



行政院所屬各機關因公出國人員出國報告書
(出國類別：開會)

參加 OECD 廢棄物減量及再利用工作組
會議出國報告

服務機關：行政院環境保護署

姓名職稱：洪榮勳專業研究員

派赴國家：法國(巴黎)

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參加「OECD 廢棄物減量及再利用工作組 (WPRPW)」
出國報告

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壹、前言

在經濟合作暨發展組織 (Organization for Economic Co-operation and Development, OECD) 於 2001 年 5 月通過「OECD 環境策略」提出永續物質管理概念，，期盼整合各國廢棄物管理經營的經驗和知識，發展出一套永續物質管理的策略性作法，能夠配合產品生命週期、增加產品使用年限，以降低對於自然資源的耗竭。而針對廢棄物的管理工作，則成立了「廢棄物預防與回收工作小組」(Working Group on Waste Prevention and Recycle; WGWPR)，配合秘書處推行各項政策與技術的手冊和工具。

我國歷年來推動廢棄物管理的經驗及成果，藉由各種交流管道與國內外相關會議，國際間已對我國的進展多有認識。以近年為例，OECD 在 2005 年即邀請我國代表以專家身份參與其廢棄物預防與回收工作小組的會議；其後，2008 年，我國以 Front Runner Country 的身分應邀參加於以色列特拉維夫舉辦永續物質管理研討會；2010 再次應邀參加 OECD 於比利時舉行之全球論壇 (Global Forum)，擔任大會評論員。OECD 永續物質管理總監 (Principal Administrator) Dr. Henrik Harjula 及部分國家代表也在 2009 年來台參加我國所主辦的「永續物質管理國際研討會」，並

提供意見、分享經驗。

此次在 OECD 位於巴黎總部所舉行的會議，是原「廢棄物預防與回收工作小組」更名為「資源生產力與廢棄物工作組 (Working Party on Resource Productivity and Waste, WPRPW)」後，所舉行之第一次工作會議，原為 OECD 內部會議，我國既非會員國亦非觀察員，一開始即不在受邀名單之列。但在了解我國積極參與的意願後，OECD 新任總監 (Principal Administrator) Peter Borkey 特別來電，告知目前 OECD 所面臨來自中國大陸的政治壓力，但表示可以以專家的身分，邀請我國與會。本於務實與實質參與的原則，我方欣然接受 OECD 邀請。然而至現場報到後，發現 OECD 自始至終都以中華台北 (Chinese Taipei, 法文 Taipei Chinois) 的正式名稱對待我們，不但在名牌識別證及參與者名單上列名中華台北，在會議桌上我國更以中華台北身分，被安排在主席台左方第二個位置 (前排右二)，主題報告人及俄羅斯代表間，可謂是對我國高度善意的表示 (詳活動照片及附件)。

貳、行程內容：

1. 會議名稱：EXPERT MEETING ON SUSTAINABLE

MATERIALS MANAGEMENT AND WASTE POLICIES, OF
THE 1st MEETING OF THE WPPRPW

2.會議地點： OECD 總部, PARIS, FRANCE

3.參加人員：廢管處洪榮勳博士

4.行程：

6月19日啓程，搭長榮航空班機前往法國巴黎

6月20日抵達巴黎，隨即前往拜會台北駐巴黎辦事處

6月21日、22日參加會議

6月23日搭長榮航空班機返國

6月24日返抵台北

參、大會過程：

1. 本次會議係 WPRPW (Working Party on Resource Productivity and Waste) 更名後第一次會議，我國獲邀參加在 6/21 15:00 ~ 6/22 16:00 所舉行的專家會議議程。邀請函、議程及各國代表名單詳附件一、三及四。
2. 由會議議程可以將此次討論議題，分爲以下部分：
 - (a) 工作報告：更新資訊系統的建置狀況、一份歐盟調查研究報告、歐盟的 Green Growth 計畫；

- (b)提案計畫：芬蘭報告提案以木材做為營建材料之永續物質管理案例的研究計畫，及討論是否納入工作組在 2012-13 工作計畫中；
- (c)計畫報告修正後之討論：討論 Greenhouse Gas Emissions and the Potential for Mitigation from Materials Management within the OECD Area 計畫修正後內容，及解除列管 (declassification) 事宜；
- (d)新議題說明：Scoping study on nanowaste，經由網路連線澳洲專家進行口頭報告，另由 Working Party on Manufactured Materials 做 OECD 相關工作概況介紹，希望以後在 WPRPW 內可以對有關工作的必要性有所討論或規劃。
- (e)秘書處報告及討論：安排以下議題進行工作組內的討論及意見交換，包括：對秘書處在 G8 高峰會 (Deauville, France) 所做的一份關於 SMM 工作與資源生產力進展的整合報告；邀請 UNEP 代表就 CSD-19 在化學品及廢棄物的後續發展作一介紹；對秘書處稍早所提出之 the source and fate of critical metals contained in mobile phones 的文件；邀請 OECD 貿易委員會 (Trade Committee) 對其正實施的多項原物料管理相關的工作進行口頭介紹。

肆、大會討論重點整理：

1. WPRPW 工作組現階段工作

- (a) 在 2008 年 G8 環境部長會議 (Kobe, 2008) 的要求下，OECD 提出了一份 “Resource Productivity in the G8 and the OECD” 的報告，內容為對目前各國資源生產力的評估、其會員國在資源生產力相關的關鍵趨勢和主要政策發展情形、並特別著重於永續物質管理的執行狀況；另外，也提出政策的挑戰與機會、及討論到未來發展所採取的步驟。
- (b) 該報告指出，雖然各國資源生產力已明顯提高，但是物質資源的開採量仍然持續增加，G8 和 OECD 國家的人均物質資源消耗是世界其他國家的三倍。G8 國家中的加拿大、德國、義大利、日本已經將經濟發展與資源消耗量脫鉤，亦即該四國的物質資源使用量已開始減少。整體而言，G8 國家的廢棄物產量仍然平均增加 10%，因此認為應以 OECD 所建議的永續物質管理原則，以物質生命週期思考減少經濟活動所使用之原生物質的整合性政策為考量，強化 3Rs (Reducing, Reusing and Recycling)，才能繼續有所進展。
- (c) WPRPW 的立場是，希望從報告中所呈現的現況與問題，利用物質流分析 (MFA)、指標等工具，繼續更新各國資源生產力

數據資料；檢討廢棄物清理的問卷調查，以便瞭解目前各國廢棄物現況；以資源生產力為重點之一，建置綠色成長指標。

- (d) 在 2009 年的 OECD Ministerial Council Meeting (MCM)，各國財政部長發表宣言中表示有需要對 Green Growth 的發展程序 (process) 要經過一定的檢視與起草過程 (review and drafting)，同時也需要整合各項相關的工作。內容包括，策略的優先性、領導力、願景、主要的投入項目、主要檢視機關、分組、利害相關者等議題。
- (e) Green Growth 在架構上需要對人類成長的需求有更明確的認知、建立政策架構、利用平順的機制及國際合作推動從現有體制的轉換、量測推動進度、及以特定議題、特定部門、政策工具的方式推動。一些基本的考量，如經濟與環境的平衡、將污染計價、各國政策的混合運用，都可能在 Green Growth 中再做應用。他們也強調財政與經濟部門在推動 Green Growth 工作中的重要角色。在推動過程中，危機說不定是轉機、資訊或政策透明化、國際性的影響、對現況瞭解程度的影響可能都是重要。
- (f) Green Growth 的指標類別，包括資源生產力 (resource productivity)、經濟與環境資產 (economic and environmental

assets) 生活的環境品質 (environmental quality of life) 、...等。
未來工作的方向，需要訂出時間表及預期產出。各國代表的發言，包括：表示 Green Growth 對經濟政策決策者是非常重要的；Green Growth 較 Green economy 為上位，且延伸到 RIO+20 的討論，將資源的工作納入計畫。

2. 歐盟環境部關於歐盟資源效率 (Resource Efficiency) 政策調查研究的初步成果

- (a) 歐盟環境部 (EEA) 認為許多國家已經啓動資源生產力相關的政策，其已成為很活躍成長的政策領域。在 2008 有 Action Plan on SCP、Raw Materials Initiative；2010 有‘Europe 2020’ strategy and its seven Flagship Initiatives；預定於 2011 年將完成的研究報告有 2011 Communication on roadmap for a resource efficient Europe、2011 Communication on commodities and raw materials。此一調查研究的目的是蒐集、分析、散播各國發展與執行資源效率政策，並且促進經驗與良好作法 (good practice) 的交流。歐盟在七月份將檢討此份報告，預定九月份公布結果。共有包括 EU-27 在內的 25 國，共 31 國回覆調查問卷。

(b) 雖然多數國家並沒有對資源和資源生產力給予明確定義，但是需要先將資源生產力納入經濟性 (economy-wide) 的策略中的一個可能重點是探討使用市場力量來影響行爲。奧地利與德國已有細緻的經濟性策略將資源效率 (resource efficiency) 納入。另外從廣義而言，有六項經濟性策略或行動計畫將資源效率作為參照，包括 National sustainable development strategies、National environmental strategies /action plans、SCP action plans、Raw materials plans and strategies、Strategies and plans related to climate change、Economic reform programmes 等。從部門來看，被認為與資源效率最密切的是能源部門（即能源效率和再生能源的使用）及廢棄物處理部門，其他有公共部門 (public sector)、建築與營建、水管理 (Water Management)、運輸部門等，少數國家提及礦業、農業、森林、工業和漁業。

(c) 在優先性資源方面，被各國家共同選擇的四個項目為：能源類物質 (energy carriers)、廢棄物 (waste)、水 (water) 與礦物 (minerals)。除了以上四項，其他被提到的物質就因地或國情不同而非常廣泛，例如，土地與土壤、木材與森林、生物多樣性、生物質、漁業、金屬、海洋和海岸等。

- (d) 一般而言，各國政策目的或目標仍屬於原則性的宣告，只有少數國家（奧地利、丹麥、義大利）提到資源使用的數量，另瑞典及荷蘭有關於國家資源消耗量對降低全世界環境衝擊的策略，提到對生態恢復力與環境衝擊的經驗非常有限。各國對資源效率的政策驅動力包括，環境相關（關心環境惡化、永續發展）、經濟相關（價格變動性、資源價格上升、經濟改革、未來稀少化、降低進口依賴度），歐盟政策在對各國國內政策也是重要推動力等。
- (e) 推動資源生產力的工作仍需要的資訊及知識缺口，包括資源效率政策與其他政策的整合方式、政策執行的良好作法、政策有效性的評估、資源效率策略目標及目的及量測方法（指標的功能）、使用以市場為基礎的工具（market-based instruments）。

3. 永續物質管理與氣候變遷（溫室氣體排放）

ICF International 公司 Deanna Lizas 報告“Materials Management and Greenhouse Gas Mitigation Potential within OECD Countries”計畫，在依據之前審查表示意見後修正之重點。該報告是和工作組就物質管理對溫室氣體的影響所做的第一次研究，改變過去以部門為分類，為以系統（廢棄物處

理程序) 為分類方式，探討對溫室氣體減量的影響。其結論認為，物質管理對溫室氣體排放的影響甚鉅，且必須從生命週期方向考慮。在四個國家的研究案例中，廢棄物管理佔溫室氣體排放的 50% 以上，替代的廢棄物處理方式可有效降低排放量。其中又以源頭減量和回收，可減少最高的單位（公噸）廢棄物的排放量。廢棄物處理政策是影響排放量的因素之一，整合性廢棄物處理 (Integrated Waste Management Practices) 被認為是最有效的策略。

4. 奈米物質的環境影響

- (a) 奈米材料與奈米物質在近年來的使用已經越來越多，根據統計，使用量最多的奈米材料包括 nAg, nTiO₂, nZnO 等，其中在美國奈米銀使用在襪子類的數量即高達超過 900 tons/yr (產生 10,000 ton CO₂/yr)，另如奈米碳管，90% 使用於電子電器產品，WWICS 資料庫統計過去 5 年使用奈米材料的產品已增加 521%，達 1317 項。國際標準組織已有 ISO TC 229 的 Joint Working Group 討論關於 Definition and Terminology，以及奈米工程材料與奈米廢棄物 (nano engineered material and nanawaste)，澳洲也開始制訂關於奈米科技的法規。

- (b) 目前對奈米物質的暴露風險評估，仍以特定作業場所為主要對象，相關政策的研析以建立暴露風險評估的架構、勞安衛及環境、消費者安全的相關法規、延長生產者責任（EPR）的法規、全球協議（global agreement）、區域及地方性政策為主。
- (c) 奈米物質或廢棄物的管理在經濟面影響的考量，可能有奈米製造業、所延伸的相關的供應鍊、公共健康的顧慮、產品召回、分級制度（Class action）、抵制、停止發展（progress block）等措施的探討。
- (d) 初步結論是，如果奈米材料是對社會有益的，就應該考慮到社會責任問題（Social responsibility）、研擬分類架構（classification framework）或許是有需要的、在實驗室中發展自然生態系統模型、利用 LCA 探討從工業所產生排放、持續數據調查蒐集以因應愈為增加的使用量與產量。OECD 現有兩個工作組在探討奈米材料，WPMN 和 WPN，WPRPW 可將重點放在奈米廢棄物的處理、處置，奈米製造及回收程序、對能源節約的效益等方面，並在未來建立與 OECD 內其他單位的橫向溝通與資訊交換機制。

5. OECD 資源生產力與廢棄物整合研究

- (a) OECD 秘書處在先前 SMM 案例研究計畫之後，對手機中關鍵金屬 (Critical metals) 後續研究提出口頭報告，希望利用文獻回顧，選定專家對象進行訪談、
- (b) 聯合國第 19 次永續發展委員會 (Council of Sustainable Development) 對於資源與廢棄物管理也表示重要意見。地面上庫存的金屬資源越來越少，這些資源的管理對經濟與環境發展的脫鉤，可以產生重要影響。調查研究已指出，只有非常少部分廢棄後的回收 (end-of-life recycling) 在金屬部分只有如鋼、鐵、鋁等金屬回收率超過 50%，其他金屬的回收再利用極為有限，亟需改進。另外目前在資源庫存量 and 回收量的資訊仍非常欠缺，增加回收成效，對於未來供應越為緊縮的金屬物質有很大幫助外，也可以降低環境壓力，並增加工作機會。
- (c) UN Commission on Sustainable Development 是 General Assembly 為確保在 United Nations Conference on Environment and Development (UNCED) 之後工作的推動執行而設立，2011 年 CSD-19 是執行週期的第四期 (fourth implementation cycle)，訂定的工作重點為：運輸、化學品、廢棄物管理 (含

有害及固體廢棄物)、採礦、永續消費與生產型態計畫的十年架構等議題。

- (d) WPRPW 所做的口頭報告中表示，就近年推動永續物質管理得到的訊息，目前看到的趨勢及想法是逐漸有國家已將經濟成長與物質消耗脫鉤，總廢棄物人均產生量降低，另外，非直接物質流逐漸被納入考量。仍然需面對的挑戰，包括永續物質管理的範疇應如何界定、對於複雜混合 (complex mix) 的政策工具的應用、數據的可取得性、執行 SMM 的費用有時可能非常龐大、可行性需以成本效益分析評估，對未來 SMM 工作的規劃有，政策訂定的示範案例探討、成本與效益分析、蒐集並比較 SMM 在自然界所得到的經驗 (natural experiences)、發展出實用性政策法規的方法等。

6. 廢棄物越境轉移

- (a) WGRPW 工作組邀請貿易及農業委員會就該組在策略性原物料的出口限制議題所正在進行的工作進行介紹。商業及農業委員會對此一議題進行研究的背景是基於希望瞭解目前各國對原物料出口限制的國家，其作法和原因為何？產生的影響如何？這些國家是否達到其限制出口的目的？是否有降

低出口限制的替代方法，及其採取出口限制後的效益或效率的情況？是否可能有減輕對出口限制的依賴？

- (b) 根據 2009-2010 年間以出口限制、出口關稅、要求許可執照等管制方法的件數區分所做統計，出口限制以含鐵廢料及鎳為主；出口關稅以銅、含鐵廢料、鋁為最高，其他有鐵、鉛、鎳、錫、鋅等；以上各物質也都有要求許可執照的作法。根據商業處的報告，在 2011-2012 年度，將會繼續在資料分析、出口限制的理論架構分析、貿易實務上的經驗分析、出口限制的案例分析 - 以礦物為例、出口限制透明化的優缺點等繼續進行探討。

伍、成果與結論：

1. 有鑑於過去環境保護工作中以廢棄物減量方式的管理，仍屬於管末處理思維，除減少廢棄物產生量外，仍無法降低因人類經濟活動及需求而導致的大量物質消耗，及因物質原料開採、製造、使用、廢棄物的處理，而產生的對環境影響與衝擊。故 OECD 提出永續物質管理的環境政策，希望將生命週期思維導入，將搖籃到墳墓的理念，再進一步演化為搖籃到搖籃 (Cradle to Cradle, C2C)，使全世界有限的資源，不會因經濟發展而耗竭，也不至因

資源分配不平衡而造成新的世界性經濟與政治問題，由於全球暖化及能源供需議題的受到重視，資源生產力及廢棄物處理之能耗與碳排放量，也促使 OECD 將資源管理與廢棄物管理結合，使經濟、環境、社會可以永續發展。

2. 對經濟合作暨發展組織而言，其正經歷成立 50 年的一個重要階段，OECD 在 2009 年的部長級會議，提出了下一個 10 年的目標：綠色成長 (Green Growth)，未來 10 年的口號為 Green Growth。原廢棄物與減量工作組也更名為 Working Party on Resource Productivity and Waste (WPRPW)，此次會議也是更名後第一次會議，由工作組名稱可以瞭解其小組所欲涵蓋的工作目標。
3. 奈米材料及科技應用已越來越廣泛，目前對安全性的注意焦點多及於製程和作業場所，OECD 內也以工商業製造角度為主要探討方向，本次會議中得到共識，未來有必要及早從奈米材料的廢棄物處理角度考量，並建立固定的 OECD 內部橫向溝通與諮商的機制。
4. 近年 WGWPR 已有關於手機中重要金屬之報告，WPRPW 後續計畫進行對這些重要金屬不同生命週期階段的政策分析，並檢視目前可能存在的政策落差及連帶的議題與可能的因應辦法。
5. OECD 貿易委員會 (Trade Committee) 正在進行的許多與原物料

管理相關的工作，包括出口限制對經濟衝擊的分析、對主要物資出口限制清單的開發、透明化最佳作法的認定等。

6. 會中對各項議題的討論，各國分別提出意見及看法，其中美國、法國、德國、加拿大、及比利時（主席）等國代表針對每一個議題，都提出各該國的看法及意見，法國代表在討論木質建材時更明確的表示法國可以在該議題上提供額外的經濟支援。由議題的討論過程，可以看出許多國家在與會前，已經過國內充分溝通與討論。
7. 會議中，議題討論之餘，我們也把握機會說明我國近來落實永續物質管理的努力，除了將於明年將環保署改制為環境資源部，廢棄物管理處將改編為資源循環司外，也將加強 C2C 的落實，並將資源生產力 (Resource Productivity) 納入資源物質管理重要指標，各國對台灣在環境工作的成績多表重視與肯定，紐西蘭代表更透過視訊電話說：Congratulations, Taiwan! 向我們道賀。我們也表示日後有任何成果，將非常願意到會議中與大家分享。雖然【中華台北】是我國參與 OECD 的正式名稱，但各國代表都以【台灣】稱呼我國。
8. OECD 當局表示本次會議係 WPRPW (Working Party on Resource Productivity and Waste) 改組更名後第一次會議，此後每年固定的

年會，都會邀請我國以中華台北的身分參加。

9. OECD 當局也表示，在每年固定的年會中，另有不定期的視訊會議，我國也在受邀之列。
10. 此後不論是 Working Party 會議或視訊會議，OECD 將會提前寄給我方會議資料參考，會議中所須討論的所有文件，不論是已解除列管 (declassified) 或列管中 (classified) 的文件，都將事先提供給我方，我國將有機會先期了解 OECD 內部的作業及最新的國際動態。
11. 會議前，曾前往我國駐巴黎台北辦事處拜會石心主任及徐炳勳一等商務秘書，交換與 OECD 接觸的工作經驗及心得。多年來，我國與 OECD 正式接觸均由該單位負責。對於本署近年來積極與 OECD 環境與經濟處及其會員國建立關係，石主任等極為肯定，並表示將在今年年底，OECD 官員前來我國參加由本署主辦的國際研討會前夕，在巴黎宴請 OECD 代表，加強雙方的聯繫。

陸、建議：

1. 對於 OECD 提供給我國機會，參與廢棄物及資源生產力工作組 (WPRPW) 專家會議，我們應該積極主動，盡量不要錯過參加任何一次實質會議，或視訊會議的機會。

2. 綜觀這次會議，議題層面包括綠色成長、溫室氣體、奈米廢棄物、稀土元素、木質建材、出口管制等，涵蓋面甚廣，爲了深化我們的參與，提供更積極的貢獻，建議國內依每次會議主題成立專家小組，在與會前於國內事先討論，俾能在會議中提出具體建言，積極參與，實質貢獻，從而發揮我國的影響力。

柒、「OECD 永續物質管理全球論壇」活動照片



2011 年 OECD 廢棄物及資源生產力工作組(WPRPW)專家會議於 6 月 21, 22 兩日在法國巴黎舉行，現場共有來自 OECD 會員國、觀察員、顧問公司共 68 人參加，另有以視訊與會的國家如紐西蘭、澳洲等，我國也以中華台北身分應邀出席。(大會現場，中場休息時間)。



我國被安排在主席台左方第二個位置（前排右二），即主題報告人及俄羅斯代表間，大會以英語、法語、俄語、意大利語同步翻譯。



與會議主席（比利時代表）John Wante 合影。



我國以中華台北（Chinese Taipei, 法文 Taipei Chinois）身分與會。



與日本代表，環境部廢棄物管理及循環處(Waste Management and Recycling Department, Ministry of Environment) Masanobu Kimura 副處長攝於 OECD 歡迎茶會。



OECD 總部內部及後院廣場。

附件一

大會邀請函



Environment and Economy Integration Division
Environment Directorate

ENV/EEI /PB/2011.14

Paris, 28 April 2011

Mr. Dr. Harvey Houg, Ph.D., PE, CIH
Professor
Department of Water Resources and Environmental Engineering
Tamkang University
151 Ying Zhuan Road, Dan Shui, Taipei, Taiwan
(by email harvey@epa.gov.tw)

Subject: Invitation to the Expert meeting session of the WPRPW meeting – 21 June 2011, 15:00 to 22 June, 15:30

Dear Dr. Houg,

I am writing to invite you to participate in the **Expert meeting on Sustainable materials management and waste policies** of the 1st Meeting of the Working Party on Resource Productivity and Waste (WPRPW).

This expert meeting will be held on 21 June 2011 from 15:00 until 22 June, 15:30 at the OECD Conference Centre, 2 rue André-Pascal, Paris, France. I attach a preliminary agenda of this meeting.

We would highly welcome your active participation in the discussions on sustainable materials management and waste policies, as well as to learn more about the policy challenges that Chinese Taipei is facing, and policy approaches that are currently being pursued to address those challenges.

Do not hesitate to contact me should you need any assistance or further information. For any other questions regarding meeting logistics, please contact Ms. Sandrine Recurt (Sandrine.Recurt@oecd.org)

I am looking forward to your active participation in this Expert meeting.

Yours sincerely,

Peter Börkey
Principal administrator, Environment directorate, OECD

enc: Draft Agenda of the Expert meeting
cc : Mr. Anthony Cox, Head of division, Environment and Economy Integration Division, OECD
Ms. Soizick de Tilly, Administrator, Environment and Economy Integration Division, OECD

附件二

大會名牌識別證



DELEGATE

22/06/2011

HOUNG

Harvey

CHINESE TAIPEI

Working Party on Ressource Productivity and Waste

CC 13

大會名牌識別證列印中華台北（Chinese Taipei）
我國在 OECD 的正式名稱。

附件三

大會議程

DRAFT AGENDA

**EXPERT MEETING ON SUSTAINABLE MATERIALS MANAGEMENT AND WASTE
POLICIES**

**PARIS, OECD HEADQUARTERS
21-22 JUNE 2011**

Tuesday, 21 June 2011			
1.	15:00	<p>Information on relevant activities inside and outside of OECD</p> <p>This session will provide brief introductions to the following:</p> <ul style="list-style-type: none"> • Activities in the Working Party on Environmental Information (Myriam Linster, OECD) • Outcome of the “2011 Survey of Resource Efficiency Policies in 31 European Countries” (Pawel Kazmierczyk, European Environment Agency) • OECD work on Green Growth (Anthony Cox, OECD) 	<p><i>Action required:</i> For information</p>
2.	16:00	<p>Presentation of a project proposal on wood as a construction material</p> <p>Finland will introduce a proposal for an SMM case study on wood as a construction material for possible inclusion in the Working Party’s work programme for 2012-13.</p>	<p>ENV/EPOC/WPRPW(2011)3</p> <p><i>Action required:</i> Decision</p>
	16:30	Coffee break	
3.	17:00	<p>Revised paper on Greenhouse Gas Emissions and the Potential for Mitigation from Materials Management within the OECD Area</p> <p>Following the discussion of this paper at the October 2010 GWPR, a revised version has been prepared, which is presented for declassification. The consultant, Deanna Lizas (ICF) will present the paper.</p>	<p>ENV/EPOC/WGWPR(2010)1/REV1</p> <p><i>Action required:</i> For comments and possible declassification</p>
	18:00	End of day one and cocktail reception	

Wednesday, 22 June 2011

4.	Wednesday 22 June 9:30 am	<p>Scoping study on nanowaste</p> <p>The Secretariat contracted Jeremy Allan (Technical Specialist on Nanotechnology at WorkCover New South Wales) to prepare this paper. He will be participating through a conference call from Australia and will present his paper to the group.</p> <p>Kristan Markey (OECD Environment Directorate) will provide an overview of relevant work in the Working Party on Manufactured Nanomaterials in order to further support a discussion on potential future work in this area within WPRPW.</p> <p>The secretariat will present the room document on “Possible Ideas for Future Work on Nanowaste”</p>	<p>ENV/EPOC/WPRPW(2011)4</p> <p><i>Action required:</i> For information and comments, as well as a possible decision on future work.</p> <p>ENV/EPOC/WPRPW/RD(2011)1</p>
	10:30	Coffee Break	
5.	11:00	<p>Policy dialogue on sustainable materials management – What is the progress so far and what are the key messages</p> <p>The secretariat will introduce two papers: a synthesis of work on SMM and a report on progress in resource productivity that was prepared for the G8 Summit in Deauville, France.</p> <p>Delegates are invited to discuss the key messages that are contained in the two papers and to provide comments on the next steps for the SMM synthesis paper.</p> <p>Guido Sonnemann, UNEP) will present the outcomes of CSD-19 on chemicals and waste</p>	<p>ENV/EPOC/WPRPW(2011)5</p> <p>ENV/EPOC/WPRPW/WPEI(2011)1</p> <p><i>Action required:</i> For discussion and comments</p>
	13:00	Lunch	

6.	14:30	<p>Presentation of terms of reference for a follow-up to the SMM case study on critical metals in mobile phones</p> <p>This agenda item will be introduced by the Secretariat. An earlier document [ENV/EPOC/WGWPR(2009)8/FINAL], which is available on the OECD waste website as well as on Clearspace, examined the source and fate of critical metals contained in mobile phones. A follow-on study is proposed to analyse the policies at different phases of the life-cycle of these metals and to identify possible policy gaps and coherence issues and potential measures to address them.</p>	<p>ENV/EPOC/WPRPW(2011)6</p> <p><i>Action required:</i> For information and comments</p>
7.	15:30	<p>The economic impact of export restrictions on raw materials</p> <p>The OECD's Trade Committee is carrying-out a range of activities on the topic of raw materials, including analysis of the economic impact of export restrictions on raw materials, the development of an inventory of export restrictions on major commodities, and the identification of best practices in transparency on such practices.</p> <p>Frank Van Tongeren (OECD Trade and Agriculture Directorate) will provide an overview of this work.</p>	<p>Oral presentation of work of the OECD Trade Committee</p> <p><i>Action required:</i> For information</p>
	16:00	Coffee Break – end of the expert meeting	

附件四

大會參與人員名冊

Participants List for Working Party on Resource Productivity and Waste
Liste des Participants pour Groupe de travail sur la productivité des
ressources et les déchets

21/6/2011 - 22/6/2011

Session	Start	End
Working Party on Resource Productivity and Waste	Jun 21 2011 9:00AM	Jun 22 2011 6:00PM

Chair/Président

Mr. John WANTE

*Engineer
Service Policy Innovation
OVAM
Stationsstraat 110
2800 Mechelen
Belgium*

*Tel: +32(0) 15 284 293
Fax: +32 (0) 15 413 072
Email: john.wante@ovam.be*

Belgium/Belgique

Yorg AERTS

*Policy advisor
Policy Innovation Service
OVAM
Stationsstraat, 110
2800 Mechelen*

*Tel: +3215284348
Fax: +3215413072
Email: yorg.aerts@ovam.be*

Johan DANIELS

*Attaché
Environnement
SPF Santé public, Sécurité de la Chaîne alimentaire et
Environnement
Eurostation
Place Victor Horta, 40/10
1060 Saint Gilles*

*Tel: +32.2.524.95.25
Fax: +32.2.524.96.01
Email: johan.daniels@milieu.belgie.be*



Canada

Mr. Tim GARDINER

*Director, Waste Reduction and Management Division
Public and Resource Sectors Directorate
Environment Canada
Environmental Stewardship Branch
Place Vincent Massey, 14th Floor
351 Boul. St Joseph
K1A 0H3 Gatineau, Canada*

*Tel: +1 (819) 934-1509
Fax: +1 (819) 997 3068
Email: Tim.Gardiner@ec.gc.ca*

Mrs. Jacinthe SÉGUIN

*Manager, Waste Policy
Waste Reduction and Management Division, Environment Canada
351 St. Joseph Blvd
K1A 0H3 Gatineau, Canada*

*Tel: +1 (819) 953 1390
Fax: +1 (819) 997 3068
Email: jacinthe.seguin@ec.gc.ca*

Mr. Douglas FORSYTHE

*Counsellor, Energy, Environment and OECD budget issues
Permanent Delegation
15 bis, rue de Franqueville
75116 Paris, France*

*Tel: +33-1 44 43 20 11
Fax: +33-1 44 43 20 99
Email: douglas.forsythe@international.gc.ca*

Chile/Chili

Mr. Joost MEIJER

*Waste Area
CONAMA
Teatino 254/258
Santiago
Chile*

*Tel: +56 2 2405794
Email: jmeijer@mma.gob.cl*

Czech Republic/République tchèque

Ms. Zdenka BUBENIKOVA

*Directeur/Directrice
Department of Waste Management
Ministry of the Environment
Vrsovicka 65
100 10 Prague 10
Czech Republic*

*Tel: +420 267 122 216
Fax: +420 267 311 545
Email: zdenka.bubenikova@mzp.cz*

Denmark/Danemark

Mr. Henrik Hagen OLESEN

*Chief adviser
Danish Environmental Protection Agency, Directors office
Ministry of Environment
Strandgade 29DK-1401 København K
1401 K Copenhagen
Denmark*

*Tel: +45 7254 4209
Email: hha@mst.dk*

Estonia/Estonie

Mr. Peeter EEK

*Director General Waste Department
Ministry of the Environment
Narva mnt 7a
15027 Tallinn
Estonia*

*Tel: + 372 626 2884
Email: peeter.eek@envir.ee*

Ms. Sari LEHTIRANTA

*Counsellor (until 30.6.2011)
Permanent Delegation
6, rue de Franqueville
75116 Paris
France*

*Tel: +33 1 45 24 71 48
Fax: +33 1 45 20 63 04
Email: sari.lehtiranta@formin.fi*

Mr. Matti OIVUKKAMÄKI

*Industrial Counsellor (until 31.8.2011)
Permanent Delegation
6 rue de Franqueville
75116 Paris
France*

*Tel: +33 1 45 24 72 17
Fax: + 33 1 45 20 63 04
Email: matti.oivukkamaki@formin.fi*

Ms. Tarja-Riitta BLAUBERG

*Senior Adviser
Environmental Protection Department
Ministry of the Environment
P.O. Box 35
00023 GOVERNMENT
Finland*

*Tel: +358-400 143 917
Fax: +358-9-160 39716
Email: tarja-riitta.blauberg@ymparisto.fi*

France

M. Yvan FAURE-MILLER

*Responsable de division
Direction générale de l'énergie et des matières premières /
Observatoire de l'économie de l'énergie et des matières
premières
Ministère de l'Economie, des Finances et de l'Industrie
61, bd Vincent Auriol
75013 Paris, France*

*Tel: +33 (0)1 44 97 08 86
Fax: +33 (0)1 44 97 09 10
Email: yvan.faure-miller@industrie.gouv.fr*

Ms. Anne-Laure GENTY

*Chargé de Mission Transferts transfrontaliers de déchets Bureau de la Planification et de la Gestion des Déchets Service de la Prévention de Nuisances et de la Qualité de l'Environnement Ministère de l'Ecologie, de l'Energie, du Développement Durable et de la Mer
Bureau de la gestion et du traitement des déchets*

Tel: +33 1 40818776

Email: anne-laure.genty@developpement-durable.gouv.fr

Mme Doris NICKLAUS

*Chargée de mission
CGDD/SEEI/ERNR2
Ministère de l'Ecologie, de l'Energie, du Développement Durable et de la Mer
Tour Voltaire 92, Place Ferney
La Défense
France*

Tel: +33 1 40 81 83 74

Email: doris.nicklaus@developpement-durable.gouv.fr

Germany/Allemagne

Mr. Andreas JARON

*Head of Division
WA II 1 - General Matters of Waste Management, Transboundary Movement of Waste
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)
Robert-Schuman-Platz 3
53175 Bonn
Germany*

Tel: +49-228-305-2570

Fax: +49-228-305-2398

Email: andreas.jaron@bmu.bund.de

Ms. Susann KRAUSE

*Deputy Head of Section
Municipal Waste Management Hazardous Waste, Focal Point to the Basel Convention
Federal Environment Agency (UBA)
Postbox 1406
06813 Dessau
Germany*

Tel: +49 340 2103 3035

Email: susann.krause@uba.de

Israel/Israël

Mr. Ilan NISSIM

*Head of Solid Waste Management Division
Ministry of Environmental Protection
Jerusalem
Kanfei Nesharim 5
95464 Jerusalem
Israel*

*Tel: +972 2 6553 801
Fax: +972 2 6553 817
Email: ilan@environment.gov.il*

Italy/Italie

Ms. Giovanna PICCARRETA

*First Counsellor - Energy & Environment
Permanent Delegation
73 rue de Grenelle
75007 PARIS
France*

*Tel: +33 1 44 39 21 50
Fax: +33 1 42 84 08 59
Email: giovanna.piccarreta@esteri.it*

Mr. Aldo RAVAZZI DOUVAN

*Co-Chair
OECD-WPBWE Committee Co-Chair
Italian Ministry of Environment, Land & Sea
Via Cristoforo Colombo 44
MATTM - DG SEC - Sustainable Development, Energy & Climate
Change
I-00147 Rome
Italy*

*Tel: +39 06 57 22 80 64
Fax: +39 06 57 22 82 25
Email: aldo.ravazzi@tfambiente.it*



Japan/Japon

Mr. Fumio ITO

*First Secretary
Permanent Delegation
11, avenue Hoche
75008 Paris
France*

*Tel: +33 1 53 76 61 82
Fax: +33 1 45 63 05 44
Email: fumio.ito@mofa.go.jp*

Mr. Masanobu KIMURA

*Deputy Director
Waste Management and Recycling Department
Ministry of the Environment
Office of Sound Material-Cycle Society
5 Godochosha, 1-2-2 KASUMIGASEKI, CHIYODA KU
100-8975 Tokyo
Japan*

*Tel: +81-3-5521-8336
Email: masanobu_kimura@env.go.jp*

Korea/Corée

Mr. Heesong CHO

*First Secretary
ENV
Permanent Delegation
4 Place de la Porte de Passy
75016 Paris
France*

*Tel: +33 1 44 05 20 59
Fax: +33 1 47 04 07 39
Email: kiucho@naver.com*

Dr. David CHUNG

*Senior Researcher
National Institute of Environmental Research
Korea*

Email: david426@korea.kr

Ms. Hyeyoung HAN

*Deputy General Manager
Korea Environment Corporation*

Email: helena425@hanmail.net

Mr. Sanghoon KIM

*Deputy Director
Resource recirculation policy division
Ministry of Environment
GOVERNMENT COMPLEX GWACHEON
Gwacheon City
Korea*

Tel: +82 2 2110 6915

Fax: +82 2 504 9210

Email: ktsh77@naver.com

Mexico/Mexique

Sandra HERRERA FLORES

*Vice Minister
Environmental Development and Regulation
Ministry of Environment and Natural Resources
Periférico Sur 4209 5° Piso - Colonia Jardines de la Montaña
14210 Mexico City
Mexico*

Tel: +52(55)56280613

Email: sandra.herrera@semarnat.gob.mx

Mr. Alfonso ZEGBE

*Minister-Counsellor for Environment and Natural Resources
Environment & Natural Resources
Permanent Delegation
8, rue de Berri
75008 Paris
France*

Tel: +33 1 56 59 29 04

Fax: +33 1 45 63 03 63

Email: alfonso.zegbe@semarnat.gob.mx

Mr. Marco Antonio VILLALÓN

Advisor
Permanent Delegation of Mexico to the OECD
8, RUE DE BERRI
75008
Mexico

Tel: +33 1 56 59 29 04
Email: marco.villalon@semarnat.gob.mx

Poland/Pologne

Mr. Rafal FRAC

Counsellor, Energy & Environment
Permanent Delegation
136, rue longchamp
75116 Paris
France

Tel: +33 1 56 28 58 89
Fax: +33 1 56 28 94 66
Email: rafal.frac@msz.gov.pl

Ms. Ewa GLABA

Expert of the Ministry of Environment
Market Supervision Department
Chief Inspectorate for Environmental Protection
Wawelska str. 52/54
00-922 Warsaw
Poland

Tel: +48 22 57 92 287
Fax: +48 22 57 92 302
Email: e.glaba@gios.gov.pl

Portugal

Mrs. Ana Cristina CALDEIRA

Department of Waste Streams and Exchange Markets
Portuguese Environmental Agency
Rua da Murgueira, 9/9A - Zambujal Ap. 7585 2611-865
Amadora
Portugal

Tel: +351 214 721456
Email: cristina.caldeira@apambiente.pt



Slovenia/Slovénie

Ms. Katja BUDA

Head of Environment and Climate Change Division
Environment Directorate
Ministry of the Environment and Spatial Planning
Dunajska c. 48
SI-1001 Ljubljana
Slovenia

Tel: +386 1 478 7378
Email: katja.buda@gov.si

Spain/Espagne

Mr. Francisco ALEZA ENCISO

Ministry of the Environment and Rural and Marine Affairs, Gen
Directorate of Environment Quality and Assessment
Plaza de San Juan de la Cruz s/n
28071 Madrid
Spain

Tel: +34 91 597 5845
Fax: +34 91 597 5938
Email: faleza@marm.es

Mr. Manuel MARTÍN RUIZ

Conseiller pour l'Environnement
Permanent Delegation
22, avenue Marceau
75008 Paris
France

Tel: +33 1 44 43 30 41
Fax: + 33 1 44 43 30 18
Email: mmartin@mma.es

Sweden/Suède

Ms. Cecilia MATTSSON

Swedish Environmental Protection Agency
Valhallavägen 195
106 48 Stockholm
Sweden

Tel: + 46 10 698 10 00
Email: cecilia.mattsson@swedishepa.se

Switzerland/Suisse

Mr. Marco BULETTI

*Waste Management, Chemicals and Biotechnology Division
Waste Recovery and Treatment Section
Office fédéral de l'environnement (OFEV)
3003 Bern
Switzerland*

*Tel: +41 31 322 68 37
Fax: + 41 31 323 03 69
Email: marco.buletti@bafu.admin.ch*

Turkey/Turquie

Mr. Zafer ATES

*Counsellor
Permanent Delegation
9, rue Alfred-Dehodencq
75116 Paris
France*

*Tel: +33 1 42 88 50 02
Fax: +33 1 45 27 28 24
Email: zates@mfa.gov.tr*

United States/États-Unis

Ms. Marie BOUCHER

*Office of Resource Conservation and Recovery
US Environmental Protection Agency
1200 Pennsylvania Ave, NW
Mail Code 5304P
Washington, DC 20460
United States*

*Tel: +1-703-308-8754
Fax: +1-703-308-0514
Email: boucher.marie@epa.gov*



EU/UE

Mr. Pawel KAZMIERCZYK

*Project Manager
Waste & Material Flows
EUROPEAN ENVIRONMENT AGENCY
Kongens Nytorv 6
DK-1050 Copenhagen
Denmark*

*Tel: +45 33 367 122
Fax: +45 33 367 151
Email: Pawel.Kazmierczyk@eea.europa.eu*

Mr. Michel SPONAR

*Policy Officer (Waste)
DG Environment
Environnement
Unit ENV.C2
Avenue de Beaulieu 29
BU29 6/69
B-1049 Brussels
Belgium*

*Tel: +32 2 298 5079
Email: michel.sponar@ec.europa.eu*

Russian Federation/Fédération de Russie

Mr. Anton CHEREDNICHENKO

*Specialist-expert
Trade Representation of Russian Federation in French Republic
49 rue de la Faisanderie
75116 Paris
France*

*Tel: + 33 (6) 48 21 56 68
Email: oecd@hrsa.ru*

Ms. Yulia KOVTUN

*Department of International Cooperation
Ministry of Natural Resources and Environment of the Russian
Federation
4/6, Bolshaya Gruzinskaya
123995 Moscow
Russian Federation*

*Tel: +7 (499) 254 58 00
Email: kovtun@mnr.gov.ru*

Mr. Konstantin KUSHNIR

*Chief specialist
Department of state policy and regulation
Ministry of natural resources and environment of the Russian
Federation*

*Tel: +7 495 718 06 66
Email: kushmir@mnr.gov.ru*

Ms. Natalia KUTKOVAYA

*Chief Expert
Ministry of Economic Development of the Russian Federation
Ovchinnikovskaya nab. 18/1
Moscow
Russian Federation*

*Tel: +79 05 762 1898
Email: Kutkovaya@economy.gov.ru*

Mr. Nikolay NEFEDIEV

*Acting director
Ministry of Natural resources and Environment of the Russian
Federation*

Chinese Taipei/Taipei chinois

Dr. Harvey HOUNG

*Environmental Protection Agency
No. 83, Sec.1, Jhonghua Rd.,
10042 Taipei*

*Tel: 886-2-23117722 ext: 2602
Fax: 886-2-23812909
Email: harvey@sun.epa.gov.tw*

Mr. John ATHERTON

Senior Program Director
International Council on Mining and Metals (ICMM)
35 Portman Square
6th floor
W1H 6LR London
United Kingdom

Tel: +44 20 7467 5078
Fax: +44 20 7467 5071
Email: john.atherton@icmm.com

Mr. Ross BARTLEY

Environmental & Technical Director
BIR - Bureau of International Recycling
Avenue Franklin Roosevelt 24
B-1050 Bruxelles
Belgium

Tel: +32 2 627 5770
Fax: +32 2 627 5773
Email: bir@bir.org

Mr. Ton GOVERDE

Director Corporate Relations of the Van Gansewinkel Group in
behalf of FEAD
FEAD
Rue Philippe le Bon 15
1000 Bruxelles
Belgium

Tel: +32 2 732 32 13
Email: info@fead.be

Mrs. Tianne GROENEVELD

BIAC
13-15 Chaussée de la Muette
75016 Paris
France

Tel: +(33-1) 42 30 09 84
Fax: +(33-1) 42 88 78 38
Email: GROENEVELD@biac.org

Mr. Corentin JUNGER

*BDE Bundesverband der Deutschen Entsorgungs-,
Rue du Commerce 31
1000 Bruxelles
Belgium*

*Tel: +32 2 548 38 90
Email: bde@bde-bruessel.eu*

UN Environment Programme (UNEP)/Programme des Nations Unies pour l'environnement (PNUE)

Mr. Guido SONNEMANN

*Innovation Programme Officer
UNEP, DTIE
15 rue Milan
75009 Paris
France*

*Tel: +33 1 44 37 7622
Fax: +33 1 44 37 1474
Email: guido.sonnemann@unep.org*

OECD/OCDE

Mr. Simon UPTON

*Director
ENV
OECD
Marshall Building 0130
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 14 56
Fax: +33 1 45 24 84 08
Email: Simon.UPTON@oecd.org*

Miss Eija KIISKINEN

*Head of Accession Unit
ENV
OECD
Marshall Building 0107
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 18 40
Fax: +33 1 44 24 96 71
Email: Eija.KIISKINEN@oecd.org*

Mr. Peter BORKEY

*Principal Administrator
ENV/EEI
OECD
Marshall Building 0240
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 13 85
Fax: +33 1 45 24 96 71
Email: Peter.BORKEY@oecd.org*

Mme Lucie BUXTORF

*Senior Legal Adviser
SGE/LEG
OECD
Château de la Muette 318
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 94 57
Email: Lucie.BUXTORF@oecd.org*

Mr. Anthony COX

*Head of Division
ENV/EEI
OECD
Marshall Building 0235
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 98 70
Fax: +33 1 44 30 61 21
Email: Anthony.COX@oecd.org*

Mme Soizick DE TILLY

*Administrator, Environmental policies and data
ENV
OECD
Marshall Building 0220
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 79 06
Fax: +33 1 44 30 61 79
Email: Soizick.DETILLY@oecd.org*

Miss Gita KOTHARI

*Legal Adviser
SGE/LEG
OECD
Château de la Muette 317
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 79 48
Email: Gita.KOTHARI@oecd.org*

Mme Myriam LINSTER

*Principal Administrator
ENV/EPI
OECD
Marshall Building 0029
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 97 44
Fax: +33 1 45 24 78 76
Email: Myriam.LINSTER@oecd.org*

Mr. Kristan MARKEY

*Administrator, Nanosafety
ENV/EHS
OECD
Marshall Building 0295
2 rue André-Pascal
75016 Paris
France*

*Tel: +(33-1) 45 24 76 96
Email: Kristan.MARKEY@oecd.org*

Mlle. Sandrine RECURT

Secretary/Assistant
ENV/EEI
OECD
Marshall Building 0243
2 rue André-Pascal
75016 Paris, France

Tel: +(33-1) 45 24 17 63
Email: Sandrine.RECURT@oecd.org

Mr. Frank VAN TONGEREN

Head of Division
TAD/PTA
OECD
Marshall Building 4321
2 rue André-Pascal
75016 Paris, France

Tel: +(33-1) 45 24 78 81
Email: Frank.VANTONGEREN@oecd.org

Expert

Ms. Deanna LIZAS

Manager
ICF International
1725 Eye Street, NWSuite 1000
20006 Washington, DC
United States

Tel: +001 202-862-1106
Email: dlizas@icfi.com

Mr. Jeremy ALLAN

Technical Specialist - Nanotechnology
Working Environment Unit
Strategic Specialist Services Group
WorkCover NSW

Tel.: +61 (0)2 8260 5824
Email: Jeremy.Allan@workcover.nsw.gov.au


Other/Autre

Mr. Yaowen CHENG

St. John's University
499, Tamking Rd, Sec.4
25135 New Taipei City
Chinese Taipei
Email: ywcheng@mail.sju.edu.tw

附件五

參加會議預備簡報稿




Report from Chinese Taipei

- Recent plan to gear up sustainable material utilization

Harvey Houg, PhD, PE, CIH
Environmental Protection Administration, Taiwan

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

Outline



- Preface
- Moving forward on a solid status
- A future plan towards sustainable recycling and reuse of resources
- Summary

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Environmental Protection Administration
Executive Yuan, R.O.C. (Taiwan)

Preface (1/2)



- Universal theme to deal with Climate Change
 - In recognition of the challenge on global climate change and resource exhaustion
 - Energy saving and carbon emission reduction
 - Integrating waste management into sustainable material recycling and use
- Causes of resource exhaustion
 - Mass production and mass consumption
 - Retrieving precious resources via Urban-Mining
 - The need to provide a more effective supporting system for resource management
- Strategy to configure zero waste and total recycling
 - Application of cradle to cradle concept
 - Recovering and reusing resources more effectively by comprehensive industrial ecological linkages and cyclical societies
 - Existing programs, goal, scope, and prospects



Green mountains and clean water



Blue sky and green land

Preface (2/2)



Initiating carbon footprint labeling system in Taiwan

- Reg. number
- Functional unit
- EPA web site



碳標字第○○○○號
每 600 ml
<http://www.epa.gov.tw>

本產品碳足跡依據「罐裝飲料產品類別規則」，Simapro 工具，PAS 2050 標準及使用 30% 一瓶活動數據，70% 二級活動數據計算結果為 130g，生命週期各階段碳足跡比例如下圖所示：



本產品於夏季時多為冷藏保存，因此夏季碳足跡較大，本公司將執行綠色供應計畫，在夏季階段減少 5% 的碳排數量，請於本產品使用完後，將飲料罐資源回收，進一步降低碳排數量。

- Title of PCR
- Calculation Tool
- Standard applied
- Data quality

- Percentage of CFP in each life stage
- Projection on future reduction



Moving forward – global trend



- Sustainable resource recycling and reuse has become a highly recognized global issue.
- Along with economical and industrial development, continuous consumption of natural resources and exhaustion of the world resources are detrimental.
- Decoupling of economical and environmental development should be pursued. The essence of sustainable resource recycle and reuse is to improve resource efficiency and resource productivity so that resource is used repeatedly and resource consumption is reduced.

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Moving forward - challenges



- Resource recycling industry needs to improve qualities of regenerated raw materials. Markets for secondary products still needs to be stimulated.
- Comprehensive linkage in resource recycling system is still lacking although most industries have practiced waste treatment and recycling.
- Innovative strategies merge into existing system to strive for breakthrough.
 - Transformation of waste management to sustainable material management
 - Promotion of cradle to cradle concept
 - Launch of land reclamation projects to provide new alternatives for final disposal

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Moving forward on a solid basis



- An overview of waste/resource management policies in Taiwan

General waste management



Safety training in garbage collection and cleaning



Wall decoration using regenerated glass



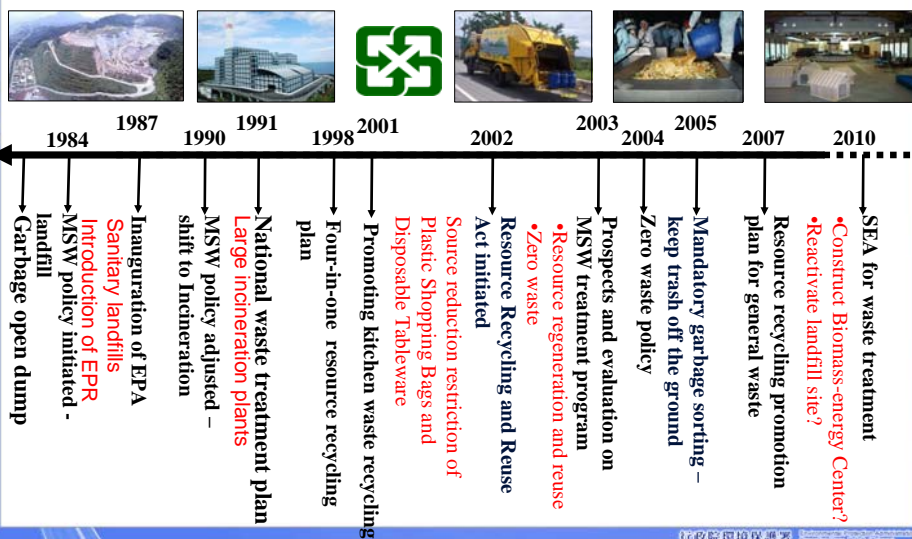
Resource recovery plant/modern incinerator

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Moving forward on a solid basis



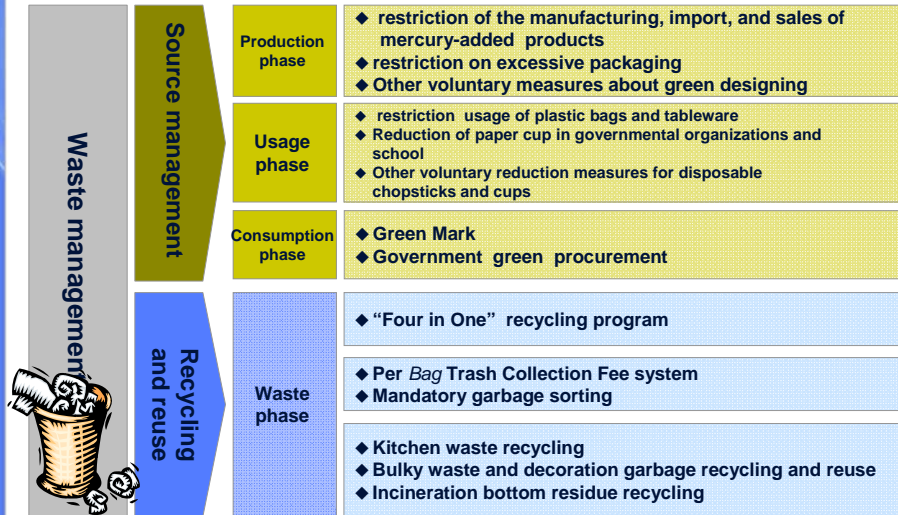
Evolution of waste treatment policies



Moving forward on a solid basis



Program implementation in three phases

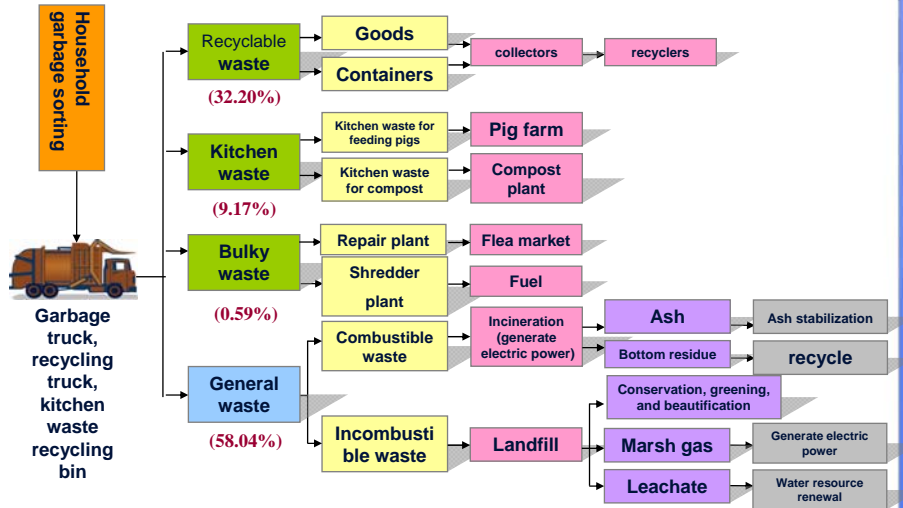


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Moving forward on a solid basis



Current framework of sorting, recycling, and disposal



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Moving forward on a solid basis



- An overview of waste/resource management policies in Taiwan

Industrial waste management

Cradle to grave



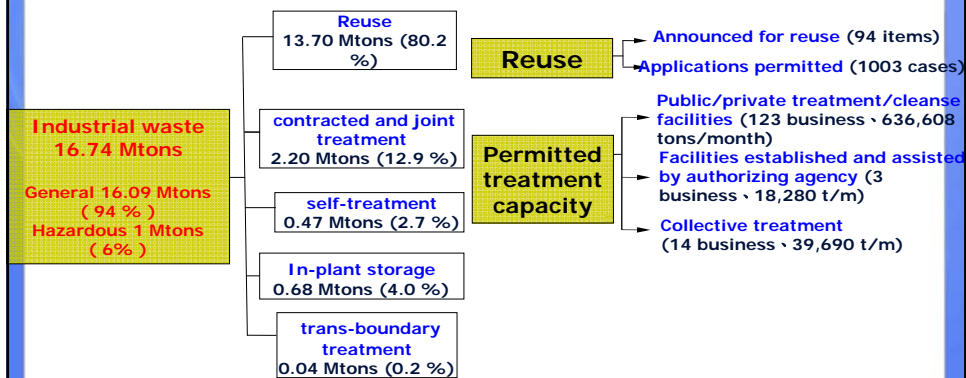
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Record reported (2009)

Facility capacity permitted and operated (2010.11)



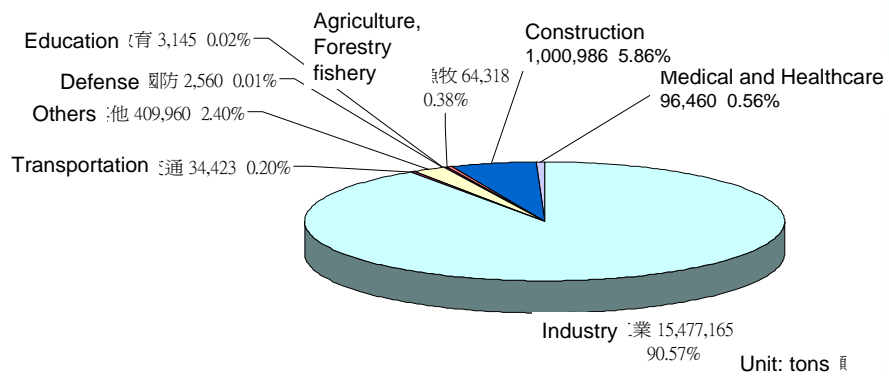
- No. of Business submitted waste cleaning plan for permission: 24,267, 97.7 % of total
- No. of business reported through internet: 22,290, 97 % of total
- Trucks with tracking GPS: over 5,000. Auditing and monitoring mobility enhanced with Ultra mobile PC(UMPC).

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Waste quantities by departments



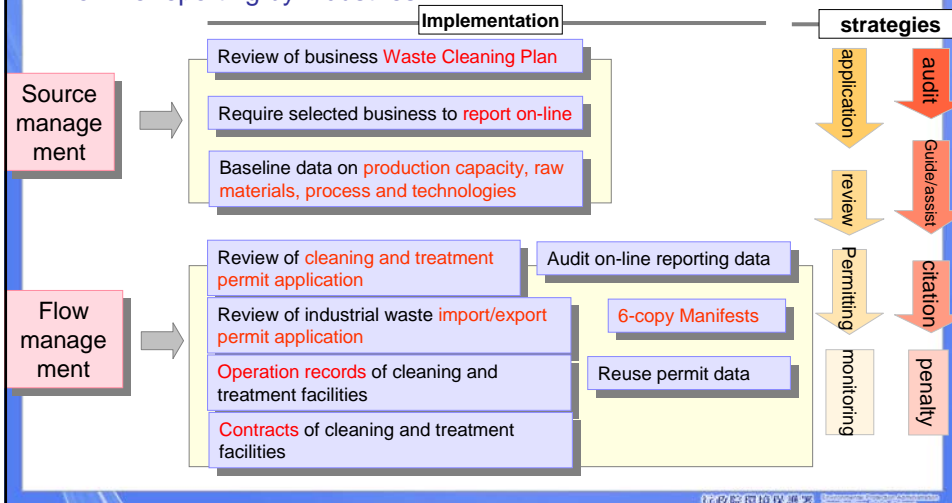
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行政院環保署

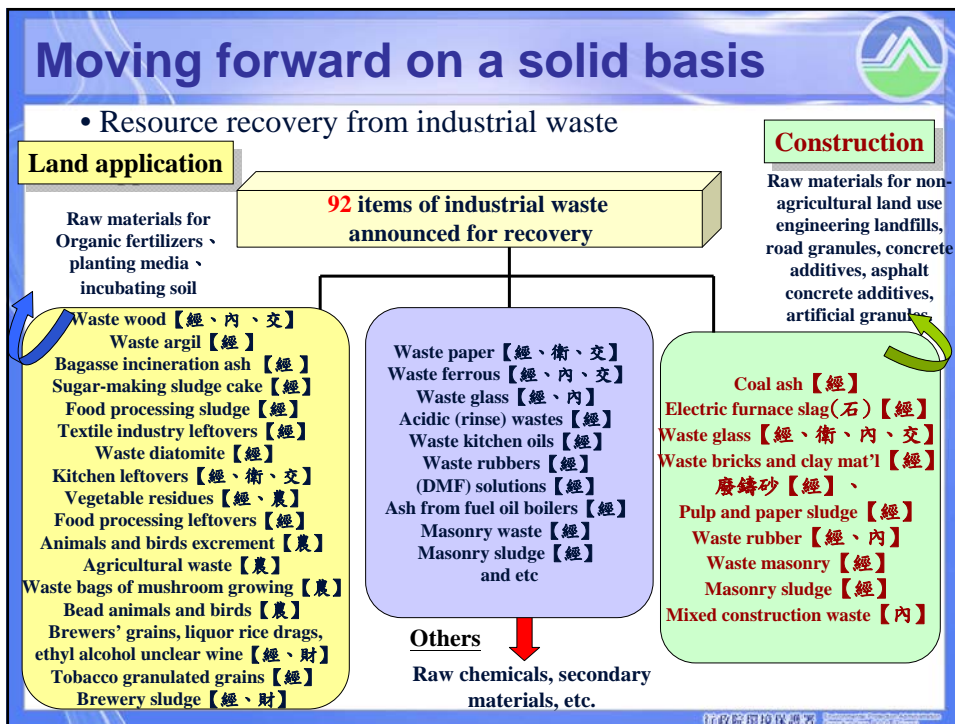
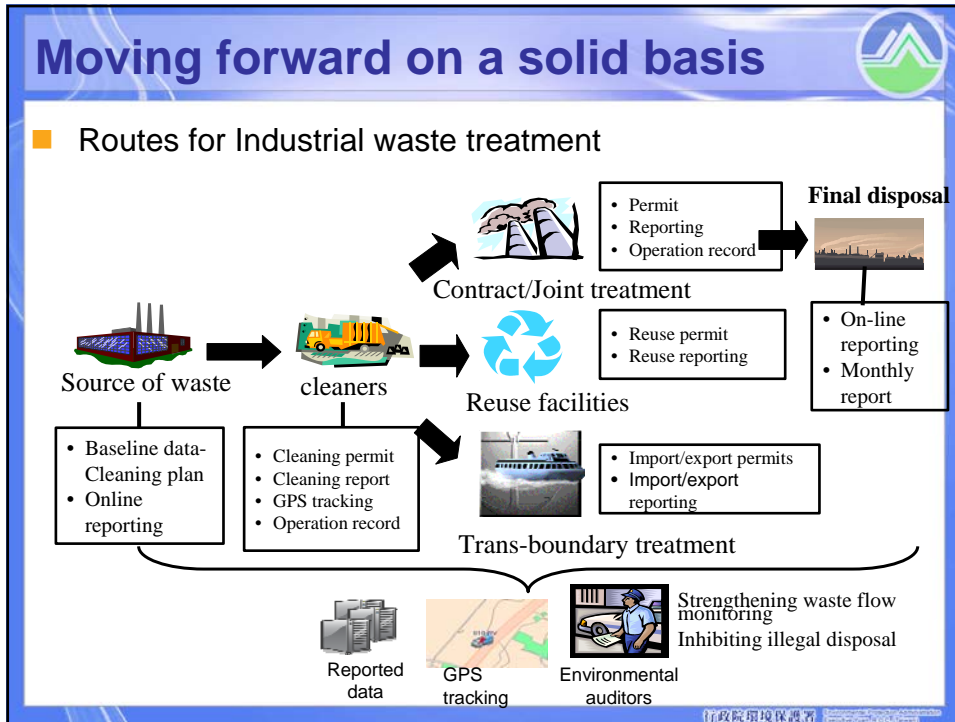
Moving forward on a solid basis



Industrial waste management mechanism — Waste cleaning plan and online reporting by industries



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Existing programs (1/13)



• ESTP Project

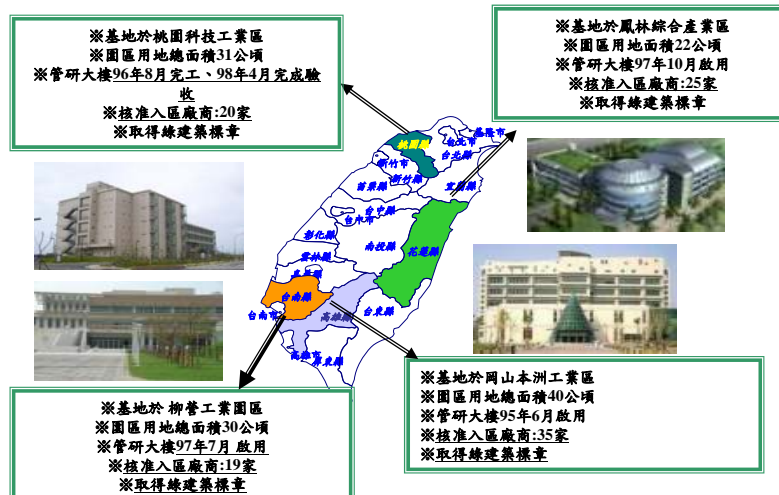
- Total project investment is budgeted for 206.8M USD. Total executed has been 124.5M as of 2009. Total investment from business has been 216.3M. Economical value produced exceeds 310M, with a B/C ratio of 4.3.
- There has been subsidies of 7.33M poured into innovative research for environmental protection and resource recovery industry. Accumulated productivity has been 76M, equivalent to a benefit ratio of 10.4.
- Resource recycling linkages created:
 - (Kaohsiung) electroplating sludge and wastewater, organic solvent, waste catalyst in petrochemical industry, and waste lead-acid battery.
 - (Taoyuan) waste illuminating light sources, waste battery, waste ash from steel plants, waste electronic equipment.
 - (Tainan) waste silver catalyst, waste electronic equipment, inorganic sludge.

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Existing programs (2/13)



99 business has been approved to move in by 2010.12



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Existing programs (3/13)



- **Industrial ecological linkages**
- Resource recovery projects implemented in industrial parks by EPA Taiwan during 2005-2009.
 - Nine industrial parks on the island have initiated projects on resource recycling linkages during 2005-2009.
- Resource recovery projects implemented in industrial parks by MOE.
 - “Energy and resources integration projects” in four industrial parks with 0.73M USD budget by IDB, MOE starting March, 2009.

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Existing programs (4/13)



- **Resource recycling and reuse**
- **System of Four-in-One Recycling Program**

1. Community residents

- ◆ Community residents form voluntary recycling organizations
- ◆ Promote household garbage sorting

4. Recycling fund

- ◆ Establish effective recycling programs
- ◆ Recycling as the mandatory responsibility of manufacturers, importers, and sellers
- ◆ Invest budget in promoting the operation of recycling system



2. Recycling company

- ◆ Encourage the development of private industries
- ◆ Collect recyclables from citizens, communities, and EPB

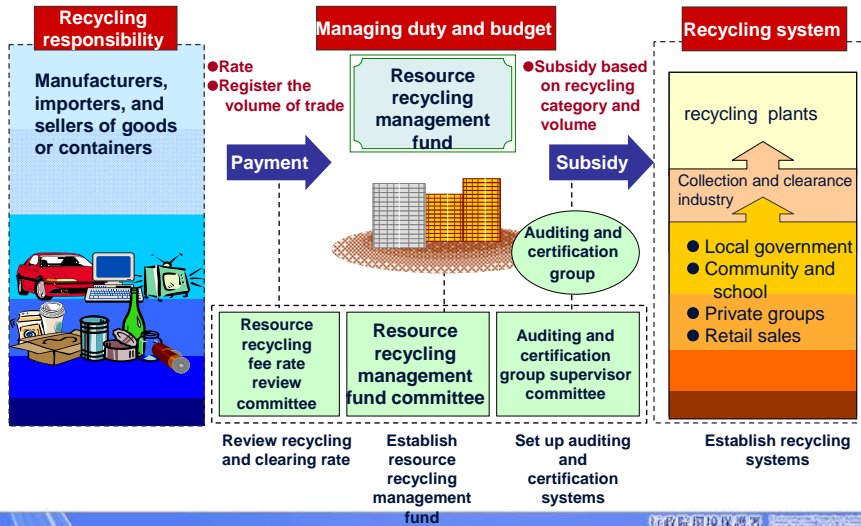
3. Local government

- ◆ Separately collect recyclables and general garbage
- ◆ Revenues of selling recyclables feed back to participants and sanitation crews

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Existing programs (5/13)

• Operation of resource recycling fund



Existing programs (6/13)

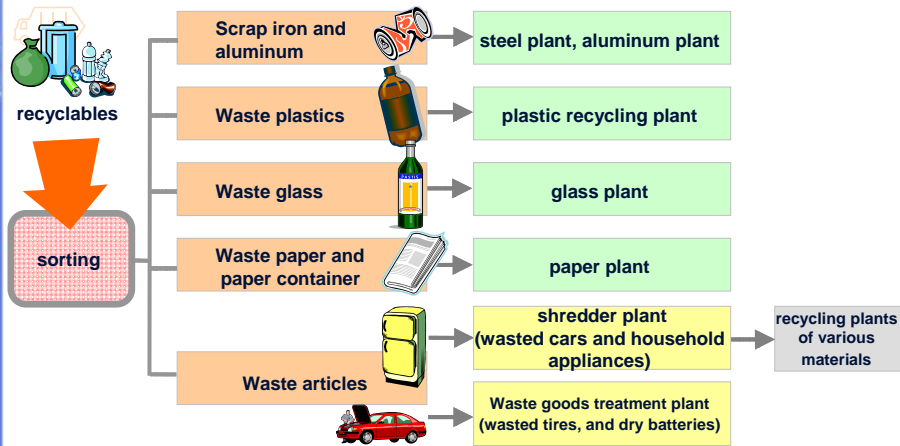
• Mandatory recyclable items

Recyclable items	Year of implementation	Recycling rate (%)		
		2008	2009	2010
Containers	1989	85.88	66.17	73.51
General batteries	1999	67.25	50.85	42.45
Automobiles/Motorcycles	1994	72.85	91.04	80.83
Car batteries	1990	62.08	37.15	74.21
Tires	1989	68.68	68.80	72.10
Lubricants	1990	44.01	61.81	71.72
Household appliances	1997	53.26	55.60	61.83
Electronics IT products	1997	39.05	31.83	40.90
Light bulbs	2002	56.48	67.42	80.02

Existing programs (7/13)



- After the sorting, recyclables is sent to various recycling plants according to the materials of containers or goods for recycling:



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Existing programs (8/13)



Kitchen waste recycling

- After straining the water of kitchen waste, households send it to EPB for following recycling
- Usage:
 - ◆ Serve as pigs' forage after high temperature cooking
 - ◆ Serve as compost at private or public composting plants
 - ◆ Serve as compost in households



Kitchen waste recycling bucket



Composting plant



Kitchen waster treatment

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Existing programs (9/13)



Bulky waste and Construction waste reuse and recycling

■ Bulky waste

Bulky waste worth repairing such as wasted furniture will be reused after repairing; the rest bulky waste is dismantled, sorted, and reused for composting modifier and fuel.



Repair store

■ Construction waste

Construction waste generated as a result of renovation, demolition from household is sent to collecting system and sorting center. Various materials are sorted out and reused.



Shredder plant

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Existing programs (10/13)



Incineration bottom residue recycling

- Incineration bottom residue management and reuse
 - Incineration bottom residue can be recycled for the additive of plain concrete, additive of bituminous concrete, additive of bricks, road grade proportion, and substitute for cover soil in landfills.
 - The recycle increased to 89.6% at the end of 2010.

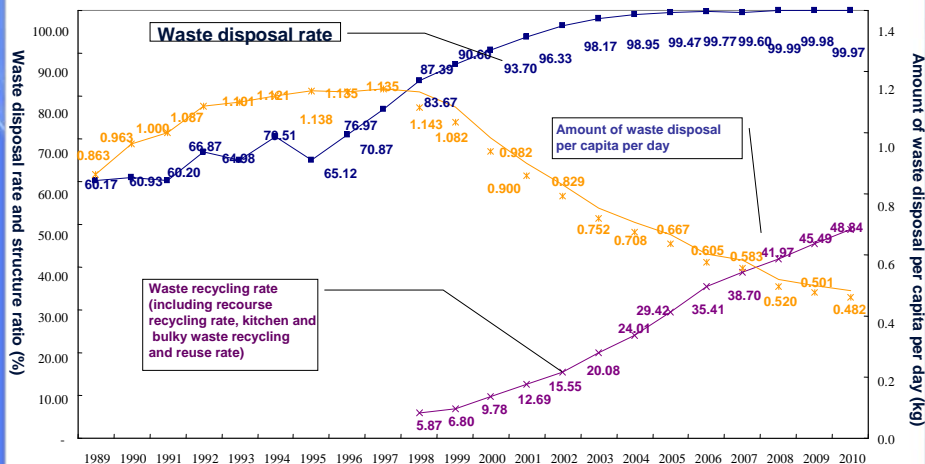


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Existing programs (11/13)



Collection and disposal statistics(1/2)



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Existing programs (12/13)



Collection and disposal statistics(2/2)

- **Average daily amount of waste disposal**
 - 1989: 17,147 tons → 1997: 24,331 tons
 - 2010: 11,153 tons
- **Amount of waste disposal per capita per day**
 - 1989: 0.863 kg → 1997: 1.143 kg → 2010: 0.482 kg
 - In 2010, the amount is 54.16% less than the highest record.
- **recycling rate**
 - 2000: 9.78% → 2007: 38.70% → 2010: 48.84%
 - 2010 resource recycling rate 38.15%; kitchen waste recycling rate 9.6%; bulky waste recycling rate 1.03%
- **Proper waste disposal rate**
 - 1989: 60.17% → 2010: 99.97%



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Existing programs (13/13)



Disposal facilities

- Waste incineration plant
 - 24 incineration plant running. Total designed capacity reaches 24,650 tons/day.
 - The disposal method has turned from “landfill” to “incineration,” accounting for 95.48%.
 - Incineration ashes and incombustibles need further efforts.
- Waste landfill
 - 67 landfills still under operation at the end of 2010.
 - All landfills are close to their saturation point. Reclamation proceeds for landfills after closure.
 - Available landfill site is hard to find any more.



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A future plan – the goal



- Realizing the resource sustainable recycling system and enhancing resource productivity and cyclic use rate.
- Initiating a strategic coalition to implement cradle to cradle concept which helps to lead to green production and consumption.
- Integrating existing projects related to resource recycling and strengthening the reuse of resources.
- Promoting the projects to construct reclaimed land and/or island with incombustibles and incineration residues and to facilitate the ultimate reuse and disposal of these materials.

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A future plan – the scope (1/2)



- Construction of national platform and evaluation system for resource recycling linkages
 - Background information on sustainable material management
 - Information system for national resource recycling linkages
 - Evaluation system for carbon reduction benefits due to resource recycling
- Increase of total numbers of resource recycling linkages
 - Implement control system on waste quantities and qualities generated from individual industry
 - Provide incentives for innovative research on resource recycling
 - Provide subsidies for land leasing on resource recycling practice
 - Implement national standardization system for regenerated resources and products
- Promotion and education programs to advocate resource recycling
 - Awards on educational demonstration projects for resource recycling
 - Publication of annual reports on resource recycling

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A future plan – the scope (2/2)



- Timeframe and budget
 - **Period** : 2012-2015
 - **Estimated budget** : USD 50 Million
- Evaluation indices and projected performance
 - **Resource productivity**: GDP/DMI , economical value created by direct material input at national scale
 - **Resource cyclical use rate**: $CU/(DMI+CU)$, ratio of resource cyclical use to the total of direct material input

Indicator (unit)	Annual Target				
	2012	2013	2014	2015	2016
Resource productivity (10 thousand NTD / ton)	4.28	4.42	4.56	4.70	4.84
Resource cyclic use rate (%)	5.24	5.57	5.90	6.23	6.57

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A future plan – prospects (1/2)



1. Collecting background information on sustainable material management in Taiwan. Completing evaluation indices of resource productivity and cyclical use rate for 8 industries.
2. Integrating four existing websites, “Industrial waste cleaning and resource recovery network”, “Energy and resources information platform”, “Industrial waste control network” and “ESTP promotion project”, as a common platform to facilitate participation and cooperation mechanism among various sectors, i.e. industries, academia, government, research institutions, and NGO’s.
3. Building up an evaluation system for resource recycle and carbon reduction efficiency which quantify carbon emission reduced due to resource recycling while building a low carbon society under the national policy.
4. Establishing strategic coalition and research/verification institution to promote cradle to cradle design. Planning on demonstration building efficient in energy saving and carbon reduction and verification system for secondary products.

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A future plan – prospects (2/2)



5. Constructing eight more demonstrating ecological industrial parks to support the development of environmental industry which facilitate resource recycling linkages and reduce carbon emission.
6. Granting awards and financial supports for recycling and reuse of incineration bottom ash and establishing verification system for recycling and reuse of fly ash so that construction and operation cost of landfills can be saved and service years extended.
7. Preparing integrated regulatory works required for land reclamation in the initial phase of the project and necessary administrative process for each implementation project of reclaimed land so that the final disposal facilities for incombustibles can be resolved.

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Summary (1/2)



- A future plan is proposed and under reviewed to seek breakthrough on the basis of existing programs in waste management and resource recycling and reuse.
- Strategies to tackle the existing obstacles
 - Supporting the development of domestic resource recycling industry and establishing proper linkages for industrial symbiosis.
 - Upgrading resource recycling technology to broaden the types of resources recovered and to increase the purity of secondary materials regenerated.
 - Implementing land reclamation projects to provide final disposal sites for the incombustibles and incineration residues of the waste.
- The guiding rules
 - Cradle to cradle design concept for resource management
 - Complete industrial ecological linkages for all resources
 - Establishment of a resource recycling-based society with zero waste and complete recycling through green production, green consumption, source reduction, recycling, reuse, and renewal.
 - strengthening the national green competitiveness.

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Summary (2/2)



- The plan will be evaluated with the following performance indices:
 - Resource productivity, GDP/DMI: 1,007(2002) → 1,286(2008) → 1,476(2012) → 1,667 USD/ton (2016), increase of 3.3% per year
 - Cyclical use rate, CU/(DMI+CU): 1.9%(2002) → 3.9%(2008) → 5.24%(2012) → 6.57%(2016), increase of 6.3% per year
- Other advantages expected from the plan:
 - Reduction of total waste amount
 - Reduction of the risk in waste treatment
 - Resolving the problems on limited capacities of domestic landfill sites and soil dumping sites for excavation and construction wastes, as well as incineration residues
 - Activation of the market for regenerated resources and secondary products.

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