans, European Commission - DG ENV.

Rapporteur: Kevin Brady, Five Winds International

09:30-10:00

Linkages and complementarities of SMM-related paradigms and policies by **Kevin Brady**.

10:00-11:00 Panel discussion with:

- ✓ **Shaoyi Li**, United Nations Environment Programme (link to UNEP initiatives)
- ✓ **Yuichi Moriguchi**, Research Center for Material Cycles and Waste Management, at National Institute for Environmental Studies (link to Japan's 3R initiative)
- ✓ **Kazunobu Onogawa**, United Nations Centre for Regional Development (link to Asian initiatives and Asia 3R Forum)
- ✓ **John Wante**, OVAM, Belgium (link to EU initiatives)
- ✓ **Caroline MacIntosh**, Public Works and Government Services Canada (Government perspective)
- ✓ **Myriam Linster**, OECD (link to OECD initiatives).

11:00-11:30



Coffee

11:30-12:30

General discussion and conclusions of the Session by the Chair.

12:30-14:00



Lunch

Session 4:

Policies for Implementing SMM

14:00-17:30

Objective:

During 2009-10, the WGWPR has three “thematic” SMM studies underway – on: i) Setting and Using Targets for SMM; ii) Key Policy Principles for SMM; and iii) An overview of available Policy Instruments for SMM (including their respective advantages and disadvantages when actually applied in an SMM context).

This Session will profile the results of these three studies, and draw appropriate conclusions for possible SMM policies.

Moderator: Jim Fava, Five Winds International

Rapporteur: Dominic Hogg, Eunomia

14:00-14:30

Main outcomes of the three policy-oriented reports by **Chris Peterson**, Five Winds International.

14:30-15:30

Five panellists will give their reflections on the report, based on their experiences with the implementation of SMM policies:

- ✓ **François Grosse**, Veolia Environnement (industry perspective)
- ✓ **Pawel Kazmierczyk**, European Environment Agency (EEA), (preliminary SMM related findings from the 2010 State and Outlook Report on the European Environment)
- ✓ **Robbert Droop**, Ministry of Housing, Spatial Planning and the Environment, Netherlands (an OECD government perspective)
- ✓ **Ujang Solihin Sidik**, Ministry of Environment, Republic of Indonesia (non-OECD country perspective)
- ✓ **Harvey Houg**, Environmental Protection Administration, Chinese Taipei (non-OECD country perspective)

15:30-16:00



Coffee

16:00-17:30

General discussion and conclusions of the Session by the Chair.

END OF DAY 2

17:45-18:45

The Secretariat, the moderators and the rapporteurs of Sessions 3 and 4 will prepare a draft summary of the 2nd day discussions.

18:45-20:30

(Optional side event) A taste of Mechelen: a guided tour with snack.

Wednesday 27 October 2010

Session 5:

Concluding Panel

09:00-12:00

Objective:

Based on the knowledge gained from the two previous SMM workshops, on the outcomes of all studies carried out so far (in particular the latest three policy reports) and the discussions of the previous Sessions, a panel will discuss concrete actions that different stakeholders (industry, government, NGOs, consumers, etc.) could take to promote and implement SMM.

09:00-10:00

Effective environmental policies and the move towards SMM policies by **Joseph Fiksel**, Centre for Resilience of the Ohio State University.

10:00-11:30

Interactive discussion between the panel and the floor, conducted by **John Twitchen**, Sauce Consultancy Ltd, UK (environmental communications company), with:

- ✓ **Ana Quiros**, Eco-Global, Costa Rica
- ✓ **Cecilia Mattsson**, Environmental Protection Agency, Sweden
- ✓ **John Hontelez**, European Environmental Bureau (EEB)
- ✓ **Bjarne Pedersen**, Consumers International
- ✓ **Per Sandberg**, World Business Council for Sustainable Development, Vision 2050
- ✓ **Anthony Cox**, OECD Environment Directorate

11:30-12:00

Conclusions of the Global Forum by the Chair:

- key findings from the Global Forum; and
- next steps and possible actions to be taken by OECD and its member countries (Council Recommendation, report on policy options, compilation of best practices, etc.).

Site visits:

Wednesday afternoon

The host country will organise site visits focusing on sustainable materials management. More details about this can be found on the [logistical note](#) for the Forum and on the Forum website www.oecd.org/environment/gfenv.

附件三

大會與會人員名冊

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Sustainable Materials Management, (Mechelen, Belgium)**

Mechelen, Belgium

25/10/2010 - 27/10/2010

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