

行政院所屬各機關因公出國人員出國報告書
(出國類別：國際會議)

參加「第6屆世界回收研討會」暨參
訪行程

服務機關：行政院環境保護署資源回收管理基金管理委員會

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派赴國家：香港

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摘要

隨著科技發展及資源大量耗用，資源回收已成為國際重要議題。本次參加第六屆世界回收研討會，主題為電子廢棄物電池及汽車回收領域，主辦單位瑞士 ICM 公司自 2005 年起舉辦第一屆世界回收研討會，另外每年各分別舉辦汽車電池及電子廢棄物回收研討會台灣近年來隨著工商業科技急速地發展、人口增加及經濟成長，隨之而來的問題就是產生大量廢棄物。行政院環境保護署（以下簡稱環保署）為解決日益嚴重之垃圾問題，積極宣導資源回收之觀念，期能透過廢棄物中可回收之物質加以回收再利用，進而減少廢棄物送入掩埋場或焚化爐的數量，以延長相關處理設施之使用年限。

為瞭解國際上有關資源回收及再利用關係最新技術及資訊，以作為未來推動業務規劃及應變決策之參考，參加於香港舉行之「世界回收研討會(World Recycling Forum)」，並拜會香港環境保護署，討論資源回收處理之政策性及技術性問題，並實地參觀香港廢電子電器及資訊物品之處理廠，希望透過研討會參與及拜會行程，與他國交換政策實施及技術發展心得，作為未來國內推動相關政策之參考。

此次行程主要為蒐集歐美與大陸在機動車輛及電子電器產品回收處理現況及遭遇問題等資訊，並瞭解國際資源回收處理技術發展，掌握知名品牌業者以搖籃到搖籃作為回收責任的趨勢。

鑑於全球資源有限，日本政府政策支持廠商在全球收購含金屬成分之廢棄物，其中電子廢棄物尤其搶手，當我國及歐美各國將電子廢棄物視為商機，日本已將其視為戰略物資鼓勵廠商全球收購，但將回收各種金屬的精煉技術留存本土，不對外輸出，反觀國內回收業者，多數技術停留在粉碎後出售給日本德國瑞士等具精煉技術之國家，電子廢棄物含有各種貴重金屬，國內業者苦於市場規模太小，回收精煉成本技術無法突破，我國與日本同為資源嚴重不足國家，日本作

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法值得國內檢討，開放評估電子廢棄物進口處理。畢竟三十年前，二仁溪下游沿岸及大發工業區等地，非法露天燃燒廢五金的情形，在現行民眾環保意識高漲，環保機關稽查公權力落實等主客觀條件下，台灣絕不允許露天燃燒廢五金的情形再次發生。

資源回收靜脈產業在全球製造業越來越受重視，值得鼓勵研發創新提高產業附加價值，國內應回收廢棄物稽核認證制度，可與國際接軌或協助他國建置，方可讓國內產業在全球綠色經濟宏觀架構中，從資源回收出發，在搖籃到搖籃占有一席之地，藉由我國法令制度引導國際靜脈產業發展。

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壹、目的

隨著科技發展及資源大量耗用，資源回收已成爲國際重要議題。台灣近年來隨著工商業科技急速地發展、人口增加及經濟成長，隨之而來的問題就是產生大量廢棄物。行政院環境保護署（以下簡稱環保署）爲解決日益嚴重之垃圾問題，積極宣導資源回收之觀念，期能透過廢棄物中可回收之物質加以回收再利用，進而減少廢棄物送入掩埋場或焚化爐的數量，以延長相關處理設施之使用年限。

另爲有效推動垃圾減量、資源回收工作及建立合理的回收管道及市場制度，環保署於 86 年 1 月 1 日起結合社區民眾、地方清潔隊、回收商及回收基金全面實施「資源回收四合一計畫」，全面實施資源回收、垃圾減量的工作，藉由回饋的方式鼓勵全民參與，並強化回收點設置以暢通回收管道，建立開放的回收清除處理市場以達到資源永續利用之目標。86 年 3 月 28 日立法修正公布廢棄物清理法第 10 條之 1（後修正爲第 16 條之 1），由民間財團法人分別據以成立廢一般物品及容器、廢機動車輛、廢輪胎、廢潤滑油、廢鉛蓄電池、農藥廢容器、廢電子電器物品及廢資訊物品資源回收管理基金等 8 個基金管理委員會，輔導並執行各項公告應回收物品及容器之回收清除處理。

後因應立法院過半數委員連署要求「資源回收管理基金」納入政府預算，依國會共識將前 8 個基管會自 87 年 7 月 1 日起移由環保署概括承受，並成立資源回收管理基金管理委員會（以下簡稱基管會），整合 8 個基管會原有執行人力，加強公告應回收項目共同合作清理功能，降低運作成本，藉由公權力主導，貫徹、落實政策執行，期能達成垃圾減量、資源永續利用之目標。

爲瞭解國際上有關資源回收及再利用關係最新技術及資訊，以作爲未來推動業務規劃及應變決策之參考，參加於香港舉行之「世界回收研討會(World Recycling Forum)」，並拜會香港環境保護署，討論資源回收處理之政策性及技術性問題，並實地參觀香港廢電子電器及資訊物品之處理廠，希望透過研討會參與

及拜會行程，與他國交換政策實施及技術發展心得，作為未來國內推動相關政策之參考。

此次行程主要為蒐集歐美與大陸在機動車輛及電子電器產品回收處理現況及遭遇問題等資訊，並瞭解國際資源回收處理技術發展，掌握知名品牌業者以搖籃到搖籃作為回收責任的趨勢。

主辦單位瑞士 ICM 公司，為世界知名的資源回收研討會招商會主辦公司，過去十年每年約主辦 5 場招商研討會，主辦地點多在歐洲及香港上海等地，主題以廢棄車輛、電池、電子廢棄物回收等研討會，參與人員多為產業界代表。國內台大機械所馬小康教授經常參與 ICM 主辦之活動，本次亦擔任主席團成員及主持部分會議工作，國內若有意爭取 ICM 來台主辦相關研討會，馬教授與該公司的關係值得借助與應用。

另外國內上市公司緯創公司亦為本次研討會贊助廠商之一，緯創公司為國際十大電子產品代工廠商，其對 HP 等品牌業者的回收責任趨勢完整掌握，本次研討會提出電腦相關產品從搖籃到搖籃的產業願景及布局，非常值得重視與深入了解，以利協助國內廠商在全球靜脈產業發展、綠色經濟開發占得先機。

貳、行程

一、計畫類別：參與「第 6 屆世界回收研討會(World Recycling Forum)」

二、前往國家：香港

三、出國期間：100 年 11 月 14 日至 100 年 11 月 19 日止，共計 6 日

四、行程表：

活動日期	內容概要	活動地點
100/11/14	啓程（搭機前往香港），同日抵達並拜訪香港環保署	台北→香港
100/11/15	參訪億達再生資源有限公司(E.TECH)電子電器物品處理廠	香港
100/11/16	參加 2011 年「世界回收研討會（World Recycling Forum）」	香港
100/11/17	參加 2011 年「世界回收研討會（World Recycling Forum）」	香港
100/11/18	參訪香港廢棄物及資源回收物轉運站（南華公司）、九龍新界東南掩埋場	香港
100/11/19	返程	香港→台北

參、與會過程及內容

一、拜會行程

透過出發前電子郵件聯繫，本會表達拜會香港環保署廢物處理政策科的意願，經由該科主管林國麟博士協助安排，林博士與本署廢管處賴副處長瑩瑩及環境督察總隊楊副總隊長素娥，於 2010 澳門舉行的兩岸四地環保論壇研討會認識，2011 年林博士請本會協助香港環保署拍攝台灣電子廢棄物回收制度法令及回收處理業現場影片，建立互助及交流管道。

本次拜會參訪更加深雙方合作情誼，同時對環保工作推展及交流均有具體成果，香港環保署於 2012 年 1 月推出垃圾收費的公民諮詢案，就是多次收集我國法令制度及台北市隨袋徵收經驗，而香港鬧區隨處可見電子產品估價回收的小販及小廣告，亦讓我們對轉口貿易的務實與彈性印象深刻，進一步影響我們檢討電子廢棄物的進出口問題。

2011 年 11 月 14 日拜會香港環境保護署，與會人員包括廢棄物管理政策組譚振強高級環境保護主任、蕭智慧高級環境保護主任及趙繼馨環境保護主任等。香港環保署隸屬於環境局，有關廢棄物回收處理等法規及管理，由廢棄物政策管理政策科負責，其組織架構如圖 1。

香港人口約 700 萬人，每天約有 9,100 噸家戶垃圾進入掩埋場處理，可見香港每人的垃圾量約為我國三倍之多，香港家戶垃圾及工商垃圾目前均不收費，現有三座掩埋場六年後陸續面臨滿場危機，新廠開發抗爭不斷，香港環保署人員非常羨慕我國焚化處理，相對香港地小人稠，掩埋場設計規格要求嚴謹，值得我國進一步取經學習，尤其是不透水設施的規範相當完整。

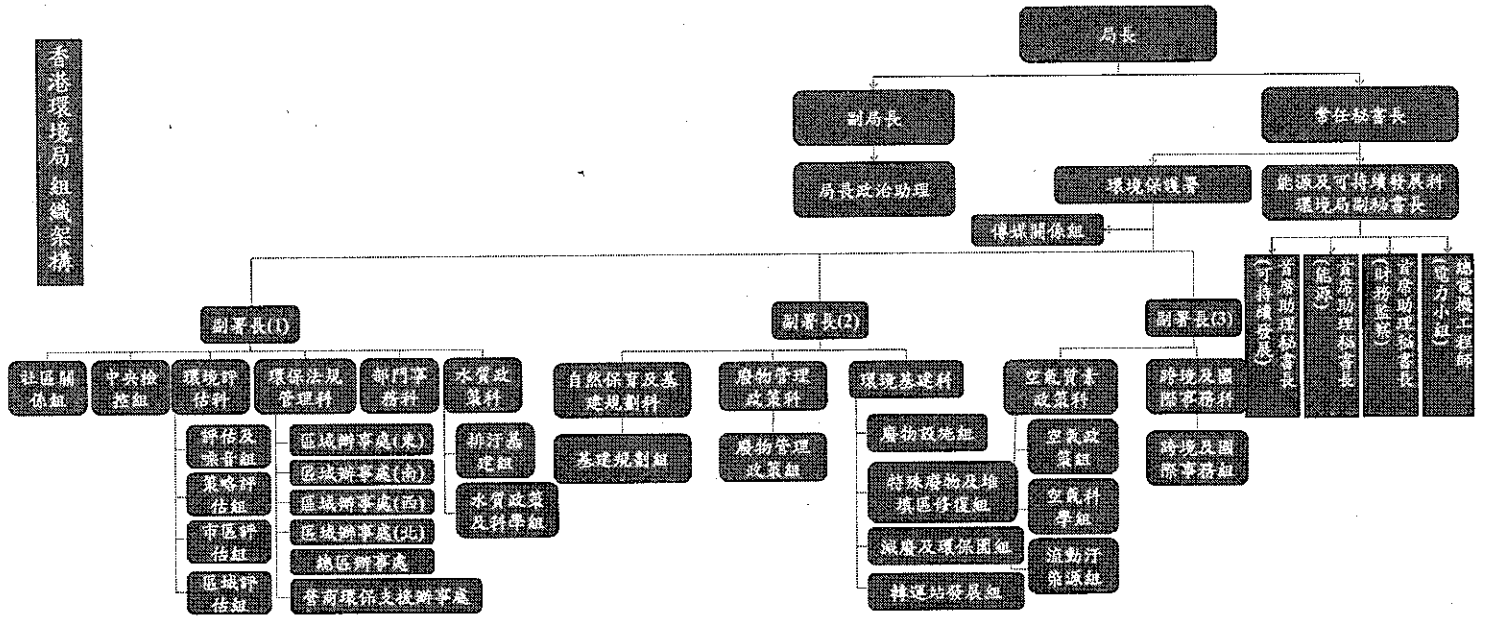


圖 1 香港環保局組織架構圖

香港每年製造數百萬公噸都市固體廢棄物，其中 40%是可回收的物質，剩餘 60%則皆送至堆填區採掩埋方式處理，對香港堆填區構成日益沉重的負擔。按香港目前廢棄物產生速度，其堆填區將在 6 至 10 年內填滿。所以香港政府特別訂定「都市固體廢物政策大綱」(2005-2014)開始討論根據「污染者自付」的原則，利用經濟措施，誘導香港市民養成資源回收的習慣，從而達到減廢目標。採取措施包括研擬立法執行「生產者責任計畫」；推動全港實行廢物源頭分類；並透過設立環保園區，為資源回收業拓展新的經濟活動。而現階段香港政府係依「減少廢物綱要計畫」避免和減少產生廢棄物。在參訪香港環保署過程中，訪談代表（廢棄物管理政策組譚振強、蕭智慧及趙繼馨高級環境保護主任）等人，對台灣之回收管理與政策十分肯定，並認為由政府統一規劃執行能使資源回收展現較大之成效。

廢電子電器及廢資訊物品部分，香港環保署自 2003 年 1 月起委托慈善機構聖雅各福群會及香港明愛分別舉辦舊電器及電腦回收計畫。2008 年 1 月時推行「電腦回收計畫」，該計畫為電腦業界資助自願參與的生產者責任

計畫。自 2010 年 10 月起，聖雅各福群會加強回收服務，推行為期三年的「綠色家電環保園」計畫及營運環保園家電再生中心，由收集車及回收點，將收集得來的電器或電腦進行拆件、維修後，將可用的電器或電腦經由慈善團體捐贈給需要的人士，其餘交由回收商處理。

另香港部分資源回收及廢棄物管理政策如「廢電器電子產品生產者責任計畫」、「廢棄物收費」及「堆填區棄置禁令」即參採台灣相關作法，以達到減少廢棄物產生的目標，並表達未來若有機會，將到台灣取經。而香港目前每年約回收處理 1 萬 0,000 公噸廢輪胎，處理後之膠片及膠粉以原（物）料方式售予東南亞及大陸，作為能源再利用(含熱裂解)及回收橡膠製品原料。



圖 2 香港環保署拜會情形

二、會議概況

1.主辦單位與會議時間

本次會議為於 2011 年 11 月 14 日至 19 日假香港九龍舉行，由國際資源循環利用委員會（The International Committee of World Recycling Forum）主辦。

2.參與人員

本次會議共計有葡萄牙、美國、印度、瑞士、德國、荷蘭、瑞典、馬來西亞、澳洲、日本、丹麥、新加坡、巴西、比利時、俄羅斯、加拿大、波蘭、韓國、英國、法國、盧森堡、羅馬尼亞、希臘、中國、香港及台灣等國家 164 人出席參與，參與者身分從政府部門、研究單位、製造業者、回收處理設備業者、回收處理業者及對各項回收處理技術有興趣者，展示區部份有 Albert HOFFMANN GmbH、Dowa Eco-System Co., Ltd.、ERIEZ Magnetics、HAMMEL Recycling GmbH、Hamos GmbH、Li Tong Group、Logan Group、MAIREC Edelmetallgesellschaft mbH、MRT System International AB、Scandinavia EcoTech LLC、Steinert Australia Pty Ltd.、The Shredder Company、TITECH GmbH、Tradscrap.com、UNTHA Recycling GmbH 及 Vecoplan AG 等業 16 家者。

三、重要論文摘述

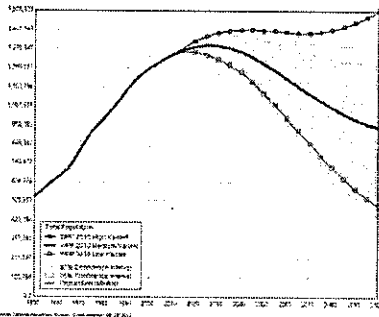
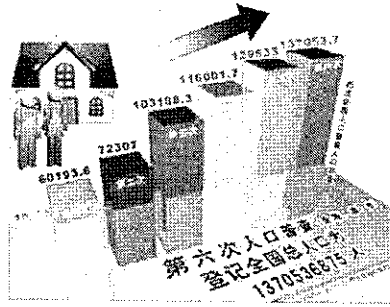
3-1 大陸人口增加對回收產業的衝擊(Impact of Increasing China' s Population on the Recycling Industry)

大陸人口數在 2010 年底達 14 億人，2000 年至 2010 年人口每年平均成長率已趨緩為 0.57%。過去 30 年大陸經濟成長率，維持每年平均 9% 的成長，在 2010 年超過日本並且成為世界第二大經濟體。

⇒ Population of China

China's Total Population

➢ The total population of China is close to 1.4 billion by the end of 2010.



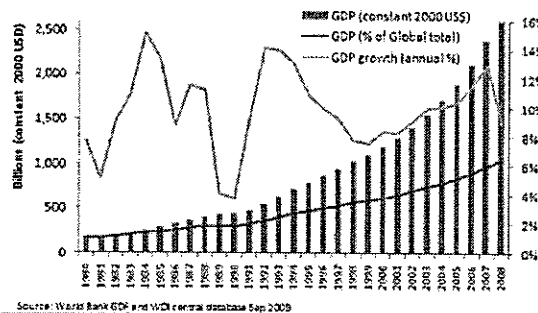
Growth Rate of China's Population

➢ From 2000-2010, the average annual growth rate of China's population has been slow down to 0.57%.

⇒ Economic Development: GDP

➢ In the past 30 years, China has achieved phenomenal economic growth, with an average annual rate of more than 9 percent.

➢ In 2010, it has surpassed that of Japan and become the world's second-largest economy.



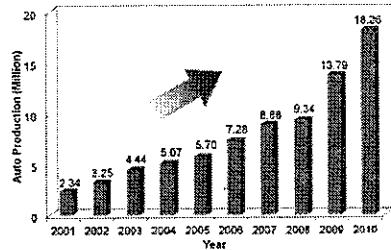
China's GDP Growth in 1980-2008

快速經濟成長，伴隨著車輛、消費性電子產品及電池等快速得升級，另人口快速成長，造成車輛、消費性電子產品及電池等大量的需求，也產生了大量的車輛、消費性電子產品及電池等報廢。而都市化造成廢棄產品流通到城市，產生大量車輛、消費性電子產品及電池等”「都市礦物」。因此造就回收產業的發展。

2009 年大陸已成為世界最大的汽車消費市場，2011 年前 8 個月大陸已生產 1,230 萬輛車輛，相較於 2010 年同期增加 4.7%，而大陸車輛人口

數在 2011 年 8 月底已超過 1 億人以上。總廢棄車輛於 2009 年已達 270 萬輛，2010 年將達 300 萬輛，預計 2020 年將達 600 萬輛。補貼更新廢棄車輛總金額由 2008 年 60 億人民幣，至 2009 年增加至 500 億人民幣。

⇒ Development of Automobile in China

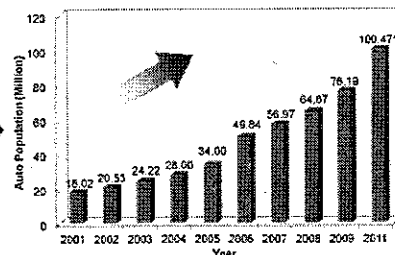


Automobile Production

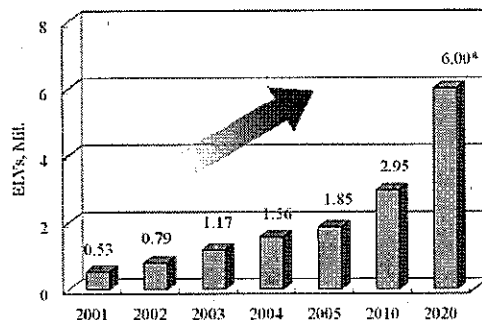
- > Since 2009, China has become the largest automobile maker in the world.
- > China produced 12.3 millions vehicles in the first eight months in 2011, with an increasing rate of 4.7% against 2010.

Automobile Population

- > China's automobile population has been over 100 million by the end of August in 2011.



⇒ Status of ELVs in China



- > The total amount of ELVs in 2009 reached 2.7 millions in China.

- > ELVs 3.0 million in 2010 & 6.0 million in 2020, respectively;

- > The automobile industry restructuring and revitalization plan (2009–2011)

- > In 2009, the total amount of subsidies for update of ELV is increased from 6 billion in 2008 to 50 billion RMB.

*: Forecast;

廢車回收市場目前仍有未解決問題包括：車輛二手零件原料市場有限；翻修產業的管理方案嚴重過時；翻修引擎不易替換使用；翻修工廠過重的稅率負擔及翻修產品缺乏統一標準及商標等。

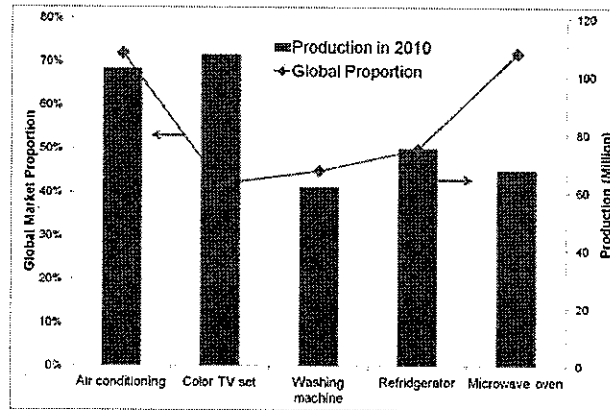
電器用品的生產從 20 世紀 90 年代迅速地增加。冷氣機和電視機的總產量在 2010 年已超過 1 億台。2010 年中國電器用品占全球出口市場

已達 32%~35%。廢電子電器每年約產生 5,000 萬台電視、400 萬台電冰箱、600 萬台洗衣機、1,000 萬台電腦及 5 億台行動電話。

⇒ Electronic and Electrical Equipment (EEE) in China

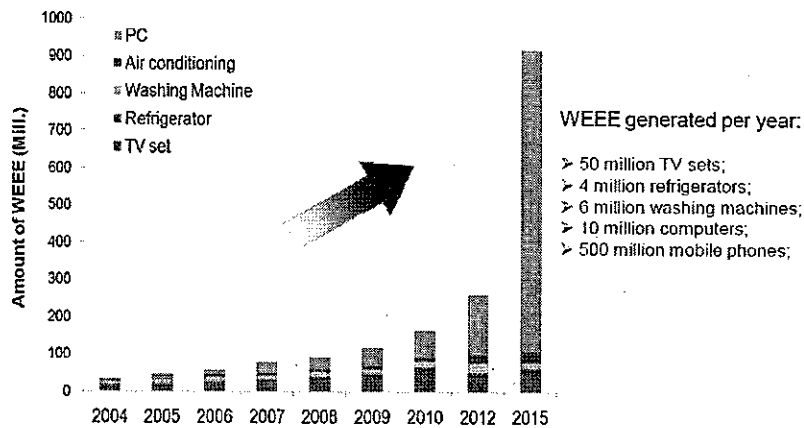
> The production of electrical appliances rapidly increases since 1990s. The total production of air conditioning and TV set has been over 100 million in by 2010.

> The production in China reached 32%-35% of the global export market by 2010.



The total production and global proportion in China

⇒ Status of WEEEs in China

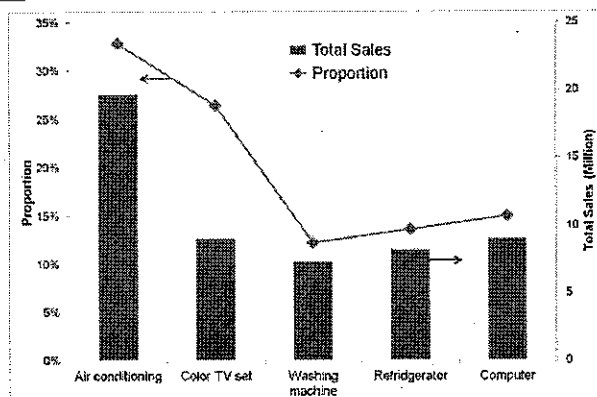


The total amount of different types WEEEs

自 2009 年 8 月 15 日起 5 種電子電器產品(電視、電冰箱、冷氣機、洗衣機及電腦)折價方案在 9 個示範城市推行，由政府提供運輸及銷售補貼。至 2010 年 6 月 1 日已推廣至 19 個示範城市，最高補貼金額可達銷售價格 10%。至 2011 年 7 月中國以折價方案銷售之電子電器產品，已達 6,011 萬 6,000 台，而回收總量已達 6,211 萬 3,000 台。

⇒ WEEE Recycle by “Trade-in” mode

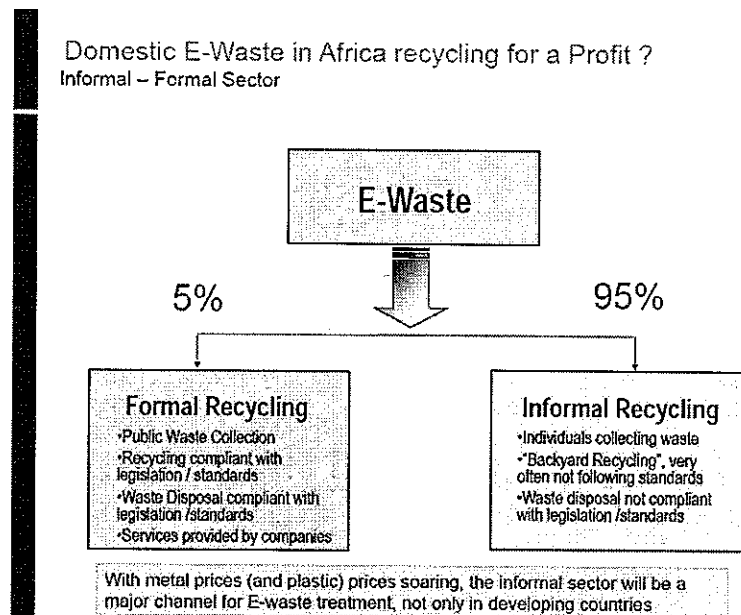
➢ By July 2011, the total sales of electrical appliances by trade-in mode in China has reached 60.116 million. The recycle amount has reached 62.113 million.



2010 年回收產業在中國已穩定發展，8 項主要回收資源物總回收量已達 1 億 4,900 萬噸，較 2009 年增加 8.3%；再生資源製造約 5,069 億人民幣價值，較 2009 年增加 13.4%。總計節省 1 億 7,900 萬噸煤消耗，減少 102 億 5,000 萬噸廢水、393 萬噸二氧化硫及 30 億 5,000 萬噸廢棄物產生

3-2 電子廢棄物回收在歐洲 8 年的發展與檢討

根據來自英國的環境保護局最新數據，約 3.5% 的總電子廢棄物為資訊科技產品與電信產品。廢電子電器約 5% 循正式回收管道回收，其回收方式大都為公共廢物收集，回收符合法規/標準且廢物處置法例/標準兼容，並由公司提供回收服務；而 95% 循非正式回收管道，其回收方式大都為個人收集的廢物，即“後院回收”，往往不遵守標準，廢物處置不合法規/標準規範。隨著金屬價格（塑料）的價格飛漲，非正規部門變成電子廢物處理的主要管道，這種現象不僅只在發展中國家發生。



巴塞爾公約締約國大會通過加速禁止已開發國家出口電腦、手機與舊電子產品等有害廢棄物到開發中國家。歐盟在 1994 年成為公約的締約國之一，依禁令禁止把有毒害物質送到經濟合作開發組織（OECD）以外的國家。但歐盟境內只有 3 分之 1 的電子廢棄物符合廢電子電機設備指令規範（Waste Electrical and Electronic Equipment Directive，WEEE）。其他 3 分之 2 的廢棄物則循著自營的廢棄物回收站回流到市面。雖然法令已明文禁止，但帶有危害人體之虞的舊電腦及電子設備，仍從歐洲被運往非洲和亞洲等開發中國家，歐洲正進行大規模查緝非法販運二手電器和電子儀器。

雖然歐盟已經立法要求製造商需負責電子廢棄物的處置機制，但非洲至今尚未立法規範禁止廢電子電器輸入及規範電子電器製造商應妥善回收電子電器廢棄物並無害化處理。惠普公司在南非執行的電子廢棄物研究計畫，包括摩洛哥和肯亞，收集了未來非洲各國政府、組織和社會如何處理電子廢物之管理及其逐漸浮現的問題，以及可能的解決方案。同時協助進行電子廢棄物的回收推動計畫，目的在吸引企業組織和政府加入成為合作夥伴，以解決整個非洲大陸的問題。

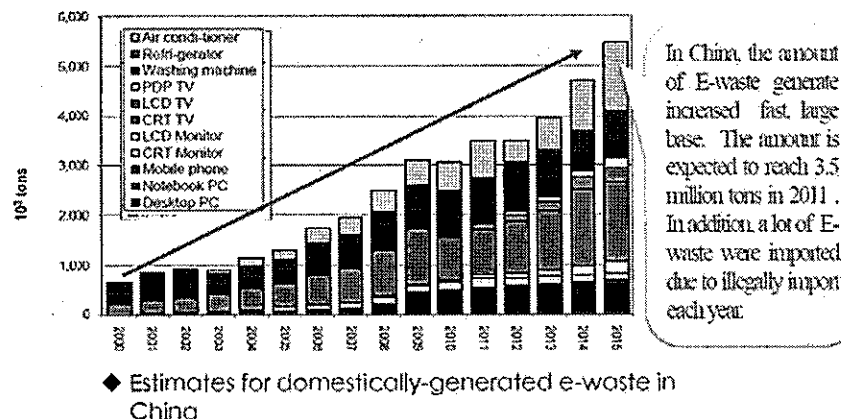


3-3 大陸電子廢棄物回收發展與問題

報告中說明主題包括大陸電子廢棄物主要問題及特點、大陸電子廢棄物資源化利用技術現狀、大陸資源化產業發展現狀及趨勢等 3 項。

大陸電子廢棄物主要特點是產生量大且時間過於集中。2008 年家電下鄉政策短時間回收大量廢家電，造成處理不當及有害物質流布等潛在危害。電子廢棄物主要成分為金屬 49%、塑料 21%及玻璃/陶瓷 18%為最高，其中金屬成分中以銅占 20%最高，其次為鐵 8%、錫 4%、鎳 2%、鉛 2%、鋁 2%。

(一) Large quantity and Rapid increase



大陸電子廢棄物資源化利用技術現狀主要提到 CRT 回收再利用技術、廢冰箱回收再利用技術及印刷電路板回收再利用技術，而其技術發展所遭遇問題及發展趨勢包括，發展高效率破碎分選成套化設備、稀貴金屬分離提煉及有效技術和設備、非金屬材料高價值化利用(包括 CRT 玻璃高價值化利用及提鉛技術、混合非金屬材料再生利用技術、阻燃塑料再生利用及再生利用產品檢測和風險評估方法和技術)等。

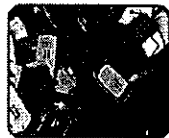
大陸資源化產業發展現狀及趨勢中提及，電子產品回收設施的規範包括電子廢棄物污染環境防治管理辦法(2008 年 2 月 1 日生效)、廢棄電器電子產品回收處理管理條例(2011 年 1 月 1 日生效)及家電以舊換新政策(2009 年 6 月 1 日-2011 年 12 月 31 日)。而大陸電子電器產品回收問題，主要為部分城市示範回收導致處理企業大幅增加，很多企業初步建成，但資源化處理能力參差不齊，大部分企業採用人工拆解和簡易機械物理技術，多數企業僅具有拆解能力，極少數企業具有深度資源化處理能力。另外尚有塑料如聚氨酯發泡塑料處製問題及 CRT 玻璃再生利用需求不足等處理問題。

Trendence and focus

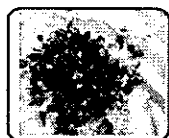
ment



integrated equipment for crushing and sorting with high efficiency.



technology and Equipment to separat and purify Precious metals.




Non-metal recycling with high value,

Development of technology and equipment is the main method to promote recycling efficiency and resolve the environmental issue.

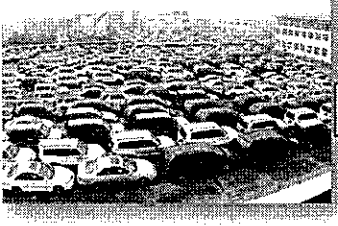
3-4 大陸廢機動車輛回收的良機與挑戰 (The Opportunity and Challenge of ELV Recycling in China)


隨著大陸汽車業的迅速發展，帶動其國內廢機動車輛回收需求與日俱增，2010 年生產及銷售車輛均超過 1,800 萬台，總車輛數超過 8,500 萬台，而年報廢數量大於 350 萬台，考量車輛使用壽命，未來幾年將會有報廢車輛高峰，報廢車輛若未妥善處理，將造成大陸日益嚴重的問題，包括環境污染、資源消耗及危害人體健康等問題。




1. Background and Regulations

- Auto industry of China develops rapidly as well as the ELV recycling demand.
 - China's production and sales volumes of automobiles in 2010 both exceeded 18 million units, constituting an all-time record for any country worldwide;
 - 2010: vehicles >85 million units, ELVs>3.5 million units;
 - Considering the life of vehicles, there will be a peak demand of ELV recycling in China in the coming years.





scrap



由 NDRC, MOST and SEPA 於 2006 年共同發起的「汽車產品回收技術政策」，努力推動大陸在 2017 年左右生產或銷售汽車產品，可達到國際先進國家的可回收率水平準。2008 年 NDRC 即 MIIT 發表的「自行禁用及回收率規則(草案)」中提出更具體、更清晰的要求，對汽車產品和禁用物質限制的回收率，這將被納入到車輛生產企業及產品公告管理系統。汽車禁用物質的要求，強制性標準已進入最後審批階段，其規範包括鉛、汞、鎘、Cr- VI、多氯聯苯和多溴二苯醚在均質材料的質量含量不能超過 0.1%，而鎘不能超過 0.01%。



1. Background and Regulations

■ Technical Policy for the Recovery of Automobile Products

➢ Launched by NDRC, MOST and SEPA jointly In 2006

- Strive to promote the recoverability rate of auto products produced or sold in China to reach the international advanced level around 2017.

Time Node	Recoverability Rate for Vehicles	Recyclability Rate for Material
2010	> 80%	> 75%
2012	> 90%	> 80%
2017	> 95%	> 85%

- Pd, Hg, Cd and Cr-VI can not be used in parts or materials of vehicles other than in cases listed in a periodically revised Annex under the conditions specified therein

NDRC: National Development and Reform Commission

MOST: Ministry of Science and Technology

SEPA: State Environmental Protection Administration

目前大陸廢車回收拆解遭遇問題包括：拆解技術及設備技術不足、無法獲得高價值之零件材料、成分標示不明造成拆解困難、塑膠及玻璃再利用率低等。因此，2011 年選擇 10 個示範城市，由商務部提供總投資的 50% 補助，試驗拆解和回收升級的示範計畫，提供補貼鼓勵車主即時報廢車輛。

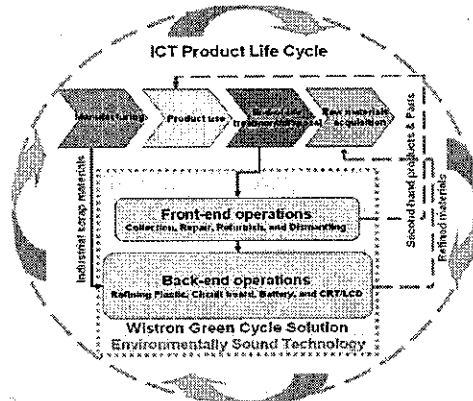
3-5 電子產業永續發展的方向-從搖籃到搖籃

國內企業緯創公司係從宏碁電腦公司代工部門獨立發展成為代工產業，未來將往綠資源事業拓展，並期許成為電子廢棄物回收的領導品牌，故於本研討會也參與並發表其將產品從搖籃到搖籃永續利用的發展策略。

該公司介紹其將塑膠、電路板、電池、螢幕回收後製成再生原料技術，包括回收、再使用、整修、拆解等四大製程，配合現有通路，策略聯盟興建再生原料的精鍊廠。



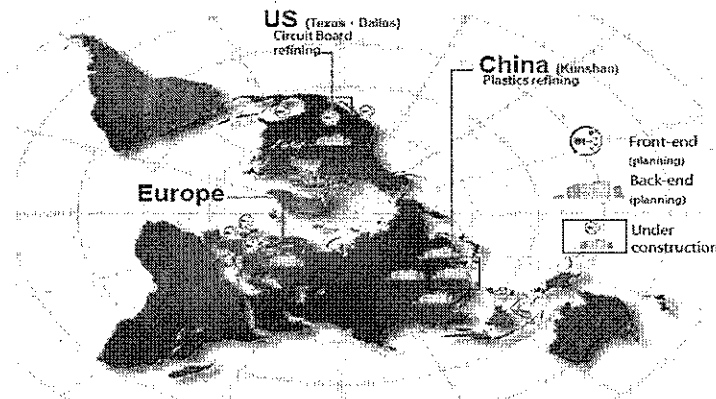
『Closed-loop』 Solutions



在大陸地區優先投資興建塑膠再精鍊廠，占地 5 萬 3,000 平方公尺，預定 2012 年底以每月產能 2,000 噸精鍊各種 ABS 等認證回收塑膠。美國電路板再精鍊廠，預定 2012 年 9 月量產 1,000 萬片認證再製電路板。



Refining Campus Footprint



四、現場參觀：

4-1 主辦單位安排參訪億達再生資源有限公司 (E. Tech Management Ltd)

廢電子電器物品處理廠

2011 年 11 月 15 日參訪億達再生資源有限公司 (E. Tech Management

Ltd) 廢電子電器物品處理廠，該廠負責人 Benny Yeung 表示，該公司總部設於北美洲，為專業處理廢棄物料環保回收服務有限公司，在香港、澳門及中國，美加都有多個廠房，進行廢電子電器物品拆解分類。美國設有燈具及電池處理工廠，墨西哥設有映像管 (CRT) 處理工廠。拆解處理後之電路板送交日本或比利時進行金屬提煉處理，其他物料會送往不同提煉廠進行提煉。經拜訪發現該廠之規模、處理量等皆較我國處理廠小，且因我國廢電子電器處理業皆為受補貼機構，在稽核認證團體執行認證作業監督下，廠區環境、物料貯存及廢棄物分類管理皆優於香港，值得香港政府及民間公司進一步交流學習。

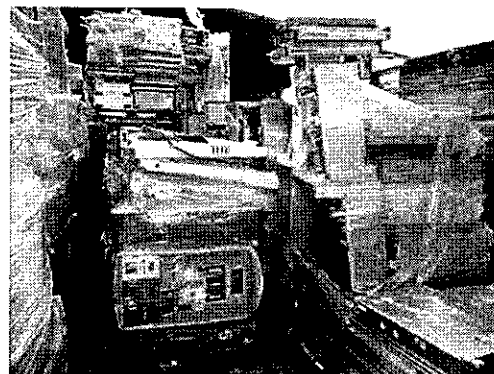


圖 4-1 廢電子電器物品待處理區(一) 圖 4-2 廢電子電器物品待處理區(二)



圖 4-3 廢電子電器物品人工拆解區 圖 4-4 廢機殼暫存區



圖 4-5 電路板分類處理機

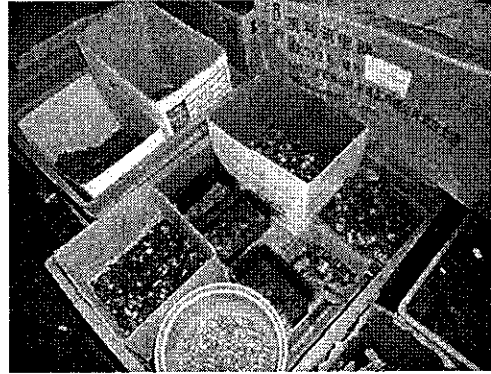


圖 4-6 廢晶片分類區

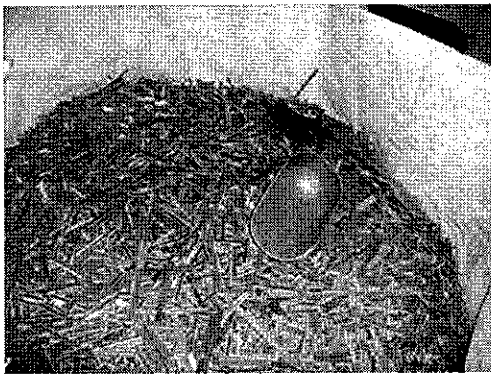


圖 4-7 廢電路板插頭分類區



圖 4-8 廢電路板插槽分類區

4-2 參訪香港廢棄物及資源回收物轉運站南華公司（協調台灣達和環保公司聯繫安排）

根據香港環保署資料，香港每日產生 5 萬 2,000 公噸固體廢物，其中 1 萬 4,000 噸（約 27%）為都市（家居及工商）垃圾，3 萬 7,000 公噸（約 71%）為建築廢料，全部需要棄置的都市垃圾、淤泥，及部份建築廢料（約 1 萬 8,000 公噸）是運往堆填區（或稱填埋場）處置。

垃圾棄置在堆填區上，由機器推散，輾碎和壓實，每天工作完畢，便加上一層薄薄的泥土，以防老鼠蒼蠅滋生，與及減少臭氣及垃圾飛揚。現代堆填區亦照顧到環境管理，在選址方面，考慮堆填區的容量（壽命），而且要遠離民居，以避免對公共衛生帶來滋擾。在日常運作上，更注意處置垃圾時所產生的臭味及景觀問題，與及盡量防止吹起泥塵和膠袋。

香港生活垃圾處理以往倚賴堆填和焚化方式處理垃圾。1989 年香港

政府制定廢物處理計畫，宣布停用位於葵涌、堅尼地城和荔枝角市區的焚化設施，以三個先進大型堆填區（新界西堆填區、新界東南堆填區及新界東北堆填區），集中處置全港所有廢棄物，輔以資源物及廢物轉運網絡，提高效率。在轉運站內，垃圾由收集車經壓縮後轉裝上大型貨櫃，然後經陸路或水路運往堆填區，資源回收物如寶特瓶等亦集中壓縮後轉運。近年資料顯示，垃圾產量不斷上升，三個堆填區預計將提早幾年飽和，有必要另覓地方堆填，或改變垃圾處理方法，故目前正積極推動廢棄物源頭分類及回收再利用。經於 11 月 18 日參訪南華西九龍轉運站發現，該轉運站於 1997 年 6 月啓用，占地 19 公頃，主要收集西九龍、荃灣及葵青等地區生活垃圾及迪士尼資源回收物（寶特瓶）。轉運站以電腦系統記錄將出入轉運站之垃圾清運車輛資料並拍照，活動傾坑輸送系統將廢棄物送往壓縮機，由機械化壓縮機將廢棄物壓縮於密封貨櫃，以自動化滑車系統於碼頭卸貨區內迅速移動，而廢棄物被轉運站接收後，亦於 24 小時內傾倒至指定堆填區。其垃圾壓縮、轉運過程多已機械化，作業相當有效率，壓縮後集中清運，有效降低運輸成本及運輸空間，且轉運站環境維持良好，其作業效率值得參考學習。

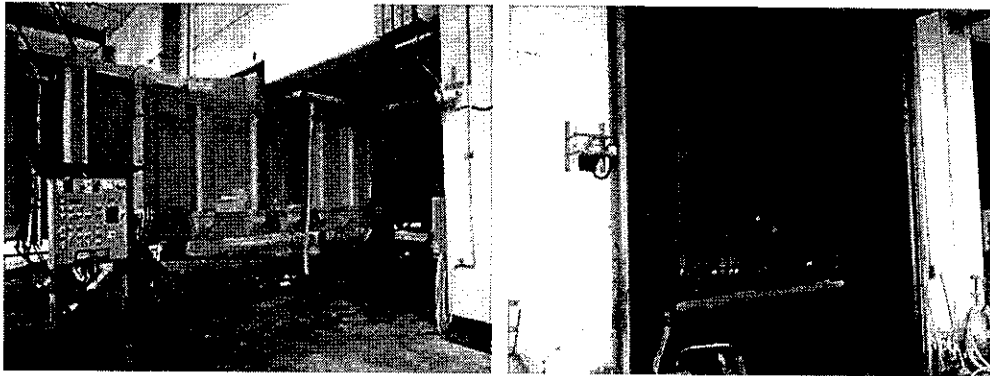


圖 4-1

圖 4-2

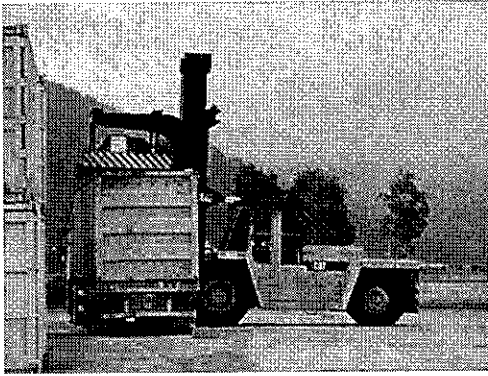


圖 4-3



圖 4-4



圖 4-5

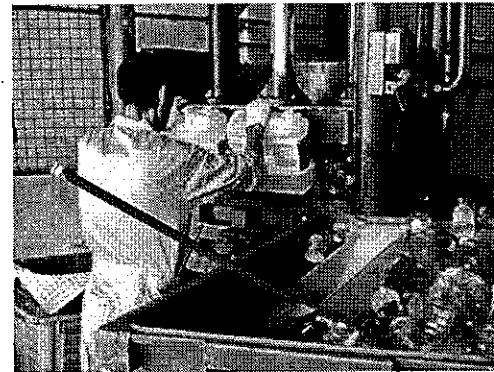


圖 4-6

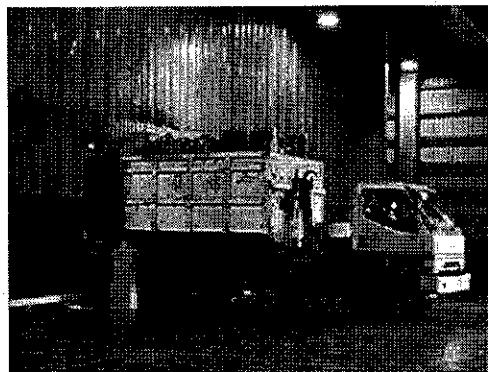


圖 4-7



圖 4-8

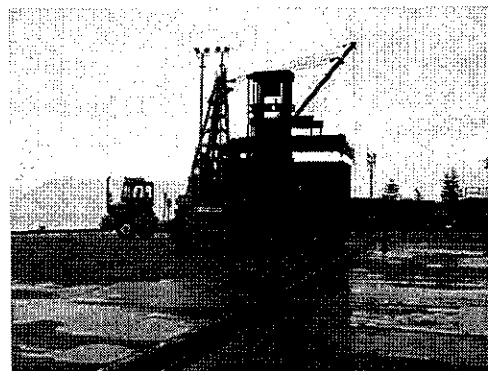


圖 4-9



圖 4-10

4-3 參訪香港九龍新界東南廢棄物掩埋場--翠谷公司(協調台灣達和環保公司聯繫安排)

開發及營運業者翠谷工程有限公司 (GREEN VALLEY LANDFILL) 香港環保署於 1993 年 8 月以 BOT 方式委託 30 年營運合約。1994 年 9 月啓用接收廢棄物，地點：九龍將軍澳大赤沙；面積 100 公頃，設計掩埋量約 5000 萬噸，每日可掩埋 7500 噸廢棄物，預定 2017 年封場關閉合約規定封場後必須再維護 30 年。

掩埋場由國際環保公司 ONYX 集團出資 50%與另外兩家香港公司 中信泰富公司(30%)及新鴻基地產公司(20%)合資成立翠谷公司，ONYX 集團 2006 年由法國 VEOLIA 集團接收並改名，目前為世界最大環保公司之一。

該廠特色為沼氣回收作為廢水處理除氨所需熱能，底層主要不透水系統除由兩層 HDPE 高密度聚乙烯組成外，中間尚有皂土布 (DEHYDRATED BENTONITE)，可以膨脹吸附滲出水，確保不透水功能。封閉復育時先覆蓋 HDPE 不透水布，再覆土 1.5 米後植生當地植物。這些設計遠高於國內現行掩埋場規範要求，值得我國參考學習。

另外該廠緊臨香港 TVB 電視總公司，特別受到媒體的關注，營運內控壓力與公關協調溝通均值得再深入了解

肆、心得

一、大陸推動重點城市示範回收、拆解廢機動車輛工作，資源回收產業奠定商機

大陸汽車技術研究中心在研討會報告廢機動車輛回收的機會與挑戰議題中提及，隨著大陸汽車業的迅速發展，帶動其國內廢機動車輛回收需求與日俱增。2010 年生產及銷售車輛均超過 1,800 萬台，總車輛數超過 8,500 萬台，考量車輛使用壽命，未來幾年將會有報廢車輛高峰，報廢車輛若未

妥善處理，將造成大陸日益嚴重的問題，包括環境污染、資源消耗及危害人體健康等問題。目前大陸廢車回收拆解遭遇問題包括：拆解技術及設備技術不足、無法獲得高價值之零件材料、成分標示不明造成拆解困難、塑膠及玻璃再利用率低等。因此 2011 年選擇 10 個示範城市，由中央提供總投資的 50% 補助，執行拆解和回收升級的示範計畫，鼓勵車主即時報廢車輛。

二、香港海陸轉運系統及掩埋場設計要求，值得借鏡學習

香港資源回收物及垃圾處理因離島眾多，壓縮後集中並以海運轉運，有效降低運輸成本及運輸空間，且轉運站環境維持良好，其作業效率值得參考學習。

掩埋場設計以兩層 HDPE 不透水布，中間再包夾皂土布，值得我們引進規範推廣。

三、香港因依賴掩埋場及垃圾尚未收費，導致不利於資源回收的環境條件

按香港目前廢棄物產生速度，其掩埋場將在 6 至 10 年內填滿。環保署 2012 年初方進行公民垃圾收費意願調查，因此藉由經濟誘因減量與回收仍需再努力。減廢所採取措施包括研擬立法執行「生產者責任計畫」；推動全港實行廢棄物源頭分類；並透過設立環保園區，為資源回收業拓展新的經濟活動。香港部分資源回收及廢棄物管理政策如「廢電器電子產品生產者責任計畫」、「廢棄物收費」及「掩埋場棄置禁令」即參採台灣相關作法，以達到減少廢棄物產生的目標。

四、香港因免稅政策，造就轉口電子廢棄物的市場

參訪億達再生資源有限公司，發現其場區作業環境，若在我國恐無法取得地方之應回收處理業登記，但香港轉口貿易盛行，業者竟能獲選為研

討會主辦單位安排之參訪工廠，顯見我國的處理業者均具國際競爭技術能量，但進出口管制作業確實造成發展障礙。

五、廢電子電器產品仍然轉口至開發中國家不當處理，造成環境污染

Klaus Hieronymi 在研討會報告電子廢棄物回收在歐洲 8 年的發展與檢討。雖然法令已明文禁止，但帶有危害人體之虞的舊電腦及電子設備，仍從歐洲被運往非洲和亞洲等開發中國家。在討論嚴謹控管歐盟境內的回收規範時，有人提倡應確保運送二手電子設備到非洲的正當性與慈善目的，更呼籲電子設備公司將環保概念融入產品設計，改變消費者的使用習慣。美國與會專家報告美國環保署推動電子廢棄物回收認證體系建置計畫，內容也以最新的不當處理相片，檢討美國不應再放任電子廢棄物輸出發展中國家，成為污染環境的元兇。

六、搖籃到搖籃，我國業者積極投資布局

國內企業緯創公司長期為世界知名電腦或電子產品的代工業者，深刻體認品牌業者對環保回收的重視，率先投入從搖籃到搖籃的生產模式，並以塑膠及電路板廠優先建廠。

在大陸地區優先投資興建塑膠再精鍊廠，佔地 5 萬 3,000 平方公尺，預計 2012 年底以每月產能 2,000 噸精鍊各種 ABS 等認證回收塑膠。美國電路板再精鍊廠，預計 2012 年 9 月量產 1,000 萬片認證再製電路板。

伍、建議

國內電子廢棄物回收處理技術與管理制度具國際競爭力，大陸有市場及商機，全球有技術及人才，能率先整合的卻是我國廠商，因為他們了解國內資源回收四合一計畫及稽核認證補貼制度，是促成搖籃到搖籃最有力

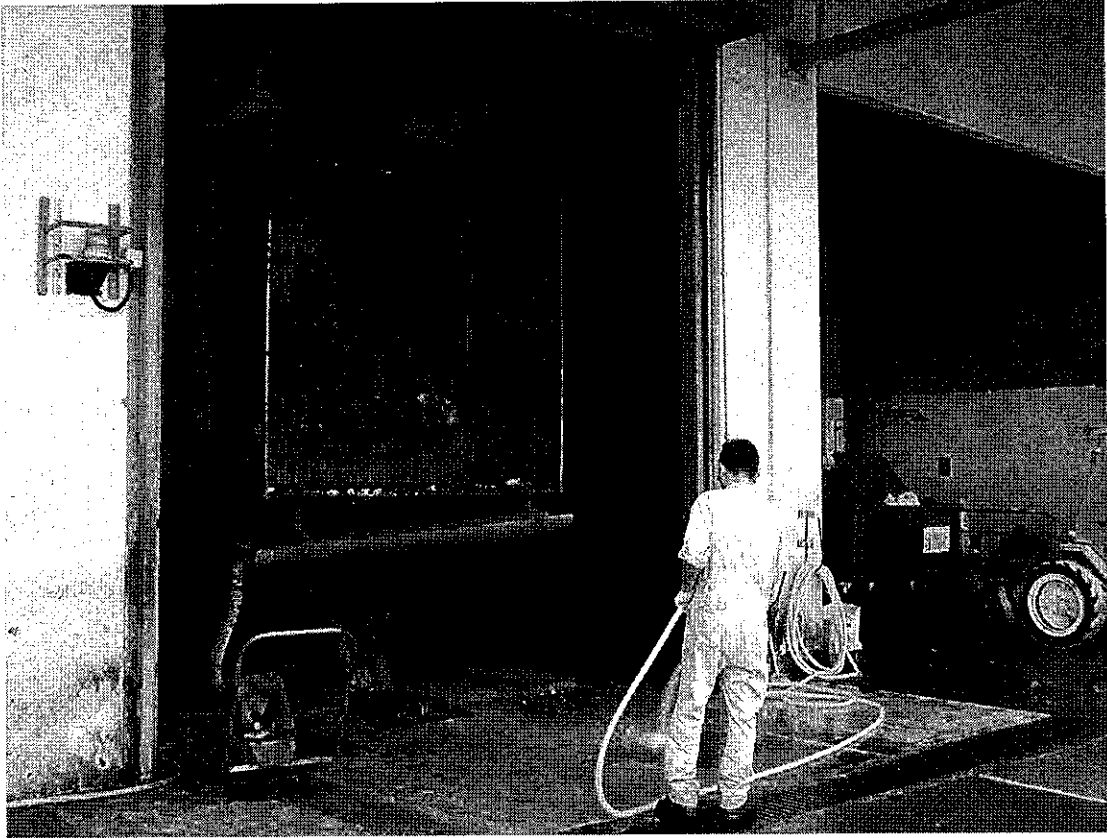
的領航先趨。

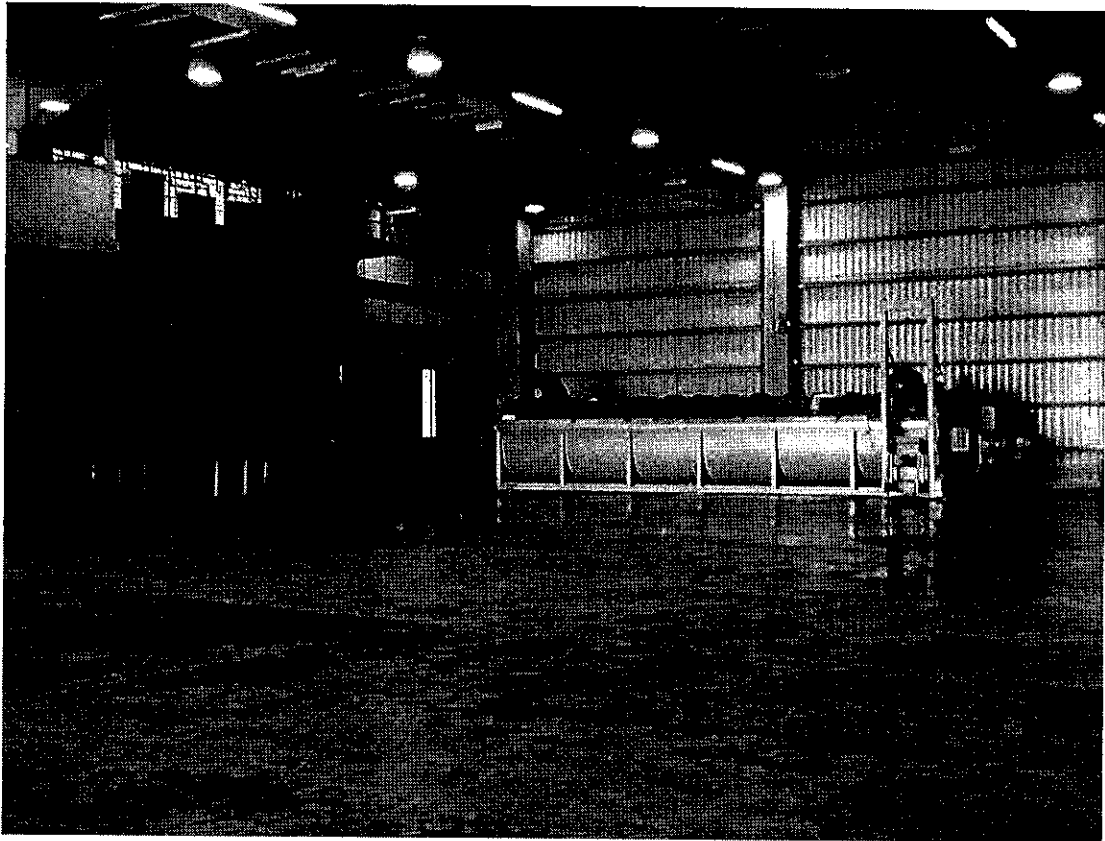
雖然我國環境負荷沉重，但電子廢棄物含貴重金屬資源，視為戰略物資回收精鍊，目前多為德國日本瑞士之商機，我國可進一步評估是否開放進口處理，除承擔電子大國回收責任，亦可扶持建立本土金屬精鍊高科技產業。

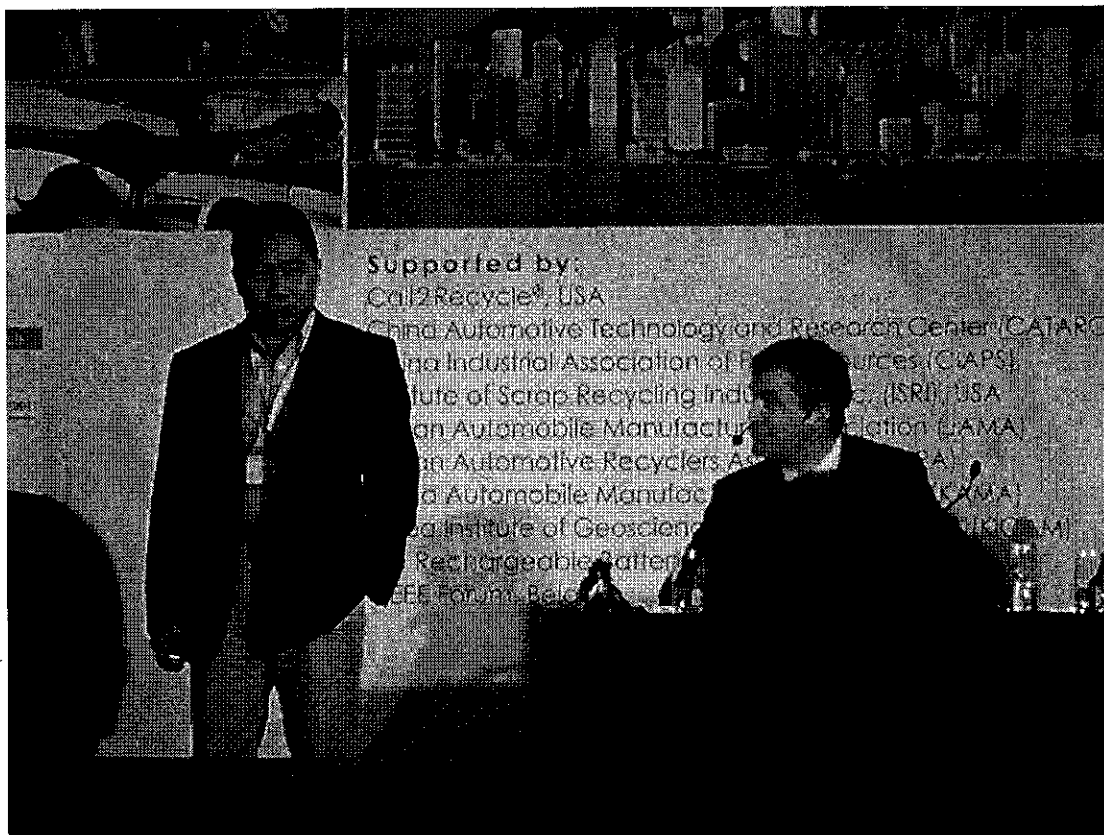


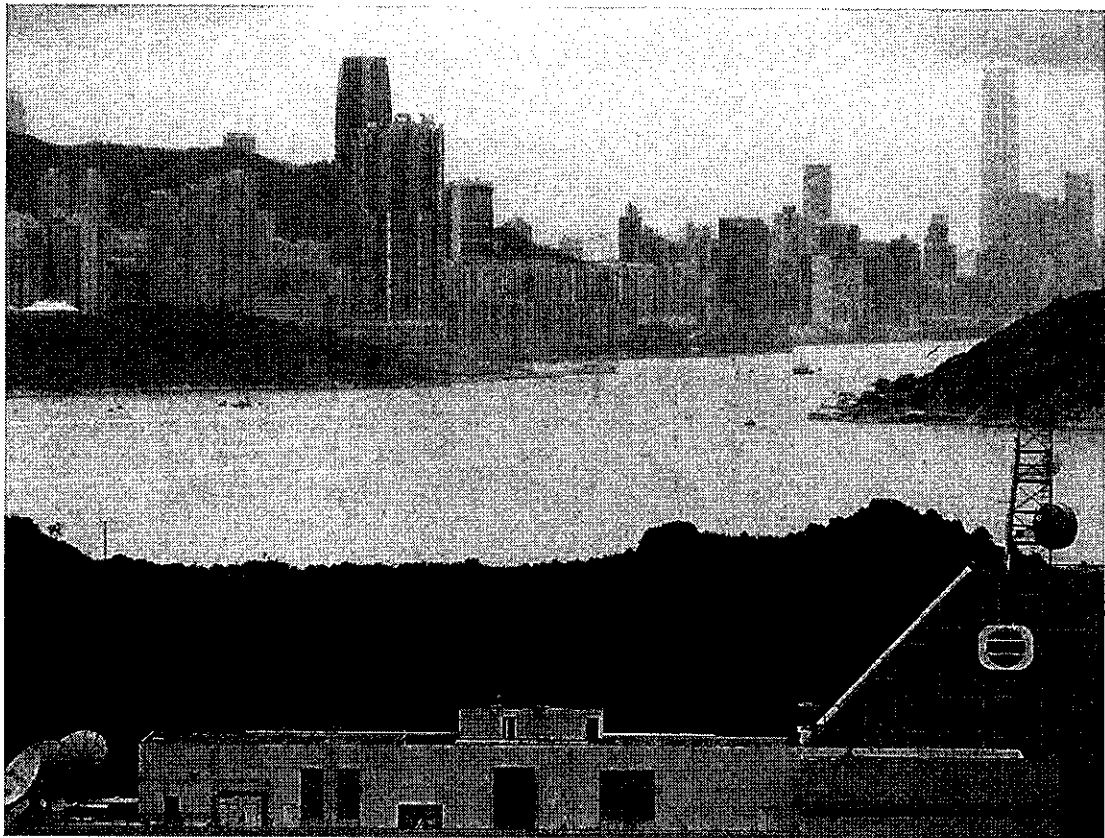
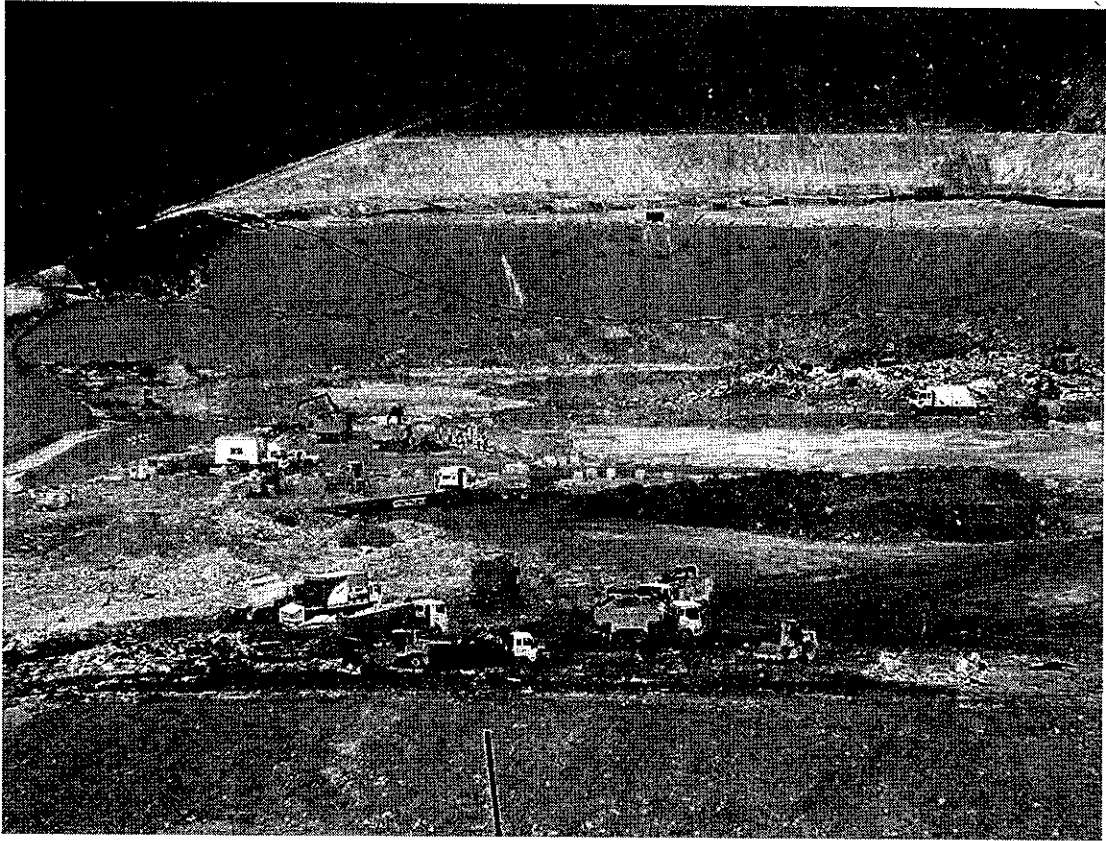














附件一 與會人員名單

Delegate List - 6th World Recycling Forum WRF 2011

* Speakers and participants panel discussion

<u>Name</u>		<u>Company</u>	<u>Country</u>
Nazareth	Pedro	3Drivers LDA	Portugal
Chao	Michael	3R Network Inc.	USA
Guo	Grace	3R Network Inc.	USA
Sardana	Amit	A2Z E Waste Management Ltd.	India
Jiang	Ping	Advanced Technology Materials Inc.	China
* Korzenski	Michael	Advanced Technology Materials Inc.	USA
* Burri	Roger	Air Mercury AG	Switzerland
Gu	Ying	Air Products & Chemicals (China) Investment Co., Ltd.	China
Schwarz	Stephan	ALBA Group	Germany
Hilker	Wilfried	Albert Hoffmann GmbH	Germany
Hoof	Frank	Albert Hoffmann GmbH	Germany
* Puckett	Jim	Basel Action Network (BAN)	USA
Van Deutekom	Huibert	Bureau van Deutekom	Netherlands
Xiao	Feng	BYD Company Ltd.	China
* Smith	Carl E.	Call2Recycle®	USA
* Chai	Jing	CATARC	China
Ekberg	Christian	Chalmers University of Technology	Sweden
* Kosaraju	Sravva	Chalmers University of Technology	Sweden
* Yang	Jiaxu	Chalmers University of Technology	Sweden
De Caluwe	Nils	Chiho-Tiande (HK) Ltd.	Hong Kong
Hohnloser	Joerg	cleanpart GmbH	Germany
Mayer	Christiane	cleanpart GmbH	Germany
* Yob	Joe	Creative Recycling Systems, Inc.	USA
Kang	Chun Keong	Cycle Trend Industries Sdn. Bhd.-	Malaysia
Aniyarangan	Premananth	Dell India Pvt Ltd.	India
Dodd	Chris	Dodd & Dodd Group Pty Ltd.	Australia
Hidai	Kenichi	Dowa Eco-System Co., Ltd.	Japan
Okuda	Wataru	Dowa Eco-System Co., Ltd.	Japan
Ono	Hiroyuki	Dowa Eco-System Co., Ltd.	Japan
Uchida	Hiroki	Dowa Eco-System Co., Ltd.	Japan
* Cheng	Daniel M.	Dunwell Group	Hong Kong
Li	Victor C.	Dunwell Group	Hong Kong
Hansen	Flemming	Eldan Recycling A/S	Denmark
Khee	Alvin	Elms Industrial Pte Ltd.	Singapore
Tan	Tim	Elms Industrial Pte Ltd.	Singapore
Chen	Hung Yi	Environmental Protection Administration Executive Yuan, R.O.C.	Taiwan
Huang	Chien Hua	Environmental Protection Administration Executive Yuan, R.O.C.	Taiwan
Chan	Wing-Kwan	Environmental Protection Department	Hong Kong
Chui	Yi-Ping	Environmental Protection Department	Hong Kong
Lam	Kwok-Lun	Environmental Protection Department	Hong Kong

Tarn	Chun-Keung	Environmental Protection Department	Hong Kong
Rapp	Susanna	Ericsson AB	Sweden
Panikker	Sivadasan	Ericsson Resource & Competence Center Sdn. Bhd.	Malaysia
Conquer	Mitchell	ERIEZ Magnetics	China
Dong	Sky	ERIEZ Magnetics	China
Guo	Colin	ERIEZ Magnetics	China
Liu	Wyle	ERIEZ Magnetics	China
* Milton	Darrell	ERIEZ Magnetics	USA
Castillo Lopes	Roberto	Essencis soluções ambientais S.A.	Brazil
Roberto Fernandes	Carlos	Essencis soluções ambientais S.A.	Brazil
* Westgeest	Alfons	EUROBAT	Belgium
Gnedenkov	Mikhail	Far Eastern Federal University (FEFU)	Russia
* Lazarev	Sergey Y.	Far Eastern Federal University (FEFU), Engineering School	Russia
Shen	Lillian	Ford Motor Research & Engineering (Nanjing) Co., Ltd.	China
Yin	Wen Ying	Ford Motor Research & Engineering (Nanjing) Co., Ltd.	China
Knoop	Henk	FOXCONN srl B.V.	Netherlands
* Tomazic	Anja	General Motors / Adam Opel AG	Germany
Jermyn	Jeffrey	Global Electric Electronic Processing (GEEP)	Canada
* Lohmeier	Siegfried	Hammel Recyclingtechnik GmbH	Germany
* Koehnlechner	Rainer	Hamos GmbH	Germany
Baba	Akihiko	Hanwa Co., Ltd.	Japan
Hirokawa	Taisuke	Hanwa Co., Ltd.	Japan
Tagawa	Tetsuya	Hanwa Co., Ltd.	Japan
* Greer	Stephen Hartwell	Hartwell Pacific/Oaktree Capital	Hong Kong
Kusenberg	Alexander	Herco Kühltechnik GmbH	Germany
Augustynowicz	Artur	Hermes Recycling sp. z o.o.	Poland
Couckuyt	Benedicte	Hermion BV	Netherlands
Driessen	Marinus	Hermion BV	Netherlands
* Dickens	Annuikka	Hewlett-Packard Asia Pacific and Japan	Singapore
* Hieronymi	Klaus	Hewlett-Packard Europe - Middle East - Africa	Germany
Kim	Kyunghnam Irene	Hyundai Motor Company	Korea
Nozawa	Kazumi	IBM Japan Ltd.	Japan
Totoki	Yoshiaki	Institute for Global Environmental Strategies (IGES)	Japan
Horne	Scott	Institute of Scrap Recycling Industries, Inc. (ISRI)	USA
* Goko	Minoru	Japan Automotive Recyclers Association (JARA)	Japan
Xie	Yanhui	Johnson Matthey (Shanghai)	China
* Kummer	Beate	Kummer Umweltkommunikation GmbH	Germany
Cheung	Esther	Li Tong Group	Hong Kong
Cruickshank	Phil	Li Tong Group	United Kingdom
Jiang	Belinda	Li Tong Group	Hong Kong
Wang	Tony	Li Tong Group	Hong Kong
Paul	Richard	LKQ Corporation	USA
Kightly	Chris	Logan Oil, Inc.	USA
Landel	Edouard	Mageland SARL	France
Chappard	Eric	MagPro Recycling Systems	France

Biehl	Sascha	MAIREC Edelmetallgesellschaft mbH	Germany
Maier	Thomas	MAIREC Edelmetallgesellschaft mbH	Germany
Reising	Jens	MAIREC Edelmetallgesellschaft mbH	Germany
Slijkhuis	Chris	MBA Polymers, Inc.	USA
* Wang	Eric	MBA Polymers, Inc.	China
Wartel	Ivan	MBA Polymers, Inc.	USA
Fusier	Jean-Philippe	MTB Recycling	France
Ma	Hsiao-Kang	National Taiwan University	Taiwan
Cheong	Francis	Nokia Pte Ltd.	Singapore
Tan	Mei Ling	Nokia Pte Ltd.	Singapore
Lumpp	Reinhard	Nord-Schroff GmbH & Co. KG	Germany
Roed	Jens	Nord-Schroff GmbH & Co. KG	Germany
Watanabe	Katsunori	OKADA AIYON CORPORATION	Japan
Florack	Peter	Osram AG	Germany
* Chu	YC	Philips Consumer Lifestyle (CL)	Hong Kong
Taylor	Brian	Recycling Today	USA
* Dubois	Michel	Recylux Group	Luxembourg
Jokic	Gerhard	REMONDIS Electrorecycling GmbH	Germany
Kolba	Helmut	REMONDIS Electrorecycling GmbH	Germany
Carencotte	Frédéric	Rhodia	France
Rollat	Alain	Rhodia	France
De Metz	Patrick	SAFT	France
Ledger	Jill	SAFT	France
Grinschgl	Alois	Saubermacher Dienstleistungs AG	Austria
Sofian	Mihai Emilian	SC REMATHOLDING Co. SRL	Romania
* Sundberg	Christer	Scandinavia EcoTech, LLC	China
Xie	Xiao Han	Scandinavia EcoTech, LLC	China
* Minter	Adam	Shanghai Scrap	China
Zhang	Xiang	Shenzhen GEM High-Tech Co., Ltd.	China
Jiang	Fred	SIMS Recycling Solutions	Australia
Skurnac	Steve	SIMS Recycling Solutions	USA
Su	Paul	Sinai International Company, Inc.	USA
* Su	Fenwei	SSAB Swedish Steel Ltd., SSAB APAC	China
Brereton	Greg	Steinert Australia Pty Ltd.	Australia
Viti	Ezio	Steinert Australia Pty Ltd.	Australia
Adams	Eric	Steineri Elektromagnetbau GmbH	Germany
Beel	Hendrik	Steineri Elektromagnetbau GmbH	Germany
Teike	Par	Stena	China
Domini	Peter	Stena Metall Service AB	Sweden
* Oscár	Phär	Stena Technoworld AB	Sweden
Ye	Guozhu	Swerea MEFOS	Sweden
Apostolou	Yannis	SYSTEMS SUNLIGHT S.A.	Greece
Kartalis	Christos	SYSTEMS SUNLIGHT S.A.	Greece
Lafkas	Konstantinos	SYSTEMS SUNLIGHT S.A.	Greece
Kienle	Armin	TechProtect GmbH	Germany

* Newell	Scott	The Shredder Company, LLC	USA
Newell	Joalton	The Shredder Company, LLC	USA
Chen	Liangge	TITECH GmbH	Japan
Neumann	Silvio	TITECH GmbH	Japan
Sasaki	Megumi	TITECH GmbH	China
Goh	Christopher	Total Petrochemicals South East Asia Pte Ltd.	Singapore
Willis	Stephanie	TradeScrap.com	USA
Rabitsch	Kurt	Treibacher Industrie AG	Austria
Caruso	Joe	Triple M Metal LP.	Canada
* Li	Jinhui	Tsinghua University	China
* Weng	Duan	Tsinghua University	China
Jadot	Victoria	Umicore	China
Luo	Daisy	Umicore	China
Maes	Arne	Umicore	Belgium
Van Kerckhoven	Thierry	Umicore	Belgium
Wan	Windy	Umicore Marketing Services (Hong Kong) Ltd.	Hong Kong
Hsiao	Ken	Umicore Marketing Services (Taiwan) Ltd.	Taiwan
Arnberger	Astrid	University of Leoben	Austria
* Hessler	Peter	UNTHA Recycling GmbH	Germany
Lin	Wen-Hwei	UNTHA Recycling GmbH	Germany
Van Peperzeel	Johan	Van Peperzeel B.V.	Netherlands
Kaiser	Stefan	Vecoplan AG	Germany
Krönig	Jörg	Vecoplan AG	Germany
Merrbach	Frank	Vecoplan AG	Germany
Lotz	Hans-Rainer	Volkswagen AG	Germany
Cho	Asam	Wai Mei Dai Group Co., Ltd.	Hong Kong
Hsu	Joseph	Wistron	Taiwan
* Lin	Patrick	Wistron	Taiwan
Cheng	Steven	Wistron Advanced Materials (Kunshan) Co., Ltd.	China
De Brouwer	Dominique	Wogen Resources Ltd.	United Kingdom
* Healey	Paul J.	Xstrata Copper	Canada
Pike	Darryl	Xstrata Nickel	Canada
Desobry	Bernadette	Xstrata Nickel International S.A.	Belgium
Wyns	Quentin	Xstrata Nickel International S.A.	Belgium

Exhibitors WRF 2011:

Albert Hoffmann GmbH, Germany
Dowa Eco-System Co., Ltd., Japan
ERIEZ Magnetics, China
HAMMEL Recyclingtechnik GmbH, Germany
Hamos GmbH, Germany
LI Tong Group, China
Logan Oil, Inc., USA
MAIREC Edelmetallgesellschaft mbH, Germany
MRT System International AB, Sweden
Scandinavia EcoTech LLC, China
Steinert Australia Pty Ltd., Australia
The Shredder Company, USA
TITECH GmbH, Germany
Tradescrap.com, USA
UNTHA Recycling GmbH, Germany
Vecoplan AG, Germany

附件二 大陸人口增加對回收產業的衝擊

6th World Recycling Forum, Nov. 16, 2011, Hong Kong, China

Impact of Increasing China's Population on the Recycling Industry

Duan Weng

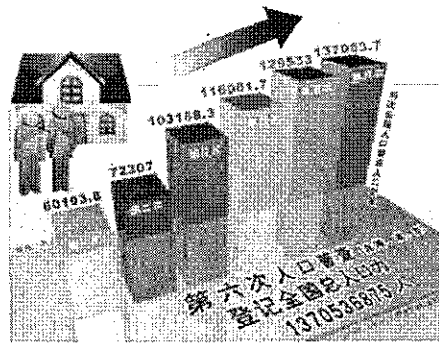
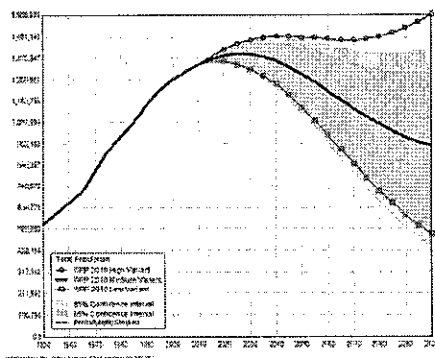
Tsinghua University, Beijing 100084, Tel.: 86-10-6277-2726,
E-mail: duanweng@tsinghua.edu.cn

- ⇒ Population of China;
- ⇒ Policies of Recycling in China;
- ⇒ Status of Recycling Industry in China;
- ⇒ Summary;

⇒ Population of China

China's Total Population

➢ The total population of China is close to 1.4 billion by the end of 2010.

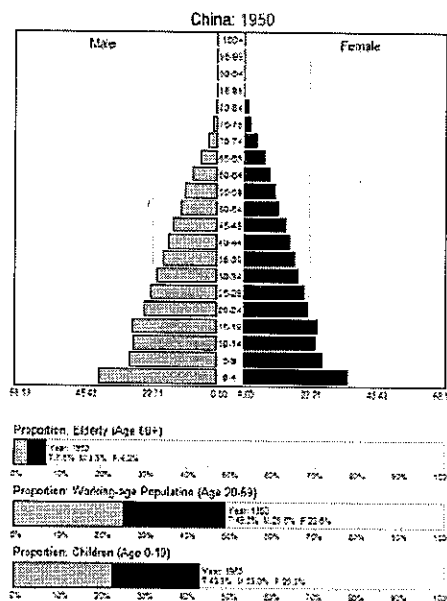
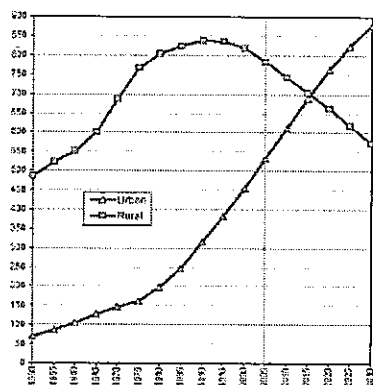


Growth Rate of China's Population

➢ From 2000-2010, the average annual growth rate of China's population has been slow down to 0.57%.

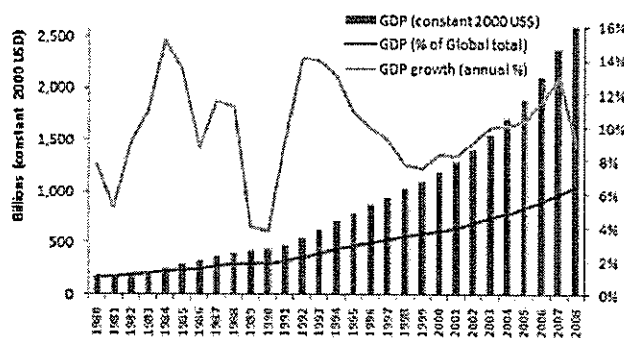
⇒ Characteristics of China's Population

- Steady increase;
- Low growth rate;
- Population aging;
- Rapid urbanization process;



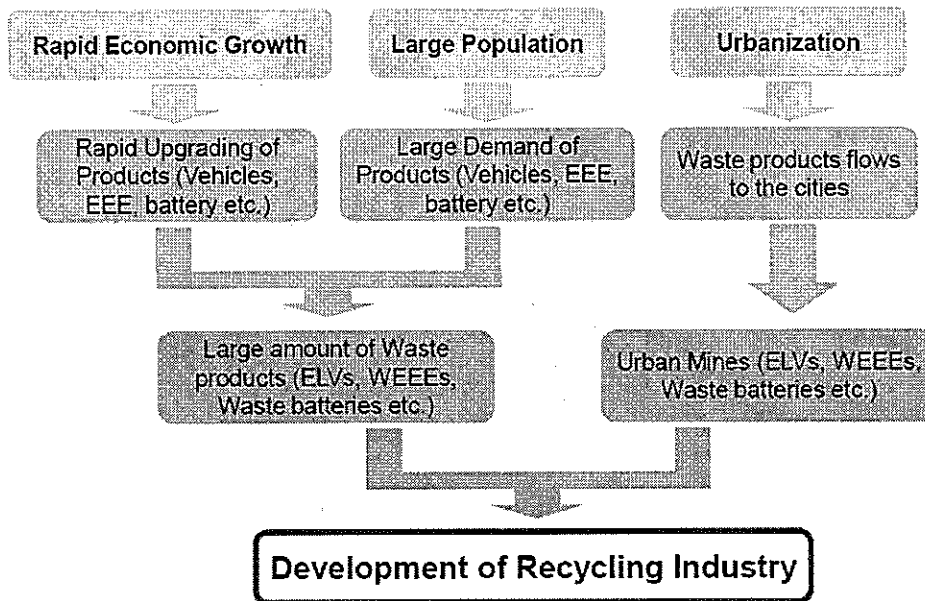
⇒ Economic Development: GDP

- In the past 30 years, China has achieved phenomenal economic growth, with an average annual rate of more than 9 percent.
- In 2010, it has surpassed that of Japan and become the world's second-largest economy.

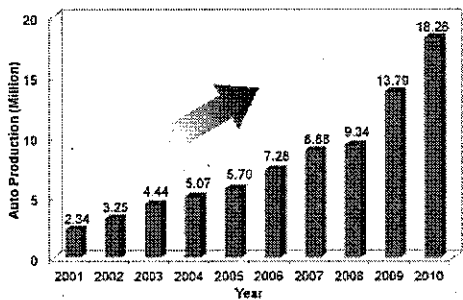


China's GDP Growth in 1980-2008

⇒ Impact on Recycling Industry



⇒ Development of Automobile in China

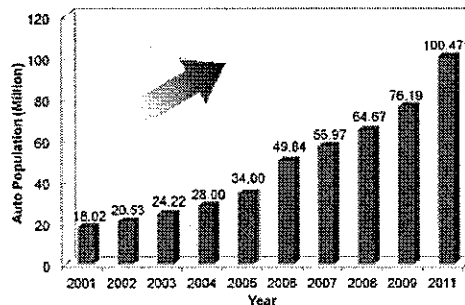


Automobile Production

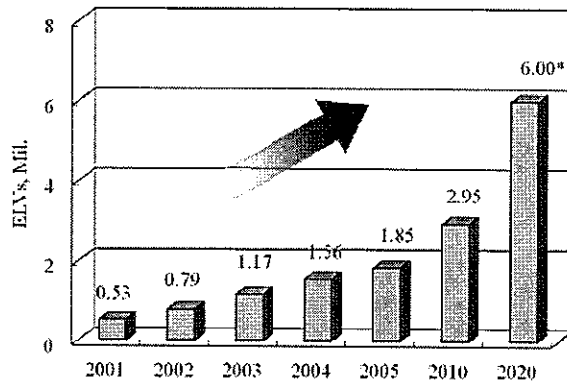
- > Since 2009, China has become the largest automobile maker in the world.
- > China produced 12.3 millions vehicles in the first eight months in 2011, with an increasing rate of 4.7% against 2010.

Automobile Population

- > China's automobile population has been over 100 million by the end of August in 2011.



⇒ Status of ELVs in China



➤ The total amount of ELVs in 2009 reached 2.7 millions in China.

➤ ELVs 3.0 million in 2010 & 6.0 million in 2020, respectively;

➤ The automobile industry restructuring and revitalization plan (2009—2011)

➤ In 2009, the total amount of subsidies for update of ELV is increased from 6 billion in 2008 to 50 billion RMB.

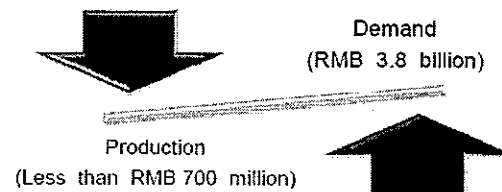
*: Forecast;

⇒ Policy for ELVs in China: Remanufacture

➤ In April, 2006, Chinese Government agreed on the remanufacture demonstration in the automobile components and exploring the experience, developing technology, as well as revising the laws and regulations;

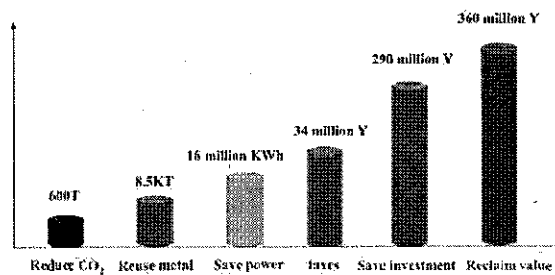
➤ In March, 2008, National Development and Reform Commission announced "Automotive parts remanufacturing Pilot Regulations", as well as the list of automotive parts remanufacturing, including 14 enterprises.

➤ In 2010, National Development and Reform Commission announced to sustainably promote the development of remanufacturing in automotive industry.



⇒ Advantages of Remanufacture

- The quality of the remanufactured productions is over the new one;
- Cost lower new products by 50%;
- Energy consumption lower recycle by 40%;
- Saving materials 70% compared with recycle;
- Good benefit environment protection compared with recycle;
- High additional values;
- High-technology, normalization and scale manufacturing mode;



⇒ Development of Remanufacture

Automobile industry restructuring & revitalization plan (2009-2011)

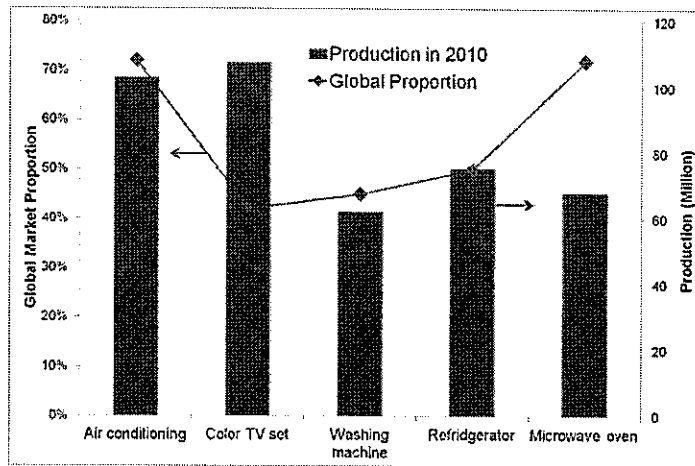
- In 2009, the total amount of subsidies for update of ELV is increased from 6 billion in 2008 to 50 billion RMB.
- To encourage the trade-in of ELVs in both cities and rural areas.

Unsolved issues

- The sources of the raw materials are limited (used parts of automobile).
- The management in the remanufacture industry is seriously dated.
- Remanufactured engine is difficult to replace.
- Over-loaded taxes for the remanufacture enterprises.
- There are no uniform standards and trademarks for remanufactured products.

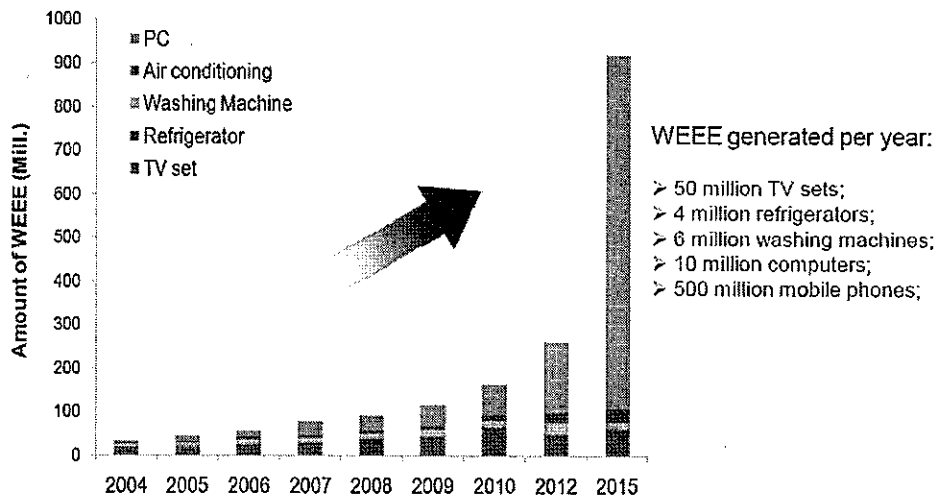
⇒ Electronic and Electrical Equipment (EEE) in China

- The production of electrical appliances rapidly increases since 1990s. The total production of air conditioning and TV set has been over 100 million in by 2010.
- The production in China reached 32%-35% of the global export market by 2010.



The total production and global proportion in China

⇒ Status of WEEEs in China



WEEE generated per year:

- 50 million TV sets;
- 4 million refrigerators;
- 6 million washing machines;
- 10 million computers;
- 500 million mobile phones;

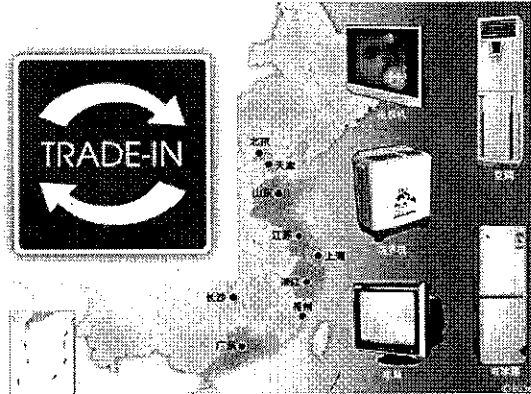
The total amount of different types WEEEs

⇒ Policy for WEEE in China: “Trade-in”

➢ Since August 15, 2009, “Trade-in” policy for five kinds of electrical appliances (TV, refrigerator, washing machine, air conditioning and computer) has been demonstrated in 9 pilot cities. The government will provide the allowance for transportation and sell.

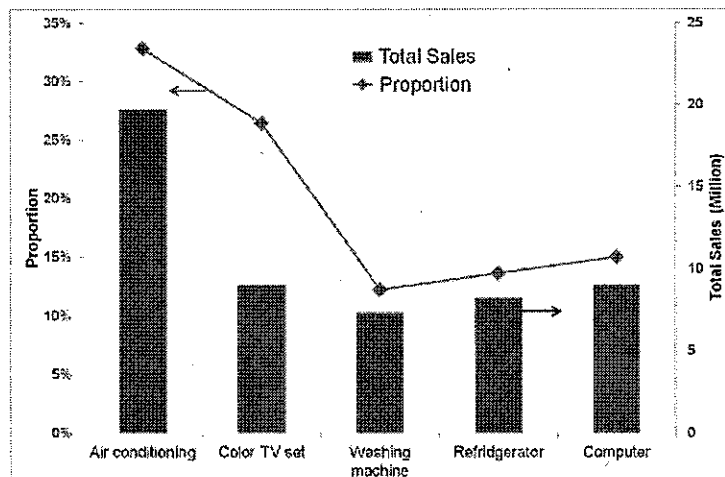
➢ Since June 1, 2010, the demonstration of electrical appliances “trade-in” policy has been extended to 19 provinces or cities.

➢ The maximum allowance could reach 10% of the sales price.

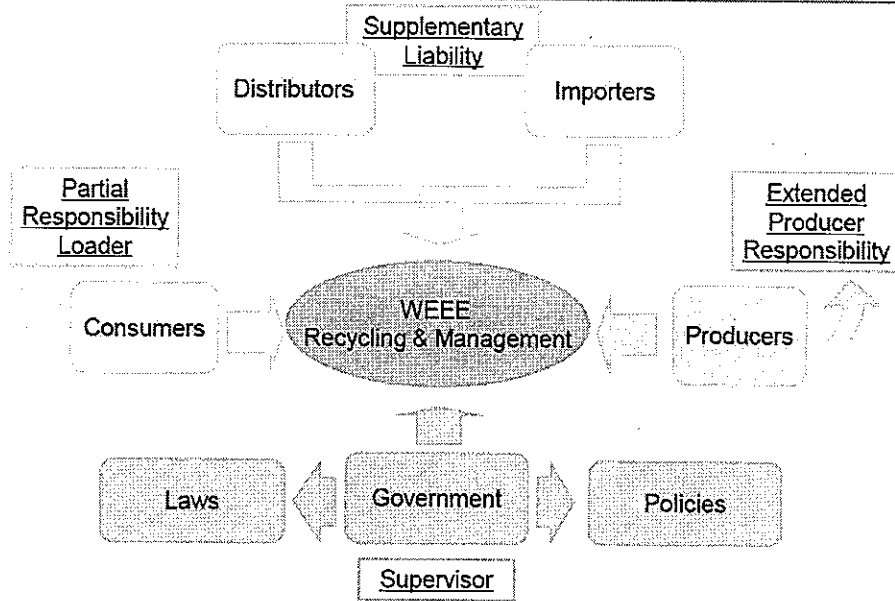


⇒ WEEE Recycle by “Trade-in” mode

➢ By July 2011, the total sales of electrical appliances by trade-in mode in China has reached 60.116 million. The recycle amount has reached 62.113 million.

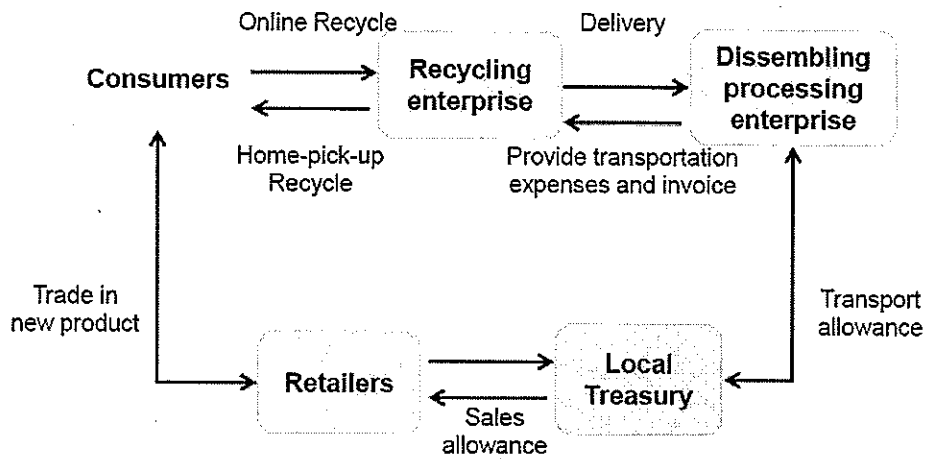


⇒ Roles of Members in WEEE Recycling and Management



Kui Chen, Congrong Yao. Recycle and reuse of electronic waste: the roles and obligations of enterprise, government and public [J]. Recycle resource research. 2006 (1): 18-21.

⇒ “Trade-in” System



⇒ Overall Status of Recycling in China

- In 2010, the recycling industry in China was steadily developed;
- In 2010, the total amount of eight major recycled resources has been reach 149 million tons, with an increase of 8.3% over in 2009.
- In 2010, these eight categories of renewable resources totally worth 506.9 billion RMB yuan, with an increase of 13.4% over in 2009.
- In 2010, the import amount of five kinds of recycled resources was 42.61 million tons, with a decrease of 21% over in 2009.
- Overall, 179 million tons of standard coal has been saved. 10.25 billion tons of waste water, 3.93 million tons of SO₂ and 3.05 billion tons of solid wastes have been decrease in 2010 by the recycling industry.

⇒ Summary


- As the country with the largest population, it is much more important for China to develop low-cost and environmentally friendly recycling technologies, and to implement Extended Producer Responsibility and effective policies to restrict the commercial operation of qualified recycling enterprises.
- Combining the state-of-the-art in China, remanufacture and trade-in policies are effective for the recycling industry.
- In order to accelerate the recycling in China, it is vital and necessary to improve public awareness regarding environmental protection by propagandizing, education and so on, in order to change their traditional viewpoint on the end-of-life domestic electric appliances.

Thank You for Your Attention!




IN TOUCH WITH TOMORROW

附件三 電子廢棄物回收在歐洲 8 年的發展與檢討



8 years of WEEE Directive in Europe
Time to remove some of the MYTH !

Klaus Hieronymi
Chairman of the Environmental Board
Hewlett-Packard Europe, Middle East & Africa

International Conference & Exhibition on Electronics, Battery & Car Recycling, Hong Kong November 16, 2011 

Mythbusters is a TV series on the Discovery Channel where scientific methods are used to test the validity of rumors, myths, movie scenes, adages, internet videos and news stories*.

For example:

MYTH: Can roaches really survive a nuclear explosion ?

MYTH: Does the color RED really make bulls angry ?

MYTH: Can 1,000 bees really lift a laptop ?



No myth is safe !

Source: Wikipedia

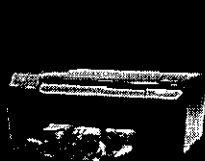
Myth:

#1 HP is just a printer company

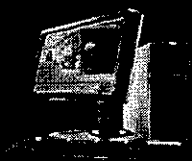


Every day HP ships...

1.3 M
cartridges



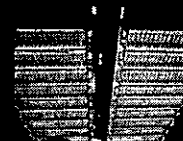
110,000
printers



75,000
personal systems



30,000
online photo orders



3,500
servers

HP manages over **200 data centers**; 380,000 servers
and millions of desktops and printers



Myth:

#1 HP is just a printer company

BUSTED!



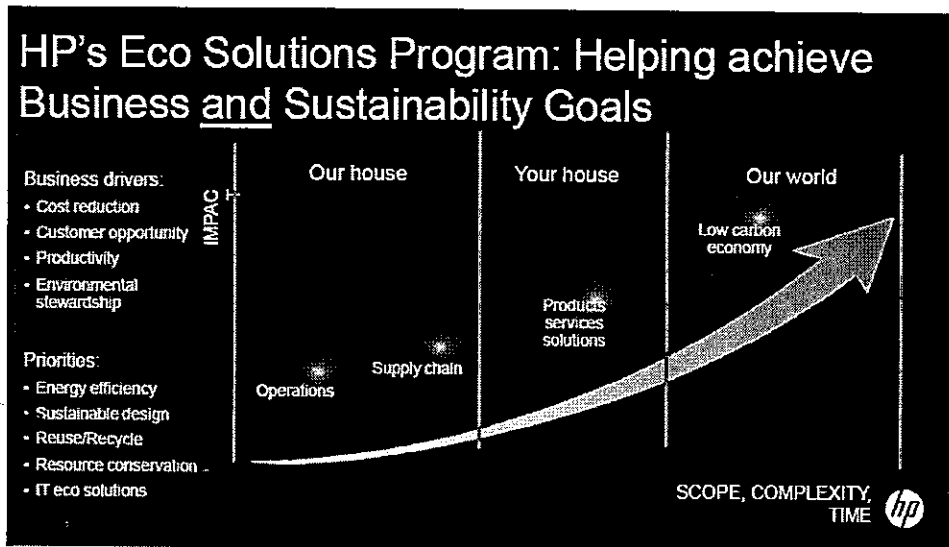
Myth:

#1 HP is just a printer company

BUSTED!

#2 HP does have a sustainability strategy





Myth:

#1 HP is just a printer company

BUSTED

#2 HP does have a sustainability Strategy

CONFIRMED

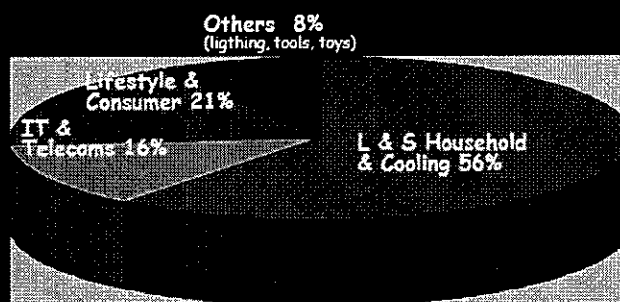


Myth:

- #1 HP is just a printer company **BUSTED!**
- #2 HP does have a sustainability Strategy **CONFIRMED!**
- #3 E-Waste consists mainly out of IT



E-Waste Composition in the EU



Data Source: Euro Stat 2006



Myth:

- #1 HP is just a printer company **BUSTED**
- #2 HP does have a sustainability Strategy **CONFIRMED**
- #3 E-Waste consists mainly out of IT **BUSTED**



Myth:

- #1 HP is just a printer company **BUSTED**
- #2 HP does have a sustainability Strategy **CONFIRMED**
- #3 E-Waste consists mainly out of IT **BUSTED**
- #4 There is huge export of E-waste to Africa



Is there a Business Case for E-Waste Exports to Africa?

Cost of recycling in e.g. Germany, according to WEEE Annex 2 (incl. collection from municipalities) for IT & Consumer Electronics **approx. 50\$/t**

Transportation cost to a port in West Africa **approx. 10\$/t**

Why do something illegal when legal treatment is much cheaper?

there is huge Export of E-Waste to Africa

„Information gained from container inspections in 2009 suggests that 1 in 8 of these shipments is waste“

(~87% is re-usable)

Dr. Margaret Bates
Centre for Sustainable Wastes Management
The University of Northampton
<http://elri-ng.org/MBatesekosummit.pdf>

where does E-Waste in Africa come from

Shipments of 2nd hand products can not be stopped. More control efforts by authorities are required to decrease amount of waste in 2nd hand shipments.

The IT market in African countries grows 5 -10% per year. The market in RSA is already larger than in some smaller European countries.

The only solution to get E-Waste in Africa under control is the establishment of high quality recycling capacity.

HP Recycling Strategy for Africa Capacity Building

HP has partnered with local recyclers and helped them to reach the high WW recycling standards of HP:

May 2011: DESCO (South Africa)

October 2011: East Africa Computer Recycling (EACR) (Kenya)

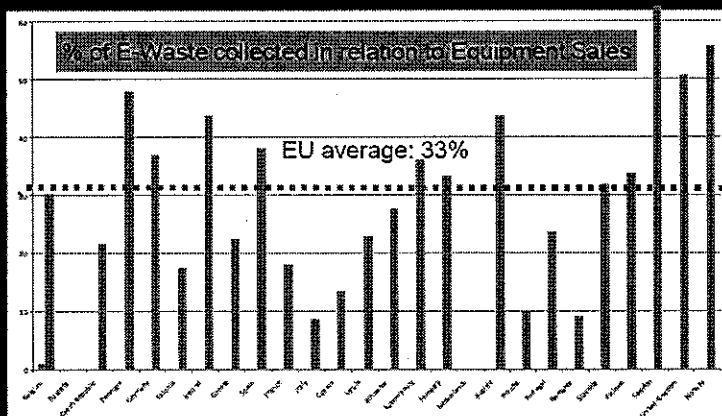
... and more to come ...

Myth:

- #1 HP is just a printer company **BUSTED**
- #2 HP does have a sustainability Strategy **CONFIRMED**
- #3 E-Waste consists mainly out of IT **BUSTED**
- #4 There is huge Export of E-Waste to Africa **BUSTED**
- #5 The EU collects only 30% of the E-Waste



Collection of E-Waste in the EU



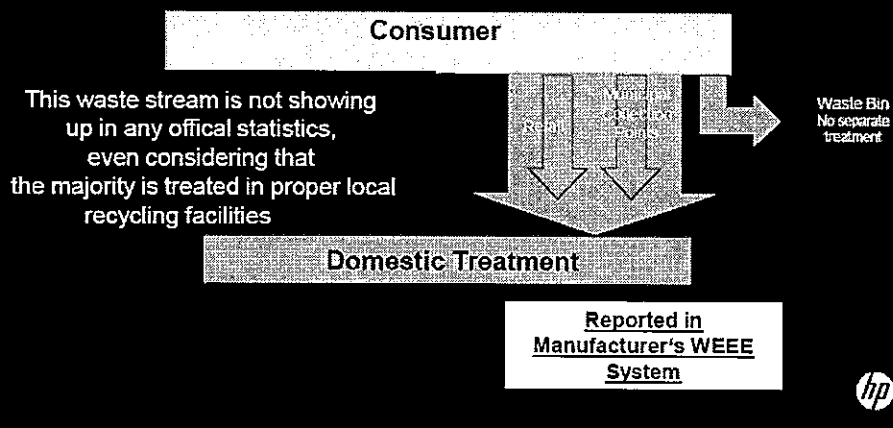
Myth:

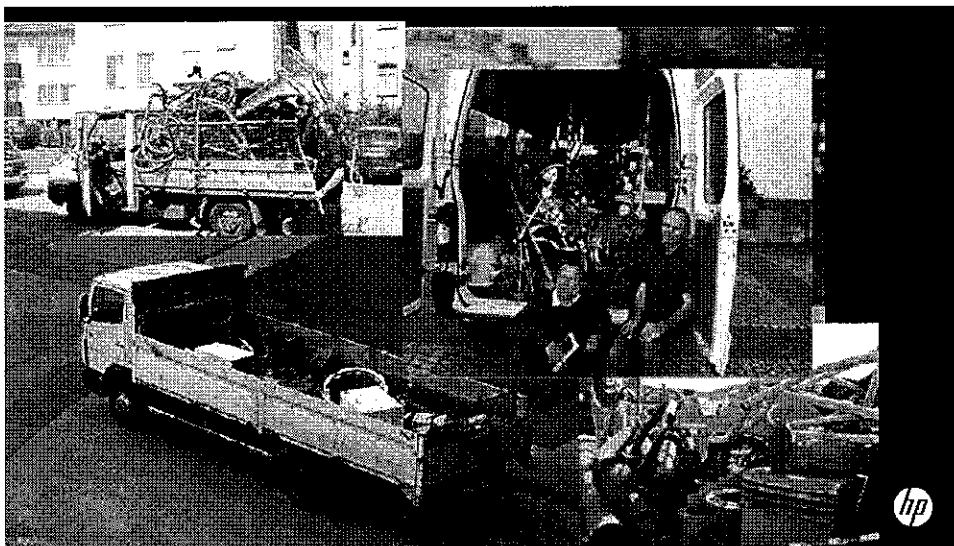
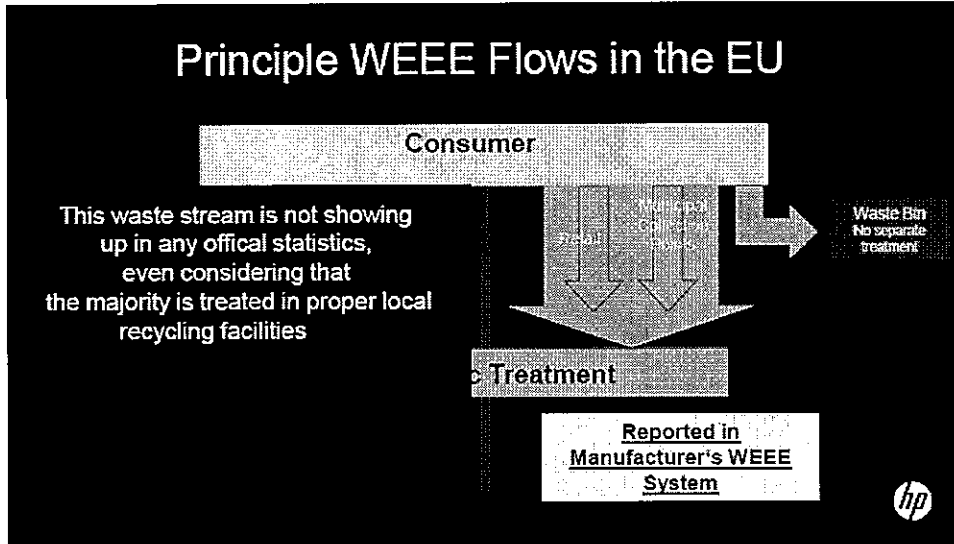
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- #4 There is huge Export of E-Waste to Africa **BUSTED**
- #5 The EU collects only 30% of the E-Waste **CONFIRMED**

British Prime Minister

"There are three kinds of lies: lies, damned lies, and statistics."

Principle WEEE Flows in the EU






Importance of Private Collection Systems

	Netherlands	Germany	Poland
E-Waste (kg/citizen) (1,2,3)	18.5	18.8	5.8
Unemployment rate (5)	4.5 %	5.9 %	9.4 %

Sources:

- (1) Witsveen+Bos, Netherlands, 04/09
- (2) PWC, Poland, 06/11
- (3) Okropol, Germany, 11/11
- (4) Eurostat
- (5) Wikipedia




Importance of Private Collection Systems

	Netherlands	Germany	Poland
Official WEEE System (% of total WEEE) (1,2,3)	31 %	42 % Includes treatment by municipalities	4 %
Total E-Waste treated by local recyclers	80 %	83 %	74 %
Waste bin (1,2,3)			
Export 2nd hand (1,2,3)	20 %	10 %	7 %
Monthly disp. salary (4)	1980 €	2040 €	618 €
Unemployment rate (5)	4.5 %	5.9 %	9.4 %

Sources:

- (1) Witsveen+Bos, Netherlands, 04/09
- (2) PWC, Poland, 06/11
- (3) Okropol, Germany, 11/11
- (4) Eurostat
- (5) Wikipedia





WEEE theft on the rise in Catalonia, say police

ENDS Europe
Monday, 22 August 2011

The economic crisis is turning the theft of waste electrical and electronic equipment (WEEE) into a "modus vivendi", according to a specialist environmental police unit (Seprona) based in Girona, north-eastern Spain.

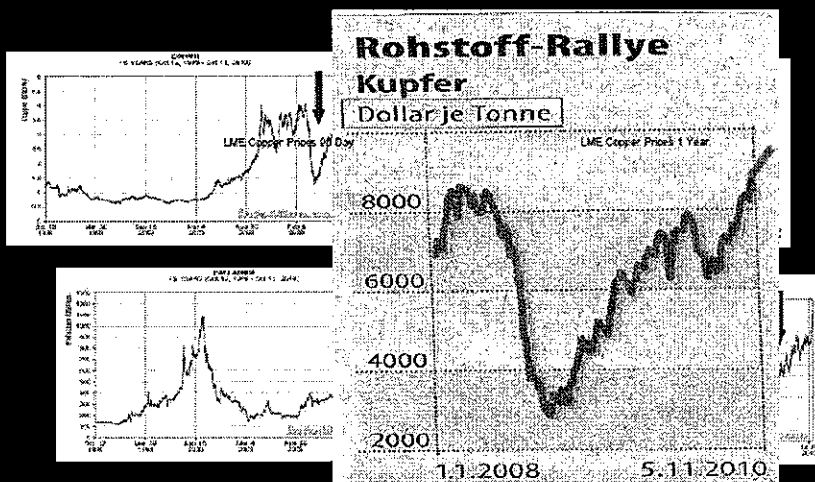
Almost half of the **185 charges brought by the unit up to the end of July related to the theft of waste domestic appliances** from official collection points, Seprona reported last week.

Specialised gangs "break into the collection points and take the waste material either to repair and resell it or to break it up", said regional chief Miguel Pelegrina.

A recent report from Spain's environmental prosecutor has revealed that **massive WEEE fraud** is occurring throughout the country. According to Ecolec – the largest WEEE recycling scheme – about 70% of the waste is escaping official channels.



The long term trend is clear...

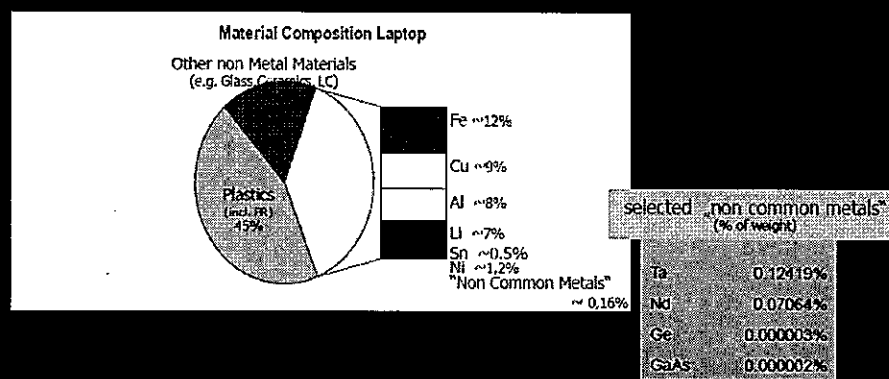


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- #5 The EU collects only 30% of the E-Waste **BUSTED!**
- #6 E-Waste solves the Rare Earth Metals Issue



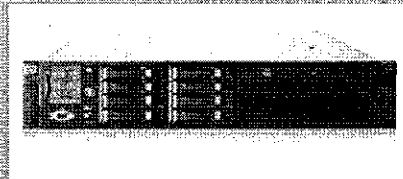
Composition of recent Laptops



➤ (responsible) IT Manufacturer's Raw Material Strategies

- ✓ Minimization
- ✓ Reduction of materials used
- ✓ New technologies

Moving from hard disks to Solid State Memory will reduce REE content of servers/PCs from approx. 0.07% to lower than 0.001% (wt)



What is creating less impact: Mining or Recycling ???

Neodymium Content

Current Laptop: 0,07 % (wt)

Future Laptop: 0,001 % (wt)

Average in Earth Crust: 0,0004 %



Rare Earth Metals still rare by 2013 ?

Country	Project	Status	Estimated Production	
			Year	Tons/Year
USA	Mountain Pass	Operational	2012	18,000
			2013	40,000
Canada	McEwen	Operational	2012	10,000
India	Malanpur	Operational	2012	10,000
Australia	Mount Weld	Operational	2012	10,000
China	Yunnan	Operational	2012	10,000
China	Dubba	Operational	2011	5,000
Malawi	Kangankum	Exploration	2012	5,000

+ > 90,000 t in 2013

Rare Earth Elements are not necessarily rare

Sources: M. Liedke & H. Elsner Commodity Top News 31, BGR Hannover 2009
* Annual Report 2011 of MolyCorp, owner of Mountain Pass

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- #2 HP does have a sustainability Strategy **CONFIRMED**
- #3 E-Waste consists mainly out of IT **BUSTED**
- #4 There is huge Export of E-Waste to Africa **BUSTED**
- #5 The EU collects only 30% of the E-Waste **BUSTED**
- #6 E-Waste solves the Rare Earth Metals Issue **BUSTED**



Major Learnings:

In the EU approx. 80% of the E-Waste is collected & treated

The Private (Informal) Sector plays an important role in collection today

Role of Private Sector depends on the scrap prices, unemployment rate, salary level and is expected to increase further

E-Waste might not be the primary choice for extracting Rare Earth Metals (from an economical & environmental view)

Thank you for your attention !

For more information visit:

www.hp.com/environment

www.hp.com/recycle

www.iprworks.org

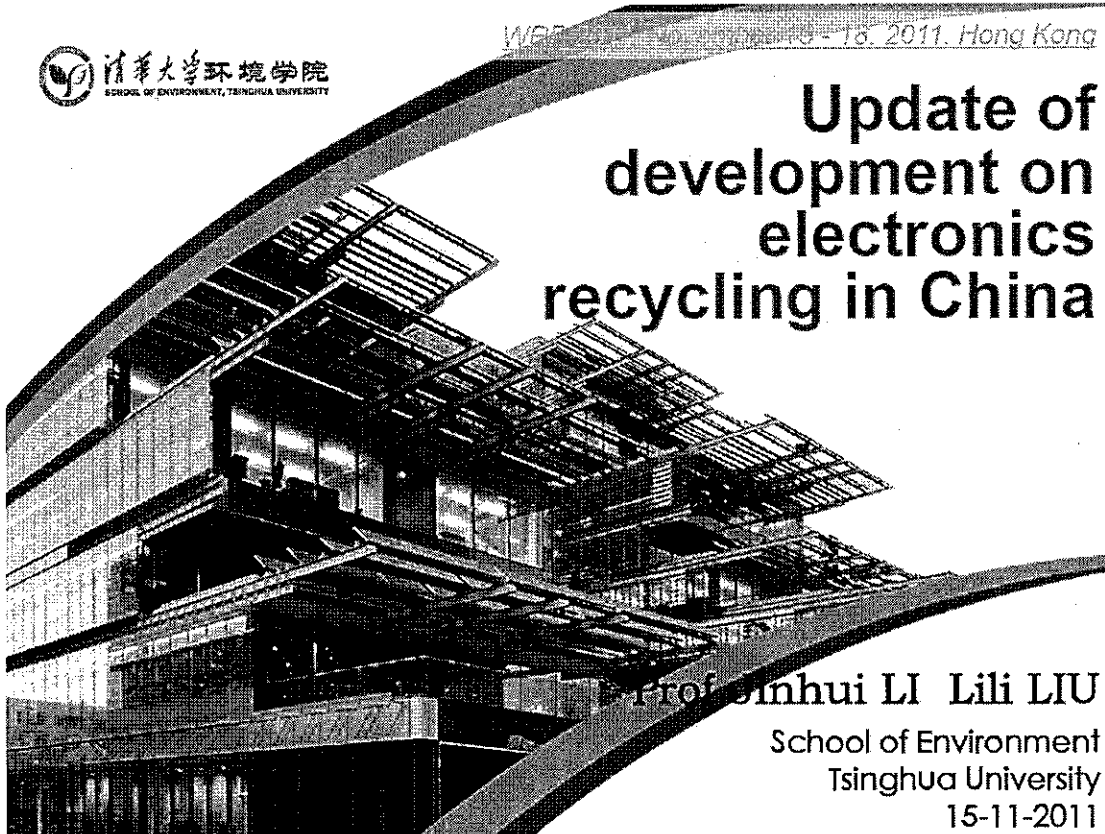


附件四 大陸電子廢棄物回收發展與問題



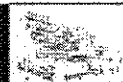
WEEE 2011, November 15-18, 2011, Hong Kong

Update of development on electronics recycling in China



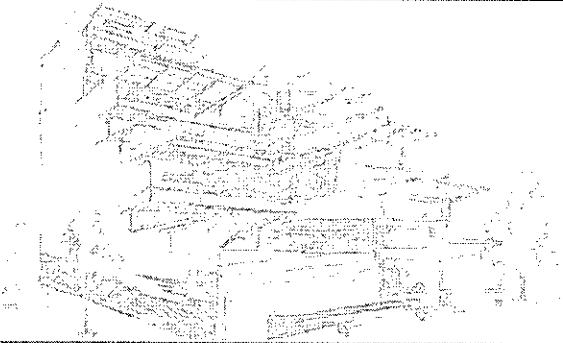
Prof. Binhui LI Lili LIU
School of Environment
Tsinghua University
15-11-2011

Subject



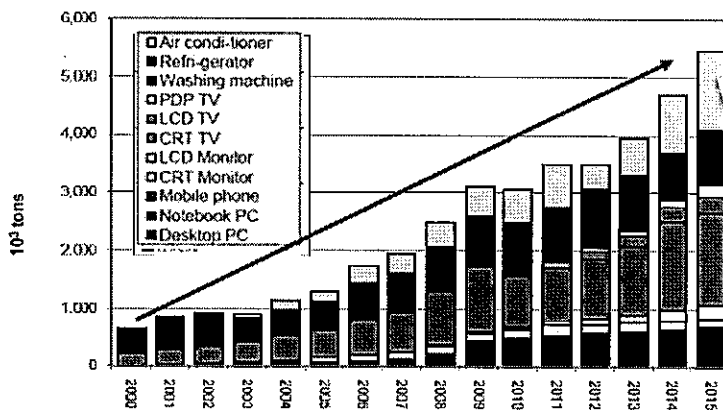
- Issue and Characteristics of E-waste In China
/中国电子废物主要问题及特点
- Status of Electronics Recycling in China
/中国电子废物资源化利用技术现状
- Development of Electronics Industry in China
/中国资源化产业发展现状及趋势

Issue and Characteristics of E-waste In China /中国电子废物主要问题及特点



Ullmann

(一) Large quantity and Rapid increase /产生量大，增长速度快



In China, the amount of E-waste generate increased fast large base. The amount is expected to reach 3.5 million tons in 2011 . In addition a lot of E-waste were imported due to illegally import each year.

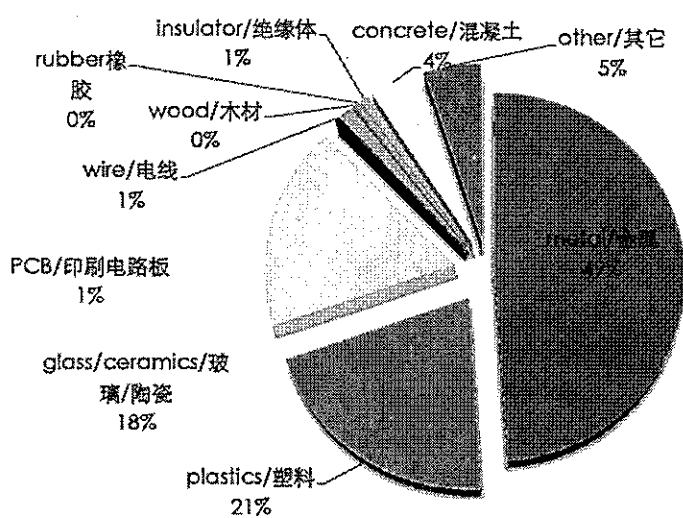
◆ Estimates for domestically-generated e-waste in China

Ullmann

(二) Potential pollution/潜在的污染性

- Improper treatment cause the the release of hazardous substances in e-waste: e-waste containing harmful substances, such as heavy metals (mercury, lead, cadmium, hexavalent chromium), brominated flame retardants (polybrominated biphenyls and polybrominated diphenyl ether(PBDEs)), refrigerants (CFC, HCFC), fluoride foam, etc./处理不当，产品中有有害物质释放
- Generation on additional or new pollutants during the process of e-waste treatment/处理过程可能添加或产生新污染物

(三) Resource/资源性



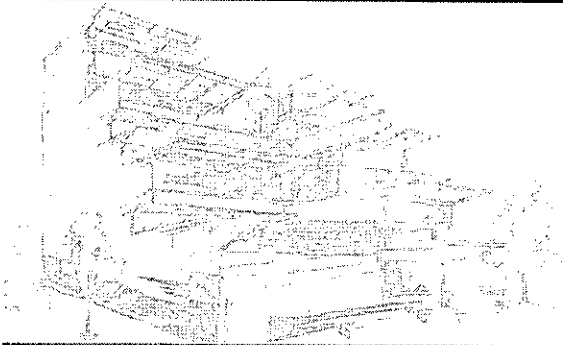
Therein, PCB/印刷电路板:

Metal/金属 (≤50%)

AU/铜	20%
Fe/铁	8%
Ni/镍	2%
Sn/锡	4%
Pb/铅	2%
Al/铝	2%
Zn/锌	1%
Sd/锑	0.40%
Au/金	500g/t
Ag/银	1000g/t
Pd/钯	50g/t

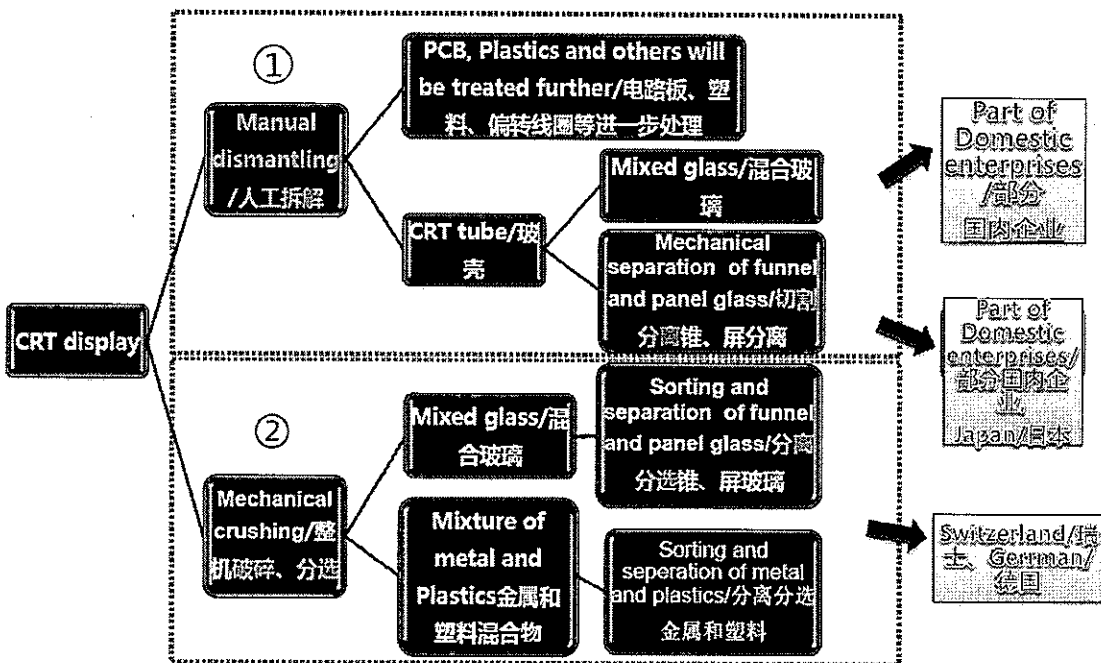
The Main Components and Ratio of E-waste

Status of Electronics Recycling Technology in China /中国电子废物资源化利用技术现状



if/ifa

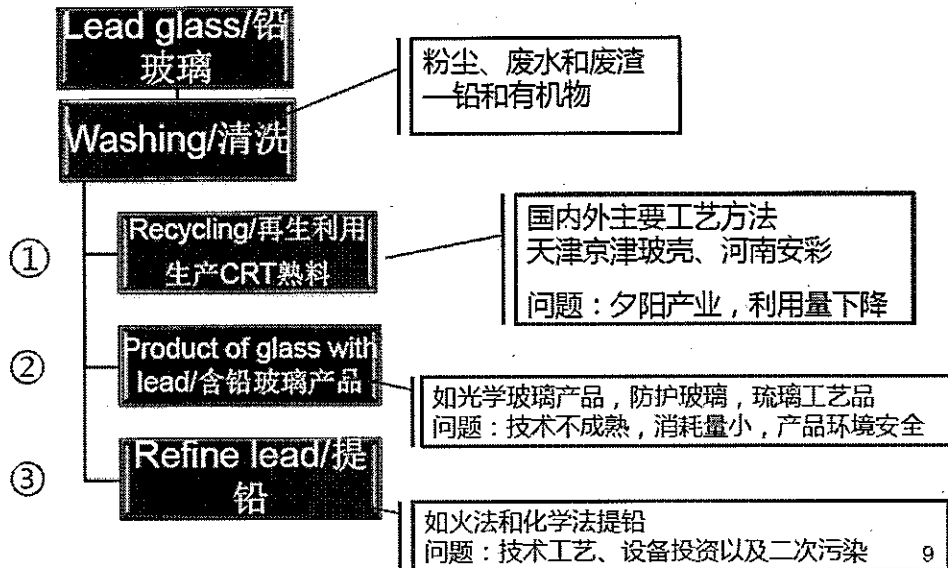
CRT Display Recycling Technology



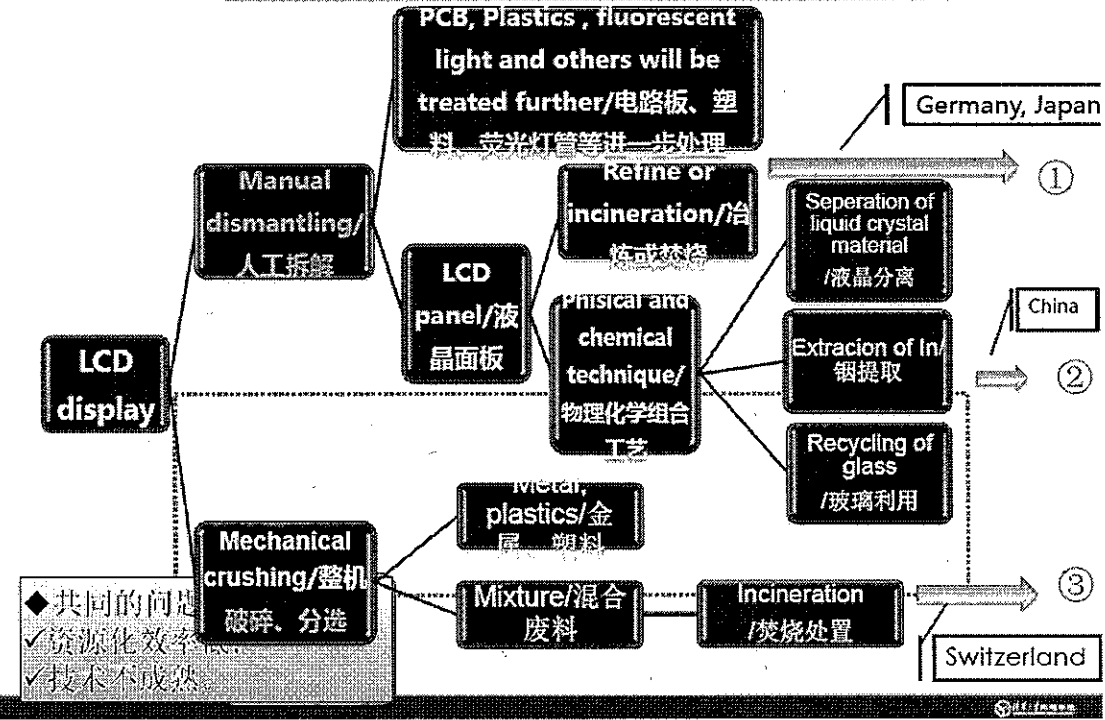
if/ifa

CRT Display Recycling Technology

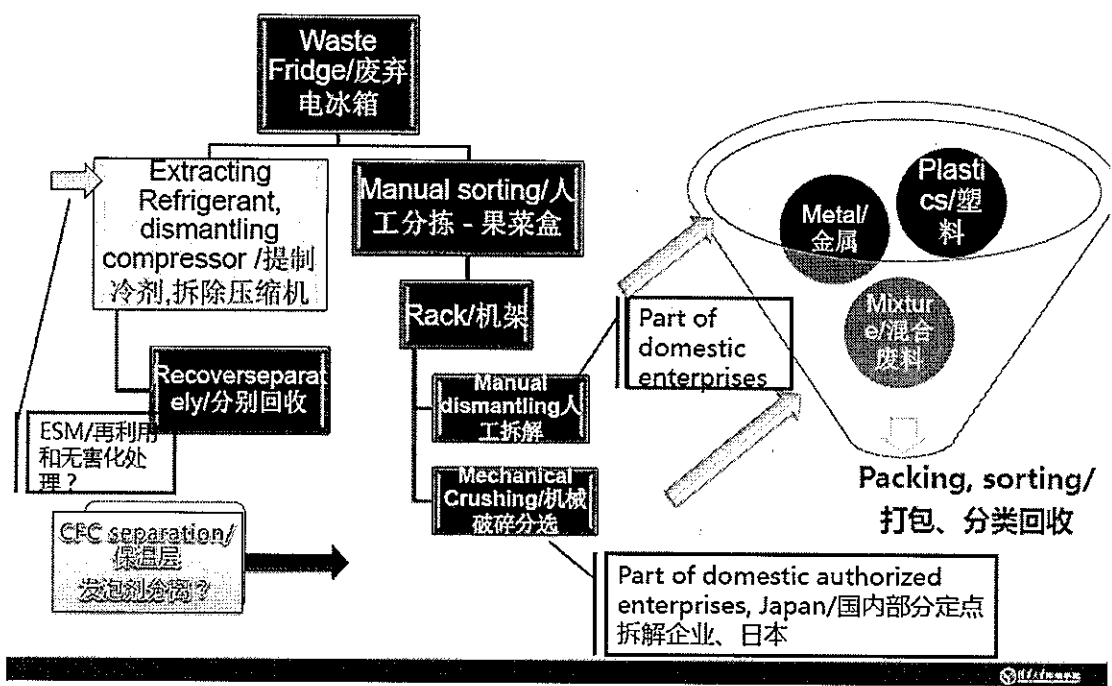
◆ Funnel containing lead/ 含铅锥玻璃的资源化处理



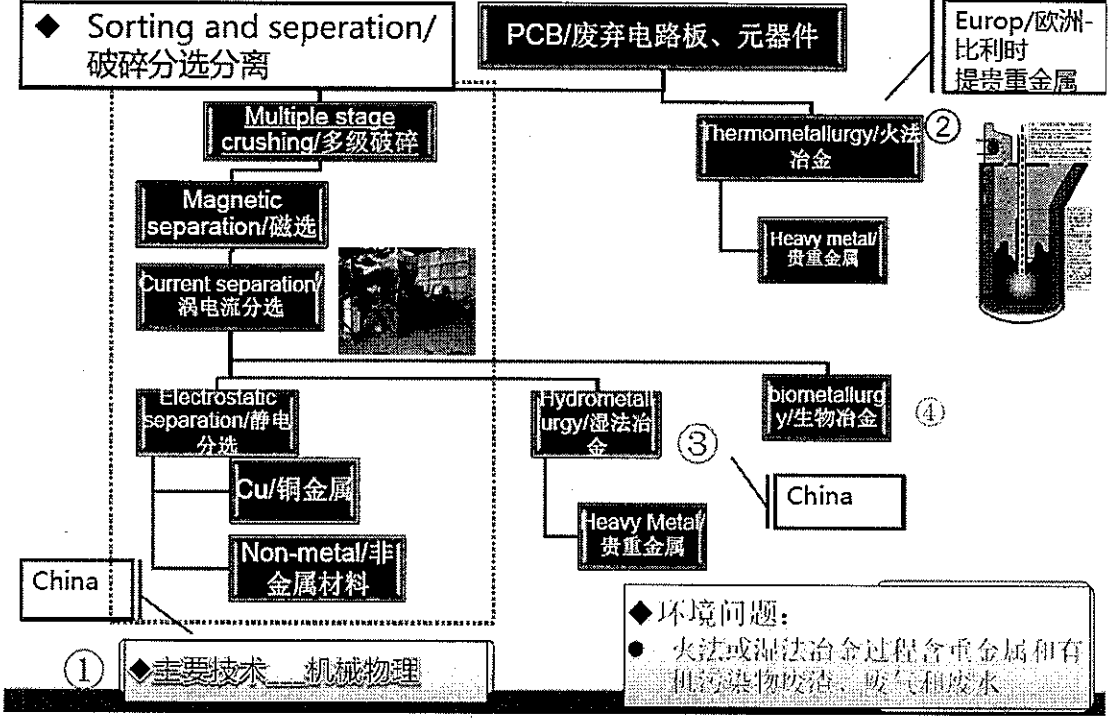
LCD Display Recycling Technology



Fridge Recycling Technology



PCB Recycling Technology



Trendence and focus of technology development

技术研发难点和发展趋势



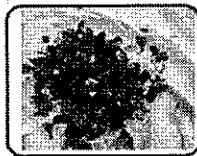
integrated equipment for crushing and sorting with high efficiency/高效破碎分选成套化装备

- 大型破碎机和细粒径粉碎机
- 破碎分选工艺集成和成套化设备研发



Technology and Equipment to separat and purify Precious metals/稀贵金属分离提纯清洁、高效技术和设备

- 预处理和分离技术
- 提纯工艺和过程



Non-metal recycling with high value/非金属材料高值化利用

- CRT玻璃高值利用和协同提铅技术
- 混合非金属材料再生利用新工艺和方法；阻燃塑料再生利用
- 再生利用产品检测和风险评估方法和技术

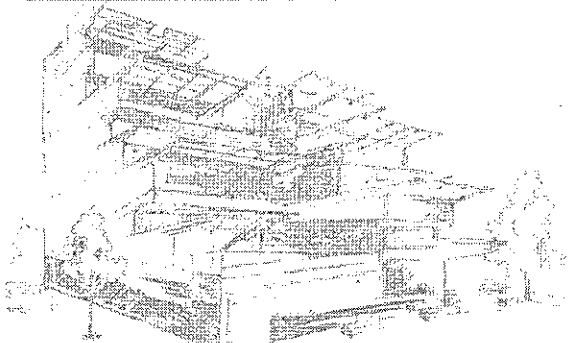
Development of technology and equipment is the main method to promote recycling efficiency and resolve the environmental issue/技术

与设备的研究是提高资源化利用效率和解决环境问题的主要手段



Development of Electronics Industry in China

/中国资源化产业发展现状及趋势



Regulations for Electronics recycling facilities

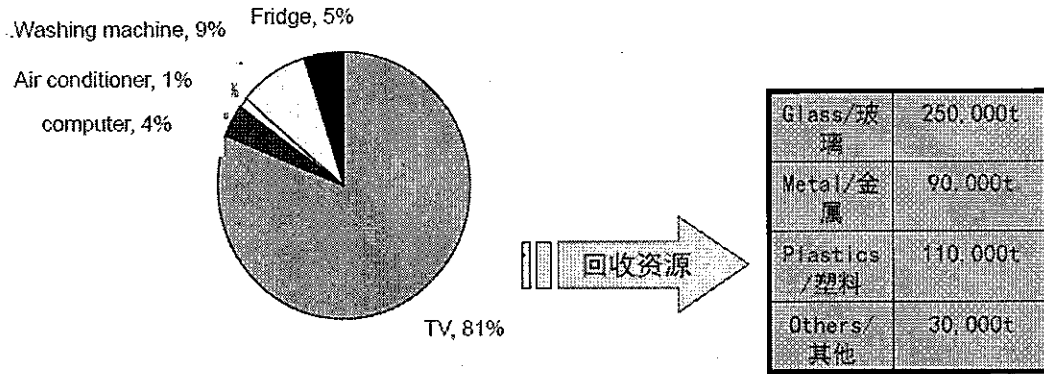


Increasing treatment facilities in China

- ◆ The registration catalogue (including temporary registration catalogue) of e-waste dismantling, recycling businesses (including individual businesses) : there are about 30 facilities in 2008; until now, above 120 facilities in China/ 电子废物利用处置单位名录 (包括临时名录): 2008年近30家到目前的约120家

The status of Electronics collection and treatment

Based on Policy for the Old for New for the Houshold Appliances, in China, according to the Ministry of Commerce from June 1, 2009 to June 28, 2011, 57.60 million units of waste household appliances were collected. /商务部数据显示, 截至2011年6月28日, 全国家电以旧换新共回收旧家电5760.9万台。



April, 2011

17

Case: Electronics recycling facilities in China

Shenzhen Gem hi-tech Co./深圳格林美高新技术股份有限公司

Fridge/冰箱处理系统

TV set, computer/电视、电脑回收处理设备

年处理5万余吨废旧电池与电子废弃物
 >年节约原矿石600余万吨
 >年减排二氧化碳8466吨
 >年节能73000吨标煤

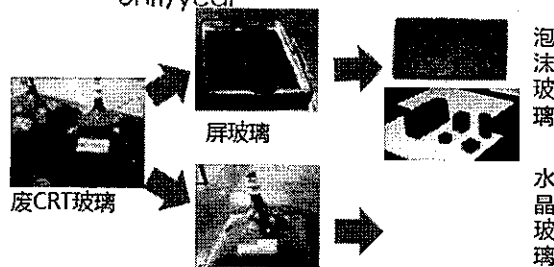
Case: Electronics recycling facilities in China



TES-AMM(Suzhou) Co./苏州伟翔 电子废弃物处理有限公司

- Capacity/设施拆解处理能力: 5,220,000 unit/year
- CRT capacity/锥屏玻璃分离技术和设备 130,000 unit/year

- 高附加值CRT玻璃
资源化再利用技术



if/inn

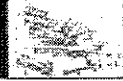
Case: Electronics recycling facilities in China

- Fuji Xerox Eco-Manufacturing (Suzhou) Co., Ltd./富士施乐爱科制造(苏州)有限公司

- Date of establishment: December 2006
- Businesses: Disassembling used office equipments such as copy machines and cartridges and separating them by materials as well as manufacturing cartridges, etc.
- Capacity for dismantling/recycling: 15,000 machines/year, 500,000 cartridges/year
- the recycling rate targets at 96 percent for products and 99.9 percent for cartridges.

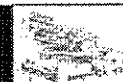
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Issue of Electronics recycling in China



- Lack of dismantling capacity/处理企业大幅增长，很多企业初步建成，但资源化处理能力参差不齐：
 - Most of facilities used the manual dismantling and simple machinery technology /大部分企业采用人工拆解和简易机械物理技术
 - Few of facilities could recycle Electronics in depth/多数企业仅具有拆解能力,极少数企业具有深度资源化处理能力
- Some plastic disposal problem, such as polyurethane foam/部分塑料处置问题，如聚氨酯泡沫塑料
- CRT glass treatment problems, such as insufficient demand for CRT recycling/CRT玻璃的处理问题，如CRT再生利用需求不足

Facility requirements/设施要求



- Treatment facilities, such as treatment equipment, pollution control equipment, and data information management system; /处理设施，如处理设备、污染防治设备等，以及数据信息管理系统；
- Sorting, packaging and other equipment, such as electric meter, metering equipment, central control equipment, etc./分拣、包装以及其他设备，如专用电表、计量设备、中央监控设备等；
- Others/其他

Recycling Technology Demand/资源化技术需求

- ◆ Design and specifications of standardized e-waste disassembly line / 电子废物标准化拆解线的设计和规范
- ◆ Dismantling technology of refrigerator and air conditioner compressor / 冰箱和空调压缩机的拆解技术
- ◆ Separation and recycling technology of plastic polyurethane foam of refrigerator / 冰箱聚氨酯发泡塑料分离和回收技术
- ◆ Cut and separation technology, glass recycling, lead extraction and separation technology of CRT/CRT切割分离技术、玻璃利用、铅提取和分离技术
- ◆ Components dismantling and recycling technology of waste circuit board / 废电路板的元件拆解和资源化技术
- ◆ Recycling technology of non-metallic mixtures / mixed plastics / 非金属混合物/混合塑料的资源化技术
- ◆ Recycling technology of LCD and lithium batteries / LCD和锂电池资源化回收处理技术
- ◆ Recycling technology of printer, duplicator and others / 复印机、打印机和硒鼓的资源化处理技术



Thanks!

Mr. Jinhui Li, Ph. D/李金惠博士

Executive secretary/执行秘书

Basel Convention Coordinating Centre for Asia and the Pacific/巴塞尔公约亚太地区协调中心
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Website of BCRC China: <http://www.bcrc.cn>

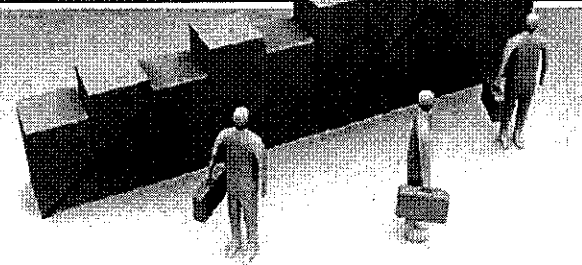
附件五 大陸廢機動車輛回收的良機與挑戰



The Opportunity and Challenge of ELV Recycling in China



中国汽车技术研究中心
China Automotive Technology & Research Center



Content



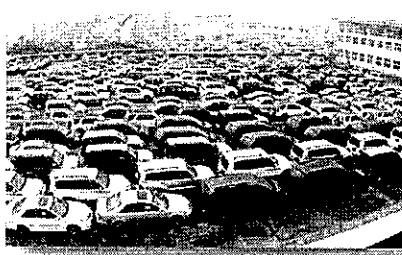
1. Background and Regulations
2. Industry Status
3. Opportunity and Challenge
4. Prospect



1. Background and Regulations

■ Auto industry of China develops rapidly as well as the ELV recycling demand.

- China's production and sales volumes of automobiles in 2010 both exceeded 18 million units , constituting an all-time record for any country worldwide ;
- 2010: vehicles >85 million units , ELVs>3.5 million units ;
- Considering the life of vehicles, there will be a peak demand of ELV recycling in China in the coming years.



scrap



1. Background and Regulations

■ More and more problems about environment, resources, human health and road safety caused by ELVs appear. Efficient recycling of ELVs is of great necessity.

- **Environment pollution**
 - Through air, water and soil etc.
- **Resources consumption**
 - Plenty of recyclable resources in ELVs
- **Human health**
 - A lot of harmful substances, including Cr, Hg, Cd, and Cr-VI which can cause cancer as well as Se and As which are also extremely harmful to human health.
- **Road safety**
 - The reliability of auto parts which are supposed to scrap drops greatly, leading road accidents.



1. Background and Regulations

■ Domestic Laws and regulations

Level	Laws/Regulations/Standards	Implementation date
Basic Laws	<i>Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste</i>	2005.4.1
	<i>Circular Economy Promotion Law of the People's Republic of China</i>	2009.1.1
Administrative Measures	<i>Regulation of End-of Life Vehicle Recycling</i>	2001.6.16
	<i>Implementing Rule of Certification for Energy Saving and Environment Friendly Auto Products-Light-duty Auto Products</i>	2006.1.1
	<i>Technical Policy for the Recovery of Automobile Products</i>	2006.2.6
	<i>Implementing Rule of Compulsory Certification for Motor Vehicles (Auto Products)</i>	2008.1.1
Standards	<i>Road Vehicles-Recyclability and Recoverability-Calculation Method</i>	2004.11.1
	<i>Environmental Protection Technical Specifications for Disassembly of End-of-Life Vehicles</i>	2007.4.9
	<i>Material Identification & Marking of Automotive Plastic, Rubber & Thermoplastic Elastomer Parts</i>	2008.7.1
	<i>Technical Specifications for End-of-Life vehicles Recycling and Dismantling Enterprise</i>	2009.1.1



1. Background and Regulations

■ Technical Policy for the Recovery of Automobile Products

➤ Launched by NDRC, MOST and SEPA jointly in 2006

- Strive to promote the recoverability rate of auto products produced or sold in China to reach the international advanced level around 2017.

Time Node	Recoverability Rate for Vehicles	Recyclability Rate for Material
2010	> 80%	> 75%
2012	> 90%	> 80%
2017	> 95%	> 85%

- Pd, Hg, Cd and Cr-VI can not be used in parts or materials of vehicles other than in cases listed in a periodically revised Annex under the conditions specified therein

NDRC: National Development and Reform Commission

MOST: Ministry of Science and Technology

SEPA: State Environmental Protection Administration

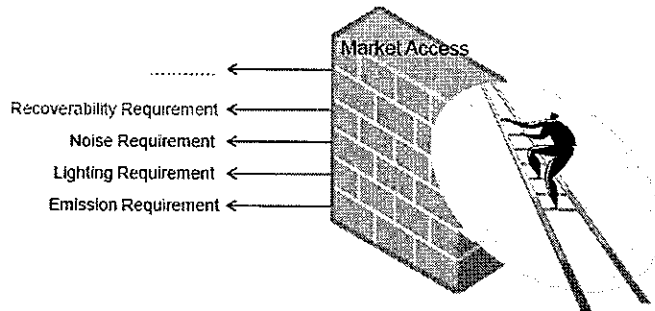


1. Background and Regulations

■ *Implementing Rule of Compulsory Certification for Motor Vehicles -Auto Products*

➤ Published by CNCA in 2008

- Motor vehicles and trailers shall perform the calculation of the recyclability and recoverability rates in accordance with the standard GB/T19515-2004 (Road vehicles-Recyclability and recoverability-Calculation method)



CNCA: Certification and Accreditation Administration of the People's Republic of China



1. Background and Regulations

■ *Regulation on Auto Prohibited Substances and Recycling Rate (Proposal)*

➤ Has been reported to NDRC and MIIT in 2008.

- More specific and much clearer requirements on recycling rate of auto products and limits of prohibited substances are raised, which will be incorporated into the management system of *Vehicle manufacturing Enterprise and Product Announcement*.

■ *Requirements for Prohibited Substances on Automobiles*

➤ Compulsory standard which has entered the final approval stage.

- Except for the cases listed
 - The mass content of Pd, Hg, Cd, Cr-VI, PBBs and PBDEs in a homogeneous material can not exceed 0.1%, while that of Cd can not exceed 0.01%.
 - The exemption list will be periodically amended. After the expiration, the exemption of reused and remanufactured products will continue to be valid.

MIIT: Ministry of Industry and Information Technology



1. Background and Regulations

- **Technical Requirement for Environmental Labeling Products light-duty vehicles**
 - EPD standard, published in 2005 and amended in 2009. The requirement on recyclability and prohibited substance was incorporated.
 - Clutch disc can not contain asbestos fiber;
 - Pd, Hg, Cd , Cr-VI can not be used except in lead alloy, storage battery, lead plating, cadmium plating, additive(stabilizer), mercury for lamp.
 - In the design process of a product, the recoverability of parts and materials shall be considered.
- **Technical Requirement for Environmental Labeling Products heavy-duty vehicles (Draft)**
 - EPD standard, has accepted comments from society in January, 2011.
 - The same requirements on recoverability rate as that of *Technical Policy for the Recovery of Automobile Products*
 - Material of asbestos fiber is forbidden in all auto parts.

MEP: Ministry of Environment Protection



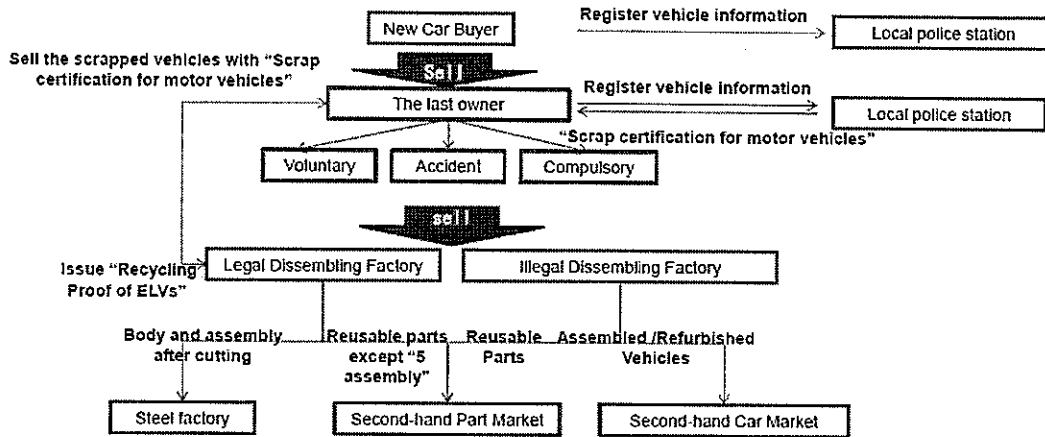
1. Background and Regulations

- **Regulation on dismantling and recycling of End-of-Life vehicles (Draft)**
 - Has accepted comments from society and will replace *Regulation of End-of Life Vehicle Recycling*
 - Vehicle assembly is allowed to enter into the process of remanufacturing under proper conditions.
 - Add the requirements on promoting comprehensive utilization of resources and development of circular economy.
 - Establish qualification system for ELV dismantling and recycling enterprises.
 - Define the responsibility of vehicle manufacturers and importers in the activities of ELVs dismantling.
 - Add and perfect the requirements to strengthen supervision and management.



2. Industry Status

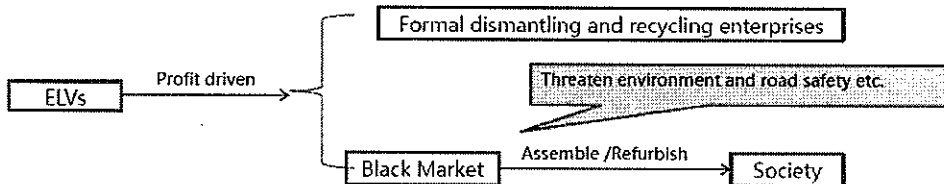
ELV Recycling System in China



2. Industry Status

Current problems of ELV recycling industry

- Formal dismantling and recycling enterprises can not receive enough ELVs while plenty of ELVs “disappear”
 - According to the data from MPS, there are 3.64 million ELVs which cancelled registration in 2010. But only 40% of those vehicles took the formal channel, while 60% of those “disappear”.
 - Formal dismantling and recycling enterprises face the problems of lack of ELVs and low profit.



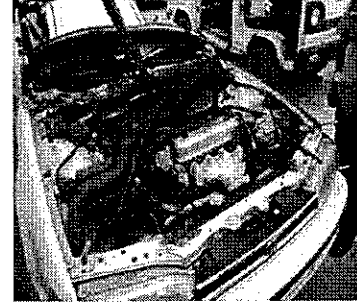
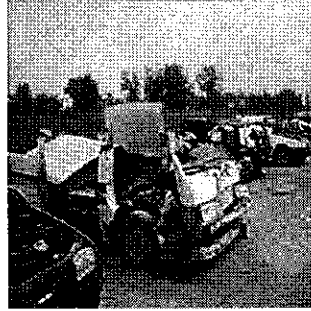
MPS: Ministry of Public Security



2. Industry Status

■ Current problems of ELV recycling industry

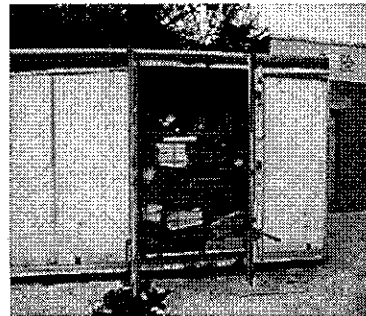
- Low dismantling level, out of date equipment.
- Difficult to get parts and material with high profit because of lack of elaborative dismantling.



2. Industry Status

■ Current problems of ELV recycling industry

- Unclear material marking leads to difficulty in specific classification for dismantling enterprises.
- Low resource utilization of nonmetal material
 - Steel and non-ferrous metal have relatively high utilization rate, while rubber, plastics and glass have relatively low utilization rate.





3. Opportunity and Challenge

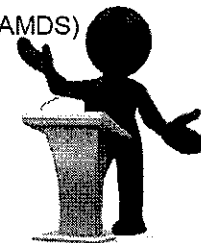
- **Opportunity and challenge coexist in ELV recycling industry in China. It is a good time to promote ELV recycling administration in China at present.**
 - **The guidance document of ELV recycling has been published while the supporting regulations and standards are being improved.**
 - **Policy support and financial support on ELV recycling**
 - Development of remanufacturing
 - Design a clear direction for remanufacturing industry in China
 - 14 demonstration trials for auto parts remanufacturing nationwide by NDRC
 - Dismantling and recycling enterprises upgrades
 - Demonstration trials for dismantling and recycling enterprises upgrades are being conducted by MC in 10 cities in China in 2011, with financial support up to 50% of the total investment.
 - Encourage vehicle owners to scrap vehicles in time
 - subsidy program for auto replacement
 - Subside program for heavy-duty vehicles and buses scrapped in advance.

MC: Ministry of Commerce



3. Opportunity and Challenge

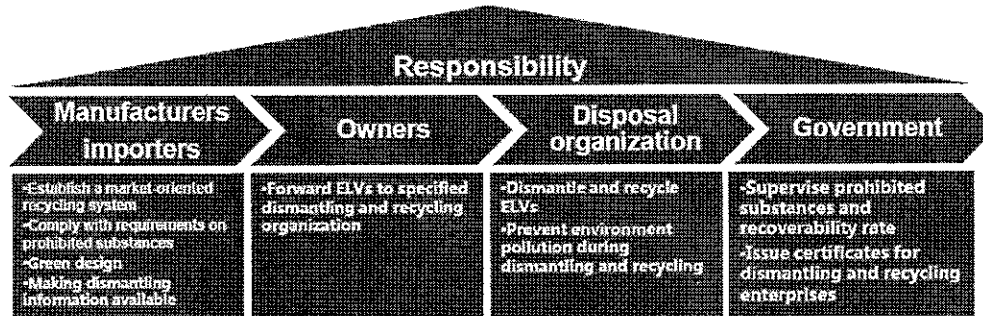
- **Opportunity and challenge coexist in ELV recycling industry in China. It is a good time to promote ELV recycling administration in China at present.**
 - **Plenty of initial research and implementation work have been done by enterprises.**
 - Study of ELV recycling laws at home and abroad
 - Study of dismantling process and specification
 - Study of ELV recycling system
 - Construction of China Automotive Material Data System(CAMDS)
 - Study of recycling technologies of automotive materials





4. Prospect

- Further perfect ELV recycling system, incorporate auto recoverability rate into Market access management system, and promote ELV recycling level of China indeed.
- Auto manufacturers take more responsibility. Establish a comprehensive ELV recycling system led by auto manufacturers.



4. Prospect

- Wade out some unqualified dismantling and recycling enterprises.
- ELV recycling will gradually turn to be market-oriented and form a complete industrial chain.
- Dismantling and recycling technologies will be promoted step by step.
- ELV recycling will reach international level.





THANK YOU !

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