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）

赴斯里蘭卡參加
「2014 更好空氣品質研討會」
Better Air Quality Conference

服務機關：行政院環境保護署

姓名職稱：空氣品質保護及噪音管制處謝炳輝副處長等**11**人

派赴國家：斯里蘭卡－可倫坡

（**Colombo**，**Sri Lanka**）

出國期間：**103**年**11**月**17**至**11**月**22**日

報告日期：**104**年**2**月**26**日

摘要

「2014 更好空氣品質研討會」係由亞洲空氣清潔中心（Clean Air Asia，CAA）、美國環保署（USEPA）與世界銀行（World Bank）等共同主辦，我國首次以贊助者角色參與該研討會。該研討會為兩年一次重大國際型會議，於 2014 年時邁入第八屆，該屆舉行地點為斯里蘭卡可倫坡紀念班達奈克國際會議大廈（Bandaranaike Memorial International Conference Hall，BMICH），會議時間係 2014 年 11 月 19 日至 11 月 21 日。大會議題涵蓋交通、能源、工業和氣候變化領域，側重於政府的政策與措施，參與者包含各國專家學者、政策制定者、決策者及執行者，在此建立聯繫網絡，相互學習並分享經驗，進行空氣品質管理學習及經驗交流，為亞洲空氣品質議題之盛會。

本次研討會係本署「國際環境夥伴計畫『小型贊助計畫』」之「城市清潔空氣夥伴計畫（Cities Clean Air Partnership）」相關活動。我國代表團由本署空保處謝副處長炳輝擔任團長，率領本署空保處及監資處同仁、臺北市、新北市、臺中市及臺南市等地方環保局同仁以及技術顧問機構人員，共計 14 人參與該研討會。

本次出國計畫主要參與活動涵蓋研討會開幕式、專題討論（城市清潔空氣夥伴計畫與永續港口）、我國城市管理經驗之成果發表（發電廠污染物質排放減量與城市清潔空氣解決方案）、海報展示、臺美環保署兩方代表會談、臺美與 CAA 三方代表會談與圓桌會議等。藉此，利用參與該研討會契機，分享我國自身成功的環境保護經驗及吸取空氣品質管理技術新知外，透過夥伴團體間彼此協商與討論，建立合作默契，奠定未來執行城市清潔空氣夥伴計畫之基礎。

目錄

壹、前言

北美事務協調委員會及美國在台協會於 1993 年 6 月 21 日簽訂「駐美國臺北經濟文化代表處與美國在臺協會環境保護技術合作協定，簡稱『中美環境保護技術合作協定』」，執行單位分別為我國行政院環境保護署及美國環保署，自此開啟臺美緊密的環保合作與交流。本署與美國環保署在中美環保技術合作協定之下，截至 2013 年底共簽訂 10 號執行辦法，第 10 號執行辦法合作規劃為 2013 年至 2015 年。

為進一步改善全球環境，加強國際合作，提升我國在全球及區域國際環保的領導地位，拓展夥伴計畫參與國家，本署在美國環保署長吉娜 麥卡馨(Gina McCarthy)女士率團訪臺之際及我國馬總統見證下，魏署長 國彥於 103 年 4 月 14 日宣布成立「國際環境夥伴計畫(International Environment Partnership，IEP)」，麥卡馨署長表示美國環保署將為該計畫之創始夥伴。我國透過國際環境夥伴計畫實施，與美國環保署共同推動各項國際環保合作，並與世界各國環保官員及專家進行交流，四個項下計劃分別為「臺灣全球環保參與計畫」、「臺美雙邊環保優先事項」、「部長環境獎助金」與「小型贊助計畫」，領域涵蓋土壤及地下水污染場址整治與管理、空氣品質保護、溫室氣體排放減量、清淨港口空氣品質、永續姐妹學校、永續低碳社區、電子電器廢棄物品回收管理、環境執法、環境教育、氣候變遷調適等。

此外，為強化國際環保夥伴計畫內容，本署 魏署長代表團於 103 年 8 月訪美行程中，安排與美國環保署第 9 分署長布魯門菲（Mr. Jared Blumenfeld）在美國舊金山舉辦記者會，共同啟動「城市清潔空氣夥伴計畫（Cities Clean Air Partnership，CCAP）」。該計畫執行目標係建立亞太城市空氣品質保護技術之交流平台，強化區域空氣品質管理與減少空氣污染源。亞洲空氣清潔中心（Clean Air Asia，CAA）係跨國性之非營利組織，總部設於馬尼拉，另在北京與德里設有辦公室，該組織以提升亞洲國家空氣品質、減少溫室氣體排放與提升人類福祉為目標，自 2007 年起，為聯合國認可之組織夥伴。

我國代表團自 103 年 11 月 17 日至 22 日赴斯里蘭卡可倫坡參與「2014 更好空氣品質研討會(2014 Better Air Quality Conference，BAQ)」，由亞洲空氣清潔中心（Clean Air Asia，CAA）、美國環保署(USEPA)與世界銀行(World Bank)等共同主辦，為兩年一度之國際空氣品質議題盛會，議題涵蓋交通、能源、工業和氣候變化等領域，並側重於政府的政策與措施。該研討會係為前述「國際環境夥伴計畫『小型贊助計畫』」之「城市清潔空氣夥伴計畫（Cities Clean Air Partnership）」相關活動，藉由活動設計，夥伴團體間彼此協商與討論，共同擬定 104 年合作夥伴目標，建立合作默契，將有助於推動國際相關業務之發展，奠定未來計畫執行之基礎。此外，我國代表團邀集本署同仁、地方環保機關及技術顧問機構人員組團參加，透過會議討論交流，吸取空氣品質管理技術新知及尋求國際合作契機，以達成國際環境夥伴計畫成立之目的。

圖 1.1、本署　魏署長 103 年 8 月 8 日於美國金門大橋國家公園與美國環保署第 9 分署長 B 氏（Jared Blumenfeld）共同啟動「城市清淨空氣夥伴專案(Cities Clean Air Partnership， CCAP)」記者會。

圖 1.2、本署　魏署長 103 年 8 月 8 日於美國金門大橋國家公園與美國環保署第 9 分署長 B 氏（Jared Blumenfeld）共同啟動「城市清淨空氣夥伴專案(Cities Clean Air Partnership, CCAP)」記者會。

圖 1.3、103 年 4 月 14 日在 馬總統見證及美國環保署麥卡馨署長下，魏署長宣讀「國際環境夥伴計畫(IEP)」成立聲明。

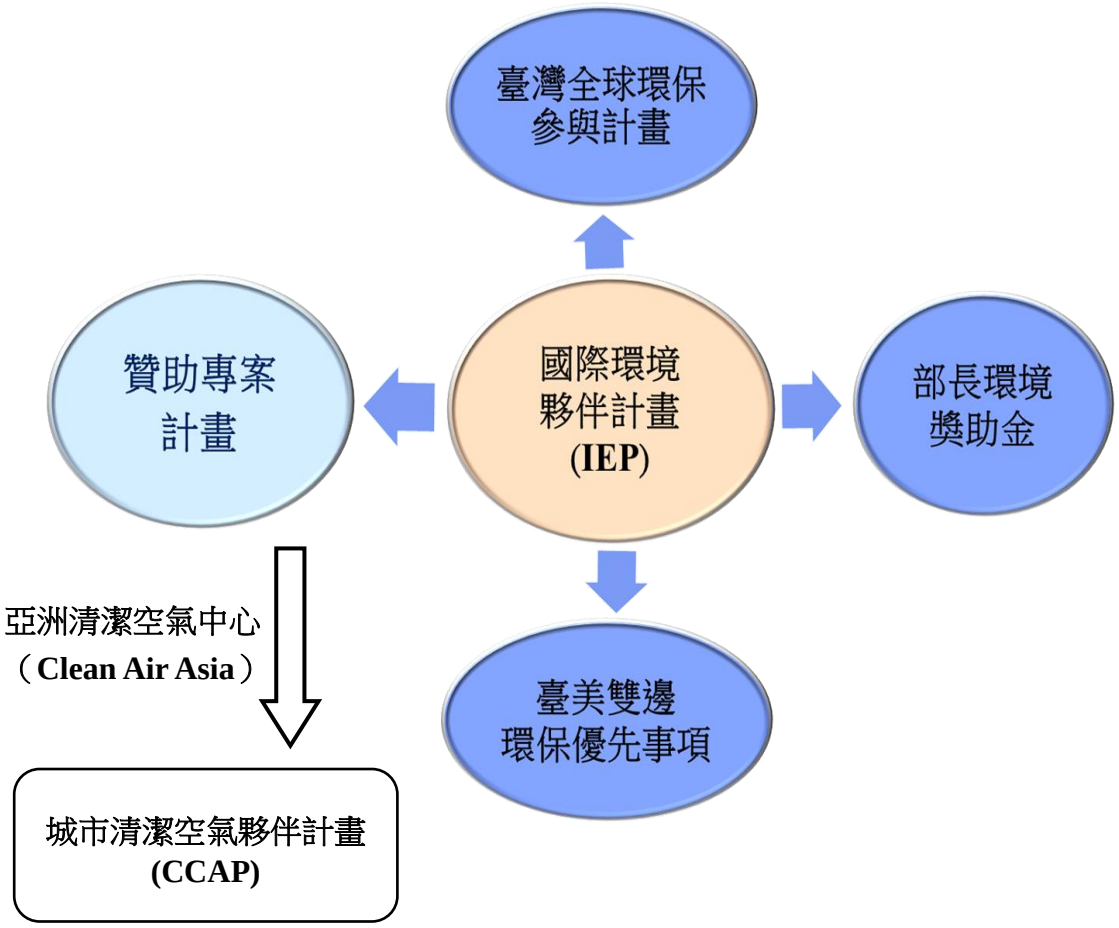

圖 1.4、國際環境夥伴計畫(IEP)及城市清潔空氣夥伴計畫(CCAP)關係圖。

註:「小型贊助計畫」自 104 年起更名為「贊助專案計畫」。

表 1.1、歷年更好空氣品質研討會舉辦地點及大會標誌

	舉辦年份	舉辦國家	大會標誌
第一屆	2002	香港	
第二屆	2003	菲律賓	
第三屆	2004	印度	
第四屆	2006	印尼	
第五屆	2008	泰國	
第六屆	2010	新加坡	
第七屆	2012	香港	
第八屆	2014	斯里蘭卡	

貳、出國人員及行程

本次赴斯里蘭卡可倫坡參與「2014 更好空氣品質研討會(Better Air Quality Conference，BAQ)」，我國代表團由本署空保處謝副處長炳輝擔任團長，率領本署空保處及監資處同仁、臺北市、新北市、臺中市及臺南市等地方環保局同仁，共計 11 人，團員名單與任務分工如表 2.1 所示。

表 2.1、我國代表團成員任務分工

單位	職稱	姓名	任務分工
環保署 空氣品質保護及噪音管制處	副處長	謝炳輝	團長/對外交流
	簡任技正	莊訓城	資訊蒐集/對外交流
	視察	陳惠琦	資訊蒐集/對外交流
	高級環境技術師	戴忠良	資訊蒐集/對外交流
	約聘人員	楊佳樺	負責與會事務/資訊蒐集/會議紀錄
環保署 環境監測及資訊處	環境監測技術師	陳香宇	AirNow 議題分享/資訊蒐集/對外交流
臺北市政府環境保護局	股長	高薇喻	專題報告/資訊蒐集/對外交流
新北市政府環境保護局	股長	邱信翰	專題報告/資訊蒐集/對外交流
桃園市政府環境保護局	專員	吳瑞祥	專題報告/資訊蒐集/對外交流
臺中市政府環境保護局	股長	柯宏黛	海報展示/資訊蒐集/對外交流
臺南市政府環境保護局	專員	林界宏	海報展示/資訊蒐集/對外交流

參、出國行程

本次赴斯里蘭卡時間為 103 年 11 月 17 至 22 日，共計 6 日。原訂於 11 月 18 日參與下午兩場會前活動(pre-event)及歡迎會(reception)，惟出發時航班受機械維修、交通管制、航班調度等因素影響，導致班機延誤 1 日而取消。11 月 19 日至 11 月 21 日配合參與大會議程，主要參與活動涵蓋研討會開幕式、專題討論（城市清潔空氣夥伴計畫與永續港口）、我國城市管理經驗之成果發表(發電廠污染物質排放減量與城市清潔空氣解決方案)、海報展示、圓桌會議。另於 11 月 20 日及 21 日安排兩場晤談，分別與美國環保署代表、亞洲空氣清潔中心董事會成員共同討論 104 年城市清潔空氣夥伴計畫之合作目標。

表 3.1、「2014 更好空氣品質研討會」行程表

日期	行程說明
11 月 17 日(一)	■啟程(臺北－香港)
11 月 18 日(二)	■因不可抗力之因素，滯留香港一天 ■啟程(香港－斯里蘭卡可倫坡)
11 月 19 日(三)	■新北市環保局代表上台報告。 ■參與城市清潔空氣夥伴計畫專題 ■根據大會議程，參與會議及討論。
11 月 20 日(四)	■臺北市環保局、桃園市政府環保局代表上台報告 ■永續港口議題 ■根據大會議程，參與會議及討論 ■與美國環保署代表會談
11 月 21 日(五)	■圓桌會議 ■與美國環保署代表、亞洲空氣清潔中心會談
11 月 22 日(六)	■返程(斯里蘭卡可倫坡－臺北)

肆、與會目的

一、為維護空氣品質，保障國民健康，我國空氣品質改善工作已推動多年，逐步建立空氣品質監測與排放清冊數據，修訂空氣品質標準，制定完善計畫目標，訂定相關管制規範。透過行政程序及經濟誘因，各縣市依自身污染特性，發展合適管理方式。歷年來，我國空氣品質已有顯著改善成果，享譽國際。「2014 更好空氣品質研討會(Better Air Quality Conference)」係為參與國際活動之契機，透過上台報告及海報展覽方式，分享我國空氣領域之環保經驗，提升我國環保機關於國際間環境保護知名度。

二、「2014 更好空氣品質研討會」議題涵蓋交通、能源、工業和氣候變化領域，側重於政府的政策與措施，參與者包含各國專家學者、政策制定者、決策者及執行者，在此建立聯繫網絡，相互學習並分享經驗，進行空氣品質管理學習及經驗交流。爰此，透過吸收各國空氣品質管理的經驗，作為我國推動空氣品質改善工作之參考。

三、該次研討會係由本署空保處謝副處長炳輝擔任團長，邀集本署及地方環保局同仁以及技術顧問機構人員，共計 14 人組成研討會代表團，每個成員皆有活動任務及參與目標，利用該研討會契機，培養國際型會議之經驗，訓練我國國際行動之人才，係為與會之最佳價值所在。

四、本次研討會係「國際環境夥伴計畫『小型贊助計畫』」之「城市清潔空氣夥伴計畫（Cities Clean Air Partnership）」相關活動，透過參與該研討會之契機，與美國環保署及亞洲空氣清潔中心（Clean Air Asia，CAA）夥伴團體間彼此協商與討論，建立合作默契，有助於我國推動國際相關業務之發展，奠定未來執行城市清潔空氣夥伴計畫之基礎。

伍、會議議程

一、2014 更好的空氣品質研討會議程介紹

2014 更好的空氣品質研討會（Better Air Quality Conference），係由 CAA、美國環保署(USEPA)與世界銀行(World Bank)等共同主辦，我國首次以贊助者角色參與該研討會。大會時間為 103 年 11 月 19 日至 21 日，於斯里蘭卡，可倫坡，紀念班達奈克國際會議大廈(Bandaranaike Memorial International Conference Hall，BMICH)舉辦，本屆主題為下一世代乾淨空氣及永續運輸解決方案。大會議程如表 5.1，主題涵蓋城市清潔空氣夥伴計畫(Cities Clean Air Partnership，CCAP)研討會議、空氣品質管理與溫室氣體減量(Air Quality Management and Climate Change Mitigation)、空氣品質與影響(Air Quality and Impacts)、交通運輸排放管理及低排放都會發展(Transport Emissions Management and Low Emissions Urban Development)、電廠、工業與其他污染源管理(Management of Emissions from Power，Industry and Other Sources)等五大議題。

圖 5.1.1、紀念班達奈克國際會議大廈

圖 5.1.2、2014 Better Air Quality 研討會議程表

二、我國代表團參與活動

本次出國計畫主要參與活動涵蓋研討會開幕式、專題討論（城市清潔空氣夥伴計畫與永續港口）、我國城市管理經驗之成果發表(發電廠污染物質排放減量與城市清潔空氣解決方案)、海報展示、圓桌會議等。活動說明如下:

(一) 參加更好空氣品質研討會之開幕式

1.活動時間:103 年 11 月 19 日，9:00-10:30

2.活動地點: 紀念班達奈克國際會議大廈(BMICH)主會議廳

3.活動流程:

(1)開幕致詞

(2)歡迎致詞

(3)主題發言

(4)研討會啟動儀式

(5)與會貴賓合照

(二) 參加「城市清潔空氣夥伴計畫專題討論(Cities Clean Air Partnership Session)」

1.活動時間:103 年 11 月 19 日，13:30-15:00

2.活動地點:紀念班達奈克國際會議大廈(BMICH)，會議室 B

3.活動流程:

(1) CAA 與美方上台致詞

(2)美方將邀請本處謝副處長炳輝上台，感謝本署為該計畫最大支持者。

(3) CCAP 城市認證說明與專家諮詢

(4) 代表城市們上台宣誓與合照

(三)城市管理成果發表

我國各城市因地制宜發展不同管理方式。新北市、臺北市、桃園市以自身成功經驗進行發表，利用該次機會提高國際能見度。活動時間、地點及場次如表 5.2.1。

表 5.2.1 城市管理成果發表活動時間、地點與場次

活動場次	時間	地點	報告主題	報告者
Reducing Emissions from Power Plants	11 月 19 日 17:15-18:45 (第 4 場)	BMICH 會議室 C	Control process for stationary source permits in New Taipei	新北市環保局 邱信翰 股長
Cities Solution for Clean Air (part 2)	11 月 20 日 17:15-18:30 (第 1 及 2 場)	BMICH 會議室 B	A study on the effectiveness for the application of thermal imaging infrared camera in air pollution control	桃園市環保局 吳瑞祥 專員
			Clean Air Action：Master plan for mobile vehicle management and green transportation in Taipei	臺北市環保局 高薇喻 股長

(四)參與海報展覽

1.參與縣市：臺中市環保局、臺南市環保局

2.展覽地點: 紀念班達奈克國際會議大廈(BMICH)內部走廊

3.場佈時間：103 年 11 月 18 日，16：00-19：00

4.海報移除：103 年 11 月 21 日，15：30-17：00

5.活動方式：現場解說海報內容

(五)永續港口專題

1.活動時間：103 年 11 月 20 日，17:15-18:30

2.活動主題：三方綠色、永續城市、港口及海運(Triple Green：Sustainable Cities, Port and Marine transport)專題。

(六)旁聽圓桌會議(BAQ Country Roundtable Discussion)

1.活動時間：103 年 11 月 21 日，09:00-12:30

2.活動方式： 以國家別分組，進行討論，包含孟加拉、中國、印度、印尼、馬來西亞、尼泊爾、巴基斯坦、菲律賓、泰國(含寮國、柬埔寨、緬甸)、斯里蘭卡及越南，共計 11 組。透過分組討論方式，探討各國政府針對「空氣污染物」及「溫室氣體減量」等議題所採取的措施與管制辦法。

三、與美國環保署及 CAA 之會談

分別於 11 月 20、21 日參與兩場會談，討論 104 年推動 CCAP 計畫工作內容。

(一) 11 月 20 日臺美雙方會談

1.活動時間：09：00-10:00

2.活動地點：紀念班達奈克國際會議大廈(BMICH)

3.與會人員：

表 5.3.1、臺美雙方會談與會人員

組織	姓名	單位/職稱
環保署代表	謝炳輝	空保處/副處長
	莊訓城	空保處/簡任技正
	楊佳樺	空保處/約聘人員
	陳香宇	監資處/助理環境技術師
美國環保署代表	Mark Kasman	Senior Advisor
	Justin Harris	Program Manager
	Phil Dickerson	Director of AirNow International

(二)11 月 21 日臺、美、CAA 三方會談

1.時間：上午 09：00 至：10:30

2.地點：Taj Samudra Hotel

3.與會人員：

表 5.3.2、臺、美、CAA 三方會談與會人員

組織	姓名	單位/職稱
本署代表	謝炳輝	空保處/副處長
	莊訓城	空保處/簡任技正
	戴忠良	空保處/高級環境技術師
	楊佳樺	空保處約聘人員
美國環保署代表	Mark Kasman	Senior Advisor
	Justin Harris	Program Manager
亞洲清潔中心代表 (Clean Air Asia)	Robert O' Keefe	Chair，Board of Trustees
	Mary Jane	Chair， Partnership Council
	Bjarne Pedersen	Executive Director
	Glynda E. Bathan-Baterina	Deputy Executive Director

陸、會議成果

本次出國計畫參與活動涵蓋研討會開幕式、專題討論（城市清潔空氣夥伴計畫與永續港口）、我國城市管理經驗之成果發表(發電廠污染物質排放減量與城市清潔空氣解決方案)、海報展示、臺美環保署兩方代表會談、臺美與 CAA 三方代表會談與圓桌會議等，相關參與重點與成果茲說明如下:

一、研討會開幕式

本署受邀參與研討會開幕式之觀禮，由 CAA 董事會主席 Mr. Robert O'Keefe、聯合國經濟與社會事務部門執行長 Mr. Nikhil Seth、斯里蘭卡交通部部長 Hon., Mr. Kumara Welgama、斯里蘭卡環境與再生能源部部長 Hon., Mr. Susil Premajayantha、日本環境部部長秘書長 Mr. Teruyoshi Hayamizu 等人依序開幕致詞，最後本署空保處謝副處長炳輝代表上台與主辦單位、與會之各國貴賓合影，為「2014 更好空氣品質研討會」揭幕。

圖 6.1.1、<開幕典禮>我國代表團於會場報到處合影

圖 6.1.2、「2014 更好空氣品質研討會（Better Air Quality conference）」開幕典禮合影，謝團長炳輝應邀上台一同與活動贊助單位及相關政府組織為該研討會揭幕。

圖 6.1.3、<開幕典禮概況>全體起立，一同聆聽斯里蘭卡國歌(左上)。來賓致詞(右上)。斯里蘭卡總統與環境與能源局部長為當地學生行頒獎典禮(左下、右下)。

圖 6.1.4、<開幕典禮概況>與會者與來賓參與情形。

二、「城市清潔空氣夥伴專題（CCAP Session）」

有關城市清潔空氣夥伴專題，目的係期望亞洲城市能夠成為空氣品質改善之示範城市。透過城市間締結姊妹市之方式，彼此交流觀摩與學習，達到亞洲城市空氣品質改善之目的。該活動由 CAA 執行長 Mr. Bjarne Pedersen、副執行長 Ms. Glynda E. Bathan-Baterina、美方代表 Mr. Mark Kasman 及 Mr. Justin J. Harris 為主談人，目的在於向各界說明有關 CCAP 計畫之未來城市認證之方向以及宣佈示範城市(pilot cities)。另邀請其他組織機構，如氣候及清潔空氣聯盟(climate and clean air coalition)、斯德哥爾摩環境機構(Stockholm Environment Institute)、城市網(Citynet)、挪威空氣研究機構(Norwegian Institute for Air Research)等進行說明，作為後續推動 CCAP 認證制度建置之參考。此外，美方與 CAA 感謝本署為 CCAP 計畫最大支持者，且邀請我國代表團團長謝副處長炳輝上台致詞，桃園市及臺中市代表亦應邀以潛在成為示範城市之身分參與該活動。

圖 6.2.1、<城市清潔空氣夥伴活動>謝團長炳輝受邀上台致詞(左下)。

圖 6.2.2、<城市清潔空氣夥伴活動>潛在參與夥伴城市代表（桃園市、臺中市、Baguio、Pasig、 Colombo、 Kathmandu 與 Haiphong）與相關單位（臺灣環保署、美國環保署、Clean Air Asia、CCAC、ICLEI、CITYNET、UCLG ASPAC、NILU 及 SEI）合影。

三、我國城市空氣品質維護成效發表與經驗分享

本次新北市、桃園市及臺北市三個縣市環保局受大會邀請分別於發電廠污染物質排放減量(Reducing Emissions from Power Plants)以及城市清潔空氣解決方案(Cities Solution for Clean Air)兩個活動場次上台發表與分享成功經驗。

圖 6.3.1、新北市環保局邱股長信翰於「Reducing Emissions form Power Plants」主題發表該市相關經驗。

(一) 新北市空氣品質維護成效發表與經驗分享

新北市環保局由邱股長信翰代表，以「新北市固定污染源管制歷程」(Control process for stationary sources permits in New Taipei city)為題進行發表。發表內容包括：新北市環境背景資料、與亞洲國家主要城市硫氧化物、氮氧化物、臭氧及粒狀物濃度比較、我國與歐美先進及鄰近國家許可制度比較、新北市與亞洲相關國家機構空氣污染管制交流經驗分享、我國固定污染源許可管制歷程、工廠全面普查作法及成果、新北市主要污染物來源行業、強化污染防制設備查核及效能驗證、電力業(SO_x及 NO_x)加嚴標準作法及污染減量、屢遭陳情場所三自管理(自動監測、自我檢查、自動記錄)作法、重大污染源聯合稽查及不法利得追繳成效、北

部空品區許可審議原則訂定、揮發性有機物減量輔導及執行成效以及分享困難挑戰及解決策略。另與會代表詢問新北市生煤管制及能源政策問題，已說明要求使用者提送來源端檢測報告及能源調度進行說明。

(二) 臺北市空氣品質維護成效發表與經驗分享

臺北市由環保局高薇喻股長代表參與本次由 Clean Air Asia(CAA)所舉辦的「2014 更好空氣品質研討會(Better Air Quality，BAQ) 」，並受邀在該研討會第二天(103 年 11 月 20 日)下午的「城市清潔空氣的解決之道(Cities'Solutions for Clean Air)」議程中，以「清淨空氣行動-臺北市的移動污染源管制及率運輸推動計畫（Clean Air Action-Master Plan for Mobile Vehicle Management and Green Transportation in Taipei）」為題，介紹臺北市在移動污染源管制方式以及其空氣品質改善的成果。內容重點概述如下：

1.環境背景說明:臺北市是以住商、交通部門為排放量主體的城市，其中運輸部門占約 33%的溫室氣體排放量；且因臺北市已無大型工廠，該市列管的固定污染源僅有蒸汽鍋爐、餐飲業、加油站等民生產業排放源,是以移動污染源為最主要的空氣污染來源;統計至 103 年 10 月止,臺北市約有 180 萬輛汽機車，車輛密度為 6,633 輛/km2，其中機車數量龐大，占總車輛數的 57%。除本市設籍車輛外，每日從鄰近縣市進到臺北市的通勤車輛約有 25 萬輛；因此，減少車輛排放空氣污染物是臺北市在空氣品質改善上的長期挑戰。臺北市以落實私人運具管制及發展大眾運輸為策略，並透過宣導引導市民的行為改變，實現以經濟有效的管制成本改善空氣品質的可能性，改善交通環境也提升市民健康與生活環境。

2.推動大眾運輸

(1)臺北市以建構綠色運輸作為首要的策略，隨著捷運路線陸續的開通，結合市區聯營公車形成便捷的交通網路，並自 99 年起推動 Youbike 公共自行車,構建大眾運輸最後一厘路延伸大眾運輸服務範圍,逐年增加大眾運輸運量。

(2) 臺北市於捷運松山線通車後，捷運總里程數已達 129.2 公里，捷運日運量達到 185 萬人次;由 14 家聯營公車業者提供的 310 條公車路線，每日營運里程數達 52 萬公里，公車日運量達到 135 萬人次；同時機動車輛成長率也在近年呈現減緩的趨勢。

(3) YouBike 最後一哩綠色運輸：YouBike 公共自行車租賃系統設置，提供零污染的公共自行車，統計至 103 年 10 月底，臺北市計有 167 處租賃站設置，5,482 輛車提供服務，每輛 YouBike 每日周轉率高達 12 人次/日，每日約有 6 萬人次的使用量，遠高於其他城市；同時，YouBike 公共自行車也使臺北市的自行車使用率由原來的 3.3%增加至 5%；為使臺北市成為自行車友善城市，政府也逐步優化市區自行車使用環境，包括設置自行車專用停車格及劃設市區自行車道(375 公里)及河濱自行車道(112 公里)，供民眾通勤及休憩之用。

(4) 臺北市亦隨時視地區需求，持續規劃檢討各項鼓勵大眾運輸配套措施，包括：開闢公車專用道、檢討公車路線以及建置交通轉運場站等。臺北市自 99 年起陸續啟動臺北轉運站、市府轉運站、木柵轉運站、南港轉運站、圓山轉運站等五大轉運站，提供便民城際公共運輸轉乘服務，鼓勵民眾搭乘大眾交通運輸工具;另亦提供偏遠及弱勢族群公共運輸服務，小型公車每日載客約 1.6 萬人次，復康小巴每日載客 3,585 人次；另為減少跨縣市私人運具的使用，也協調業者開發跨城際快速公車。

(5) 臺北市透過優質多元公共運輸成功取代私人運具，本市大眾運輸量逐年增加，97 年度起，捷運及聯營公車運量總和皆在每日 300 萬人次以上，統計至 103 年 10 月底，臺北市每日使用大眾運輸(捷運及公車)之總搭乘人數達到 330 萬人次，捷運平均每日人數約較 100 年成長約 6.5 萬，約可取代 1.4 萬輛機車及 1.03 萬輛汽車之使用，減少氮氧化物約 53 公噸/年，非甲烷碳氫化合物約 133 公噸/年。

3.私人運具管制

(1) 本市的車輛總數由 92 年 168.9 萬輛，成長至 101 年達 185.6 萬輛，成長率為 9.8%；但因大眾運輸系統日趨完善，每千人持有機車數已自

99 年度起轉為負成長。

(2) 管制私人運具尾氣排放：為管制私人運具的尾氣排放，確保其符合空氣污染管制法之排放標準，臺北市目前計有 2 座柴油車排氣檢測站已及 197 間機車排氣定檢站辦理車輛排氣檢測；每年約可檢測 7,000-8,000 輛的柴油車以及 50 萬輛的機車。

(3) 推動柴油車低污染識別標章：為保護民眾之健康、提升空氣品質，減少市民上下班尖峰在公車專用道時暴露於公車排氣污染，臺北市以空品淨化區之理念，透過加嚴車輛排放標準並核發「柴油車低污染識別標章」，以減少污染物的排放，達到改善空氣品質、維護民眾健康之施政目標。本市現行之「低污染車輛識別標章制度」，並加嚴管制標準其污染度排放標準降低為 15%，車輛驅動力（馬力比）提高為 45%，與行政院環保署目前實施使用中柴油車國家排放標準加嚴 25%。臺北市自 98 年推動低污染車輛識別標章制度，第一階段(98 年)首先鎖定行駛在公車專用道的公車為管制對象，實施後頗受好評，因此第二階段(99 年 3 月)擴大至本市所有聯營公車，第三階段(99 年 7 月)則是將臺北轉運站車輛納入管制，第四階段(100 年)加入市府轉運站客運業者及物流業者，第五階段(101~102 年)則結合陽明山及信義計畫區空品淨區推動計畫推廣低污染標章。低污染車輛識別標章制度實施後，民眾對柴車廢氣之檢舉案件逐年下降，其中，又以公車最為明顯，陳情公車(客運)件數由 98 年 209 件下降至 101 年 87 件，下降比例為 58.4%;而 102 年統計至 12 月陳情件數更僅有 33 件。透過柴油車低污染車輛標章的推動，統計至 103 年 6 月底，臺北市計有 3,213 輛公車及 2,217 輛柴油貨車參與，每年估計可降低 127 公噸細懸浮微粒（$PM_{2.5}$）排放量。

(4) 淘汰二行程機車：機車管制則以老舊高污染二行程機車為管制重點，二行程機車因引擎設計關係，容易產生冒煙現象，行政院環保署已訂定機動車輛空氣污染物排放加嚴標準，於 93 年 1 月份起實施第四期排放標準，在此加嚴標準下，該二行程機車無法符合前項新車出廠標準，車廠已全面停產。惟為管制目前路上尚有使用的老舊二行程機車現有之二行程機車，臺北市將該車種列為重點稽查對象，除鎖定本市

路邊機車停車格、人行道、停車場、社區及騎樓等停車處進行未定檢機車巡查抄牌外，亦不定期於本市主要道路上加強執行二行程機車之隨機攔車排氣檢測稽查，以督促車主維修保養車輛，降低廢氣排放。除針對二行程機車加強稽查取締外，為鼓勵民眾加速提早淘汰二行程機車，臺北市更提供車主二行程機車淘汰加碼補助及二行程機車換購電動機車補助，分別補助 3,000 元及 13,000 元。

4.空氣品質改善十年有成：臺北市歷經十多年空氣污染源管制、減量及改善，並鼓勵市民及公部門使用大眾捷運系統、電動機車及油氣雙燃料車，公車聯營業者優先選用油電混合公車、選擇性觸媒還原（SCR）公車，有效降低都會區移動性污染源排放量。根據環保署統計資料，臺北市 102 年空氣品質之不良站日數（PSI>100）降至只有 6 站日，相較於十年前（93 年）68 不良站日，改善幅度達 91%。空氣品質顯著改善。

5.亞洲唯一入圍 C40「2014 城市氣候領導獎」：臺北市以「清淨空氣-來自你的行動(Clean Air—It's Your Move)」入圍獲得 C40 城市氣候變化組織（Climate change leadership group,簡稱 C40）和德國西門子公司合辦「2014 城市氣候領導獎」的「空氣品質」類獎項，同時參與該競賽之「全球公民票選城市特別獎」並以最高票數獲得勝出。臺北市曾在 2011 年西門子委託經濟學人舉辦的亞洲綠色評比中名列前茅，今年又入圍空氣品質獎項的決選名單，並一舉獲得全球公民票選城市特別獎項，更顯示市民充分參與對抗氣候變遷和一同建設綠色城市的決心與信心。臺北市以有效的政策手段及展現在空氣品質改善上的實際成效，讓臺北市一舉獲得 C40 組織的肯定，首次參加「城市氣候領導獎」即獲入圍。臺北市政府透過跨局處協力合作，建構一個便利、安全、綠能的交通運輸環境，讓每位市民在臺北市從走出家門起到目的地間的每一哩路的移動都能更具效率、節能、智慧及省時，透過硬體環境的建置改變民眾的運輸行為，進而提升空氣品質，行走之間就能達到環境保護與節能減碳之效，持續打造環境永續的低碳城市。

(三) 桃園市空氣品質維護成效發表與經驗分享

桃園市環保局由吳專員瑞祥為代表，分享「紅外線熱顯像儀應用於空氣污染防制工作之成效」。首先介紹桃園市地理環境及區域特性，引入桃園市近年來空氣品質狀況及空氣污染防制工作之分析及策略擬定，並說明紅外線熱顯像儀等科技儀器之特性及運用在稽查工作上之效益。透過案例介紹，說明科技儀器與桃園市空污稽查作業之緊密結合關係，及如何有效降低稽查人力負荷及釐清污染排放事實。

主題分享後的問題詢答過程，與會人員對於本主題主要詢問儀器使用上的限制、儀器價格與需求選擇及如何導入與搭配稽查人力及污染源負荷，針對相關詢問回應則以桃園市近年來使用科技儀器之成功經驗，實際執行手法及作業方式，以及面對污染源廠家及負荷狀態進行相關分析及策略研定，提供相關建議供提問人員及在場與會人員參考。

圖 6.3.2、臺北市環保局高股長薇喻(左下)及桃園市環保局吳專長瑞祥(右上)於「Cities Solutions for Clean Air Part 2」主題發表執行成果。另莊簡任技正訓城於會中發表我國經驗，現場反應熱烈。

四、海報展覽

大會現場共有 34 個海報發表，我國臺中市及臺南市環保局亦受大會邀請於會場展覽轄內成果，臺中市展現針對電力業及鋼鐵業進行調查及推動管制措施，以改善 $PM_{2.5}$ 之成果;另臺南市則以低碳生活(Low Carbon Life Style)為主題分享其成功經驗。其他參展海報，多數為南亞地區國家，主要議題集中在交通移動源污染排放及區域空氣品質成因調查的研究，均係個案，較少有各級政府之空污管制政策。茲將各海報主題摘譯中文如下所列供參：

1.孟加拉 DHAKA 製磚工業對空氣品質和健康衝擊影響
2.孟加拉 DHAKA 交通流量降低對空氣品質的影響
3.印度 Chennai 利用人工類神經網路開發可提早預測 Manali 工業區 NO2 警示系統
4.印度不同車輛污染源排放 $PM_{2.5}$ 概述
5.印度 Chenni 都市地區民眾在大氣中粗細懸浮微粒的暴露評估
6.斯里蘭卡主要都市中車輛污染排放對空氣品質惡化的影響
7.加爾各答城市空氣品質資料分析與國家標準的比較
8.以斯里蘭卡可倫坡都市七個交通要衝作為研究地點，探討因交通運輸產生 VOC 濃度變化
9.斯里蘭卡家戶的黑碳排放
10. 加德滿都公車司機的健康與空氣品質之關係
11. 選擇一種穩定的車輛排放模式之方法論
12. “為了一個健康的國家而減少車輛排放”之專案研究
13. 斯里蘭卡可倫坡公車司機暴露在空氣污染之健康衝擊
14. 孟加拉 CHITTAGONG 車輛燃料轉換改用天然氣的空氣品質影響
15. 在發展中國家，燃燒牛糞的影響
16. 在巴基斯坦 Islamabad 大氣空氣品質測量與分析
17. 在孟加拉 DHAKA 都市及工業地區，室內或戶外 VOC 等級
18. 針對採礦卡車現場排放概述
19. 馬來西亞海岸沿線不同季節的 PM_{10} 差異特性
20. 都市大眾運輸系統使用者暴露在空氣污染物中
21. 紐西蘭奧克蘭 CBD 地區柴油運輸車輛熱點衝擊管理監控體系
22. 促成乾淨能源的小額貸款，以一個福音社交行為論壇為例
23. 群體約束和知識管理在創造更好的環境政策中之角色
24. 在印度 Thrissur 適合行人步行的設施
25. 菲律賓機動車輛污染排放與燃料的關係
26. 菲律賓燒烤活動使用爐具與燃料污染排放在風管中的測試
27. 利用 LCSA 測量工具評估未來的運輸燃料，介紹 PROSUITE 一種可長期使

用影響評估方法

28. 印度 DHAKA 為改善空氣的積極作為，介紹快速運輸公車為例
29. 為改善移動污染源排放，從駕駛人的訓練與認知著手
30. 可倫坡的步行環境與空氣品質
31. 可倫坡的船舶污染
32. 有關 NMT 的公共認知調查
33. 台中市電力業及鋼鐵業的 $PM_{2.5}$ 控制
34. 臺南市車輛反怠速政策推動經驗

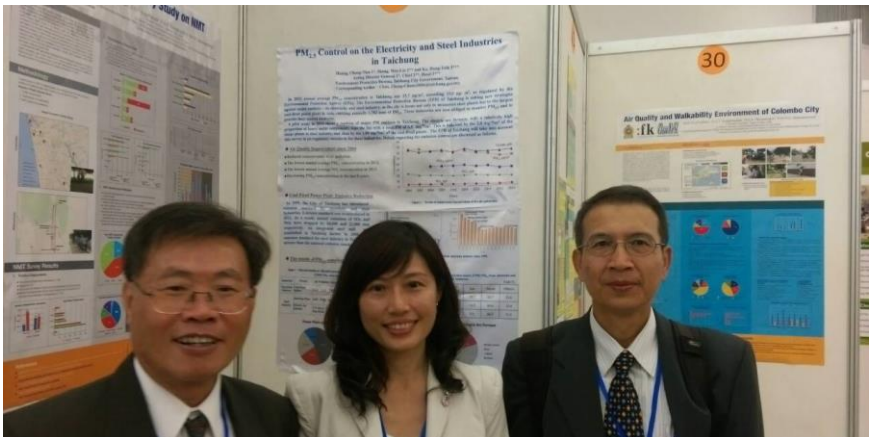

圖 6.4.1、臺中市環保局柯股長宏黛與謝團長炳輝及莊簡任技正訓誠合影。

圖 6.4.2、臺南市環保局林專員界宏與謝團長炳輝及莊簡任技正訓城合影。

五、「圓桌會議(BAQ Country Roundtable Discussion)」

圓桌會議活動方式係以國家別分組，進行討論，包含孟加拉、中國、印度、印尼、馬來西亞、尼泊爾、巴基斯坦、菲律賓、泰國(含寮國、柬埔寨、緬甸)、斯里蘭卡及越南，共計 11 組。透過分組討論方式，探討各國政府針對「空氣污染物」及「溫室氣體減量」的議題所採取的措施與管制辦法。

考量因我國與中國大陸間空氣污染傳輸與地緣關係，旁聽中國大陸地區主要城市之空氣污染防制問題、現行管制策略及未來管制方向之相關議題，以了解其中國大陸城市空污管制現況，活動照片如圖 6.5.1，說明會議重點如下:

圖 6.5.1、圓桌會議參與概況

(一)各城市分享重點

1.北京市目前約 2,300 萬人口，500 萬輛各式車輛，為中國大陸政治、文化、科技創新及對外交流等中心。燃煤、車輛廢氣、工業廢氣，以及車行揚塵為主要空氣污染來源， 相關管制措施包含燃料管制、懸浮微粒管制、推動區域聯合管理及車輛管制。

(1) 燃料管制：2016 年啟用油品國家六期標準。煤年使用量由 2004 年 3,000 萬噸，減至 2013 年 1,800 萬噸，預計 2017 年再減至 1,000 萬噸，

改以天然氣或優質煤取代。

(2) 懸浮微粒管制：該市於 1998 年至 2010 年經過 10 個階段 PM_{10} 管制，並於 2012 年啟動 $PM_{2.5}$ 管制機制。

(3) 推動區域聯合管理：推動六省市(京津冀魯晉內蒙)區域協同減排，監測成果共享、空品管制區突發事件聯防聯控，以及成立公眾環境參與中心。

(4) 管制交通車輛數量及通行，以控制移動污染源產生之污染。

2.上海市建置 60 多處空品自動測站及 200 多套 CEMS 以即時掌握污染情形，並結合污染源監測及天氣預報，提供預期可能發生事件之公眾服務，做為決策支援參考。2015 年將啟動區域預報中心，將扮演減排協調、$PM_{2.5}$ 預警，以使秋冬擴散不佳季節之預警有效性提高。

3.廣州市執行小型鍋爐汰換更替、黃標車減量，另投入四億經費支持汰舊計畫，提昇油品質量，並執行特定區每日 2-3 次街道洗掃以降低揚塵。此外該市辦理餐廳油煙防制競賽並擇優獎勵、調整產業結構以降低污染、提高在線監控比例、建置臭氧排放清單，以及實施油氣回收。

4.大連市為大陸貨物吞吐量劇增之港口城市，逐步重視港區及船舶空氣污染問題，目前大連港對於貨櫃船、散裝船連接岸電技術也進行了研發並且進入試用階段，目前使用率約 15%-20%，未來將提升到 60%，並提高機械化作業比率，此外，大連港對於進出港區及碼頭之重型車輛也開始著手管理，如何有效控制進出港區重型車輛產生之廢氣排放，亦為大連港區現階段探討的重要課題之一。

5.武漢市著重執行人員能力提升、數據資料庫建構、技術支撐等作為，可使預報準確率提昇，使民眾對政府信任度提升。藉由行政支援可使境外污染聯防聯控，提高預警效果。該市與歐盟進行跨域污染預報聯防合作。

6.哈爾濱因氣候關係煤年用量約 3,800 萬噸，目前積極進行煤改氣工程，以及潔淨煤使用，另由大慶油田協助供電及冬季供暖作業，冬季並以部分燒結桿(農廢)取代煤。另配合國家政策執行黃標車淘汰將煤減至現行用量 65%以下，執行以大鍋爐取代小鍋爐政策聯合供暖，近年已拆除 490 台小型鍋爐。

(二)由中國大陸各城市管制經驗分享，整體於減少空氣污染和溫室氣體排放主要工作重點如下:

1.落實執法。

2.產業結構與能源結構重新檢視及調整，如煤炭總量管制。

3.加強區域合作，如空氣污染傳播對象聯防。

4.建立高污染天氣防制機制，以保障公眾健康。

5.重點行業的治理：加強鋼鐵、水泥、石化業等高 SO2 廢氣處理效能以及排放高污染行業及車輛加速淘汰。

6. VOCs 管制—石化行業及表面塗裝相關行業勾稽。

7.大氣污染防制法修訂：新增章節針對重點區域排放加強管制緊急應變說明。

8.人才培訓-重點行業持續與國內外機構產學合作及技術創新。

(三)有關中國大陸城市對於空氣污染管制工作及遭遇之困難，仍面臨許多的整合性問題：

1.各城市型態與發展差異，影響其空污管制策略。

2.有關大方向的執行目標，各城市仍需擬定有效管制策略，以達到減量目標。

3.有關固定、移動及逸散源管制尚無整合性的管制策略。

4.有關蒐集監測數據與擬定管制策略之間重要關聯性。

六、「永續港口」

針對永續港口議題，本研討會上主要透過下列兩個主題之專案分享以達到交流研商之目的。

(一)三方綠色

永續城市、港口及海運(Triple Green：Sustainable Cities, Port and Marine transport)議題將港口及城市的綠色運輸做結合，美國環保署（Mark Kasman）分享西岸港口成功經驗，也是國內港區專案計畫歷年執行管制策略研擬及推動之參考藍圖；德國專家（Dr. Axel Friedrich）以船舶排放量的觀點，分析了船舶排放減量技術、減量實質意義及減量成本效益，並分享德國公務船「Polarstern」成功經驗，為世界第一艘具觸媒及微粒

過濾設備之科學船舶。此外，該主題會議透過小組座談的方式，邀請五位專家（環境、科學、貨物運輸、航運及貨主）以不同觀點針對主題提出不同領域之看法，並以互動的方式讓與會的成員諮詢相關問題。

(二)改善空氣品質的效益評估（Estimating the Benefits of Improved Air Quality）議題

分別包含了馬摩拉海及土耳其海峽納入排放控制區之環境與健康效益評估及澳洲雪梨船舶排放對人體健康之衝擊評估等專案研究與永續港口有直接之關聯性，經由此主題會議讓我們了解到未來國際海事組織若將馬尼拉那海及土耳其海峽納入排放控制區在環境的效益上以排放量（環境效益）而言，船舶排放之懸浮微粒貢獻比例由 5%下降至 1.7%；而二氧化硫比例由 46%降至 4.6%，在健康效益的方面上，將可降低約 77%-93%伊斯坦堡之風險值；另一方面也了解到如何應用 BenMAP 於船舶排放效應評估及其操作上須面臨的各項挑戰。

圖 6.6.1、<永續城市、綠色港口及海上運輸>本處辦理永續港口業務，故特此參與該活動，汲取相關經驗。

七、 美國環保署及 CAA 之會談

本署分別於 11 月 20 日及 21 日參與兩場會談，討論 104 年實施 CCAP 及 IA11 計畫工作內容。

一、本署與美國環保署雙邊會談

11 月 20 日美國環保署邀請本署針對 103 年度實施「城市清潔夥伴計畫(Cities Clean Air Partnership，簡稱 CCAP)之現況以及 104 年度「臺美雙邊環保優先事項(Implement Arrangement10)」之推動進行討論。

有鑑於今年度 8 月我國環保署長訪美並與美國環保署第 9 分署長布魯門菲（Mr. Jared Blumenfeld）共同啟動「城市清潔空氣夥伴計畫」一同參與 CCAP 啟動儀式，藉由該參與活動的機會，雙方對於臺美合作議題相談甚歡。此外，透過美方代表轉述，美國環保署長麥卡馨女士由衷地感受到臺美雙方合作的誠意，並認為該次（103 年 4 月）訪談華為極具收穫性以及回饋性質，同時感謝本署執行該計畫相關事項，促使得臺美雙方交流更上一層樓。

另本署執行該計畫現況極度受美方重視與關切，為了表達臺美雙方合作的默契與決心，美方代表提出以下幾點建議，如下列所示。

(一)美方代表 Phil Dickerson 感謝本署監資處提供監測資料於美國環保署參考。有關於 104 年「ABACAS 與 BenMap workshop」相關活動，該代表預計六月來臺，並邀請國外專家學者一同分享相關經驗，共襄盛舉。

(二)美方得到消息，有關亞洲發展銀行(Asian Development Bank, ADB)似乎有臺灣代表於該單位服務，因該銀行為主辦單位亞洲清潔空氣中心(Clean Air Asia, CAA) 執行 CCAP 專案主要合作夥伴之一，建請確認該消息是否屬實。倘若消息屬實，美方建議主動聯絡該單位之臺灣代表，俾利於未來執行 CCAP 專案之相關內容。

(三)藉由 CCAP 專案執行與實施，美方希望提供一個網絡平台，整合空污防治及改善相關專家們的聯繫方式，建立完善的專家清冊。未來民眾若有相關需求，則逕自搜尋該網絡平台之專家學者聯繫方式，節省因聯繫困難所耗費的時間。透過該平台，民眾也能清楚了解到各個專家學者們不同的專業與能力，達到擴大因應不同需求之選擇性。

(四)有關 104 年「Global Partnership Conference or International Environmental Conference」 本署長預計出訪華府 DC 之活動，因涉及綜計處「環境教育」與空保處 CCAP，美方建請地方環保局一同參與該活動。

(五)本署感謝美國環保署透過「國際環境夥伴計畫」與「臺美雙邊環保優先事項」的實施，使得臺灣能有更多國際交流的機會。本署建議未來若要舉辦各式各樣的活動，期能將活動舞台帶到臺灣來，期能提高臺灣國際形象之能見度。

(六)我國代表團利用「2014 更好空氣品質研討會」之契機，除了有機會認識自世界各地之專家學者外，也參與大會相關活動，如上台報告與海報展覽等，提升臺灣自身的國際形象。因該研討會為兩年一次性活動，且巡迴世界各地舉辦，本署建議未來舉辦場地在臺灣或是東京等；此外，若能在臺灣舉辦，本署相當歡迎夥伴團體參觀臺灣監測站及其他空污防治措施等。

(七)有鑑於 104 年 CCAP 與 IA11 之計畫內容，當中不少為出國訪查與參與國際活動之專案，因該案須採購機票以及其他行政支援，故本署永續室提出委辦公司協助辦理之提案，將一系列出國之行政支援外包給廠商，俾利相關活動之進行。美方提出該行政支援之經費是否為該計畫項下支應，或編列其他預算於該提案。

圖 6.7.1、本署同仁與美國環保署資深顧問 Mark Kasman、計畫經理 Justin Harris 與 AirNow 專案經理 Phil Dickerson 針對 IEP 及 IA 議題進行會談。

本署感謝美國環保署透過「國際環境夥伴計畫」與「臺美雙邊環保優先事項」的實施，使得臺灣能有更多國際交流的機會。本署建議未來若要舉辦各式各樣的活動，期能將活動舞台帶到臺灣來，期能提高臺灣國際形象之能見度。

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二、11 月 21 日為臺、美、CAA 三方會談

主要針對 104 年度「城市清潔夥伴計畫(Cities Clean Air Partnership，簡稱 CCAP)做討論。

(一)本署提出的方向如下：

1.CCAP 計畫運作中，除經費贊助外，本署可扮演的角色？104 年計畫運作可否將本署與其他國際重要組織做一結合？

2.推動城市登錄及認證是否為 104 年計畫核心？是否組成委員會來進行。我國政府、學界或技術機構可否參與登錄或是評鑑？另外是否會在臺灣召開會議。

3.104 年 8 月在本署與美國環保署署長將在美國召開第一屆 CCAP 會議，本署本年度(104 年)贊助 CAA 時是否會涵蓋這項工作。

(二) 三方討論協商後的重點如下：

1.有關 104 年 2 月美國環保署(Justin Harris 及 Mark Kasman)與 CAA 執行長與副執行長訪臺，利用該機會將 CCAP 計畫內容與工作事項確認。

2.有關未來計畫推廣「城市認證」部分，我國除了扮演經費贊助角色外，美方與 CAA 期待我國能夠提供專家學者及相關技術，協助其他國家推動認證制度，規劃我國政府、學界或技術機構成為核心諮詢單位之一。另可透過我國地方城市參與，利用 CCAP 成為夥伴城市，無論是在國際交流及環境領域上之國際能見度亦有幫助。

3.有關城市認證制度部分，其初步想法如下:

(1)藉由各方開放性協商與諮詢，規劃具體與量化之認證準則與條件。

(2)採取第三方認證機制，以達公開公正之目的。

(3)參考紐澤西案例，經認證後給予清潔空氣標章 (Clean Air Label)。

(4)提供誘因機制，如直接誘因(技術支援工具、行銷溝通)與間接誘因(經濟、健康)。

4. 有關 104 年 8 月「Global Partnership Conference or International Environmental Conference」本署 署長出訪華府 DC 之活動，預計召開第一屆 IEP 及 CCAP 會議。本署贊助 CAA 之經費將規劃為邀請 25 個發展中城市及美國 2 個城市(Bay Area 與加州南岸)之差旅費。另美方建請地方環保局一同參與該活動。

圖 6.7.2、與會人員包含本署代表(謝團長炳輝、莊簡任技正訓城、戴高環忠良及承辦人楊佳樺)、美國環保署代表(Mark Kasman、Justin Harris）、與 CAA 董事會 Rober O'Keefe、Mary Jane Ortega 及執行長 Bjarne Pedersen 與副執行長 Glynda Bathan 合影。

三、11 月 20 及 21 日會談重點整理

(一)美方代表 Phil Dickerson 感謝本署監資處提供監測資料於美國環保署參考。有關於 104 年「ABACAS 與 BenMap workshop」相關活動，該代表預計六月來臺，並邀請國外專家學者一同分享相關經驗，共襄盛舉。

(二)美方得到消息，有關亞洲發展銀行(Asian Development Bank，ADB)似乎有我國代表於該單位服務，因該銀行為主辦單位亞洲清潔空氣中心(Clean Air Asia，CAA) 執行 CCAP 專案主要合作夥伴之一，建請確認該消息是否屬實。倘若消息屬實，美方建議主動聯絡該單位之我國代表，俾利於未來執行 CCAP 專案之相關內容。

(三)藉由 CCAP 專案執行與實施，美方希望提供一個網絡平台，整合空污防制及改善相關專家們的聯繫方式，建立完善的專家清冊。未來民眾若有相關需求，則逕自搜尋該網絡平台之專家學者聯繫方式，節省因聯繫困難所耗費的時間。透過該平台，民眾也能清楚了解到各個專家學者們不同的專業與能力，達到擴大因應不同需求之選擇性。

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柒、心得與建議

一、更好空氣品質研討會為亞洲國家針對空氣污染防制工作之交流平台，對於國家與國家間，城市與城市間，實為一個促進國家或城市間之交流機會，本次活動參與，除能分享我國自身成功的環境保護經驗及吸取空氣品質管理技術新知外，亦增加我國環保機關於國際間環境保護知名度。

二、透過該研討會活動設計，本署與美國環保署及 CAA 夥伴團體間彼此協商與討論，共同擬定 104 年合作夥伴目標，建立合作默契，實有助於推動國際相關業務之發展，並奠定未來計畫執行之基礎。

三、綜觀本次參與發表之各城市簡報資料，我國空氣污染防制經驗、技術、思維及空氣品質管制法令與策略已相較完整且具體，未來倘有相關國際研討會，我國亦可積極爭取發表或主辦之機會。

四、各國對於空污管制及各項環境議題重視度已大幅提升，尤其是污染跨域傳送之議題甚表重視，更投入許多研究、監測與管制工作。本署多年來亦持續執行國內環境監測工作，監控大區域範圍之空氣品質狀況及長期趨勢，對於國內環境現況已有相當掌握。我國因受地形及氣候的因素，環境污染物跨境傳輸的問題日益嚴重，例如東亞沙塵或東南亞生質燃燒等，其中因中國大陸因主要以燃煤主要能源，造成影響最為嚴重，每年秋天至隔年春天最易受境外污染影響；另我國因地理位置處於這些空氣污染物的傳輸路徑上，受到最直接影響，而對於境外污染物的傳輸現象監測與預測顯得相當重要。

五、有關臺美計畫永續港口之議題，透過該研討會建立起多元溝通管道，除俾利後續辦理相關專家會議外，也能增加不同領域專家之諮詢窗口。另國內港區之推動，現階段因我國港區空氣污染管制專案尚未應用過 BenMAP 模式來評估船舶排放減量對於人體建康效益之影響，因研討會中充分獲得 BenMAP 應用於船舶減量效益的案例，建議國內未來可應用 BenMAP 模式研擬港區空氣污染減量策略，建立更完整之決策參考依據。

捌、附錄

一、我國城市管理經驗之成果發表(臺北市/新北市/桃園市環保局)

二、海報展示(臺中市/臺南市環保局)

三、城市認證架構及介紹

四、更好空氣品質研討會手冊

五、出國報告摘要版

Clean Air Action：Master plan for mobile vehicle management and green transportation in Taipei

Wu, Sheng-Chung and Chiu, Kuo-Su
Commissioner, Division Chief
Department of Environmental Protection Taipei City Government, Taiwan R.O.C
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Abstract:
The main air pollution source in Taipei City is mobile vehicles. The total number of the registered vehicles in Taipei City is 1.8 million; and the vehicle density is 6,633/km^2. Apart from the vehicles already in Taipei City, about 250,000 vehicles commute from other cities to Taipei City.
Taipei City Government provides zero-pollution public bicycles and low-pollution buses via the promotion of YouBike and low-pollution vehicle symbol for diesel vehicles to citizen in Taipei City to move from home to the destination more efficiently, energy-saving, intelligently and time-saving, which is more environment-friendly.

1. First mile and last mile green transportation

Taipei City has already obtained great achievement in the promotion of the public bicycles-YouBike. The amount of the renting stations is up to 162, and the total number of the bicycles for citizens is 5,350. Member can use the YouBike without any charge during the first 30 minutes.The average turnover rate of each YouBike is 12 times per day. YouBike also increased the usage rate of the bicycles in Taipei City from 3% to 5.5%.

2. Diesel vehicle low-pollution identification symbol

Taipei City enhances the diesel vehicle emission standard and issue the "low-pollution identification symbol" in order to improve the air pollution emission caused by diesel vehicles. The "low-pollution identification symbol" is the mark to diesel buses, passenger transportation and logistics industry, based on the standard stricter than the latest national standard vehicles in use by 25% in order to improve air quality and citizens' health.
There are 3,879 buses in Taipei City obtained the symbol, up to 87% buses have acquired low-pollution symbols.
Taipei City is not only trying to build a sustainable traffic environment for citizens to form a close public transportation network but also providing for the citizens by the intelligent transportation integration system-Fun travel in Taipei App so as to construct a convenient, safe and green-energy traffic transportation system.

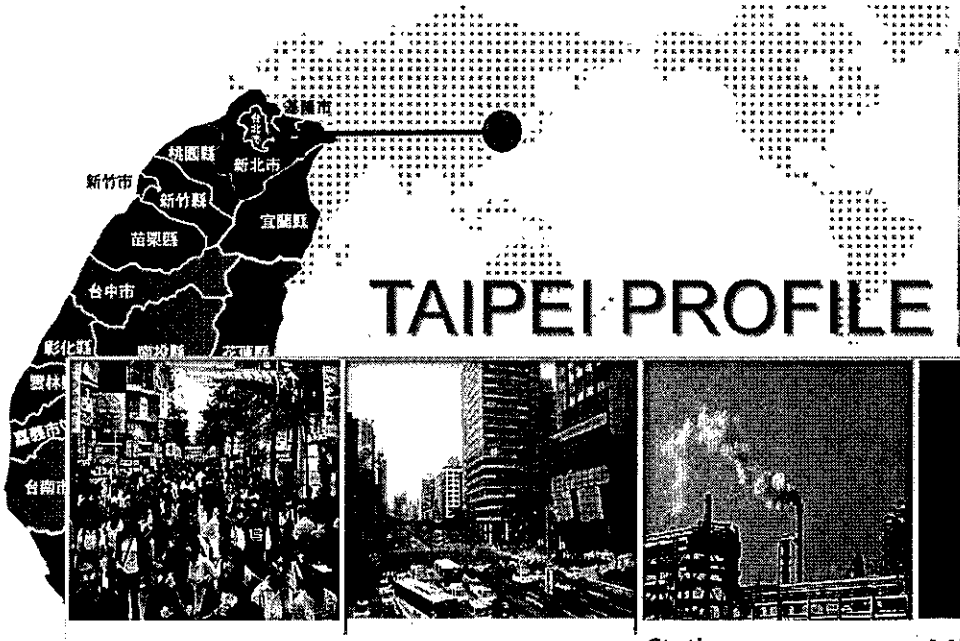
Keywords:last mile green transportation, public bicycles, low-pollution identification symbol

Tag: Motor Vehicle Emissions and Fuels

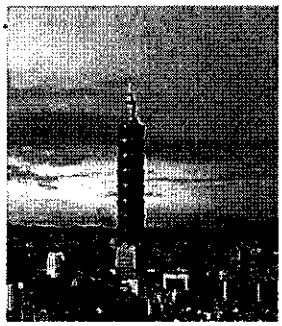
Clean Air Action

Master Plan for Mobile Vehicle Management and Green Transportation in Taipei

Dept. of Environmental Protection
Taipei City Government
Dec , 2014



TAIPEI PROFILE



Population :
2.69 million

Area :
272 km^2

Vehicles :
1.76 million

Scooter : 0.99 million
Car : 0.69 million
Truck : 61 thousand
Bus : 14 thousand

Stationary sources :
297 permitted

Construction :
3,344 Sites

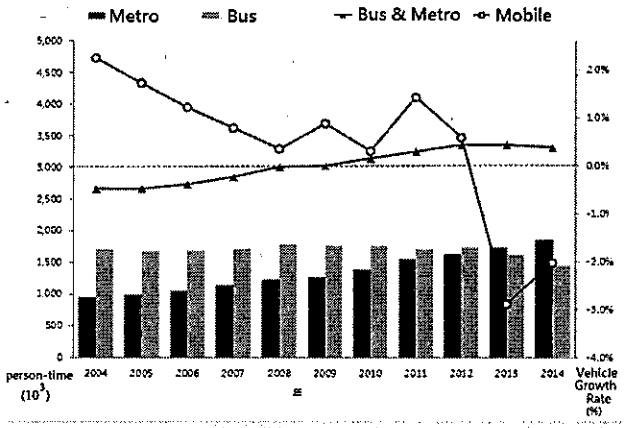
MRT :
Length 121.3 km

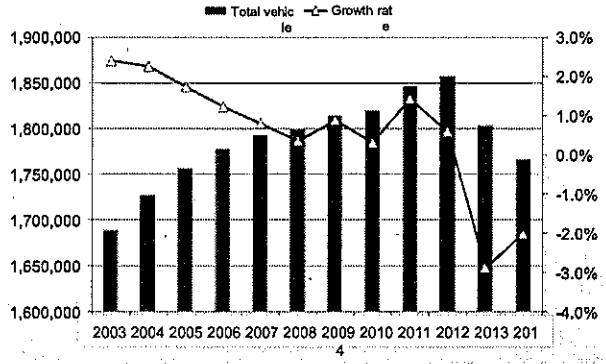
Daily Passenger: :
MRT 1.85 million
Bus 1.47 million

Environmental Loading of Mobile Sources

Major Pollutants from Vehicles

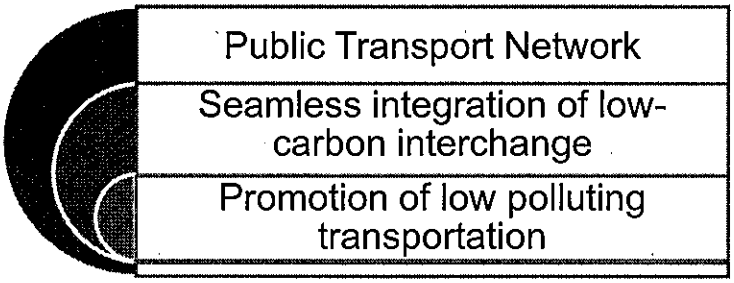
- The mobile vehicles are the major sources of air pollutants.
- Development of public transportation system, replacing private vehicles (scooters, cars), integrated public transport, green transportation with an average transport capacity of 3.3 million / day

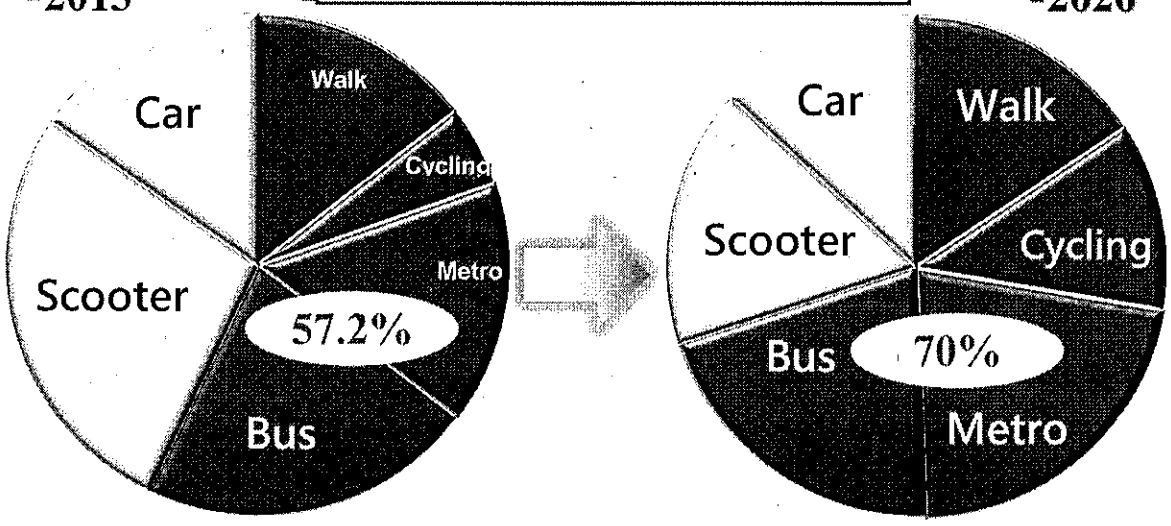




Strategy 1：Development of Public Transportation

Mass Transportation Goals of 2020



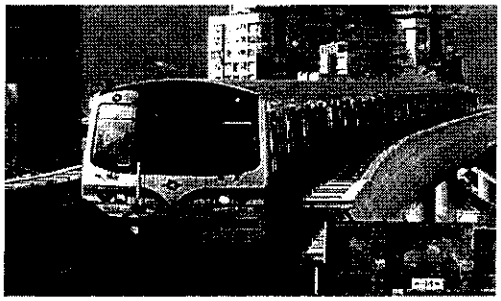


Strategy 1：Development of Public Transportation

Green Transportation in Taipei

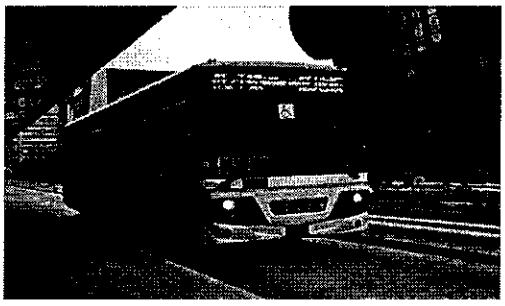
Metro : the main urban transport in Taipei

- MRT Routes：12
- Stations ：117
- Length：129.2 kilometers
- Daily passengers ：1.85 million
- Cumulative passengers ：50 million



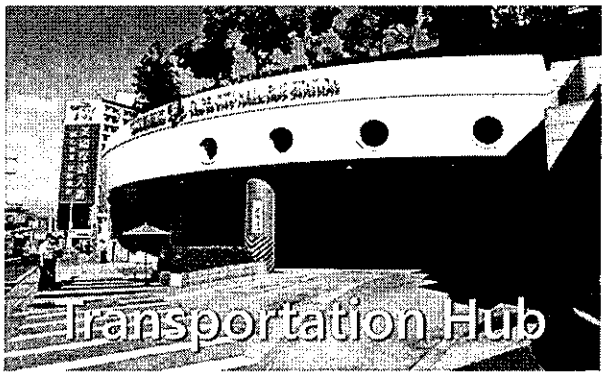
Bus：for connection and transfer

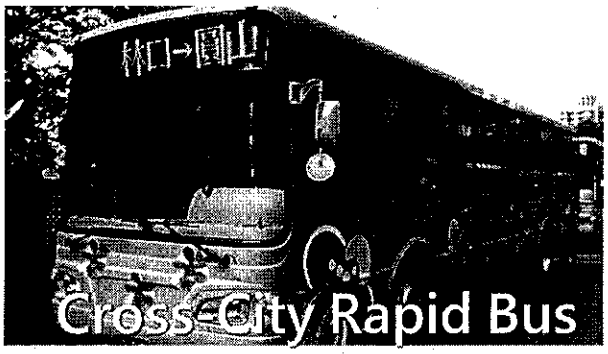
- Routes：310
- Operation mileage：520,000 kilometers
- Vehicle amounts ：3,727
- Daily passengers ：1.35 million
- There were 14 bus companies in service

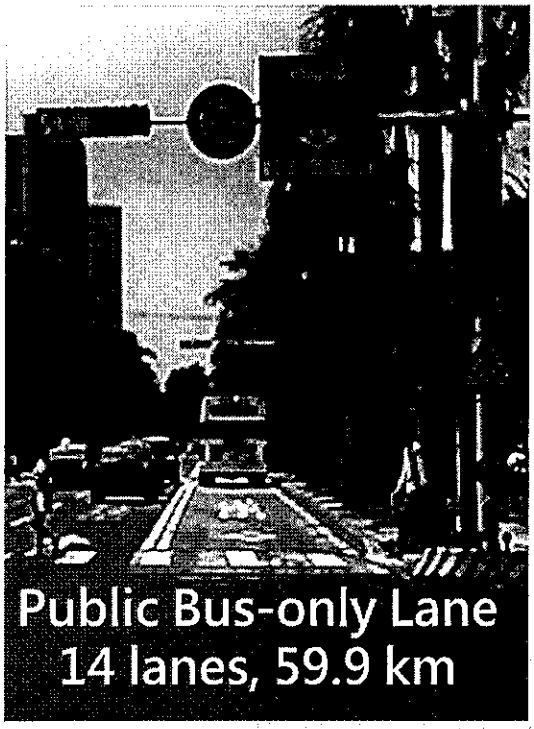


Strategy 1：Development of Public Transportation

Green Transportation in Taipei



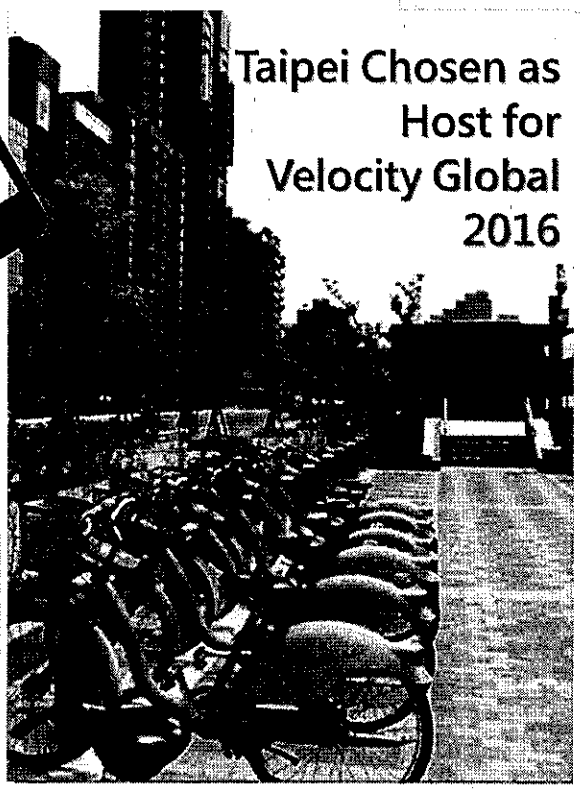




Strategy 1：Development of Public Transportation

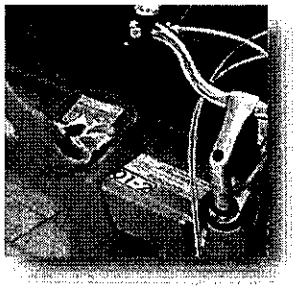
Youbike：Last Mile For Green Transportation

- Amounts：5,482
- Stations：167
- Daily passengers：over 60,000
- Cumulative passengers：24 million
- Turnover rate：12 times/bike/day
- Members：2.14 million



■Easy to Register

■Easy to Use



Strategy 1：Development of Public Transportation

Last Mile For Green Transportation

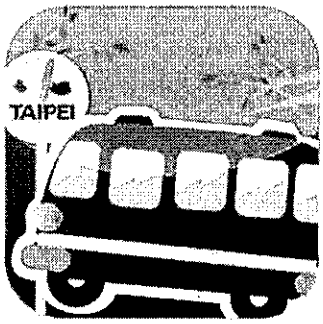
Strategy 1：Development of Public Transportation

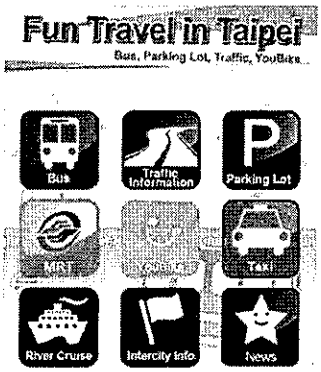
Intelligent Transportation Management

Fun Travel in Taipei

■ Smartphone App

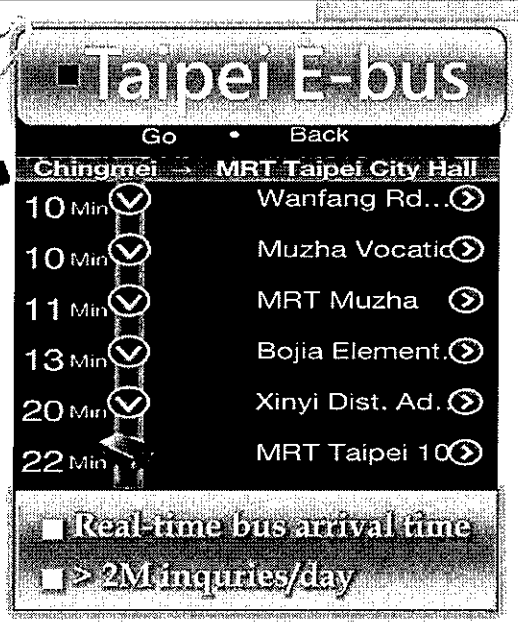
▪Providing real-time and complete transportation information in Taipei





■ Open Data

- Smartphone Apps: 48
- Websites: 14
- >2.38M inquries/day



Outstanding Transportation Project Award 2013

Granted by the Eastern Asia Society for Transportation Studies (EASTS)

Strategy 2 ： Private Vehicle Emission Management

Management of Diesel Vehicles

Public Diesel Vehicle Exhaust Emission Inspection Station

■ Stations：2

■ Inspection amounts：7,000-8,000/yr

Low pollution Identification Symbols

■ Stricter than the latest national standard for vehicles in use by 25%.

■ 4,436 diesel buses and 936 diesel trucks joining the self-management of diesel vehicles, can reduce the TSP emissions amounted to 104.7 tons annually.

Ultra Low Emission Buses

■ Age of Bus in Taipei must be less than 8 years.

■ Hybrid Bus：107

■ De-Nox SCR Bus：2,300

Strategy 2 ： Private Vehicle Emission Management

Control and Reduce Strategy of Scooters

Inspection of Scooter

- Subsidy 3,000 NTD for eliminating two-stroke scooters.
- cooperated with scooter shops to set 197 scooter inspection stations to execute yearly inspection of scooters.
- Execute vehicles strengthen 7,861 scooters inspection audit.

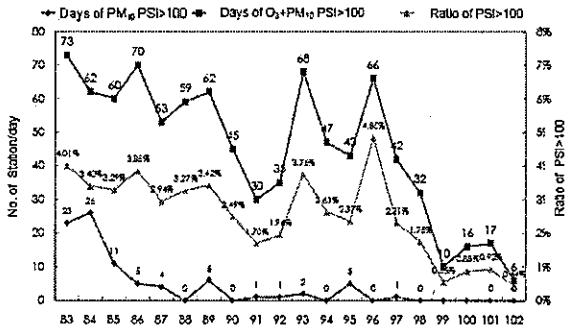
Promotion of Electric Scooter

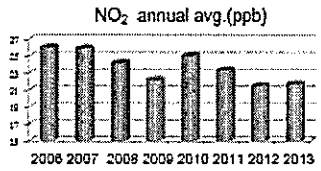
- Subsidy 23,300 NTD per E-Scooter purchased
- 350 free battery-recharging stations
- Establish more free battery-recharging stations to promote E-scooter .

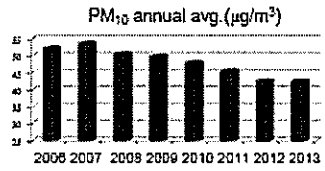
Conclusion

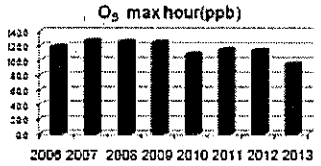
Improvement of Air Quality

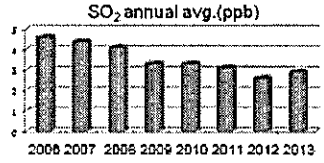
- PSI> 100 ratio showed improvement in the long-term.
- Pollutant concentrations continued to decline.









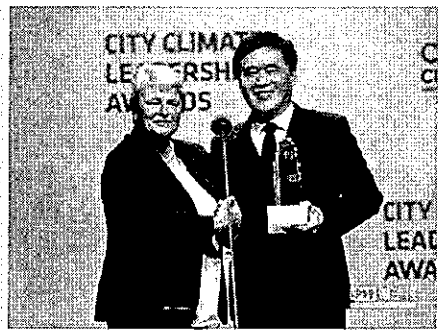


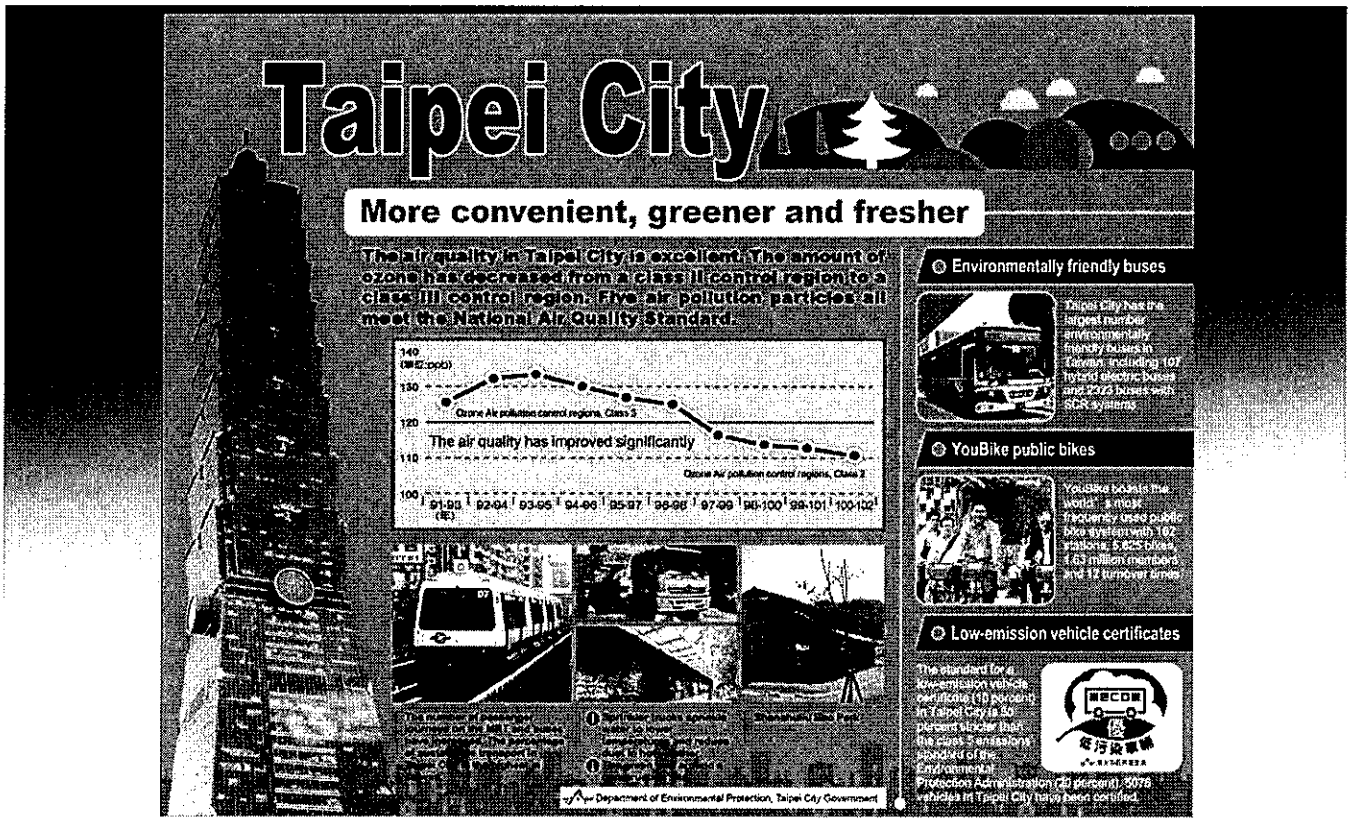
Pollutant/avg. period	2006	2007	2008	2009	2010	2011	2012	2013	2006vs.2013
TSP/annual	52.1	53.6	50.4	49.7	47.9	45.4	42.5	42.5	18.4%
$PM_{2.5}$ auto/annual	28.9	32.5	30.3	28.7	28.8	28.4	25.3	26.9	10.0%
$PM_{2.5}$ FRM/annual								19.5	
SO_2/annual	4.6	4.4	4.1	3.3	3.3	3.1	2.6	3.0	37.0%
NO_2/annual	26	25.9	24.2	22.2	25	23.3	21.5	21.5	16.5%
O_3/max. 8th hour	118.8	126.7	125.5	124.9	108.4	114.8	113.8	95.2	19.9%

Conclusion

C40 City Climate Leadership Awards 2014

- Siemens and the C40 Cities Climate Leadership Group (C40) announced the winners of the City Climate Leadership Awards 2014 at a ceremony held on September 22nd in New York City. The Awards honor cities all over the world for excellence in urban sustainability and leadership in the fight against climate change.
- Taipei had nominated with the project of "Clean Air–It's your move" in the category of air quality, and then had the Citizen's Choice award winner.
- The project of "Clean Air–It's your move" demonstrated that Taipei City government reduce air pollution from mobile sources, and show the efforts to enhance the green transportation environment. Including the build high-quality rapid transit system, more stringent emission standards with Low-Emission-Lable cleaner buses, as well as the high turnover rate of the YouBike, let people enjoy the convenience of urban transport.





Control process for stationary sources permits in New Taipei city

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Abstract:

Lots of environmental nuisance events occurred in Taiwan during 80'. For promoting and fulfilling the policies of environmental protection, Taiwan government continually issued several effective environmental laws from 1988. The permit system was the most represented one.

The laws ruled all public and private facilities should acquire permit from authority before setting and operation when they were defined as pollution sources. The facility should operate in accordance with the permit content. The environmental protection agency would audit all issued permits and the pollution sources annually, to check whether the permit content is violated.

There are about 20,000 registered factories within the jurisdiction of New Taipei City, only about 2,400 are ruled as pollution sources. For the sake of understanding the difference, an investigation task of citywide factories was implemented from 2008, consequently increasing the subjected factories for over 300. We also assign the electricity generation and raw coal consumers as prioritized control business which are asked to follow strengthened standard and examine frequency. By matching the effective means including control from source, self-management, regular maintenance, optimization the operation condition, cooperation with related authorities our city indeed reduce the pollutants discharged and improve air quality.

Furthermore, New Taipei City, will seek to cooperate with other cities in northern Taiwan, even other counties and cities in Taiwan to establish aggressive permit regulation principles and check mechanisms of various businesses in order to effective management the assigned business. We will implement strict issue and control process of permits to more severe pollution sources and seek international partnership cooperation for improving the air quality of global village.

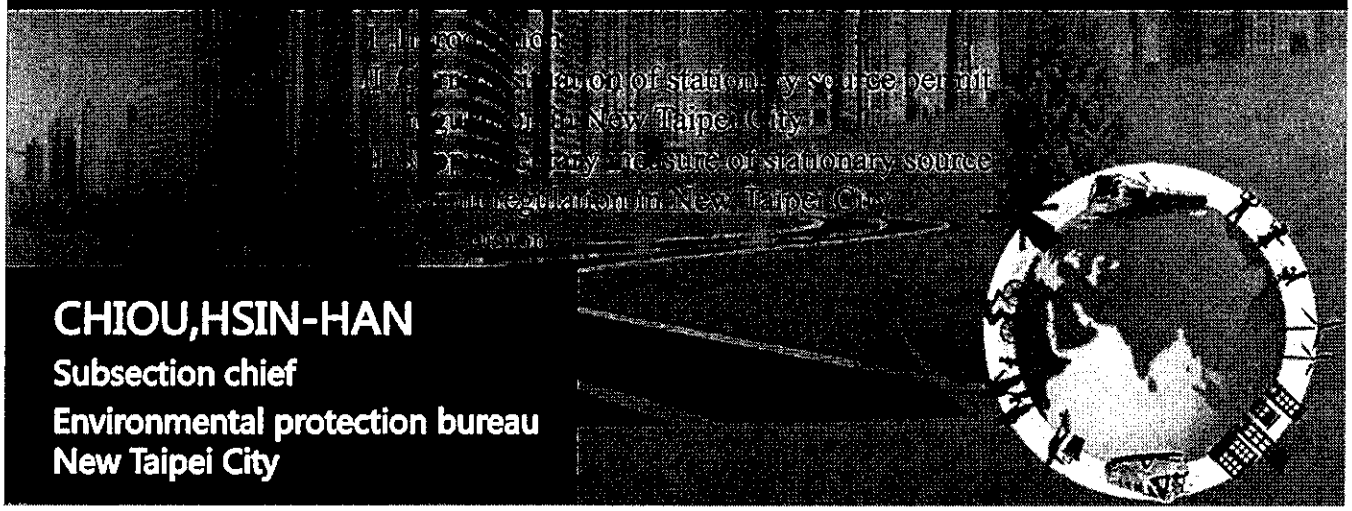
Keywords: air quality, permits, stationary sources

Tag: Air Quality and GHG Management

BAQ
BETTER AIR QUALITY CONFERENCE
sri lanka
19-21 November 2014

Integrated Conference of Better Air Quality 2014 and Intergovernmental 8th Regional Environmentally Sustainable Transport Forum in Asia

Contrl Process for Stationary Sources Permits in New Taipei City



CHIOU,HSIN-HAN
Subsection chief
Environmental protection bureau
New Taipei City

I. Introduction

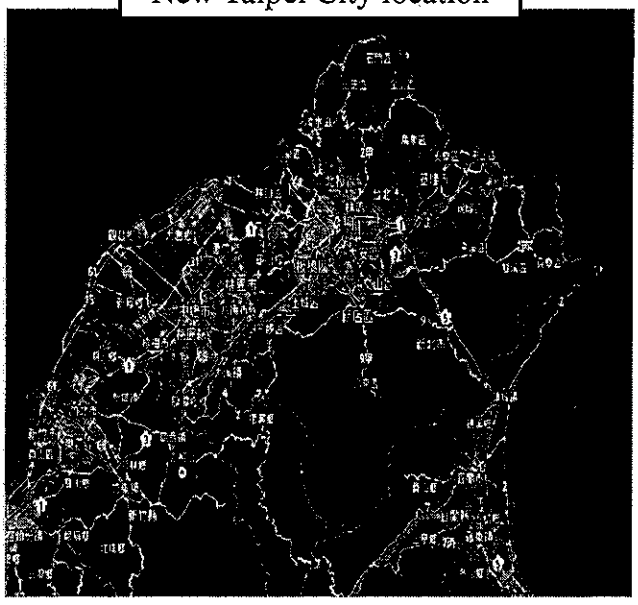
Background Information

Area: 2,052 km^2, approximately 6% of Taiwan's land area ,17% urban and 83% rural.

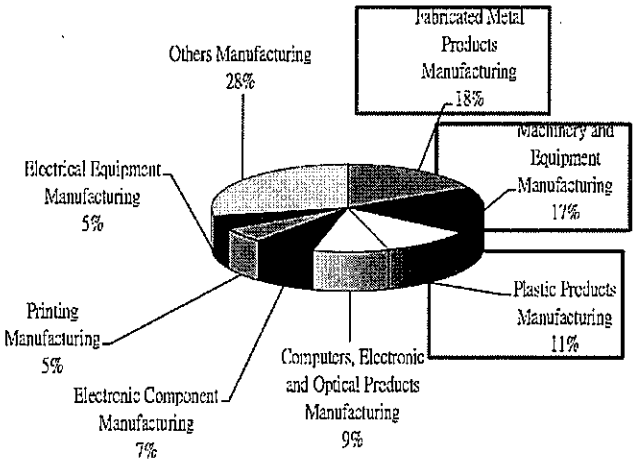
Population: 3.95 million,17% people of Taiwan, 1,925 people/km^2; mostly live in the west region of the city.

Registered Factories: 20,000 (Majority of which are metal, mechanical and plastic related business.)

New Taipei City location

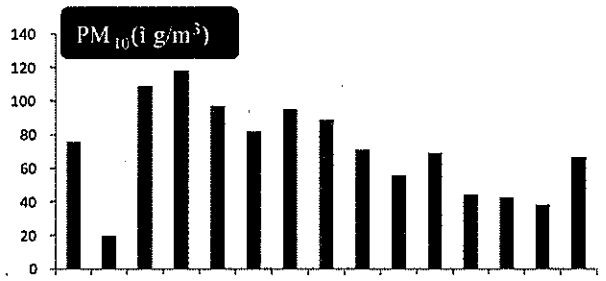


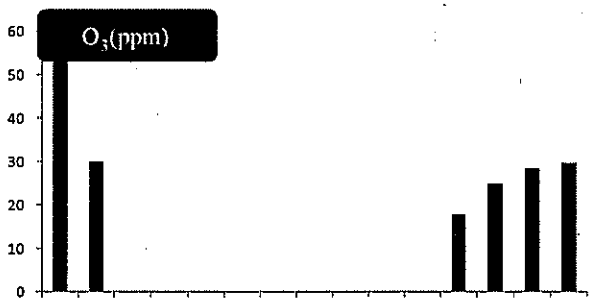
Composition of Manufacturing Industry

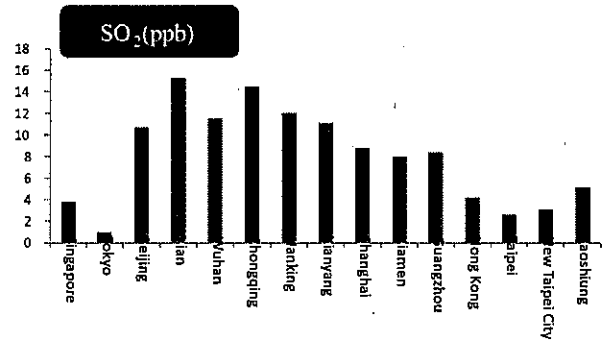


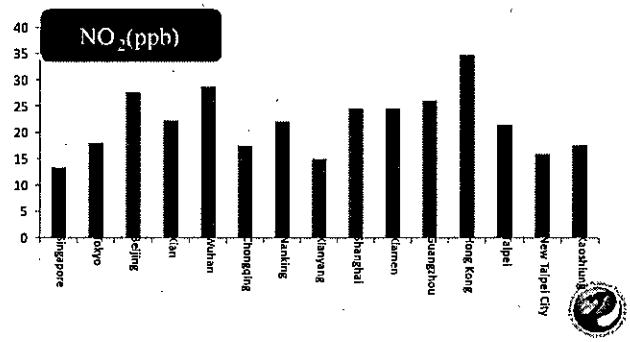
New Taipei City Air Quality Compared to Major Cities in Asia

The concentration of SO_2 and NO_2 in New Taipei City is close to Singapore and Tokyo. Air quality of PM_{10} is better than most cities in China but not as good as Tokyo.









Analysis of Permit Regulations by Country

Trends of permit regulation include by-plant permits (U.S.) and classification of permits (U.K.)

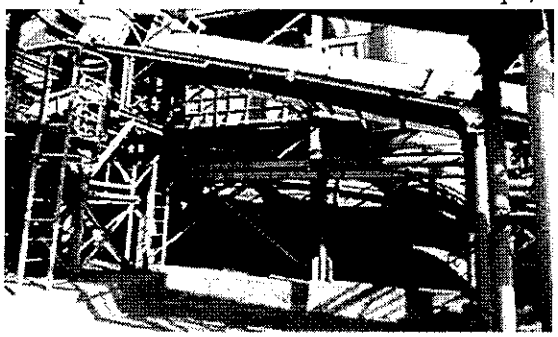
Taiwan adopts a by-plant permit regulation, currently regulating 390 kinds of industrial process.

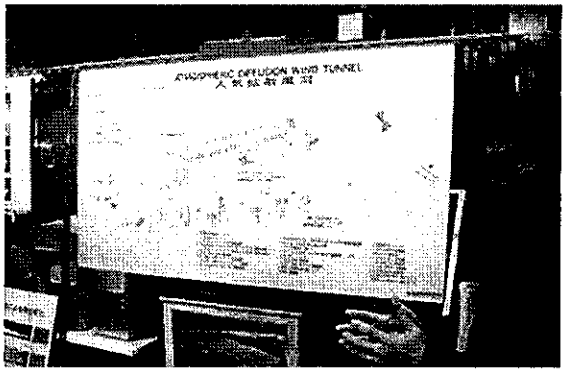
Coun-try / Project	U.S.	U.K.	China	HK	Singapore	Taiwan
Types of permits	Permits to Construct Permits to Operate	A1 Installation A2 Installation B Installation	Air Pollution Permits	Air Pollution License (operating permit)	Installation permit Operation permit Storing permit	Permits to Construct Permits to Operate
Authority	Federal - EPA Local environmental /air quality authorities	A1—Environment Agency A2,B—Local authorities	State Department of Environmental Protection	Environmental Protection Department	Pollution Control Department	EPA Local environmental protection departments
Target source	1.Major source that emits any air pollutant >100 tons/yr . 2. discharge HAPs 3. Waste Incinerators	Energy, metal, mine, chemicals, wastes	Businesses (no common standard so far; regulated by local authorities)	31 engineering projects including acrylic acid, cement, aluminum, ceramics, etc.	16 industrial process including cement, chemicals, coking, metal plating, fossil fuel and incinerators.	Regulating 8 batches 89 professions 390 industrial process

Interaction & exchange control experience with asian countries

NIKKO, Tepco at Yokohama Power Plant, AZBIL, National Institute for Environmental Studies (Japan), TOPIS(Seoul),Nanjing city,Clean Air Asian (CAA)

Participate and host international workshops; invite experts for academic and technical advancement





The Development and Evolution of the Air Pollution Permit Regulation

The air pollution permit regulation including emissions standards, monitoring test, air emissions reporting and prevention regions management, etc.

Our regulation will increase hazardous air pollutants, risk precursors and enforce codes progressive towards reduction of air pollution.

Regulated strategy	1992	1995	2000	2005	2014
Permitting system management	Announcement Object; 1st; 2nd; 3rd; 4th; 5th; 6th; 7th; 8th				566 factories; 762 processes
Monitoring test			Test CEMS	Test 2 announcements CEMS 3 announcements	Test 299 pipes; 12 CEMS pipes
Air emissions reporting			Announcement Object; 1st; 2nd		215 factories
Emission standards	■General standards	■PM industry standard	■SN industry standard	■VOCs industry standard	28 Specific standards
Area of prevention management			■Certain scale	■BACT ■PSD	Second level prevention regions
HAPs management			■Dioxin/Heavy metal emission standards	■VOCs	13 VOCs fee

Panoramic investigation of factories

Field investigation yearly stage by stage for about 20,000 registered factories.

Strengthen stationary source permit regulation and regulatory permit objects.

Registered factories Namelist	Census Factories	Stationary source control
Factory registration information in EDD	❶Make checklist ❷Audit permission in situ Preliminary estimate emissions of registered Factories	❶Expansion regulation objects ❷Push exemplary projects
●Master regulated point source ➢Stationary source database ●Screening unregulated point source ➢Deducted regulated point source ➢Investigation stage by stage yearly	●Examine process and items ➢Basic information ➢Pollution operations ➢The use of raw materials ➢Emissions ➢Preliminary estimate compliance with regulatory ●Estimating emissions ➢Announcement coefficient ➢1,000V	●Expansion inventory ●8 batches permit regulations ●Air pollution processing fees report and pay ➢Regulatory guidance and advocacy meeting ➢Producting technical manual ●execute printing industry census and reduce Project ●Reduction guidance

Ⅱ. Current situation of stationary source permit regulation in New Taipei City

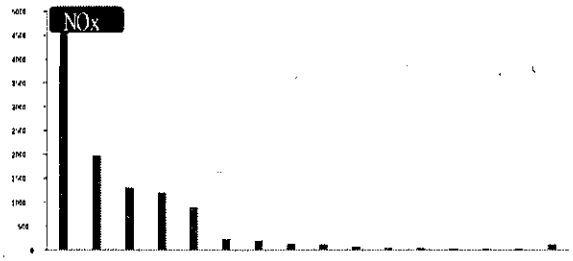
The Air pollutant emissions of permitting in New Taipei City

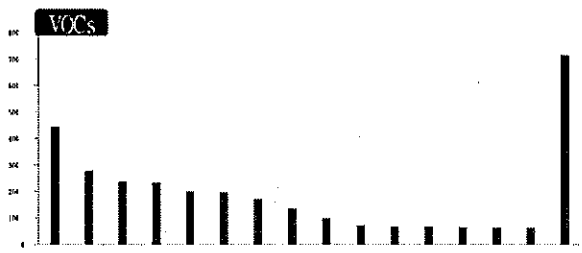
Stationary source permitting regulate 2,368 factories, the main pollution located in the western sites of New Taipei City.

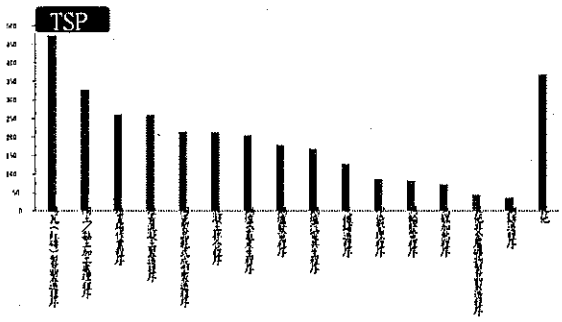
SOx：4,244 tons, NOx：10,873 tons (Boiler power generation, boiler cogeneration, waste incineration accounts for about 71%)

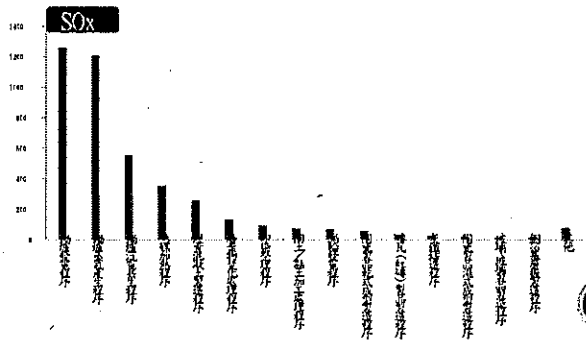
PM：3,107 tons (Brick / red brick manufacturing, kaolin / clay processing, stacked field operations accounted for about 34%)

VOCs：3,800 tons (PU leather manufacturing,planographic operating process,epoxy resin manufacturing, contribution about 31%)









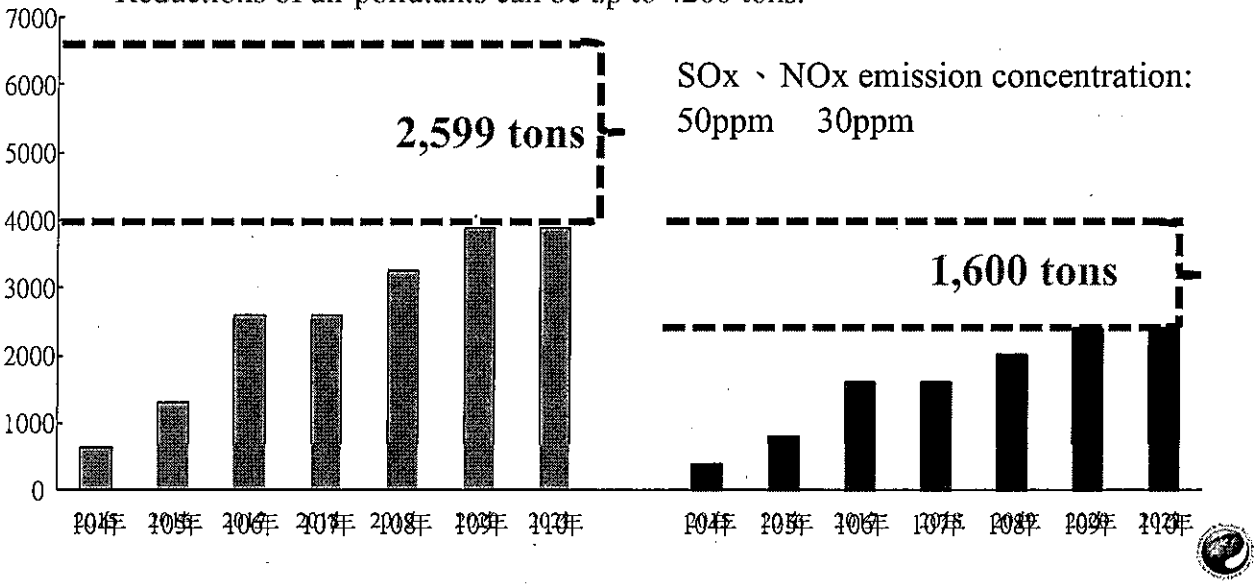
We announced and implemented stricter standards for steam power machine of power industry on Feb 6,2013.

Stricter standards

Total emissions regulation : Within the buffer or extension process, annual emissions shall not exceed 2008 emissions.

Stricter emission concentration ： SOx (Stricter 75-85%)，NOx (Stricter 50-90%)

Reductions of air pollutants can be up to 4200 tons.

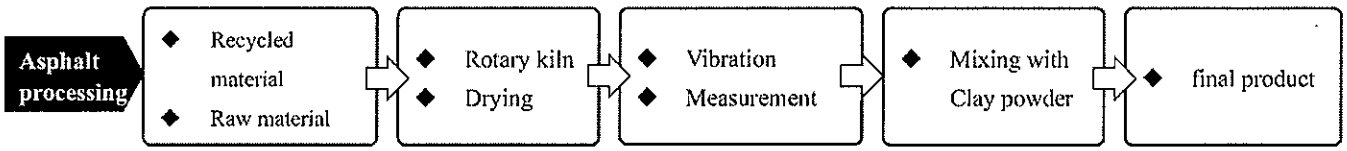


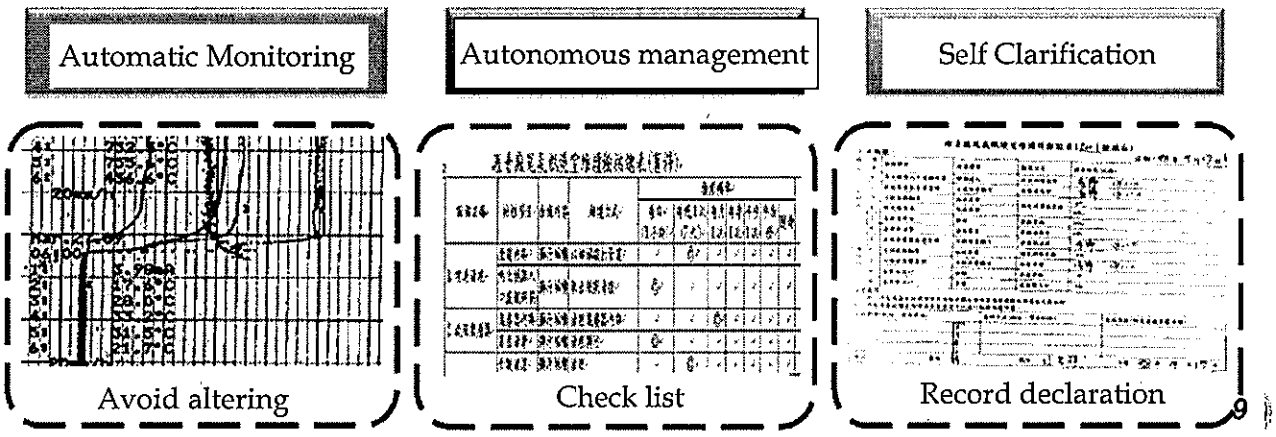
Ⅲ. Supplementary measure of stationary source permit regulation in New Taipei City

Strengthen for permitting management of asphalt production

The petitions for odor derived from asphalt manufacturing by citizens is a major problem in New Taipei City.

Installation of odor control equipment and asked for "three self-management", including automatic monitoring,operation and maintenace by sop ,recording datas for audit.



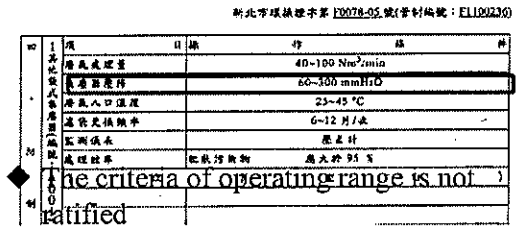


Promote examinates' validity and accuracy on their control equipment

Permitting examination and confirmation in field for monitoring instrumentation of control equipment that meter settings and operating parameters range.

The rationality of control equipment efficiency and the feasibility of check in situ are included in the approved permitting content.

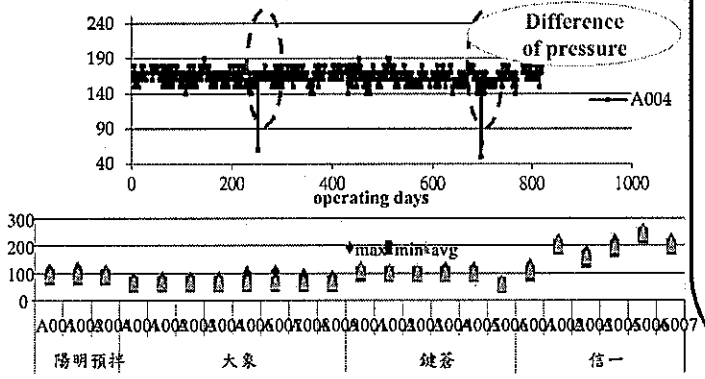
1. Approved permitting before check



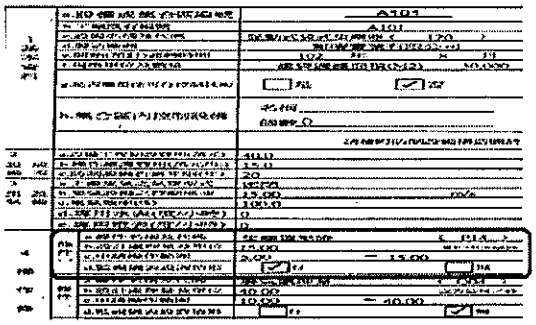
◆ The criteria of operating range is not ratified

◆ Installation of meter is not required

2. The result check



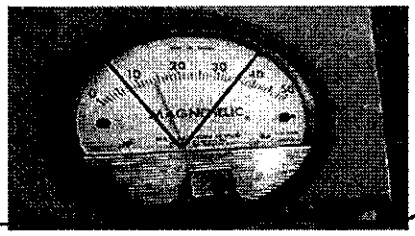
3. Review of criteria and requirement



◆ Operating range within±50 ㎜ H_2O

◆ Must set differential pressure meter

◆ Operating range between 25-75% of full.



Ⅲ. Supplementary measure of stationary source permit regulation in New Taipei City

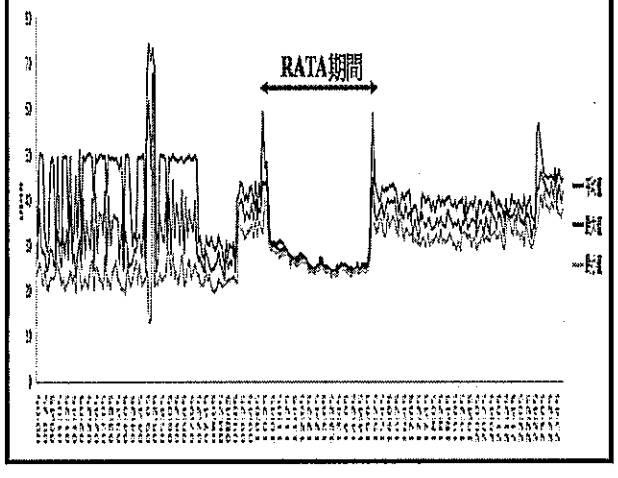
Analysis for data of major pollution sources and joint inspection

The collection of air control fee is based on raw materials and fuels management (including the amount of use, content analysis, periodic sampling and record of declaration)

Analyzing datas of major pollution sources ：check rationality and accuracy od data to control emissions of pollutant efficiently.

The fabricate data made by unscrupulous businessmen was found through interagencies ' cooperation. The collection of air control fee was NT$275,000,000.(US$9million)

Data analysis for major pollution sources

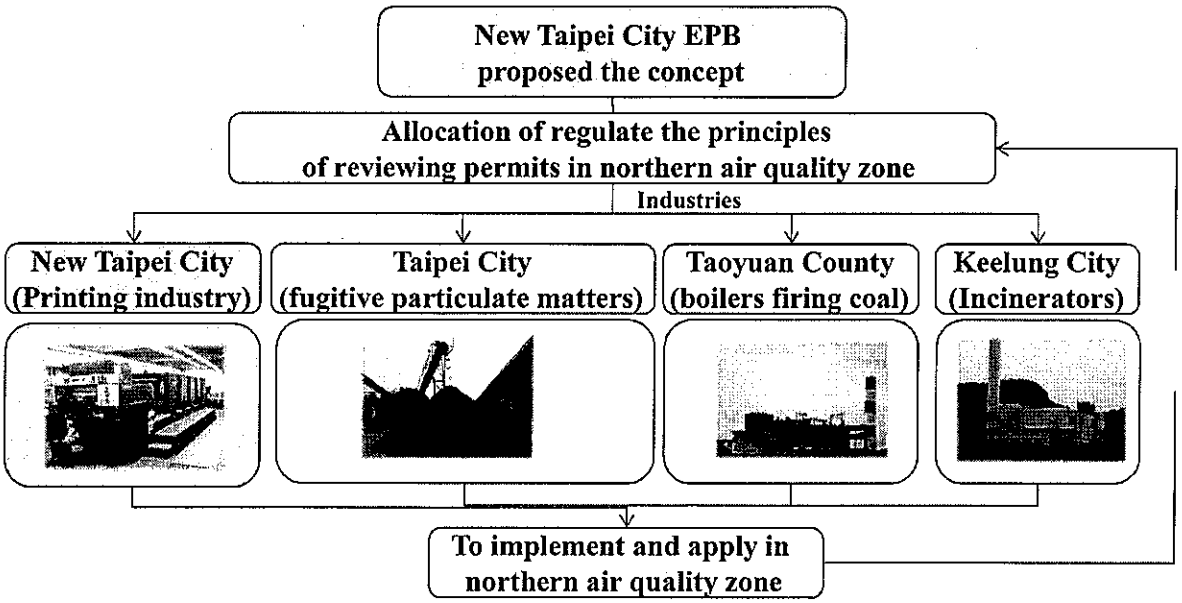


Interagencies' joint inspection

Combined the experiences of local authorities to establish the principles of reviewing industries permits

Combined the reviewing experiences of four authorities of northern air quality zone to establish the same principles of reviewing industries permits

Establish the principles of reviewing permits of printing industry, boilers firing coal, incinerators and fugitive particulate matters



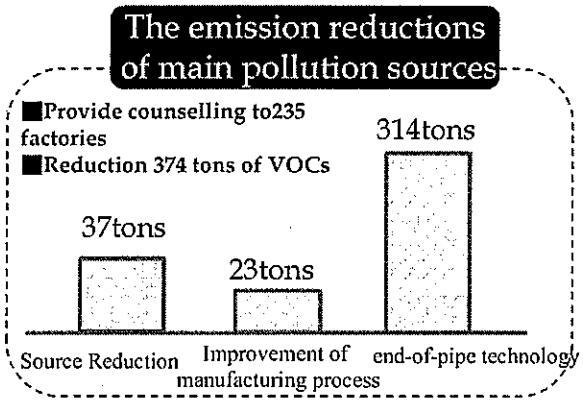
Ⅲ. Supplementary measure of stationary source permit regulation in New Taipei City

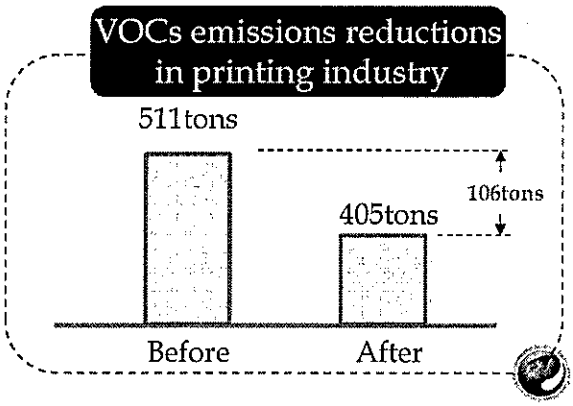
Emission Reductions of VOCs

Industries：Coating、Semiconductor、Plastics Industry、Pressure Sensitive Tape、Printing industry

Reduced 480 tons of VOCs

- Providing counselling for main pollution sources of emission reduction
  - The industries (Coating、Semiconductors、Plastics Industry、Pressure Sensitive Tape)
  - Reduced 374 tons of VOCs
    - Source Reduction- Low VOCs degreaser、Water-based paints
    - Improvement of manufacturing process- Solvent recovery equipment、Improve gas collection efficiency、Adjustment of operating parameters in process
    - End-of-pipe technology-Add 4 air pollution control equipment
- Specific industry-Printing industry
  - Reduced 106 tons of VOCs
    - Improvement of Materials- Alcohol-free cleaning agents、printing ink
    - Improvement of manufacturing process- gas gathering systems、Extrusion type of ink cartridge
    - Air pollution control equipment-Add gas scrubber column
- Annual reduction of VOCs emission to 480 tons





- **In the past, the permits management focused on prevention control of pollution emissions , however, with raising public concerns and response requirements, local authorities have to do some measures to supplement the permits management as follows:**
  - ✓ Tighten emissions standards
  - ✓ Strengthen the surveillance detection mechanism
  - ✓ Establish the principles of Permits reviewing
  - ✓ Provide the counselling of emission reductions to major sources of pollution / specific industries
  - ✓ Inter-regional and interagencies cooperation

- **The using of raw materials , recording parameters of control related equipment automatically, managing of hazardous substances and combining the management of wastewater/waste/ toxic substances in the future. Above measures improve the multi-faceted management of whole plant, promote administrative efficiency and ask factories to pay more attention to the concept of prevention and implementation management of permits**

A study on the effectiveness for the application of thermal imaging infrared camera in air pollution control

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Abstract

Taoyuan County is a large industrial and commercial county in Taiwan , meanwhile, due to many plants of diversified industries, the characteristic and situation of pollution release are thus very complicated. Moreover, the air pollutants released from the production processes of plants could create pretty large impact on the air quality and peripheral living environment.

The Environmental Protection Bureau of Taoyuan County Government has introduced continuously scientific instrument such as "thermal imaging infrared camera" to seize effectively the operation situation of release source, air-pollution prevention equipment and air pollution release channel, etc. Such equipment has advantages such as: out-of-plant remote surveillance, capability to monitor the temperature change of facility and assistance to the audit personnel for the released air current that cannot be seen by naked eye. Therefore, it can provide real-time thermal image information for clarification and judgment, and such information can help the audit personnel to understand the operation issues in the plant and decide a good timing to enter the plant for audit, in other words, the loading on the audit personnel can be effectively reduced, and the pollution fact can be effectively clarified too.

That project has successfully solved pollution petition issues in industrial zone of high pollution potential, and the overall petition cases have been reduced by a percentage of 92%, meanwhile, lots of plants violating the regulations and laws or not fulfilling the operation items of the permit are found out. After the finish of the overall improvement, VOCs can be reduced by 4150.995 tons/year. It is clear that the use of scientific instrument in association with administrative control power, the real release situation of the volatile organic compounds (VOCs) can be effectively seized, and the integrity and correctness of the overall release quantity can then be enhanced.

Key words: air pollution, infrared, audit

Tag: Management of Other Sources of Emissions

第8屆「更好空氣品質國際會議(Bttter Air Quality)」

紅外線熱顯像儀應用於空氣污染防制工作之成效

陳世偉[1]、倪炳雄[2]、傅豫東[3]、蘇振昇[4]、吳瑞祥[5]

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桃園縣政府環境保護局, 中華民國 台灣省 桃園縣

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摘要

桃園縣為中華民國之工商大縣，縣內工廠林立且設立工廠家數位居全國第三，且因設立工廠行業廣泛，使得污染排放特性及情況相對複雜。工廠在生產操作過程中所排放的空氣污染物對於空氣品質及周遭的生活環境往往也造成相當大的衝擊。

桃園縣環境保護局為有效掌握的排放源、防制設備及排放管道操作狀況，近年持續導入科技儀器「紅外線熱顯像儀」，利用其具有廠外遠端監控、設施溫度變化及輔助稽查人員肉眼所看不見排放氣流等優勢，提供即時熱影像變化資訊進行釐清與判定，進而瞭解廠方操作問題及掌握進廠稽查時機，有效降低稽查人力負荷及釐清污染排放事實。

該專案已成功解決高污染潛勢之工業區污染陳情問題，整體陳情減案達 92%，並陸續查核出多家工廠違反法規及未落實許可證操作事項，整體改善完成後 VOCs 減量達 4150.995 公噸/年。顯見利用科技儀器結合行政管制能量，可有效掌握揮發性有機空氣污染物實際排放狀況，提昇整體排放量完整性與正確性。

關鍵詞：空氣污染、紅外線、稽查

Tag: Management of Other Sources of Emissions

8th International Meeting on Better Air Quality

A study on the effectiveness for the application of infrared thermal imaging camera in air pollution control

Speaker：Wu , Jui-Hsiang

Environmental Protection Bureau
Taoyuan County Government
Taiwan(R.O.C)

2014.11.20

Outline

Case
clusion

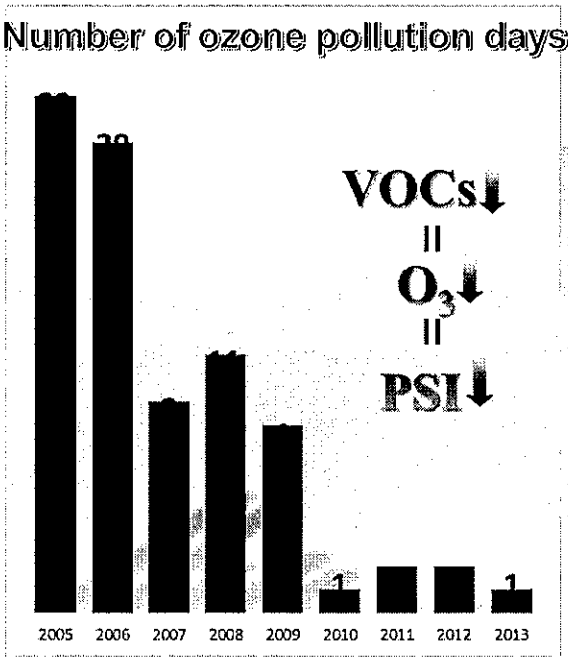
Foreword

ABOUT TAOYUAN

- **Geography**： Taoyuan County is located approximately 40 km southwest of Taipei in northern Taiwan and occupies 1,220 km^2
- **Population**：2,050,600 in the end of July, 2014.

103/12/25 will be upgraded to Taoyuan City.

Foreword



CONTROL POLICY

P Reducing the number of poor air quality days

D Introduce scientific instrument

C Enter the plant for audit

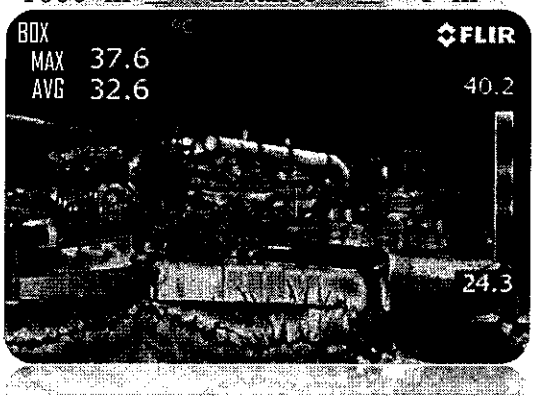
A Improve effectiveness

Instrument

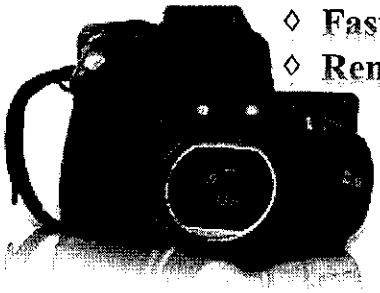
Infrared thermal imaging camera

2000 °C ≧ temperature ≧ -50 °C

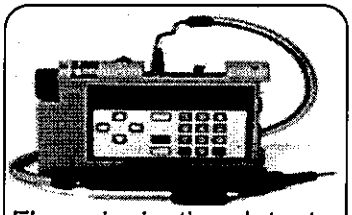
1000 m ≧ distance ≧ 1 m



- ◊ Easy to carry
- ◊ Fast to screening
- ◊ Remote Monitoring

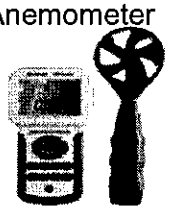


With other instruments



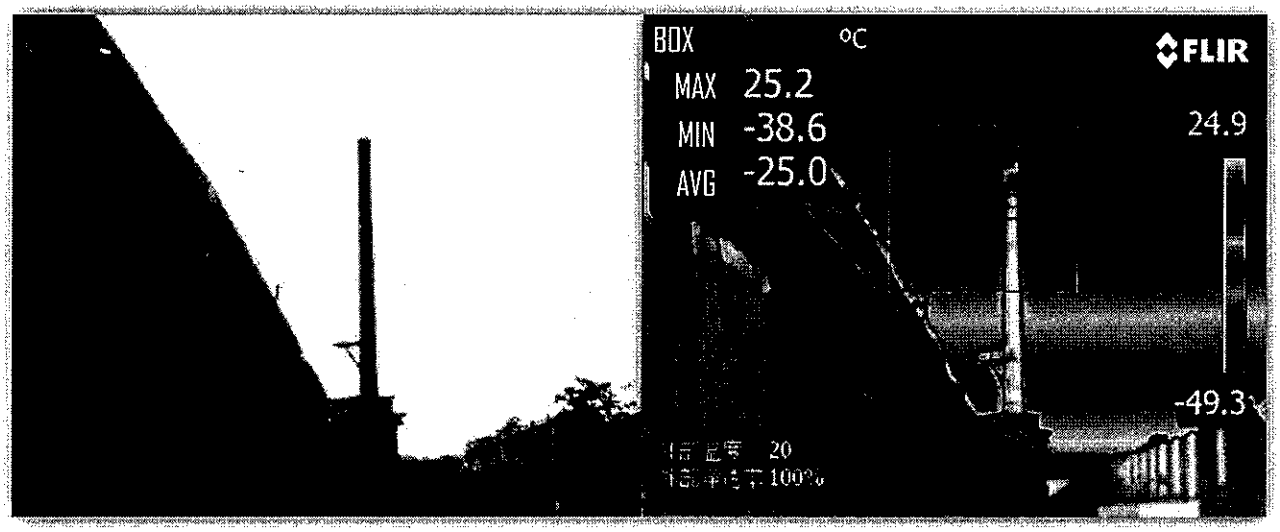
Flame ionization detector

Anemometer



Instrument

We can not see, and it helped us to see



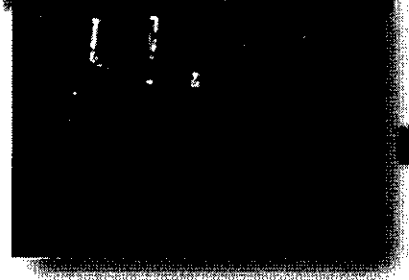
By naked eyes

By infrared thermal imaging camera

Key Point

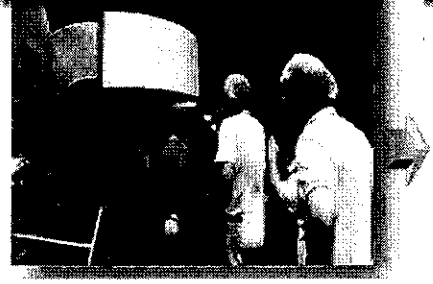
Confirm
(The target)

Monitoring
(Abnormal operation)



Rushed
(Into the factory)

Evidence collecting
(Exhaust gas flow)



Evidence collecting
(Exhaust by pass)

Evidence collecting
(ConC. measurement)

Case Studies

Illegal pollution sources Monitoring

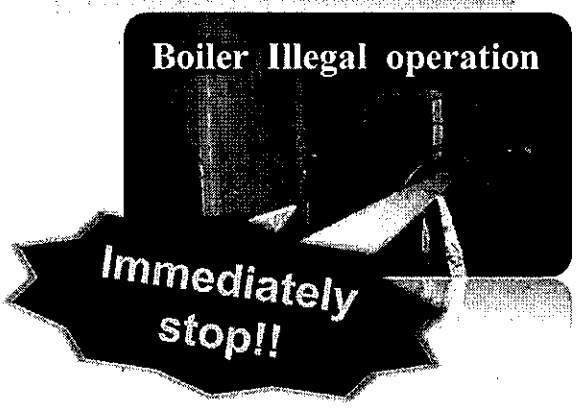
No operating license
Stacked fuel (lots of wood)

Prove illegal

Illegal operation???

Night monitoring

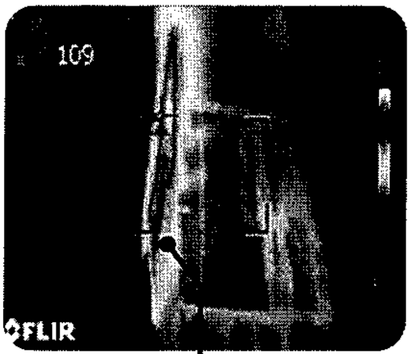
Boiler Illegal operation

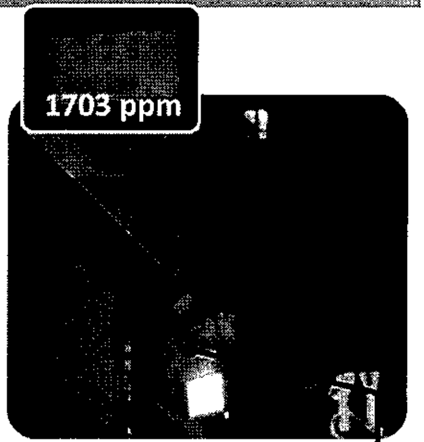


TAOYUAN 桃園

Case Studies

Pipeline leak detection





- [illegible] gas collection pipeline.
- The appearance looks slightly breakage

- Use infrared thermal imaging camera can quickly find leaks in many pipeline.

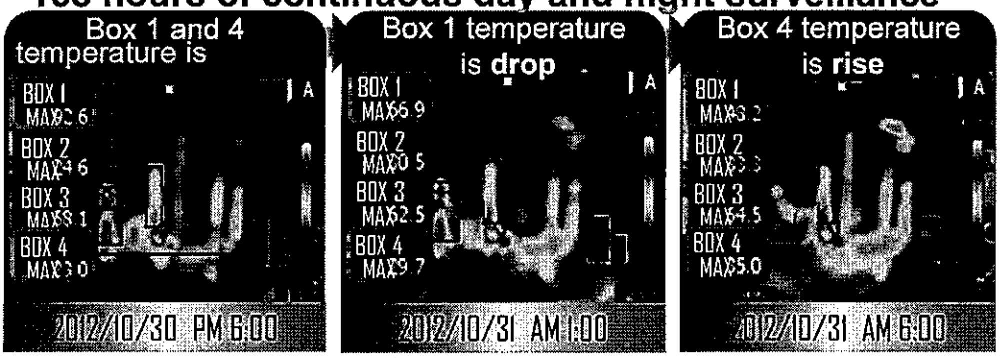
- Measured emission concentration with Flame ionization detector.

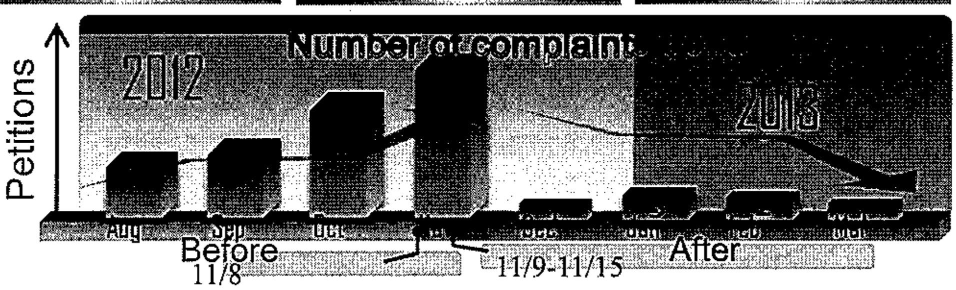
TAOYUAN 桃園

Case Studies

Project of pollution petition

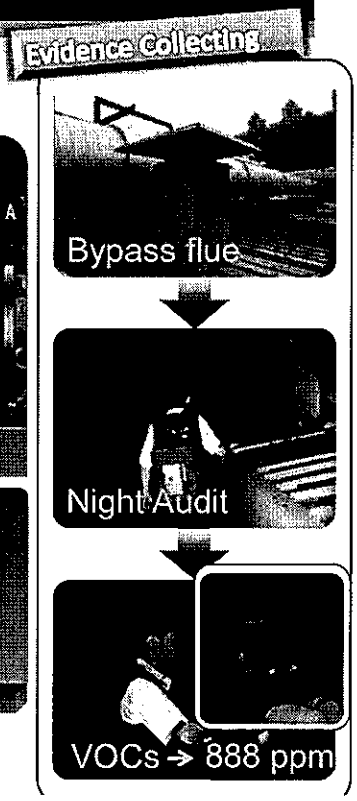
168 hours of continuous day and night surveillance





11/8
audit abnormal op.

11/9-11/15
Shutdown and improve



TAOYUAN 桃園

Conclusion

1. That project has successfully solved pollution petition issues in industrial zone of high pollution Potential(EX:Pingzhen industrial zone petition case 92% reduction).

2. Inspectors combination of technology instrument can improve energy and reduce pollution emissions control(EX:Taoyuan County, reduction of volatile organic compounds 4150.995 tons/year).

3. Effectively reduce ozone incidents and improve air quality(In 2014 the number of bad ozone day is one day).

Emissions Management of Electricity and Steel Industries' $PM_{2.5}$ over Metropolitan Taichung

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Emvironment Protection Bureau, Taichung City Goverment, Taiwan
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Abstract

Taiwan's long-term efforts to mitigate air pollution have been reflected in the trends of reduction in PM10 and O3 concentrations in recent years. WHO pointed out that with an average concentration of PM2.5 in 35.0 μg/m3, the person's risk of death increased by 15.0% per 10.0 μg/ m3, as well as the incidence of respiratory illnesses and cardiovascular disease also simultaneously increased. The announcement on PM2.5's potential healthy threat attracts the attention of both the EPA and the public.

In 2013, annual average PM2.5 concentration in the Taichung city was about 25.7μg/m3, higher than the EPA's allowable air quality 15.0 μg/ m3. Asia's largest coal-fired power plant in the coast side, which has annual emissions of PM2.5 of 1,702 tons/year, makes thing even worse, not to mention of several steel plants in the city. The local EPB is setting the strategy aimed at the city's main industrial emission sources – electricity industry and the steel industry. They are to monitor as well to provide control measurements.

In 2012, a pilot study showed that the electric arc furnace total particle matters are the highest 6.5 mg/Nm3 with a relatively high proportion of heavy metal components, followed by steel industry sintering plant 2.8mg/Nm3; than the coal-fired plant 1.80 mg/Nm3. The EPB will take these measurements to set regulatory standards to regulate the industries accordingly. The details on the emissions management are discussed in the contents.

Keywords: $PM_{2.5}$ 、coal-fired power plant 、steel industry

臺中市電力業及鋼鐵業 $PM_{2.5}$ 排放管制

黃崇典 1*、商文麟 2**及柯宏黛 3***
代理局長 1*，科長 2**，股長 3***
臺中市政府環境保護局，臺灣
通訊作者：趙重周(c0006@taichung.gov.tw)

台灣長期在空氣污染減量的努力已反應在 PM_{10} 與 O_3 濃度降低上，但近年 $PM_{2.5}$ 空氣污染問題逐漸受重視，世衛組織指出當 $PM_{2.5}$ 年均濃度達 35 $\mu g/m^3$ 時，人的死亡風險比 10 $\mu g/m^3$ 約增加 15%，呼吸系統病症和心血管病的發病率也同步增高，其對健康的潛在傷害讓環保署及民眾不得不重視。

臺中市位於台灣中部，2013 年本市 $PM_{2.5}$ 年平均濃度約為 25.7 $\mu g/m^3$，高於空氣品質標準 15 $\mu g/m^3$，位於本市的台中火力發電廠目前為亞洲最大的燃煤發電廠，每年排放原生性 $PM_{2.5}$ 為 1,702 噸/年。臺中市政府環境保護局為改善 $PM_{2.5}$ 污染問題，規劃對本市 $PM_{2.5}$ 排放量最大的工業—電力業及鋼鐵業進行調查及研訂管制措施。

2012 年 $PM_{2.5}$ 管道濃度檢測結果顯示，鋼鐵業電弧爐 6.5 mg/m^3 最高，鋼鐵業燒結廠 2.8 mg/m^3，台中電廠 1.80 mg/m^3。本市將依不同行業別訂定 $PM_{2.5}$ 管道排放標準，鋼鐵業電弧爐 $PM_{2.5}$ 排放濃度高，且重金屬成分比例偏高，將是本市優先訂定管制標準予以管制的行業。

關鍵字：$PM_{2.5}$、燃煤發電廠、鋼鐵業

$PM_{2.5}$ Control on the Electricity and Steel Industries in Taichung

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Acting Director General 1*, Chief 2**, Head 3***
Environment Protection Bureau, Taichung City Government, Taiwan.
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In 2013, annual average $PM_{2.5}$ concentration in Taichung was 25.7 μg/m³, exceeding 15.0 μg/ m³, as regulated by the Environmental Protection Agency (EPA). The Environmental Protection Bureau (EPB) of Taichung is setting new strategies against major emitters – its electricity and steel industry, as the city is home not only to numerous steel plants but to the largest coal-fired power plant in Asia, emitting annually 1,702 tons of $PM_{2.5}$. These industries are now obliged to monitor $PM_{2.5}$ and to provide their control measures.

A pilot study in 2012 shows a ranking of major PM emitters in Taichung. The electric arc furnace, with a relatively high proportion of heavy metal components, tops the list with a total PM of 6.5 mg/Nm³. This is followed by the 2.8 mg/Nm³ of the sinter plants in steel industry, and than by the 1.80 mg/Nm³ of the coal-fired plants . The EPB of Taichung will take into account this survey to set regulatory standards for these industries. Details regarding the emission control are discussed as follows.

◆ Air Quality Improvement since 2004

- Reduced concentration of air pollution.
- The lowest annual average PM_{10} concentration in 2012.
- The lowest annual average NO_2 concentration in 2013.
- Decreasing $PM_{2.5}$ concentration in the last 8 years.

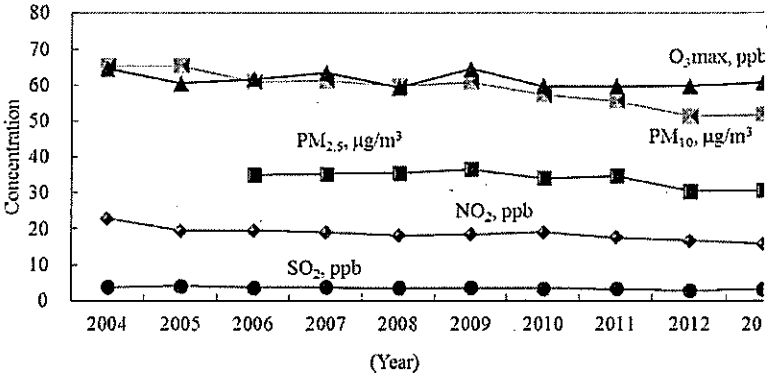

Figure 1 · Trends of annual mass concentration of five air pollutants.

◆ Coal-Fired Power Plant Emission Reduction

In 1999, the City of Taichung has introduced mission standard for electricity and steel ndustries. A stricter standard was re-introduced in 012. As a result, annual emissions of SOx and Ox have dropped by 64,000 and 22,000 tons spectively. An integrated steel mill was stablished in Taichung harbor in 2008. The mission standard for steel industry in Taichung is ricter than the national emission standard.

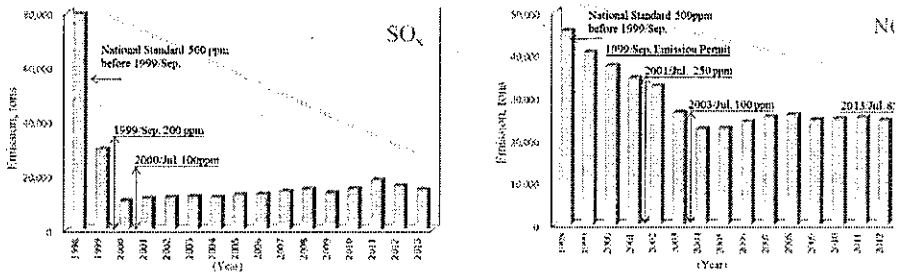

Figure 2 · Trends of emission from electricity industry since 1999.

◆ The results of $PM_{2.5}$ sampling from stationary sources

Table 1 · Characterization of filterable particulate matter (FPM) and condensable particulate matter (CPM) $PM_{2.5}$ form Electricity and Steel Industries.

ustries	Process	Air Pollution Control Devices	FPM, mg/Nm³	CPM, mg/Nm³	Emission Factor
tricity lustry	Coal-Fired Boilers	SCR · FGD · ESP	0.87	2.27	5.79 g/MHW
teel lustry	Sintering Plant	ESP · FGD · SCR	0.69	2.16	1.66 g/Ton
	Electric Arc Furnace	CO Flare · Cooling Tower · Bag House	2.05	2.6	1.89 g/Ton

Table 2 · Components of filterable particulate matter (FPM) $PM_{2.5}$ from electricity a steel industries.

Unit:

Sources	Total Carbon	Ion	Metal	Othe
Power Plant Coal-Fired Boilers	44.0	20.7	23.7	11.6
Steel Industry Sintering Plant	11.2	14.8	60.6	13.4
Steel Industry Electric Arc Furnace	10.5	9.3	68.3	11.9

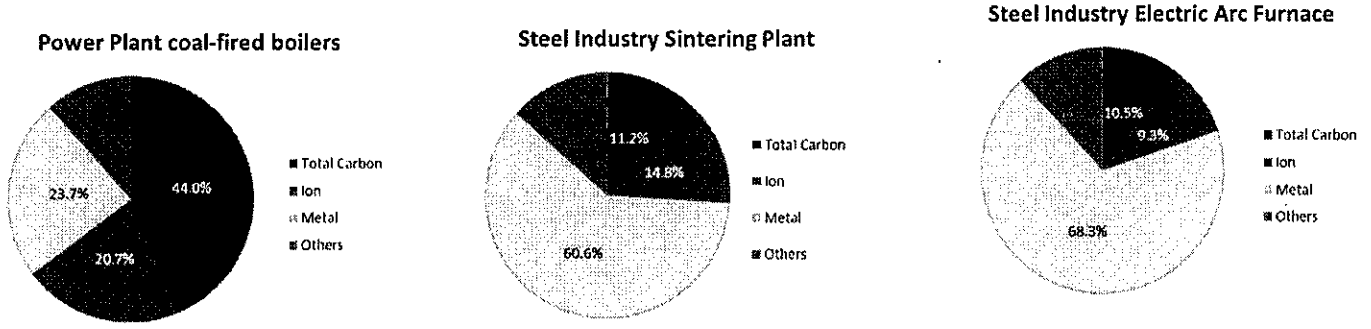

Figure 3 · Components of filterable particulate matter (FPM) $PM_{2.5}$ from electricity and steel industries.

Tainan City Successful Experience for the Promotion of Vehicle Anti-Idling Control

Chang, Hwang-Jen[1], Chiu, Jui-Chi[2], Lin, Chieh-Hung[3]

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Abstract

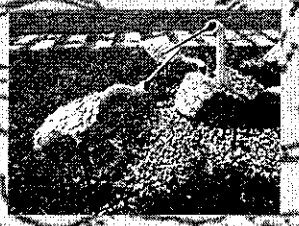
Mobile sources of air pollution has significantly influenced on air quality in Asian cities. To effectively reduce vehicle pollution, and to improve air quality and maintain people's health, Tainan City has started to change people's habit of using vehicles since 2006. It was the first case that "Turn off the engine when not driving and stop global warming" were used as slogan to launch the policy of vehicle Anti-Idling control. Tainan City is the first city in Asia passing Self-Government Ordinances to specify vehicle idling not exceeding 3 minutes, which was then adopted by central government and officially legislated to synchronously implemented nationwide in 2012.

For reinforcement of key control in some areas where vehicle is easy to be vehicle idling, the policy of anti-idling in taxi waiting area and anti-idling vehicle in campus has been gradually promoted since 2013. Monitoring data shows that NO, HC and CO concentration in ambient atmosphere during the peak time to and from schools where demonstrate zero vehicle idling is only 50% of those without promoting vehicle idling control. The effectiveness is significant. So far, various vehicles 9184 were inspected to improve after policy promoting. Based on decrease of 3 minutes idling each vehicle per day, 1157 tons CO2 has been reduced. Out subsequent goal will be continuing to push citizen's support for anti-idling vehicle.

Keywords: Tainan City, anti-idling, Self-Government Ordinances, vehicle idling control

Low-Carbon Life-Style

Environmental Protection Bureau of Tainan City Government Director-General CHANG, HWANG-JEN
Environmental Protection Bureau of Tainan City Government Technical Specialist CHU, MEI-KUEI
Environmental Protection Bureau of Tainan City Government Air Quality and Noise Control Management Section Manager CHIOU, RUEI-JI



1 Introduction

Tainan City was selected as demonstrating Low-Carbon-City for Southern Taiwan in 2011. Mayor William Lai announced that 2012 is the first year of Low-Carbon-Tainan, and a "Low-Carbon-City Project Office" was established on March 16th that year.

2 Vision & Strategies for Promoting Low-carbon City

The low carbon blueprints (Fig.1) in Tainan from top to bottom are one prospect, two goals, eight directions, and ten plans. Perform 12 subprojects, 33 promote measures, 83 specific practices, carbon reduction benefits up to 366,000 tonnes, yielded a rich harvest in 2012. Perform 10 subprojects, 45 promote measures, 91 specific practices, carbon reduction benefits up to 1,340,000 tonnes.

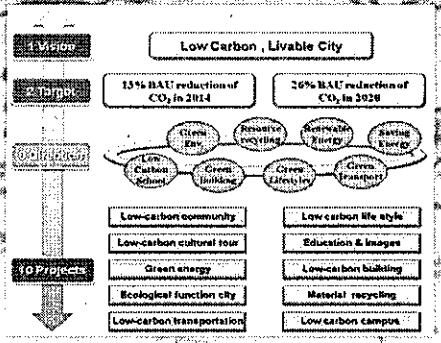
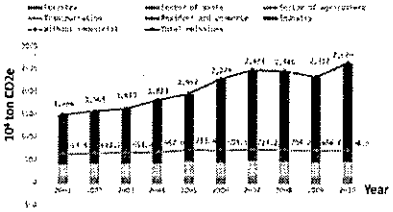


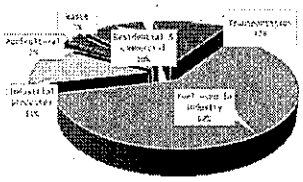
Fig.1 low carbon blueprint and vision of Tainan City

3 Implementation of the outcomes and effectiveness

(1)Greenhouse gas interrogation

Tainan City is the first one get Verification for GHG Inventory of the City. The total GHG inventory in Tainan City was 2,619.7 mt CO_2-e; sector of Energy was 1,902.26 mt CO_2-e, contributed 73% to the total value (fuel used in industry, transportation, and resident and commerce took 50.7%, 12.1% and 9.9%, respectively) of Tainan City in 2010. The others were 566.42 mt CO_2-e in the sector of Industrial Processes, 116.26 mt CO_2-e in the sector of Agriculture, and 34.72 mt CO_2-e in the sector of waste; they took 22%, 4% and 1% to the total value, respectively.





CO_2 Emissions (2010) & CO_2 emissions composition of Tainan

(2)Product carbon footprint

The results of product carbon footprint (Table 1), similar carbon labeling product, LOHAS Good Rice and Red Brick Pudding were lower of carbon emissions.

(3)Low carbon, green energy,electric cars in Tainan

CO_2 emissions from the electric vehicle is lower than 50g / km, CO_2 emissions from gasoline combustion engine of 200g / km, CO_2 emissions from gasoline engine vehicle is four times than the electric car. Carbon reduction benefits of electric vehicles up to 46.8 tonnes / year, Fuel consumption expenditures decreased 1.06 million yuan

(4)Promotion and advocacy of low-carbon diet

Meatless Day per week, public sector meeting provide 6,340 copies vegetables meals in 2012, about 22.2 million person response, estimated 8,028,219 people respond to every Meatless Monday, estimated to reduce carbon dioxide emissions up to 6,260 tons.

(5)Carbon reduction

Promote universal participation in carbon reduction action in 2012 carbon reduction promote and advocacy implementation effects won the first prize in the national first category, residential and commercial energy saving, water-saving performance won the first prize in the national first category, promote "Meatless Day per week" get excellent award.

Implement activities outcome of Tainan

Table 1. Product carbon footprint

Product	Emissions	Unit
LOHAS (Lifestyles of Health and Sustainability) Good Rice	1.49 $kgCO_2e$	1kg per product
Geely Mullet	24.32 gCO_2e	1g per mullet
Roasted Caramel Pudding	344.18 gCO_2e	150g per puddung
Milkfish Q-cookie	260.97 gCO_2e	60g per product

4 Conclusion

Our city, Tainan, will use green policies as our foundation, combine with innovative regulations, and establish low-carbon city promotion commission to develop clear reductive targets, strategic directions, incentives, measures and principles. Moreover, we would like to induce the whole communities and industries to build low carbon thinking and culture, and promote green living functions jointly. By building the construction of low carbon buildings, communities, commercial districts, transportation environment, and participating with international strategic alliances, we will enhance our international competitiveness. Hope that government and the private sectors could work together to create a low-carbon sustainable Tainan city, and build a new low-carbon focus of world-class.

DRAFT as of 14 Nov 2014

Cities Certification Framework
CAA's Proposed Framework of Incentives, Support and Accountability for Better Air Quality in the Urban Environment

Introduction

The unprecedented pace of growth in Asian cities reflects an impressive economic expansion in global trade and development across industrial, commercial and household sectors, along with new environmental challenges that threaten the long-term success of these gains. Urban air pollution has become one of the most visible and damaging environmental costs of this progress that has the potential to damage not only human and environmental health, but stifle the possibility for long-term economic growth and stability.

To address this pervasive problem, CAA is proposing a new initiative to help launch cities throughout Asia on a fast track to cleaner air using the power of a progressive, independent certification and incentive scheme. The initiative will be designed to leverage the type of critical partnerships, technical support, funding and accountability mechanisms that cities need to identify and effectively mitigate the most significant sources of local and regional air pollutants. The initiative comes in the wake of the rising costs of air pollution, which is now recognized as the "largest single environmental risk" according to the World Health Organization. WHO estimates that premature deaths caused by air pollution have doubled, accounting for one in eight deaths – over 7 million lost lives in 2012.

What is Eco-certification and how can it help?

Certification is a tool that has been widely used in recent decades to stimulate voluntary actions to reduce adverse environmental impacts across a variety of sectors including tourism, agriculture and energy-consuming products. A certification scheme generally offers some kind of incentive to participating companies or organizations that implement a list of specific environmentally beneficial actions conforming to the scheme's requirements for certification. The benefits of compliance usually include a range of marketing advantages related to exclusive use of an eco-label or certified marketing claim, tax benefits and other fiscal incentives designed to expand markets and consumer demand for greener goods and services, and technical support to facilitate continuous improvements to reduce environmental impacts.

Eco-labeling certification schemes can provide credibility and accountability for green claims, and demonstrate the feasibility of best available technology to meet more rigorous standards of environmental protection. Just as accounting firms perform impartial financial audits to give investors, taxpayers and philanthropists confidence in the fiscal health of a company, NGO or a government, eco-labeling certification schemes can give consumers and others in the chain of commerce confidence in the credibility of environmental claims concerning the environmental attributes of goods and services. They can also help mediate trade disputes and accelerate market acceptance of environmental innovations by providing clear standards of practice with which to compare the relative environmental performance of different companies or other institutions and reliable data with which to measure the tangible environmental benefits of specific air quality management strategies.

Citizens, investors, government agencies, and other businesses can use these certified yardsticks to make choices about the products they need to buy or institutions they need to support in order to secure the greatest improvements in environmental quality and sustainability. Setting a high bar and creating incentives for continuous improvement can stimulate market demand and mainstream the use of new technology as early adopters are rewarded with greater recognition and demonstrate success with the new greener products, policies and practices.

Certification offers a valuable tool to help cities solve the complex problem of air pollution in its ability to stimulate a set of synchronous actions. In particular, programs targeting urban air pollution and greenhouse gas emissions will require effective coordination across different institutions to address emissions from transportation, industrial production, and the built environment. Success not only requires changes in goods and services, such as more efficient vehicles and cleaner burning fuels, but also new approaches to land use decisions, and targeted investments in architecture and infrastructure such as roads, wastewater treatment and electric power generation that extend far beyond household purchasing practices, changes in product design or eco-efficient manufacturing practices. Certification can help create a consistent action plan and roadmap for implementing these changes and tracking progress in a way that inspires confidence of investors and other stakeholders who can provide access to necessary funding, technical support, and enabling policies.

How Does Eco-certification Work?

The best, most reliable and respected certification schemes are founded on a set of meaningful and consistent standards for environmental protection and/or social justice, developed and administered by an organization or group with mechanisms to independently verify compliance. Once the standards are established, the certifying body works with participants to establish goals and time-bound targets to demonstrate compliance, at which point, certification is granted. The participating organization is then given a license to use the scheme's claim, eco-label, or other communication and marketing tools, and to avail themselves of any fiscal incentives or technical support that may be on exclusive offer.

The process to develop the standards and certification mechanisms must be open and transparent; reflecting input from technical experts, consumers and other stakeholders, government and candidate institutions for certification. The ultimate success of such programs lies in a strong scientifically proven relationship between the criteria for compliance and measures of environmental quality, such as energy or water conservation or reductions in specific types and levels of air pollutants.

It's also important that certification schemes have an established system for improving and expanding the requirements in ways that reflect the evolution of best practices and new technology, so as to ensure that the program sustains its mission to provide a mechanism of public recognition for those institutions, goods and services that take initiative to meet the highest standards of environmental performance. As best practices improve and are widely adopted, certifiers may need to raise or change the standards over time in order to further challenge participants to achieve higher levels of performance. Alternatively, the scheme could be designed to retire at the point at which cities in the target area achieve success in meeting the highest air quality criteria. These and other critical elements

of strong sustainability certification schemes are detailed further in a set of Credibility Principles and Codes of Practice established by iSEAL, a large network of the leading certifying agencies and other stakeholders.

What elements would a city certification include?

CAA envisions an innovative certification program to support cities in adopting best practices to mitigate urban air pollution, using a series of mutually reinforcing policies, fiscal incentives and technical support to enable cities to identify and eliminate the biggest contributing sources of air pollutant emissions. Certification requirements will be designed to measure, support and promote achievements in three essential domains:

- Policy-making to establish the necessary authorities to act to control air pollution;
- Capacity building measures to acquire technical support for effective action;
- Action to institute specific substantive air pollution control measures that achieve specific measurable reductions in key air pollutants.

The program will be developed following the iSEAL Principles of Credibility and Codes of Good Practice for Standards-setting, Impacts and Assurance, and taking direction from the United Nations Forum on Sustainability Standards. These guidelines outline the primary elements that will comprise the operating framework for the Clean Cities initiative. They include: Governance, Standards, Accountabilities and Incentives.

Within each of these areas, there are a number of options that CAA will consider in developing the program through an open and transparent series of stakeholder consultations. The goal is to both challenge cities to establish firm commitments to air quality management and then provide strong financial and technical support that cities need to find and implement the most cost-effective and sustainable measures to control air pollution. Once established, the system is provides a mix of incentives to stimulate "virtuous competition" to reward higher levels of compliance and sustained commitments to continuous improvement.

Governance

The credibility of certification is rooted in the governance of the organization that develops the standards and administers the accreditation process. The program initially will develop within CAA's current structure (e.g board of directors, operating policies, etc), but new structures will likely be built around the program, starting with the development of the standards and process for accreditation. CCAP, the new partnership structure CAA has formed with government leaders and funding agencies will be engaged heavily. The program will also be heavily informed by one or several formal advisory committees to obtain substantive input from city governments, business leaders, consumer and citizen advocates, anti-poverty campaigners, and science and academic leaders.

An important element will be an effective policy to identify and eliminate potential conflicts of interests. The program will feature strict policies against financial, political or other vested interests in the design

and outcome of decisions regarding the certification among those involved in the administration and governance of the program. Consideration will be given to the possible need to establish a separate accreditation organization to administer the program, award certification, etc separate from CAA itself

The business model ultimately developed will be designed to balance high standards for compliance with capacity-building and financial support, in ways that ensure that the program is not overly burdensome and remains widely accessible to the broad range of city governments within Asia-Pacific region. Priorities will focus on cost-effective compliance mechanisms whose costs can be more than offset by demonstrable savings and increased revenues associated with improved air quality and its resulting health and economic benefits. In service to this goal, CAA will explore options for providing direct financial assistance to support cities in taking specific steps toward certification, such as creating an independent foundation or coordinating with international aid agencies to establish a joint fund for urban air quality.

Standards

Standards will provide a framework with which to progressively measure achievements in the three domains listed above (policy making, capacity building and demonstrated action and impact). The program is envisioned to develop in an open, transparent and iterative fashion, focusing first on building a foundation of policies and technical capacity, along with baseline air quality measures and source characterization, against which to track progress. Because cities are so diverse, each having a unique set of factors driving their air pollution challenges, success of the certification program will depend in part on standards having some customizable elements that recognize strategies and achievements that may have greater significance for some cities than for others. Thus, the standards-setting process will be progressive, and offer more diversification as more cities commit to compliance. This will likely take the form of a combination of strict pass/fail criteria, along with relative scores rating the quality of certain air quality management measures, and progressively more stringent maximum thresholds for a specific set of criteria air pollutants. All criteria will be developed through an open and transparent process involving outside expert advisory panels and public consultations.

First tier standards will apply equally to all cities and will be largely qualitative, specifying minimum requirements for internal management systems that designate authorities and accountabilities within city government critical to improving air quality. In addition, cities will likely be expected to commit to trainings and partnerships to obtain technical support in the use of tools like SCORE and RACE to inventory primary sources of local air pollution and to set priorities for action, including strategies for air quality monitoring and emissions control. This baseline level of compliance may also include a risk assessment element that will enable cities to assess the "socio-economic" (social, economic and ecological) costs of baseline levels of air pollution.

In subsequent phases, standards development will focus on more quantitative compliance criteria that may require specialized technical support and capacity building needed to target the most important local sources of air pollution. This stage is envisioned as a progressive compliance structure that would offer bronze, silver or gold levels of compliance, in proportion to the city's relative level of achievement.

Cities will gain a higher grade certification as they move from capacity-building to implementation of specific actions that result in measurable reductions is specific air quality criteria. CAA will also consider criteria that measure improvements in related socio-economic indicators, such as prevalence of deaths or hospital admissions due to respiratory and other diseases, average vehicle miles travelled, or business and household energy savings. Additionally, CAA will explore strategies to ensure that air quality improvements benefit all sectors within a city in ways that enhance liveability and vibrancy for all, especially the most vulnerable members of society.

Accountabilities

Compliance with the first tier standards will be self-verified, with CAA tracking policies, training, etc that participating cities develop to meet their obligations for opting into the program. For subsequent tier certification, CAA will consider several available options for using third-party certifiers.

Independent verification that's free from conflicts of interest is critical to the credibility of any certification system. It's important that the auditors tasked with awarding certificates of compliance have no stake in either the success of the certification program itself, the tools and technology defining standards or required for compliance, or the ultimate outcome of a participating city's effort to get certified. Neither should those involved in creating standards or verifying compliance benefit in any way from the financial or other incentives that result from certification.

Financial auditing and oversight agencies such as the big three accounting firms (KPMG, PWC, and TK) may be well-positioned to perform certification audits as they already work in that capacity in providing financial auditing services for cities and government agencies. Other private certification agencies that work with other product-related eco-labeling schemes may also be considered. Costs and financing will be critical factors in determining the best verification strategy for cities. It will be important to develop a financing mechanism that does not overly burden participating cities, many of which are already working within very limited budgets. It may be possible to derive financing for audits from a portion of the cost savings that cities realize from the air pollutant mitigation strategies they undertake as a result of the certification program.

Incentives

Benefits of certification come in the form of direct incentives provided by the certifying agency and its partners, and indirect health, environmental economic and social advantages of mitigating problems that the standards are designed to solve. CAA envisions creating an integrated set of direct benefits that will be designed to stimulate a cascade of indirect benefits that are anticipated to grow with advanced levels of compliance.

Direct Incentives:

Three general types of benefits are being established:

- **Tools for technical assistance** to support capacity-building and sustainable infrastructure. Several tools are already in development, including a city-to-city mentoring program, training and technical

assistance opportunities and a virtual knowledge platform. These tools will directly engage participating cities with a network of international air quality experts, program administrators from other cities that have achieved significant air quality, and software and other virtual tools to help cities chart the most cost-effective pathways to lower pollutant emissions and better air quality.

- **Marketing and communications** that promote the value of certification and promote commercial development for certified cities. A primary benefit of certification is the licensed access to marketing materials including claims and labels associated with the program. Just as the organic label has built strong markets for certified crops, and bond ratings help investors find municipalities with more reliable accounting systems, a Clean Cities certification will help attract business from the growing community of individual and institutional consumers and investors who are seeking to support environmentally conscious economic development. Certification could also help cities reclaim investment losses caused by degraded air quality as the program bolsters the city's image as a healthy place to visit, live and work. It provides workers, companies, tourists and others with a credible indicator of a city's environmental health and commitment to sustainable development. The confidence-building aspect of certification is a proven strategy for overcoming market resistance to eco-innovations of many types. By committing to certification goals, cities send a powerful signal to the marketplace that helps stimulate commercial enterprise to develop the kinds of products and technologies needed to facilitate the transition to more sustainable operations.
    - **Access to intergovernmental processes, global health initiatives and business development** to strengthen regional support for collective actions that leverage greater gains in regional air quality than could be achieved by ad hoc certification initiatives. CAA is working to build in a regional component linking city certification to intergovernmental cooperative agreements that could help secure mutually supportive policies, economic instruments, and public infrastructure investments critical to advancing air quality management at the local level. CAA is also exploring possible partnerships and other strategies to align certification with global health initiatives at the institutional level through the WHO and other public health programs that can benefit from air quality initiatives, potentially unlocking more diverse resources for certified cities. Finally, similar coordinating efforts will target the business sector to establish clean air certification as a primary qualifying criteria for economic development programs initiated through industry channels such as regional and international chambers of commerce, trade agreements and business associations.

Indirect Benefits

Studies consistently confirm the sizeable and diverse economic, health and social benefits of air quality management programs. In financial terms, studies show that returns on air quality investments can be as high as a factor of thirty, when accounting for improved health and productivity, as well as economic benefits of improved visibility and other environmental quality measures.[1] Communities that take the

[1] http://www.epa.gov/cleanairactbenefits/prospective2.html and http://www.ehjournal.net/content/7/1/41

lead stand to gain the greatest economic advantage in adopting air quality management strategies and studies show it's now possible to de-couple environmental damage from economic development.

CAA seeks to strengthen these indirect economic, health and social advantages for certified cities by linking the certification to grant programs and other mechanisms for increased commercial development. CAA is working with a diverse group of funders to open channels for priority access to grants and other financing to support cities in achieving higher levels of certification. A longer-term effort is planned to help private investors recognize commercial advantages of clean city certification and develop commitments to channelling preferential investments that expand commercial enterprise in these regions in ways that advance air quality management objectives. Strategies may target local and regional chambers of commerce, trade associations, labor and consumer advocates as well as anti-poverty campaigners and green investment organizations.

Implementation

The near-term proposal is for a two-year effort to launch the program, with an initial goal of achieving commitments from ten cities. The first steps will be consultative and engage a range of stakeholders, including large and small cities, to develop a first tier set of standards and mechanisms for accreditation and second or third party verification. At the same time, CAA will begin to build linkages with external partnerships to incentivize the program and build recognition and support among stakeholders oriented around significance of certification in marketplace and in advancing broader goals for sustainable production and consumption.

The following summarizes the near-term plans for developing the clean air certification program, and anticipated schedule and milestones.

A. **Governance Structure (2 months)**
   Goal: research strengths and limitations of possible governance options including models for organizational structure (CAA as secretariat/administrator vs new CCAP standard development and accreditation body); define roles for key partners; board representation, funding sources. Develop a proposal and plan for external advisement including legal counsel.
B. **Standards Development (9 to 12 months)**
   Goal: establish a first tier set of criteria that initiate commitment to city participation.
   1. Research and develop draft Tier 1 standards (issued as draft standard)
   2. Expert consultation on elements of draft standard and related metrics to establish strong technical basis for first tier and future criteria.
   3. Tier 1 standard revision and re-circulate for comment (issued as final proposed standard)
   4. Revision and issue final standard
   5. Visioning process for developing Tier 2 and more comprehensive set of standards
C. **Accountability (3 to 4 months)**
   Goal: Develop a proposal for compliance verification mechanism(s) and levels of compliance.

1. Type and mechanism of verification (voluntary claims, mandatory third party audits and certification),
2. Levels and/or measures of compliance (progressive compliance –bronze, silver, gold; pass/fail; comparative rating).
3. Candidates for accreditation as third party certifiers: accounting firms/auditors; other certifiers, NGOs, a new CAA subsidiary.

D. Incentives and Communications/Marketing (6 to 8 months)

Goal: develop a menu of incentives and marketing tools, and process for licensing their exclusive use by certified cities and possibly active partnerships.

1. Develop candidate logos, labels and other marketing tools
2. Research licensing process for other certifications (Green Seal, World Tourism Organization, MSC, FSC and Energystar). Develop proposal or recommended options for CAA.
3. Consultation with possible partners to develop financial incentives, technical support and feasibility and possible partnership elements including city-city partnerships, and other types of collaboration with regional or national stakeholders, other certification schemes, and trade and consumer associations, and intergovernmental, corporate, or philanthropic investment and development groups.

Proposed questions for consultation:

1. What would make your institution or organization sign up for this?
2. We want this to be a simple, efficient framework that makes a difference. What are your suggestions for us to develop a framework that is simple, efficient and one that makes a difference?
3. What key criteria do you suggest should be included in the city certification framework?

BAQ
BETTER AIR QUALITY CONFERENCE
sri lanka
19-21 November 2014

Integrated Conference of Better Air Quality 2014 and Intergovernmental 8th Regional Environmentally Sustainable Transport Forum in Asia

Recognizing Cities efforts to improve Air Quality through City Certification

An innovative Program of CCAP

Bjarne Pedersen
Executive Director
Clean Air Asia

Introduction

CLEAN AIR ASIA

- Today we are discussing a new innovative initiative aimed at
  - Fast tracking cities on the road to cleaner air and sustainable development
  - Leverage critical partnerships, technical support, funding and accountability
  - Proven success in other sectors

What is eco-certification

- A tool to stimulate and reward voluntary actions,
- Incentives for steps taken including a 'label' or logo such as technical support, marketing
- Credibility and accountability for environmental claims
- A consistent set and steps of action
- A set of standards and a communications element (in short)

How does it work?

- Meaningful and consistent set of criteria/steps/standards
- Development must be open, transparent and inclusive
- Science based link between criteria and improvement
- ISEAL as the reference point for best practice

What would/could the criteria include 1

- Policy-making to establish the necessary authorities to act to control air pollution;
- Capacity building measures to acquire technical support for effective action;
- Action to institute specific substantive air pollution control measures that achieve specific measurable reductions in key air pollutants.

What would/could the criteria include 2

- First tier: Minimum requirements/building the foundation
- 2 more tiers – progress improvements and more quantities criteria plus technical support.
- Possibly socio-economic indicators when progressing

Incentives

- Direct:
  - Tools for technical assistance
  - Marketing, communication, brand of city
  - Access to international processes, global health initiatives, business development
- Indirect:
  - Economic, health, social

Other issues

- Governance
- Accountability
- Timeframe – development and consultations, up to 12 months

Consultation and insights

- What would make a city or your institution or organization sign up for this?
- What are your suggestions for us to develop a framework that is simple, efficient and one that makes a difference?
- What key criteria do you suggest should be included in the city certification framework?
- Who should we consult for maximum buy in and impact
- Bronze, Silver and Gold ? Or ?

For more information: www.cleanairasia.org

BAQ
BETTER AIR QUALITY CONFERENCE
sri lanka
19-21 November 2014
8th EST
REGIONAL ENVIRONMENTALLY SUSTAINABLE TRANSPORT FORUM IN ASIA

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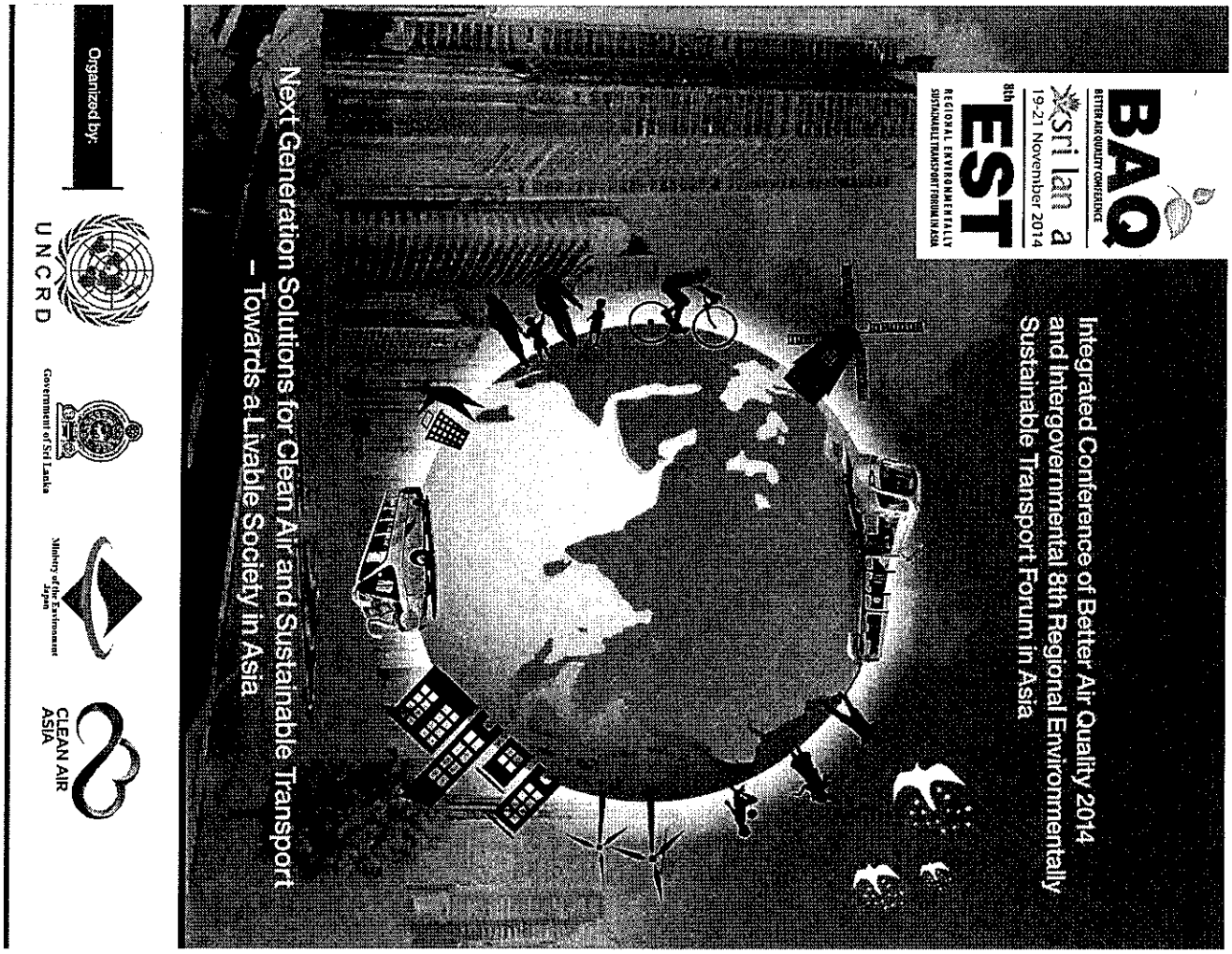

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WELCOME MESSAGES

Government of Sri Lanka

His Excellency Mahinda Rajapaksa
President
Democratic Socialist Republic of Sri Lanka

Considering the contribution it will make towards improving Air Quality in the Asian Region, I am pleased to send this message to the International Conference on Better Air Quality 2014 (BAQ 2014) and the 8th Regional Environmentally Sustainable Transport (EST) Forum being held in Colombo.

Sri Lanka is privileged to host this important event on Sustainable Development and Environmental Protection in view of the relevance it has to the current issues that affect aspects of development and social progress in the world.

BAQ 2014 brings together policy makers, practitioners and industry leaders to discuss issues covering key sectors of transport, energy industry and climate change with emphasis on innovation, and the opportunity to learn and share experiences in a vital field of social and economic activity.

This 8th Regional EST Forum in Asia as a high level inter-governmental policy forum, will provide a strategic knowledge platform to address policy and institutional challenges on multi-sectoral environment and transport issues.

The theme for this integrated study "Next Generation Solutions for Clean Air and Sustainable Transport – Towards a Livable Society in Asia" will address current areas of importance, such as unprecedented urbanization and the steady economic growth in Asia that has increased the pace of motorization and industrialization. This will include the challenges in realizing safe, efficient, affordable and people & environment-friendly transportation systems.

I trust the exchange of experience and knowledge of new technology in these relevant fields at this event will help formulate new policies and programs across Asia that will establish innovative partnerships for progress.

I commend the Clean Air Asia (CAA) of the Philippines and the United Nations Centre for Regional Development (UNCRD) Japan, who are co-organizers of this event with the Sri Lankan Ministry of Environment and Renewable Energy and the Ministry of Transport, for their initiative in enabling Sri Lanka to host this event of significance.

I welcome all foreign participants to Sri Lanka and wish they will take away the best memories of our friendship and hospitality, while contributing to regional progress on Air Quality, and wish this integrated event of exceptional regional importance every success.

Government of Sri Lanka

Hon. Susil Premajayantha
Minister of Environment
and Renewable Energy
Sri Lanka

Environment, health and quality of life are interrelated as the environment plays a crucial role in people's physical, mental and social well-being. Environmental pollution is not only seriously affecting the humans in the form of diseases and disasters but also the animals, plants and all the objects in the environment. It's time for global institutions and governments to join hands to preserve the environment for a healthy livable society.

More than fifty percent of the today's world population live in urban areas. Countries across Asia are becoming rapidly urbanized and hundreds of millions of people will be added to Asian cities in the next decades. As the cities' economies grow so will the demand for energy and the number of vehicles. With the economic growth and ever growing population, the Asian cities are facing the problem of creating a livable society which is attractive to live, work and play. The challenge is to make the cities livable with clean air, a low carbon footprint, green buildings and spaces and Environment Sustainable transport systems that embrace public transport, walking and cycling.

Air pollution is one of the biggest hurdles for creating a livable society, having far reaching health, economic and environmental impacts. Emissions of air pollutants cause serious health effects as well as smog, haze, acid rain, which affect the quality of life in the society. Air pollution in urban areas is linked to a range of health problems from minor eye irritations in the short term to chronic respiratory diseases such as asthma, cardiovascular diseases and lung cancer in the long term. The health impacts of urban air pollution continue to worsen globally, with some reports projecting that air pollution is set to become the top environmental cause of premature mortality by 2050. Therefore, addressing the issue of air pollution is becoming increasingly important for the wellbeing of society.

Air quality is very much influenced by the transport sector as it is the most dominant source of emission of most air pollutants. Taking this into consideration, Sri Lanka has identified the need for establishing a sustainable transport system for cleaner air. Vehicle emission standards were introduced and cleaner fuels were promoted to address the issue of air pollution from vehicular emissions.

It is a great privilege to host this important conference in Sri Lanka which will be a catalyst in the introduction of innovative and smart solutions to ensure a safe and equitable environment. As a co-organizer of the Integrated Conference, it is the objective of the Ministry of Environment and Renewable Energy to provide a platform for policy makers, practitioners and industry leaders to share experiences and engage in finding innovative solutions towards ensuring safe and healthy environment by reducing air pollution. Sri Lanka is fully committed to make this Integrated Conference a successful and productive endeavor towards ensuring a livable society in Asia.

I warmly welcome the participants of the Integrated Conference of Better Air Quality 2014 and Intergovernmental 8th Regional Environmentally Sustainable Transport Forum in Asia to Sri Lanka.

Government of Sri Lanka

Hon. Kumara Welgama
Minister of Transport
Sri Lanka

Having organized "Integrated Conference of Better Air Quality (BAQ) 2014 and Intergovernmental 8th Regional Environmentally Sustainable Transport (EST) Forum in Asia" in Sri Lanka, makes me feel very proud and I wish to extend my warm greetings for this conference.

This Integrated Conference makes a platform to bring together a thousand policymakers, technical experts, practitioners and industry leaders from around the region for Asia's leading event on air quality, covering key sectors of transport, energy, industry and climate change. That will be surely a timely requirement when considering on industrialization in all over the world.

With human vulnerability to environmental change reaching unpredictable levels, sustainable development has now been recognized as the key to the long term persistence of any economic activity. We in Sri Lanka, have to be especially concerned on this since our country has been identified as a "biodiversity hotspot" where its many endemic species are subjected to serious threat. The earth's atmosphere – the air we breathe – is indeed one of the planet's key natural resources, on which every form of life depends. Many human activities what we broadly recognize as "development" discharge huge quantities of polluting substances into the atmosphere, and this trend has escalated in the current decades, despoiling this vital natural resource at an alarming rate.

An effective transport system is vital for economic well-being and good quality of life. However, there is widespread concern that the continuing growth of transport is damaging to the environment. Transport is estimated to be responsible for nearly a quarter of global energy-related CO2. There are also rising concerns about its impact on health of living beings. Besides the pollution caused by the increased number of vehicles, we need to consider the additional impact of traffic congestion, where excessive quantities of pollutants are discharged by slow moving vehicles.

So that we have to take actions to deal with this problems in terms of sustainable transport by improving public transport and related infrastructure systems; using cleaner fuels; and imposing standards for monitoring and vehicle emissions. Furthermore, adopting sustainable transport technologies and behaviors allows us to balance our need for mobility with more sustainable lifestyles. Sustainable transport will requires a fundamental shift in investment patterns, based on the principles of avoiding or reducing trips through integrated land-use and transport planning. Moreover it is necessary to shift to more environmentally friendly modes of transport and improving vehicles and fuels, which is seen as a priority to reduce urban air pollution and greenhouse gas emissions. In order to reduce volumes of traffic and emissions, regulations and standards, environmental friendly technologies and concepts for public transport and 'green cities' have to be implemented. And also a sustainable transport policy, to safeguard air quality and human health, will require a systematic integration of numerous modes of transport. I hope this conference will be a ray of sun to achieve this.

Mr. Nikhil Seth
Director of the Division for Sustainable Development
United Nations Department of Economic
and Social Affairs

I am very pleased to welcome you all to the Integrated Conference of BAQ 2014 and Intergovernmental Eighth Regional EST Forum in Asia to be held in Colombo, Sri Lanka from 19 to 21 November 2014. The Conference will be co-organized by the United Nations Centre for Regional Development (UNCRD), Ministry of Transport and Ministry of Environment and Renewable Energy of Sri Lanka, Ministry of the Environment of Japan, and Clean Air Asia.

UNCRD is one of the overseas offices of the Department of Economic and Social Affairs of the United Nations and we are very pleased that UNCRD has been leading the EST initiative in Asia since 2004. The voices of Asian countries have fed into the outcomes of the Sustainable Development process, shown by the Rio+20 outcome – The Future We Want containing a section on Sustainable Transport and the current text of Sustainable Development Goals having targets on sustainable transport in several places.

I am happy to be part of the Integrated Conference, which comprises two leading events in Asia: Regional EST Forum in Asia, and Better Air Quality (BAQ); under the overall theme of "Next Generation Solutions for Clean Air and Sustainable Transport – Towards a Livable Society in Asia". Indeed, clean air and sustainable transport are two crucial elements for a liveable society and there is no better way to debate on next generation solutions. With experts that are gathered for the two events, the Integrated Conference is expected to consider innovative and smart solutions to counter air pollution and greenhouse gases that are caused by production of energy, industrial activities and transport as well as to accelerate the shift towards more environmentally sustainable transport (EST) in Asian cities and countries.

It is significant that this discussion is taking place while at the United Nations we are preparing for the discussion of the post-2015 Development Agenda and the finalization of the Sustainable Development Goals. I am looking forward to an active discussion on Next Generation Solutions for clean air and sustainable transport and I am hoping that the outcomes will make a significant contribution to the global discussion on the post-2015 Development Agenda.

CLEAN AIR ASIA

Robert O'Keefe
Chair, Board of
Trustees
Clean Air Asia

Bjarne Pedersen
Executive Director
Clean Air Asia

Mary Jane Ortega
Chair, Partnership
Council
Clean Air Asia

We, at Clean Air Asia extend our warmest welcome to all the participants of the Integrated Conference of Better Air Quality 2014 and Intergovernmental 8th Regional Environmentally Sustainable Transport Forum in Asia!

Ten years ago, the Better Air Quality Conference (BAQ) was also held in South Asia in Agra, India. Now for the first time in a decade, the BAQ is back again in South Asia, in the beautiful city of Colombo, Sri Lanka. Over the years the conference has gone from strength to strength and this is truly a milestone in our fight for better Air Quality and liveable cities for all.

Better air quality continues to be a major challenge for the Asian region. Air pollution is confirmed to be the world's largest single environmental health risk—causing premature deaths due to cardiovascular and respiratory disease. What's more, Asia faces the highest risk as most of air pollution's impact falls on this region. We are faced with the undeniable facts of human suffering, environmental degradation and monetary costs of air pollution. Coupled with the contribution of many sources of air pollution to climate change there is a great urgency to alter the situation and have a tangible and clear impact.

This conference is a milestone gathering of people working together to create and explore solutions to one of the most pressing issues across Asia. The conference is also a testament to the fact that we still have the opportunity and most importantly, the will to make a real impact on one of the major challenges of our times.

You are all the very reason why we at Clean Air Asia started the BAQ in 2002; to gather stakeholders to cultivate and strengthen an ethos of partnerships and collaboration which makes us all the more effective and passionate about our mission for better air quality, livable cities and making a real difference to the environment and the lives of citizens across Asia.

BAQ always reinvigorates us at Clean Air Asia both as staff and as an organization. We are determined to continue to build on our strengths but also focus even more on the long term impact and real change we can achieve across our programs and with our members, national networks, partners and founders.

On behalf of Clean Air Asia we welcome you to this milestone conference and again thank you for your support.

Ministry of the Environment Japan

Mr. Yoshio Mochiduki
Minister of the Environment
Japan

I am highly pleased to be able to hold the Integrated Conference of Better Air Quality (BAQ) 2014 & Intergovernmental Eighth Regional Environmentally Sustainable Transport (EST) Forum in Asia in Colombo, Sri Lanka with the participation of representatives of countries of Asia.

Asia has various traffic and environmental problems such as air pollution and traffic congestion due to significant motorization resulting from rapid economic growth and urbanization. Furthermore, climate change has become a clear and present danger for all of us. Therefore, urban development achieving both economic growth and reduced environmental burdens has become a critical challenge. As a way to address this challenge, it has become increasingly important to work towards the implementation of various measures for the purpose of realizing environmentally sustainable transport (EST) that includes air pollution and traffic noise measures, promotion of public transportation, and traffic safety measures, with a long-term perspective.

This EST forum in Asia, started in 2005 with the participation of 13 countries, now have participants from 24 countries. At city level, 22 cities participated in the Asian Mayors' Event in Kyoto in 2007 and adopted the Kyoto declaration, while the number is expected to increase to 47 cities now. The EST has become a region-wide initiative which covers entire Asia, and has expanded to Latin America and Africa. I am sincerely pleased to see that this initiative has continued and evolved over nearly 10 years.

Japan has experienced serious environmental issues including air pollution. To overcome these issues, Japan has continued to address air pollution as well as global climate change using various measures, including regulation, technology development and promoting the use of low-emission vehicles and public transport. Through these experiences, I believe Japan can make a significant contribution to the efforts of Asian countries being faced with, or are about to face, with problems similar to ours.

I have great expectations for this Eighth Forum to provide a valuable opportunity for knowledge sharing toward the development of the Post-2015 Development Agenda and the new global framework of climate change. I also expect that this forum serves as a valuable opportunity for strengthening regional environmental cooperation among Asian countries and beyond.

ADB

Nessim Ahmad
Deputy Director General, Regional and Sustainable Development Department
concurrently Chief Compliance Officer
Asian Development Bank

By 2050, Asia is projected to become 64 percent urban, with 300 million people added to cities in China and 404 million to cities in India. Urbanization, motorization, and economic prosperity in the region have resulted in higher urban air pollution levels causing severe cardiovascular and respiratory illnesses, and even deaths. WHO estimates that outdoor air pollution caused 7 million premature deaths worldwide in 2012, with more than 2.6 million occurring in Asia. It is imperative that Asian countries address air pollution in urban development, transport planning, policies and investments.

Given the importance of air quality data in air quality management, this year we completed with Clean Air Asia a study on how to improve air quality monitoring systems in Asian cities. It analyzed the constraints several Asian cities face in providing reliable and meaningful data on air quality and recommended remedial action. The findings of this study will be discussed in a dedicated session in the BAQ.

Recognizing that transportation is a major source of air pollution, ADB launched in 2010 the Sustainable Transport Initiative that guides ADB's investments towards inclusive, clean, and energy-efficient transport projects. A Carbon Neutral Transport Corridor in the Greater Mekong Subregion; a regional recognition program for green freight and logistics efficiency; and the application of innovative tools such as the Clean Air Scorecard Tool (CAST) and Rapid Assessment of City Emissions from Transport and Energy (RACE) are among the initiatives we are implementing with Clean Air Asia.

All these support green growth, an important focus of ADB's Environmental Operational Directions, 2013–2020, and the strengthening of environmental governance and management capacities – including, of course, air quality management.

As one of the founding members of Clean Air Asia, ADB is pleased to support the BAQ once again this year. We look forward to sharing and learning new approaches and solutions to the air quality challenges that help make Asian countries and cities livable.

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Roland Haas
Programme Director for Cities, Environment and Transport
Deutsche Gesellschaft für internationale
Zusammenarbeit (GIZ) GmbH

Sustainability is at the core of all GIZ activities. We have been active in supporting Asian countries in fighting air pollution directly and indirectly for many years through bilateral and regional projects and programmes on behalf of the German Federal Government. With our partners we work on the reduction of industrial emissions and indoor air pollution, the promotion of cleaner fuels and vehicles, sustainable and energy efficient transport, and help establish the required legal framework and enforcement procedures.

Only recently, the co-benefit aspect of air quality management and climate change mitigation has gained momentum. Short-lived climate pollutants play a considerable role in climate change and, in the case of black carbon and ozone, also for air pollution with its impacts on public health.

GIZ delivers advice and know-how for capacity development to our partner countries. Acting on the policies of the Federal Republic of Germany, we work not only for our Federal Ministry for Economic Cooperation and Development (BMZ) but also for our Ministry dealing with environmental protection (BMUB) as well as for other clients from across the globe. The BMUB is very active in climate change mitigation, especially from the transport sector, one of the major sectors dealt with during this integrated conference.

GIZ has been actively involved in all BAQ conferences right from the beginning in 2002. GIZ is a member of the Clean Air Asia Partnership and in its Partnership Council, the regional network that played a key role in creating this initiative and organising the BAQs.

Our biggest technical cooperation programme dealing with air pollution and climate change mainly from transport, the ASEAN-German Technical Cooperation Programme "Cities, Environment and Transport," will continue for the next couple of years. This allows GIZ, on behalf of BMZ, to continue supporting ASEAN Member States in fighting air pollution and climate change mitigation.

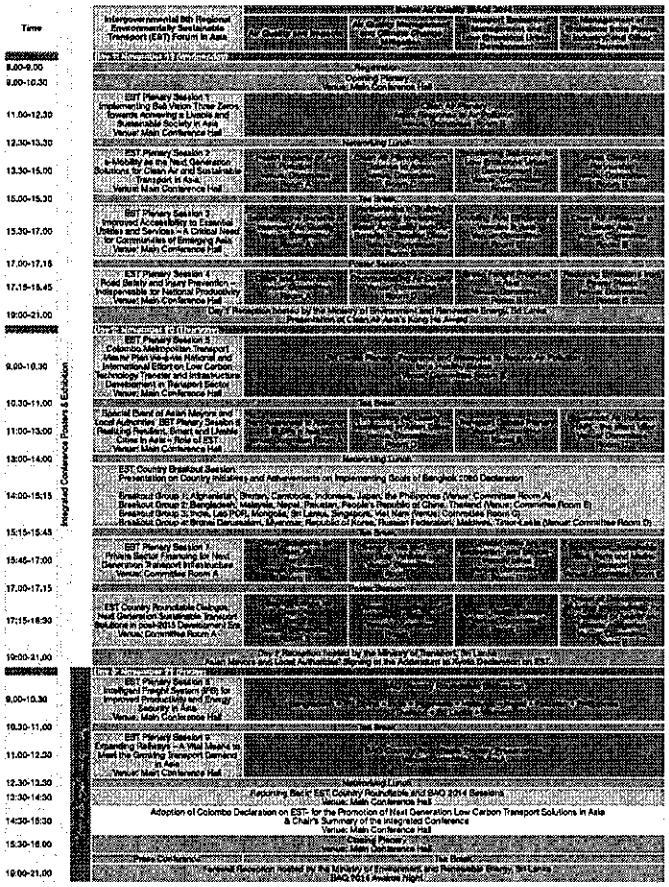
Date/Time	Title	Organizers	Venue	Remarks
17 November (Monday)				
09:00 – 17:00				
09:00 – 16:30				
18 November (Tuesday)				
08:30 – 14:00				
08:30 – 15:30				
08:30 – 16:00				
09:00 – 12:00				
09:00 – 15:30				
09:00 – 16:00				
13:30 – 18:00				
13:30 – 16:30				
14:00 – 17:30				
15:30 – 16:30				
16:30 – 17:30				
17:30 – 19:00				

BAQ
BETTER AIR QUALITY CONFERENCE
sri lanka
19-21 November 2014
8th EST
REGIONAL ENVIRONMENTALLY SUSTAINABLE TRANSPORT FORUM IN ASIA

Integrated Conference of Better Air Quality 2014 and Intergovernmental 8th Regional Environmentally Sustainable Transport Forum in Asia

Next Generation Solutions for Clean Air and Sustainable Transport – Towards a Livable Society in Asia

Recognizing that clean air and sustainable transport are essential to a livable society in Asia, we call for innovative and smart solutions (policy, institution, technology and financing) that significantly reduce air pollution and greenhouse gases from energy, industry, transport, and area sources, and ensure a safe, equitable, environment and people-friendly transport system by accelerating the shift towards more environmentally sustainable transport (EST) in Asian cities and countries.



19 November | 9.00-10.30

Opening Plenary
Venue: Main Conference Hall, Bandaranaike Memorial International Conference Hall (BMICH) Colombo

Welcome Remarks
Mr. B. M. U. D. Basnayake, Secretary, Ministry of Environment and Renewable Energy, Sri Lanka (5 min.)

Opening Remarks
Mr. Robert O'Keefe, Chair of Board of Trustees, Clean Air Asia (5 min.)
Mr. Nikhil Seth, Director of the Division for Sustainable Development, United Nations Department of Economic and Social Affairs (UN DESA) (5 min.)
Mr. Teruyoshi Hayamizu, Councillor of Minister's Secretariat, Ministry of the Environment, Japan (5 min.)
Hon. Mr. Kumara Welgama, Minister of Transport, Sri Lanka (5 min.)
Hon. Mr. Susil Premajayantha, Minister of Environment and Renewable Energy, Sri Lanka (5 min.)

Special Message by UN Secretary-General **Mr. Ban Ki-moon** (5 min.)

Keynote Address
Transforming Societies through Next Generation Transport and Clean Air Solutions in Post 2015 Development Era
Mr. Nikhil Seth, Director of the Division for Sustainable Development, United Nations Department of Economic and Social Affairs (UN DESA) (20 min.)

Introduction of the Chief Guest
Mr. Don Jayaweera, Executive Director, Clean Air Sri Lanka (5 min.)

Address by the Chief Guest
H. E. Mr. Mahinda Rajapaksa, President of the Democratic Socialist Republic of Sri Lanka (15 min.)

Launch of the Commemorative Stamp for the Integrated Conference

Group photo

The keynote speaker for the Integrated Conference of BAQ 2014 and Intergovernmental 8th Regional EST Forum in Asia is Mr. Nikhil Seth, the Director of the Division for Sustainable Development in the United Nations Department of Economic and Social Affairs (UN DESA).

This UN DESA Division is responsible for supporting the intergovernmental negotiations for the post-2015 development agenda which is the key topic he will cover in his keynote address on Transforming Societies through Next Generation Transport and Clean Air Solutions in Post 2015 Development Era.

During his career with the United Nations since 1993, Mr. Nikhil Seth has served as Special Assistant and Chief of Office to the Under-Secretary-General for Economic and Social Affairs (Sept 1993 – Jun 2001), Chief of the Policy Coordination Branch in the Division for ECOSOC Support and Coordination (Jun 2001 – Jan 2003), as Secretary of the Economic and Social Council (ECOSOC) and the Second Committee of the General Assembly (Feb 2003 – Aug 2006), and as Director of the DESA Office for ECOSOC Support and Coordination (Aug 2006 – Aug 2011), where he guided the ECOSOC's work in implementing several new key mandates, including its Annual Ministerial Review and Development Cooperation Forum.

Before joining the UN Secretariat, he was a delegate to the UN in the Permanent Mission of India to the United Nations (Sep 1990 – Sep 1993) and involved with various UN conferences and summits including the Rio Summit on Environment and Development and the climate change related process. After joining the UN, he has been involved in the organization of the Copenhagen Summit on Social Development, the Monterrey Conference on Financing for Development, the Mauritius Conference on Small Island Developing States, the Millennium Summit, World Summit on Sustainable Development and the UN World Summit, beside the Rio+20 Conference.

He joined the Indian diplomatic service in 1980 and his diplomatic assignments included Geneva, Democratic Republic of Congo, Central African Republic, Gabon and Equatorial Guinea.

Before joining the Indian diplomatic service, he worked as a Lecturer in Economics in St. Stephen College, Delhi University for 2 years (Aug 1977 – Sep 1979).

Mr. Nikhil Seth holds a Masters degree in Economics from Delhi University.

19 November I 19:00 – 21:00

Welcome reception hosted by the Ministry of Environment and Renewable Energy, Sri Lanka
Presentation of Clean Air Asia's Kong Ha Award
Venue: Waters Edge

20 November I 19:00 – 21:00

Dinner reception hosted by the Ministry of Transport, Sri Lanka
Asian Mayors and Local Authorities' Signing of the Addendum to Kyoto Declaration on EST
Venue: Hilton Hotel

21 November I 19:00 – 21:00

Farewell reception hosted by the Ministry of Environment and Renewable Energy, Sri Lanka
BAQ 2014 Awards Night
Venue: Mount Lavinia Hotel

Transportation Service:
Shuttle service from BMICH to the dinner venue is available to all participants at the main driveway of BMICH starting 18:30. Likewise, shuttle service from the dinner venue to designated hotels such as Hilton Hotel, Taj Samudra Hotel, Cinnamon Lakeside Hotel, Cinnamon Grand Hotel, Cinnamon Red Hotel and Galadari Hotel is also available to all participants at the main driveway of the dinner venue starting 20:45.

21 November 2014 I 15.30-16.00

Closing Plenary
Venue: Main Conference Hall

Closing Remarks

Mr. Bjarne Pedersen, Executive Director, Clean Air Asia (5 min.)

Ms. Chikako Takase, Director, UNCRD (5 min.)

Mr. Teruyoshi Hayamizu, Councillor of Minister's Secretariat, Ministry of the Environment, Japan (5 min.)

Hon. Mr. Kumara Welgama, Minister of Transport, Sri Lanka (5 min.)

Hon. Mr. Susil Premajayantha, Minister of Environment and Renewable Energy, Sri Lanka (5 min.)

Announcements

Press Conference

Post Event
Courtesy call and Visit of Asian Mayors to Colombo City Hall (by invitation only)
Venue: Council Chamber, Colombo Town Hall

EIGHTH REGIONAL ENVIRONMENTALLY SUSTAINABLE TRANSPORT FORUM IN ASIA PROGRAM
Colombo, Sri Lanka

Day 1, 19 November 2014 (Wednesday) I 11:00 – 12:30

EST Plenary Session 1
Implementing Bali Vision Three Zeros – Zero Congestion, Zero Pollution, Zero Accidents Towards Achieving a Livable and Sustainable Society in Asia
Session Chair: **Hon. Mr. Susil Premajayantha**, Minister of Environment and Renewable Energy, Sri Lanka
Facilitator: **Mr. Todd Litman**, Founder and Executive Director, Victoria Transport Policy Institute (VTPI)
Rapporteur: **Mr. Karl Adam Peet**, Partnership on Sustainable, Low Carbon Transport (SLoCaT)
Venue: Main Conference Hall

Presentation of Background Paper:
Implementing Transport Policies and Programmes toward Realizing "Bali Vision Three Zeros – Zero Congestion, Zero Pollution, and Zero Accidents towards Next Generation Transport Systems in Asia -by **Mr. Todd Litman**, Founder and Executive Director, Victoria Transport Policy Institute (VTPI), Canada (20 min.)

Panel Discussion:
1. **Mr. Tulasi Prasad Sitaula**, Secretary, Ministry of Physical Infrastructure and Transport, Nepal
2. **Ms. Elly Sinaga**, Director General, R&D Agency, Ministry of Transportation, Indonesia
3. **Mr. Mukund Kumar Sinha**, Joint Secretary, Ministry of Urban Development, India
4. **Mr. Ildefonso T. Patdu, Jr.**, Assistant Secretary for Project Implementation, Department of Transportation and Communications Philippines
5. **Prof. Dinesh Mohan, Professor Emeritus**, Indian Institute of Technology Delhi, India
6. **Mr. Comie Hulzenga**, Secretary General, Partnership on Sustainable, Low Carbon Transport (SLoCaT)

Discussion Points:
1. What are the major driving forces for next generation transport system (both at local and national level) to meet the aspirations underlined in Bali Vision Three Zeros? If not, what is the cost of inaction in transport sector in terms of – environmental degradation, suppressed mobility and loss of access to essential utilities and services resiliency and quality of life?
2. Can Asian countries avoid the problems experienced by other countries during rapid periods of industrialization and urbanization? Are prevailing models of city and transport planning apt to confront local traffic constraints and environmental degradation in cities?
3. How well are Asian government agencies doing to collaborate for sustainable planning solutions? For example, are transportation agencies working with environmental agencies and social service to create more efficient and inclusive transportation systems?
4. What role should planners, engineers and architects play in guiding sustainable development? What is needed to build capacity in these professions?

Open Discussion:

Day 1, 19 November 2014 (Wednesday) I 13:30-15:00

EST Plenary Session 2
e-Mobility as the Next Generation Solutions for Clean Air and Sustainable Transport in Asia
Session Chair: **Hon. Dr. Hassan Abdullahi**, Minister of Urban Development Affairs, Afghanistan
Facilitator: **Mr. Ralph Wahnschafft**, Independent Senior Advisor on Sustainable Development Policies, Berlin, Germany
Rapporteur: **Mr. Simon Ka Wing Ng**, Chief Research Officer, Civic Exchange
Venue: Main Conference Hall

Presentation of Background Paper:
1. e-Mobility as the Next Generation Solutions for Clean Air and Sustainable Transport in Asia -by **Mr. Ralph Wahnschafft**, Independent Senior Advisor on Sustainable Development Policies, Berlin, Germany (15 min.)
2. The Electric Mobility Policy and Electric Vehicle Pilots Projects in Bhutan - by **Mr. Lhaba Tshering**, Chief Planning Officer, Perspective Planning Division, Gross National Happiness Commission Secretariat, Thimphu, Bhutan (10 min.)
3. Electric mobility in public transportation: Experiences with e-buses and e-taxis in Shenzhen -by **Mr. Michael Kwai**, Deputy General Manager, Shenzhen Bus Company, Shenzhen, China (10 min.) (tbc)

Panel Discussion:
1. **Mr. Aurangzeb Haque**, Additional Secretary, Ministry of Communications, Pakistan
2. **Mr. Daniel Darius M. Nicer**, Assistant Secretary, Department of Environment and Natural Resources, Philippines
3. **Mr. Sagar Dynaneshwar Naik**, Mayor, Navi Mumbai Municipal Corporation, India
4. **Mr. Evgeny Vakulenko**, First Secretary, Department of International Organizations, Ministry of Foreign Affairs, Russian Federation
5. **Mr. Lhaba Tshering**, Chief Planning Officer, Gross National Happiness Commission Secretariat, Bhutan
6. **Mr. Roland Haas**, Programme Director, ASEAN-German Technical Cooperation
7. **Mr. Shun Watanabe**, Terra Motors Corporation, Japan

Discussion Points:
1. What are the new emerging trends in e-Mobility? Why should e-Mobility matters to Asian countries and cities in realizing next generation transport system? What it means in terms of Bali Vision Three Zeros?
2. What policy, institutional mechanism, and new partnerships can trigger advancement of e-Mobility in Asia?
3. Is current level of transport infrastructure and institutional arrangements conducive to expansion of e-Mobility in Asian countries?
4. What are the knowledge, financial and technical assistance/solutions available at international level for promotion of e-Mobility?
5. What opportunities e-Mobility do offer us in meeting the internationally agreed target of limiting the average global temperature rise to maximum 2° C (above pre-industrial level)?

Open Discussion:

Day 1, 19 November 2014 (Wednesday) I 15:30-17:00

EST Plenary Session 3
Improved Accessibility to Essential Utilities and Services – A Critical Need for Communities of Emerging Asia
Session Chair: **Mr. Daniel Darius M. Nicer**, Assistant Secretary, Department of Environment and Natural Resources, Philippines
Facilitator: **Ms. Marie Thynell**, University of Gothenburg
Rapporteur: **Mr. Santosh Kodukula**, Local Governments for Sustainability (ICLEI)
Venue: Main Conference Hall

Presentation of Background Paper:
1. Improved Accessibility to Essential Utilities and Services – A Critical Need for Communities of Emerging Asia -by **Mr. Peter O'Neill**, Chief, Transport Policy and Development Section, UN ESCAP (15 min.)
2. Next Generation Urban Mobility Plans -by **Mr. Manfred Breithaupt**, Senior Transport Advisor, German International Cooperation (GIZ) (10 min.)

Panel Discussion:
1. **Mr. Mahendra Subba**, Joint Secretary, Ministry of Urban Development, Nepal
2. **Mr. Chan Dara**, Director General, General Department of Transport, Ministry of Public Work and Transport, Cambodia
3. Representative of Ministry of Land, Infrastructure and Transport, Republic of Korea
4. **Mr. A. Wassay Rahim**, Senior Advisor to Minister, Ministry of Urban Development Affairs, Afghanistan
5. **Mr. Rashid Hassan**, Advisor, Ministry of Environment and Forests and Climate Change, India
6. **Mr. Do Nam Thang**, Deputy Director General, International Cooperation Department, Ministry of Nature Resource and Environment, Viet Nam
7. **Ms. Chutinthorn Praditphet**, Policy and Plan Analyst, Ministry of Transport, Thailand

Discussion Points:
1. How have the Asian cities addressed access to essential utilities and services in their transport policy, planning, and implementation? What does it mean in terms of inclusive growth, national productivity, poverty reduction and human development?
2. How can the inequalities in such accessibility between urban and rural areas be addressed within countries?
3. How effective have the current transport policies and programs been in addressing rural-urban connectivity towards socio-economic upliftment of the rural community and the farmers (health, education, employment, food and livelihood security, productivity, etc.)?
4. What can trigger socio-economic considerations in transport policy, planning, and implementation?
5. Which are the champion cities? What critical lessons can we learn from them?
6. How well are Asian cities integrating transport and land use planning ("smart growth," "transit-oriented development" and vehicle parking policy reforms), and implementing pricing policy reforms? These are often as important as road and transit infrastructure planning.

Open Discussion:

Day 1, 19 November 2014 (Wednesday) I 17:15-18:45

EST Plenary Session 4

Road Safety and Injury Prevention – Indispensable for National Productivity

Session Chair: **Mr. Tulasi Prasad Sitaula**, Secretary, Ministry of Physical Infrastructure and Transport, Nepal
Facilitator: **Prof. Dinesh Mohan**, Professor Emeritus, Indian Institute of Technology Delhi
Rapporteur: **Mr. Colin Hughes**, Director of National Policy & Project Evaluation, ITDP
Venue: Main Conference Hall

Presentation of Background Paper:
1. Implications of Road Safety in National Productivity and Human Development in Asia -by **Prof. Jac Wismans**, SAFER-Vehicle and Traffic Safety Centre, Sweden (15 min.)
2. Impact of Traffic Accidents on Indian Economy and Productivity -by **Prof. Dinesh Mohan**, Professor Emeritus, Indian Institute of Technology Delhi, India (15 min.)

Panel Discussion:
1. **Hon. Mr. Rohana Kumara Dissanayake**, Deputy Minister, Ministry of Transport, Sri Lanka (tbc)
2. **Mr. M. A. N. Siddique**, Secretary, Road Transport and Highways Division, Ministry of Road Transport and Bridges, Bangladesh
3. **Ms. Nguyen Thi Thu Hang**, Deputy Director General, Ministry of Transport, Viet Nam
4. **Dr. Carlos Dora**, Coordinator, Department of Public Health and Environment, World Health Organization (WHO)
5. **Prof. Sanjivi Sundar**, HUDCO Chair Professor in TERI University
6. **Prof. Yoshitaka Motoda**, Iwate Prefectural University, Japan
7. **Mr. Madhav Pai**, Director EMBARQ-India

Discussion Points:
1. Road safety and injuries prevention are major public health priority. How do they cost to national productivity and human development?
2. What are the root causes of the growing road accidents and fatalities in Asia? Is it a policy problem, regulation failures, enforcement problem, infrastructure design problem, or a combination of all?
3. What does it mean to have dedicated NMT (walking and bicycle) lanes in the heart of Bali Vision Three Zeros – Zero Congestion, Zero Pollution, and Zero Accidents?
4. Despite the fact that NMT offers the maximum co-benefits with least cost or investment, what are the major barriers and challenges faced by Asian countries in integrating (NMT) in their urban and transport policy, planning and implementation? Can we realize next generation transport system and 21st century cities without giving due consideration to safe and dedicated NMT facilities and infrastructure?
5. What critical lessons do we learn from Indian case?
6. How to implement and/or enforce the WHO 2011-2020 Decade of Action recommendations?

Open Discussion:

[Launch of Report on "Transport Emissions and India's Diesel Mystery - Comparing Top-Down and Bottom-Up Carbon Estimates"]

Day 1, 19 November 2014 (Wednesday) I 19:00-21:00

Welcome Reception Hosted by Ministry of Environment & Renewable Energy, Sri Lanka

Day 2, 20 November 2014 (Thursday) I 9:00-10:30

EST Plenary Session 5

Colombo Metropolitan Transport Master Plan vis-à-vis National and International Effort on Low Carbon Technology Transfer and Infrastructure Development in Transport Sector

Session Chair: **Hon. Mr. Rohana Kumara Dissanayake**, Deputy Minister, Ministry of Transport, Sri Lanka (tbc)
Facilitator: **Mr. Cornie Huizenga**, Secretary General, SLOCaT
Rapporteur: **Mr. Karl Adam Peet**, SLOCaT
Venue: Main Conference Hall

Presentation:
Colombo Metropolitan Transport Master Plan and Areas for International Cooperation -by **Mr. Dhammika Perera**, Secretary, Ministry of Transport (MOT), Sri Lanka (15 min.)

Panel Discussion:
1. ADB's Cooperation and Technical Assistance on Low Carbon Transport Development in Asia -by **Ms. Karma Yangzom**, Environment Specialist, Asian Development Bank (ADB) (10 min.)
2. International Cooperation of Ministry of the Environment of Japan for the Promotion of Low Carbonization in Developing Countries -by **Mr. Teruyoshi Hayamizu**, Councillor of Minister's Secretariat, Ministry of the Environment (MOE), Japan (10 min.)
3. Technical Cooperation for Transitioning to a Low Carbon Development Path- WB's Strategy in Transport Sector -by World Bank (WB) (10 min.) (tbc)
4. JICA's Technical Cooperation Towards Low Carbon Infrastructure Development -by Japan International Cooperation Agency (JICA) (10 min.)

Discussion Points:
1. With rapid growth in private vehicles in Asia and with the international commitment to keep the average global temperature rise to maximum 2° C above pre-industrial level, what are the critical decarbonizing policy options for Asian countries to consider in the transport sector?
2. Should Asian countries actively consider shifting from road (which depends heavily on fossil-fueled vehicles) to more environmentally friendly rail based transportation system?
3. What type of partnerships could trigger implementation of wide-scale advanced information technologies such as intelligent transport systems (ITS)/intelligent freight system (IFS) to achieve greater efficiency in transport operation and services leading to reduction of CO2 emissions?
4. What is the prospect of e-Mobility in Asia as next generation zero carbon emission vehicles?
5. What are the biggest barriers Asian countries are facing with regard to low carbon transport solutions and technology transfer? What role international organizations and development agencies can play for low carbon technology transfer and infrastructural development in the developing countries of Asia?
6. What lessons we can learn from Colombo Metropolitan Transport Master Plan? Will it lead to a low carbon development path? What international cooperation and support available for Colombo and other Asian cities to decarbonize their transport (including freight) operation and services for long term benefits?

Open Discussion:

Day 2, 20 November 2014 (Thursday) I 11:00-13:00

EST Plenary Session 6

Special Event of Asian Mayors and Local Authorities – Realizing Resilient, Smart and Livable Cities in Asia – Role of EST

[Followed by signing of the Kyoto Declaration (addendum) for the Promotion of Environmentally Sustainable Transport -Towards Realizing Resilient, Smart and Liveable Cities in Asia' at the Welcome Reception on Day 2 / 19:00-21:00]

Session Chair: **Hon. Mr. Ahamed Jamaldeen Mohamed Muzammil**, Mayor, Colombo Municipal Council, Sri Lanka
Facilitator: **Ms. C.P.C. Mohanty**, UNCRD & **Mr. Thomas Hamm**, Technical Adviser, UN DESA
Rapporteur: **Mr. Simon Ka Wing Ng**, Civic Exchange
Venue: Main Conference Hall

(Invited Cities) - (tbc)
Dhaka, Sylhet, Shanghai, Bangalore, Bhubaneswar, Navi Mumbai, Surat, Semarang, Surabaya, Yogyakarta, Batam, Makassar, Palembang, Surakarta, Tangerang, Ulaanbaatar, Kathmandu, Karachi, Islamabad, Quezon, Baguio, Cebu, Makati, Jeju, Seoul, Suwon, Chuncheon, Donghae, Singapore, Matale, Colombo, Kandy, Kattankudy, Bangkok, Chiang Mai, Hai Phong, Ho Chi Minh, Akkaraipattu, Batticaloa, Kalmunai , Anuradhapura, Jaffna, Ratnapura, Galle, Hambantota, Matara Badulla, Bandarawela, Kurunegala, Colombo, Dehiwela-Mt.Lavinia, Kaduwela, Moratuwa, Sri Jayawardenapura Kotte, Gampaha, Negombo

Keynote Presentation:
Healthy Performance of Urban Transport - a measure of success for resilient and liveable cities -by **Dr. Carlos Dora**, Coordinator, Department of Public Health and Environment, World Health Organization (WHO) (10 min.)

Presentation of Background Paper:
Realizing Resilient, Smart and Livable Cities in Asia – Role of EST -by **Mr. Sungwon Lee**, Vice President, The Korea Transport Institute (KOTI) (10 min.)

Other Presentations:
1. EcoMobility: An Integral Part of the Next Generation Transport System in Asia – Role of Dedicated Walkways and Cycleways (NMT) -by **Mr. Emani Kumar**, Deputy Secretary General, Local Governments for Sustainability (ICLEI) (7 min.) (tbc)
2. Seamless Multimodal Integration for Smart City Public Transportation Network -by **Mr. Manfred Breithaupt**, Senior Transport Advisor, German International Cooperation (GIZ) (7 min.)
3. WHO/WPRO's perspective on Health and Air Pollution -by **Mr. Jung Sub Yeom**, Regional Office for the Western Pacific, World Health Organization (WHO) (7 min.)

[In addition to the background report, a number of City reports will be made available through UNCRD website (http://www.uncrd.or.jp/) for additional reference in support of policy discussion]

Panel Discussion:
1. **Mr. Herbert Constantine Maclang Bautista**, Mayor, Quezon City, Philippines (tbc)
2. **Mr. Sagar Dynaneshwar Naik**, Mayor, Navi Mumbai Municipal Corporation, India
3. **Mr. Harnojoyo**, Vice Mayor, Palembang City, Indonesia (tbc)
4. **Mr. Syamsu Rizal MI, S. Sos, M. Si**, Vice Mayor, Makassar City, Indonesia (tbc)
5. **Mr. Edgardo C. Labella**, Vice Mayor, Cebu City, the Philippines (tbc)
6. **Mr. Rauf Akhtar Farooqui**, Administrator, Karachi Metropolitan Corporation, Pakistan (tbc)
7. **Mr. Xiaojian Dai**, Deputy Director-General, Shanghai Municipal Transportation Commission, People's Republic of China
8. **Mr. Md. Aminul Islam**, Chief Estate Officer, Dhaka North City Corporation, Bangladesh

Discussion Points:

1. How far have the Asian cities integrated quality of life and safety as central to their transport policy, planning and development, including transport infrastructure development?
2. Which Asian cities have the best traffic safety record? Why? What does this teach us?
3. Which Asian cities provide the best quality of life to residents, both poor and wealthy? Why? What does this teach us?
4. One of the proposed Sustainable Development Goals (SDGs) for the post-2015 development agenda is to make cities and human settlements inclusive, safe, resilient and sustainable. How far have we succeeded in building resilience of our cities given the transport infrastructures' vulnerability to impacts of climate change and natural disasters? What would be the cost of inaction on resiliency?
5. Next generation smart cities and transport solutions call for wider scale implementation of intelligent transport system (ITS) for increasing efficiency, fuel economy, and productivity, reducing pollution, and improving road safety. What type of partnerships at city level could be helpful to that regard?
6. What are the biggest hindrances for Asian cities to build required transport infrastructures to meet specific mobility needs of those in vulnerable situations – women, children, persons with physical disabilities and older persons? How can these humanitarian provisions be mainstreamed in city development strategies or action plans? What type of cities we should dream for by 2030?
7. What could Asian cities offer in support of the transport related commitments (on electric mobility; railways; public transport; fuel economy; and green freight) made at the UN Secretary General's Climate Summit 2014? What voluntarily policies, programmes, projects, including master plans, they could develop, introduce and implement in support of these transport commitments?

Open Discussion:

Adoption of the Addendum to Kyoto Declaration on EST by Asian Mayors and Local Authorities

Day 2, 20 November 2014 (Thursday) I 14:00-15:15

COUNTRY BREAKOUT SESSION ON EST

Presentation on Country Initiatives and Achievements on Implementing Goals of Bangkok 2020 Declaration

Breakout Group 1

Countries: Afghanistan, Bhutan, Cambodia, Indonesia, Japan, the Philippines

Session Chair: **Mr. Hugroho Indrio**, Senior Advisor to the Minister for Technology, Energy, and Environment, Indonesia
Facilitator: **Mr. Manfred Breithaupt**, Senior Transport Advisor, German International Cooperation (GIZ)
Rapporteur: **Mr. Stefan Bakker**, German International Cooperation (GIZ)
Venue: Committee Room A

- Presentation by Afghanistan Delegation (7 min.)
- Presentation by Bhutan Delegation (7 min.)
- Presentation by Cambodia Delegation (7 min.)
- Presentation by Indonesian Delegation (7 min.)
- Presentation by Japan Delegation (7 min.)
- Presentation by the Philippines Delegation (7 min.)

[Country presentations (using maximum 5 slides) to focus on – (a) major achievements/new initiatives; (b) critical challenges faced; and (c) major plans, including mega-projects and master plans, in pipeline for future action]

Expert Comments/Intervention:
1. **Ms. Bronwen Thronton**, Development Director, Walk21 (3 min.)
2. **Prof. Sanjivi Sundar**, HUDCO Chair Professor, TERI University (3 min.)
3. **Prof. Jac Wismans**, SAFER-Vehicle and Traffic Safety Centre (3 min.)

Open Discussion:

Breakout Group 2

Countries: Bangladesh, Malaysia, Nepal, Pakistan, People's Republic of China, Thailand

Session Chair: **Mr. Aurangzeb Haque**, Additional Secretary, Ministry of Communications, Pakistan
Facilitator: **Mr. Madhav Pai**, Director, EMBARQ-India
Rapporteur: **Mr. Ben Fabian**, United Nations Environment Programme (UNEP), Nairobi
Venue: Committee Room B

- Presentation by Bangladesh Delegation (7 min.)
- Presentation by Malaysia Delegation (7 min.)
- Presentation by Nepal Delegation (7 min.)
- Presentation by Pakistan Delegation (7 min.)
- Presentation by People's Republic of China Delegation,(7 min.)
- Presentation by Thailand Delegation (7 min.)

[Country presentations (using maximum 5 slides) to focus on – (a) major achievements/new initiatives; (b) critical challenges faced; and (c) major plans, including mega-projects and master plans, in pipeline for future action]

Expert Comments/Intervention:
1. **Ms. Maria Thynell**, University of Gothenburg (3 min.)
2. **Prof. Dinesh Mohan**, Professor Emeritus, IIT-Delhi (3 min.)
3. **Prof. Yoshitaka Motoda**, Iwate Prefectural University (3 min.)

Open Discussion:

Breakout Group 3

Countries: India, Lao PDR, Mongolia, Sri Lanka, Singapore, Viet Nam

Session Chair: Mr. B.M.U.D. Basnayake, Secretary, Ministry of Environment and Renewable Energy, Sri Lanka
Facilitator: Ms. Sophie Punte, Executive Director, Smart Freight Centre
Rapporteur: Mr. Jagir Rathore, Smart Freight Centre
Venue: Committee Room C

- Presentation by India Delegation (7 min.)
- Presentation by Lao PDR Delegation (7 min.)
- Presentation by Mongolia Delegation (7 min.)
- Presentation by Sri Lanka Delegation (7 min.)
- Presentation by Singapore Delegation (7 min.)
- Presentation by Viet Nam Delegation (7 min.)

[Country presentations (using maximum 5 slides) to focus on – (a) major achievements/new initiatives; (b) critical challenges faced; and (c) major plans, including mega-projects and master plans, in pipeline for future action]

Expert Comments/Intervention:
1. Mr. Cornie Huizenga, Secretary General, SLoCaT (3 min.)
2. Mr. Surya Raj Acharya, Tribhuvan University (3 min.)
3. Mr. Lewis M. Fulton, Co-Director, NextSTEPS Programme, University of California, Davis, USA (3 min.)

Open Discussion:

Breakout Group 4

Countries: Brunei Darussalam, Myanmar, Republic of Korea, Russian Federation, Maldives, Timor-Leste

Session Chair: Hon. Mr. Abdulla Muththalib, Deputy Minister, Ministry of Housing and Infrastructure, Maldives
Facilitator: Mr. Simon Ka Wing Ng, Chief Research Officer, CNS Exchange
Rapporteur: Mr. Sudhir Gota, India
Venue: Committee Room D

- Presentation by Brunei Darussalam Delegation (7 min.)
- Presentation by Myanmar Delegation (7 min.)
- Presentation by Republic of Korea Delegation (7 min.)
- Presentation by Russian Federation Delegation (7 min.)
- Presentation by Maldives Delegation (7 min.)
- Presentation by Timor-Leste Delegation (7 min.)

[Country presentations (using maximum 5 slides) to focus on – (a) major achievements/new initiatives; (b) critical challenges faced; and (c) major plans, including mega-projects and master plans, in pipeline for future action]

Expert Comments/Intervention:
1. Mr. Todd Litman, Victoria Transport Policy Institute (3 min.)
2. Prof. Mohamed Rehan Bin Karim, University of Malaysia (3 min.)
3. Mr. Roland Haas, ASEAN-German Technical Cooperation (3 min.)

Open Discussion:

Day 2, 20 November 2014 (Thursday) I 15:45-17:00

EST Plenary Session 7

Private Sector Financing for Next Generation Transport Infrastructure

Session Chair: Mr. Mukund Kumar Sinha, Joint Secretary, Ministry of Urban Development, India
Facilitator: Mr. Lewis M. Fulton, Co-Director, NextSTEPS Programme, University of California, Davis, USA
Rapporteur: Mr. Robert Earley, CAA
Venue: Committee Room A

Presentation of Background Paper:
1. Mobilizing Private Sector Financing for the Realization of Next Generation Solutions for Sustainable Transport in Asia -by Mr. Cornie Huizenga, Secretary General, Partnership on Sustainable, Low Carbon Transport (SLoCaT) (15 min.)
2. The High Shift Scenario: How cities can save $100 Trillion by 2050 for More Public Transport, Walking and Cycling with Lower Car Use-by Mr. Lewis M. Fulton, Co-Director, NextSTEPS Programme, University of California, Davis, USA (10 min.)

Panel Discussion:
1. Mr. Dhammika Perera, Secretary, Ministry of Transport, Sri Lanka (tbc)
2. Mr. Niranjankumar Becharlal Zanzmera, Mayor, Surat Municipal Corporation, India
3. Mr. Syamsu Rizal MI, S. Sos, M. Si, Vice Mayor, Makassar City, Indonesia (tbc)
4. Mr. Edgardo C. Labella, Vice Mayor, Cebu City, the Philippines (tbc)
5. Mr. Manfred Breithaupt, Senior Transport Advisor, German International Cooperation (GIZ)
6. Mr. Colin Hughes, Director of National Policy & Project Evaluation, ITDP

Discussion Points:
1. How might different orientations of transportation infrastructure funding and policy affect the overall transportation infrastructure investment needs as well as transportation expenditures by consumers, business, and governments? Is there an alignment between sustainable transportation, cost-effective mobility and access improvement, and low carbon development, or are these in conflict with each other?
2. The 7th Regional EST Forum in Bali/Indonesia in 2013 noted that many developing and emerging economies had considerable infrastructure deficit at the current level of urbanization. As Asia goes through rapid urbanization, countries like India will require an estimated financing of US$70 billion in the next 5 years, US$450 billion or more over the next 20 years. What potential opportunities the private sector offer in building next generation sustainable transport infrastructures to meet the growing transport demand?
3. The frequency and magnitude of natural disasters (flood, earthquake, cyclones, landslides, etc.) are on the rise across Asia, yet the majority of developing countries and cities, have not made "resilience" a major part of their transport policy, planning, and financing for infrastructure and services development. What are the possible new and innovative options, including partnership options, for local and national government authorities to consider for leveraging such financing needs?
4. Is the national financing on dedicated walking and bicycle infrastructures a sunk cost or a visionary investment with long term benefits towards a smarter and resource efficient community?
5. To what extent Asian countries evaluate the performance of major transport projects/investments, prior to investing and after implementation? Do we have examples where they have provided critical lessons on long term gains or losses in terms of quality of life, resiliency, and national productivity?

Open Discussion:

Day 2, 20 November 2014 (Thursday) I 17:15-18:30

Country Roundtable Dialogue on EST

Next Generation Sustainable Transport Solutions in post-2015 Development Era

Session Chair: Hon. Mr. Sunil Premadasantha, Minister of Environment and Renewable Energy, Sri Lanka
Facilitator: Mr. Nikhil Seth, Director, Division for Sustainable Development, UN DESA
Rapporteur: Mr. Thomas Hamlin, Technical Advisor, UN DESA
Venue: Committee Room A

Presentation of Background Paper:
1. The Role of National Policies in Financing and Scaling Urban Transport -by Mr. Colin Hughes, Director of National Policy and Project Evaluation, Institute for Transportation and Development Policy (ITDP) (15 min.)
2. Next Generation Sustainable Transport Solutions in post-2015 Development Era -by Mr. Madhav Pai, Director (India Program) EMBARQ – The WRI Center for Sustainable Transport (CST) (10 min.)

[Additional Reference document – Proposal of the Open Working Group (OWG) for Sustainable Development Goals (SDGs) dated 19 July 2014 for consideration of UNGA]

Discussion Points:
1. With a post-2015 development agenda/SDGs aiming to replace the MDGs, what should be the defining features of the next generation transport solutions?
2. What critical lessons have we learnt from past and current transport policies and programmes? and from past achievements or mistakes in transport sector? What should be the key features of the macro-economic policies for better implementation of sustainable transport (to ensure social equity, economic prosperity, and environmental conservation) in post-2015 era?
3. What should be the defining features of – (a) multi-stakeholder partnerships; (b) international cooperation (North-South, South-South, triangular); (c) ODA and (d) governance and institutional arrangements in realizing next generation transport system in post-2015 development era?
4. Making cities smart, resource efficient, resilient and livable will be one of the defining characteristics of urban communities in post-2015 development era. At the same time, it is important to provide access to clean, safe, affordable and sustainable transport options for the benefit of all, including vulnerable sections of the society – women, children, physically challenged and old persons. How should Asian countries and cities evaluate their current transport policies, programmes, transport projects and chalk out advanced transport solutions in post-2015 development era?
5. What is required to create cities where affluent residents who can afford to own a car will choose to travel by walking, cycling and public transit for a portion of their trips? What should neighborhood design will encourage affluent residents to walk and bike for local trips? What type of public transit can attract affluent commuters? What Asian cities are good examples?
6. How should cities and countries measure sustainable transportation system performance? What data are needed for this? How well are Asian cities doing to collect this performance evaluation data?

Country Response:
Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, People's Republic of China, Indonesia, India, Japan, Republic of Korea, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, the Philippines, Pakistan, Russian Federation, Singapore, Sri Lanka, Thailand, Timor-Leste, Viet Nam

Day 2, 20 November 2014 (Thursday) I 19:00-21:00

Asian Mayors and Local Authorities' Signing of the Addendum to Kyoto Declaration on EST followed by- Reception Hosted by Ministry of Transport, Sri Lanka

Day 3, 21 November 2014 (Friday) I 9:00-10:30

EST Plenary Session 8

Intelligent Freight System (IFS) for Improved Productivity and Energy Security in Asia

Session Chair: Hon. Mr. Kumara Welgama, Minister of Transport, Sri Lanka (tbc)
Facilitator: Mr. Peter O'Neill, Chief, Transport Policy and Development Section, UN ESCAP
Rapporteur: Mr. Karl Adam Peet, Partnership on Sustainable, Low Carbon Transport (SLoCaT)
Venue: Main Conference Hall

Background Paper:
1. Intelligent Freight System (IFS) for Improved Productivity and Energy Security in Asia -by Prof. Werner Rothengatter, Karlsruhe Institute of Technology & Ms. Sophie Punte, Executive Director, Smart Freight Centre (15 min.)
2. Intelligent Freight System- Efficient Intermodal Integration as Low Carbon Solution in Japan -by Mr. Masaru Kumai, Deputy Manager, Environmental Transport Promotion Division, Foundation for Promoting Personal Mobility and Ecological Transportation (Eco-Mo Foundation), Japan (10 min.)
3. Road-Map Towards Green Freight in Asia

- Moving Towards a Regional Agreement on Green Freight in Asia -by Mr. C. R. C. Mohanty, United Nations Centre for Regional Development (UNCRD) (5 min.)
- ADB's Initiative on Green Freight and Logistic in Asia -by Ms. Nneeda Crishna, Climate Change Mitigation Specialist, GMS Environment Operations Center, Asian Development Bank (ADB) (5 min.)
- Towards National Action Plans – GIZ's Technical Cooperation on Green Freight and Logistics in Asia -by Mr. Roland Haas, Programme Director, ASEAN-German Technical Cooperation (5 min.)
- CAA's Efforts for the Green Freight Initiative in Asia -by Mr. Robert Earley, Transport Program Manager, Clean Air Asia (CAA) (5 min.)
- UN ESCAP's work and plans for promoting Green Freight and Logistics Systems in Asia -by Mr. Madan Regmi, Transport Division, United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) (5 min.)

Panel Discussion:
1. Mr. Evgeny Vakulenko, First Secretary, Department of International Organizations, Ministry of Foreign Affairs, Russian Federation
2. Ms. Sophie Punte, Executive Director, Smart Freight Centre
3. Mr. Giok Seng Lee, Secretary General, Asia Pacific Natural Gas Vehicles Association (ANGVA), Kuala Lumpur

Discussion Points:
1. Is freight and logistics a grossly neglected area in the transport sector of Asia? How does intelligent freight system (IFS) matter to Asian countries in terms of productivity, energy security, and safety?
2. What should be defining policy and institutional reform in transport sector to create enabling conditions for promotion of IFS in Asia?
3. Asia's freight sector is also becoming a fast growing source of pollution and GHG emissions. What role IFS could play in supporting the international commitment of limiting the average global temperature rise to maximum 2° C to avoid the drastic impact of climate change?
4. What should be the defining characteristics of – (a) international cooperation and (b) multi-stakeholders partnerships to decarbonize the freight and logistics sector of Asia?
5. Last three Regional EST Forums discussed the important of greening the freight and logistics sector and further recognized the need for moving towards a "Regional Agreement on Green Freight in Asia". How can we accelerate such efforts through the Regional Commission (UN ESCAP / Forum of Asian Ministers of Transport)?
6. Since congestion imposes major costs on shippers, will they support congestion pricing as a solution? Why or why not?

Open Discussion:

[Launch of Report on "Green Freight in Asia"]

Day 3, 21 November 2014 (Friday) I 11:00-12:30

EST Plenary Session 9

Expanding Railways – A Vital Means to Meet the Growing Transport Demand in Asia

(efficient, smart, cost effective, high capacity, usual friendly rail infrastructure)

Session Chair: Hon. Mr. Anura Priyadharshana Yapa, Minister of Petroleum Industries, Sri Lanka (tbc)
Facilitator: Mr. Mitko P. Papazoff, ASEAN Representative, International Union of Railways (UIC)
Rapporteur: Mr. Surya Raj Acharya, Tribhuvan University
Venue: Main Conference Hall

Presentation of Background Paper:
1. Expanding Railways – A Vital Means to Meet the Growing Transport Demand in Asia -by **Mr. Milko P. Papazoff**, ASEAN Representative, International Union of Railways (UIC) (15 min.)
2. Our progress and achievements towards decarbonizing Japanese Railway System -by **Ms. Hisako Nishio**, Deputy Director, Singapore Office, East Japan Railway Company (10 min.)
3. Indian Railways and its Critical Role in Regional Connectivity and Regional Development -by **Mr. Mukund Kumar Sinha**, Joint Secretary, Ministry of Urban Development, India (10 min.)

Panel Discussion:
1. **Mr. Mukund Kumar Sinha**, Joint Secretary, Ministry of Urban Development, India
2. **Mr. Ruzain Idris**, Under Secretary, Ministry of Transport, Malaysia
3. **Ms. Hisako Nishio**, Deputy Director, Singapore Office, East Japan Railway Company
4. **Prof. Mohamed Rehan Bin Karim**, University of Malaysia
5. **Mr. Ralph Wahnschafft**, Independent Senior Advisor on Sustainable Development Policies, Berlin, Germany

Discussion Points:
1. Given the large increase in transport demand in developing and emerging economies, it is crucial to achieve significant modal shift from high carbon modes (e.g., road, aviation) to low carbon and high energy efficient modes (rail and public transport). In action terms, what it means to – (a) governments, (b) private sector (railways companies), and (c) international institutions?
2. Which Asian cities are good examples of providing affordable and high quality rail passenger services? Which cities provide good examples of integrating rail and land use planning to create transit-oriented development? What can other cities learn from these examples?
3. Under the Transport Action Area presented at the UN Climate Summit 2014, International Union of Railways (UIC) – with its 240 members worldwide including in Europe, People's Republic of China, Russia, India and the United States – launched the Low-Carbon Sustainable Rail Transport Challenge to promote the use of rails for freight and transport to achieve 50% reduction in energy consumption and 50% reduction in CO2 emission by 2030 together with 50% increase in passenger and land freight rail share over the same period. How can EST member countries support these international commitments through enabling actions and green investments?
4. What critical lessons we can draw from Indian Railways on the potential role of railways on ensuring wider regional connectivity for poverty eradication, national productivity, human development, and sustainable development?
5. Rail technologies (in terms of engine, energy efficiency, speed, safety, anti-collision system, etc.) are constantly on evolution. What role could such railway technologies play in improving the passenger as well as freight transport system in Asia? What lessons can we learn from Japanese railway system in this regard?
6. What are the examples of major rail corridor developments (passenger and freight) in Asia? What critical lessons do they offer? What were the biggest motivation behind such developments? What impact will they have in post-2015 development era if such efforts are sustained?

Open Discussion:

Day 3, 21 November 2014 (Friday) I 13:30-14:30

Reporting Back-the Country Breakout Sessions on EST and BAQ 2014 Sessions
Session Chair: **Ms. Momena Khatun**, Deputy Secretary, Ministry of Environment and Forests, Bangladesh (tbc)
Rapporteur: **Ms. Marie Thynell**, University of Gothenburg, Sweden
Venue: Main Conference Hall

Reporting by:
- Reporting Breakout Group-1 (7 min.)
- Reporting Breakout Group-2 (7 min.)
- Reporting Breakout Group-3 (7 min.)
- Reporting Breakout Group-4 (7 min.)
- Reporting BAQ 2014 (15 min.)

Open Discussion:

Day 3, 21 November 2014 (Friday) I 14:30-15:30

Adoption of Colombo Declaration on EST- for the Promotion of Next Generation Low Carbon Transport Solutions in Asia & Chair's Summary of the Integrated Conference
Co-Chairs: **Hon. Mr. Susil Premajayantha**, Minister of Environment and Renewable Energy and **Hon. Mr. Kumara Welgama**, Minister of Transport, Sri Lanka
Facilitator: **Mr. G.R.C. Mohanty**, UNCRD & **Mr. Cornie Huizenga**, Secretary General, SLoCaT

BETTER AIR QUALITY 2014 CONFERENCE PROGRAM
Colombo, Sri Lanka

19 November 2014 (Wednesday) I 11:00 – 12:30

BAQ Clean Air Plenary
Asia's Response to Air Pollution
Organized by: United Nations Environment Programme and Clean Air Asia
Chairs: **Bjarne Pedersen**, Executive Director, Clean Air Asia and **S.M.D.P. Amuru Jayatilaka**, Director General, South Asia Co-operative Environment Programme (SACEP)
Venue: Committee Room B

Global call for action on air pollution at the First UN Environment Assembly and the UNEP response in the region	**Kaveh Zahedi**, Regional Director, UNEP Regional Office for Asia and Pacific
The health imperative for urgent action on air pollution	**Dr. Carlos Dora**, Coordinator for Department of Public Health and Environment, World Health Organization

Country presentations:
- **Chen Liang**, Director General, Foreign Economic Cooperation Office of Ministry of Environmental Protection, PR China
- **Hon. Susil Premajayantha**, Minister of Environment and Renewable Energy, Sri Lanka
- **Dr. Patcharawadee Suwanathada**, Pollution Control Department of Ministry of Environment, Thailand

International organizations' support to Asian countries' efforts to reduce air pollution:
- **S. Chander**, Special Senior Advisor, Asian Development Bank
- **Dr. Lorenz Petersen**, Director, Water, Energy and Transport Division, Deutsche Gesellschaft für internationale Zusammenarbeit (GIZ) GmbH
- **Francoise Clottes**, World Bank Country Director for Sri Lanka and the Maldives

Special announcement on the Clean Air Asia WALK campaign "Every Step Makes a Difference"	**David Guerrero**, BBDO Guerrero and Board of Trustees, Clean Air Asia

Please pay attention to the announcement on the voting mechanics for the BAQ 2014 Transport Debate session.

19 November 2014 (Wednesday) I 13:30-15:00

BAQ Stream: Air Quality and Impacts
Health Impacts of Air Pollution
Organized by: Health Effects Institute and World Health Organization
Chairs: **Daniel Greenbaum**, President, Health Effects Institute and **Yeom Jung-sub**, Technical Officer, World Health Organization - Regional Office for the Western Pacific
Venue: Committee Room A

The Burden of Disease from Air Pollution: Global and Asian estimates	**Aaron Cohen**, Health Effects Institute
Air pollution and health in PR China: current evidence and research needs	**Huang Wei**, Peking University
Health and environmental impacts of coal-fired power plants	**Jeremy Schreifels**, US Environmental Protection Agency
Confronting the double burden of household and ambient air pollution in India	**Kalpana Balakrishnan**, Sri Ramachandra University - Chennai, India
Air pollution: meeting the global and regional public health challenge	**Dr. Carlos Dora and Heather Adair-Rohani**, World Health Organization Geneva

BAQ Stream: Air Quality Management and Climate Change Mitigation
Clean Air Planning: From Science to Action
Organized by: German International Cooperation (GIZ) and Clean Air Asia
Chair: **Roland Haas**, Programme Director for Cities, Environment, and Transport, GIZ
Venue: Committee Room C

Welcome remarks	**Martina Kolb**, GIZ Clean Air for Smaller Cities in the ASEAN Region
Clean air planning: overview and approach	**Napaporn Yuberk**,GIZ Clean Air for Smaller Cities in the ASEAN Region
Panel discussion 1: Tools and techniques used in research on the status of air quality and emission sources Moderated by **Dr. Jose Bienvenido Manuel Biona**, Centre for Engineering and Sustainable Development Research of De La Salle University, Philippines	**Dr. Bang Ho**, National University of Vietnam **Dr. Doris Montecastro**, Ateneo de Davao University, Philippines **Dr. Dollaris (Waty) Suhadi**,Sahabat Cipta - Indonesia
Panel discussion 2: Stakeholder inclusion in clean air planning and action Moderated by **Dr. Sven Callebaut**, Capacity Development Advisor	**Kaye Patdu**, Clean Air Asia **Ma. Cristina Octavio**, Iloilo City, Philippines **Bunleu Narapinit**, Nakhon Ratchasima Municipality, Thailand
Concluding remarks	**Roland Haas**, GIZ

BAQ Stream: Transport Emissions Management
Transforming Solutions for Low Emissions Urban Development
Organized by: SOLUTIONS/Wuppertal Institute, ICLEI – Local Governments for Sustainability - South Asia and Clean Air Asia
Chair: **Oliver Lah**, Project Coordinator, SOLUTIONS/Wuppertal Institute
Venue: Committee Room D

Transport emissions in Asia : status and trends	**Alvin Mejia**, Clean Air Asia
Sharing opportunities for low carbon urban transportation	**Oliver Lah**, Wuppertal Institute
Low emissions transport strategies and uptake	**Ashish Rao-Ghorpade**, ICLEI South Asia
The High Shift Scenario: How to dramatically cut car based travel in cities by 2050	**Lew Fulton**, University of California Davis
Improving cities in Asia through electric vehicles	**Shun Watanabe**, Terra Motors
City experiences:	**Sunil D. Pote**, Thane Municipal Corporation, India
Transferring Solutions: India Experience	**Amit Bhatt**, EMBARQ India

BAQ Stream: Low Emissions Urban Development
Cities Clean Air Partnership
Organized by: Clean Air Asia
Chairs: **Justin Harris**, US Coordinator for International Environmental Partnership, US Environmental Protection Agency and **Glynda Bathan**, Deputy Executive Director, Clean Air Asia
Venue: Committee Room B

Introduction of Cities Clean Air Partnership (CCAP)	**Mark Kasman**, USEPA
Recognizing cities efforts to improve air quality through city certification - an innovative program of CCAP	**Bjarne Pedersen**, Clean Air Asia
Discussion and feedback from panelists Moderated by **Justin Harris** and **Glynda Bathan**	• **Mary Jane Ortega**, ICLEI Global Executive Committee • **Martina Otto**, Climate and Clean Air Coalition • **Emani Kumar**, ICLEI Global Secretariat and South Asia • **Dieter Schwela**, Stockholm Environment Institute • **Thamara Mallawaarachchi**, CITYNET • **Bjarne Sivertsen**, Norwegian Institute for Air Research (NILU)
Strengthening capacity of cities through city partnerships	**Glynda Bathan**, Clean Air Asia

19 November 2014 (Wednesday) I 15:30-17:00

BAQ Stream: Air Quality and Impacts
Estimating the Benefits of Improved Air Quality
Organized by: US Environmental Protection Agency and Clean Air Asia
Chair: **Neal Fann**, US Environmental Protection Agency
Venue: Committee Room A

Environmental and health benefits from designating the Marmara Sea and the Turkish Straits as an emission control area (ECA)	**Mar Viana**, Institute of Environmental Assessment and Water Research, Spain
Characterizing the human health burden from air pollution in Sydney, Australia	**Richard Broome**, Ministry of Health, New South Wales, Australia
Estimating the human health impacts from shipping emissions in Sydney, Australia	**Ed Jegasothy**, University of Sydney, Australia
Estimating health effects and economic impacts of fine particle pollution in Washington State	**Ranil Dhammapala**, Washington State Department of Ecology, USA
Review of challenges and successful diagnostic modeling in India	**Utkarsh Mukkannawar**, University of Pune, India

BAQ Stream: Air Quality Management and Climate Change Mitigation
Partnerships in Building Capacity towards Better Air Quality and Co-Benefits in Smaller Cities
Organized by: German International Cooperation (GIZ) and Clean Air Asia
Chair: **Roland Haas**, Programme Director for Cities, Environment, and Transport, GIZ
Venue: Committee Room C

Welcome remarks	**Martina Kolb**, GIZ Clean Air for Smaller Cities in the ASEAN Region
Training Update: T4CA in Numbers	**Napaporn Yuberk**, GIZ Clean Air for Smaller Cities in the ASEAN Region
Panel Discussions	Moderated by **Sven Callebaut**, Capacity Development Advisor

Moving Beyond Training: Outcomes of Capacity Building Initiatives
- **Thi Vuong Linh Pham**, Centre for Environmental Monitoring, Vietnam Environment Administration
- **Dasrul Chaniago**, Ministry of Environment-Indonesia
- **Wilhelmina Lagunilla**, Environmental Management Bureau - Cordillera Administrative Region, Philippines

Sharing the Success and Ensuring Sustainability through Partnerships
- **Tanya Gaurano**, Clean Air Asia
- **Napaporn Yuberk**, GIZ
- **Hoang Duong Tung**, Vietnam Environment Administration
- **Dasrul Chaniago**, Ministry of Environment-Indonesia

T4CA Beyond 2015 (Open Discussion)

19 November 2014 (Wednesday) I 15.30-17.00

BAQ Stream: Low Emissions Urban Development

Doubling Fuel Efficiency of Vehicles in Asia

Organized by: Global Fuel Economy Initiative, UN Environment Programme, GIZ Transport and Climate Change Project and Clean Air Asia
Chair: **Lew Fulton**, Global Fuel Economy Initiative and Co-director, NextSTEPS Program at Institute of Transportation Studies, University of California Davis
Venue: Committee Room D

Fuel Economy State of the World 2014: The World is Shifting into Gear on Fuel Economy	**Lew Fulton**, Global Fuel Economy Initiative / University of California Davis

National programs and measures on fuel economy:
- India: **S. Sundaramoorthy**, Bureau of Energy Efficiency
- Sri Lanka: **Thusitha Sugathapala**, Sri Lanka Sustainable Energy Authority
- Malaysia: **Mohd Nazmi bin Mohd Nur**, Malaysia Automotive Institute
- Vietnam: **Le Anh Tu**, Vietnam Register

Fuel Economy Policy Pathways for the ASEAN Region	**Chee Anne Roño**, Clean Air Asia and **Stefan Bakker**, GIZ
Open discussion	Moderated by **Lew Fulton** and **Bert Fabian**, UNEP Transport Unit

BAQ Stream: Management of Emissions from Power, Industry, and Other Sources

Clean Air Initiatives in South Asia

Organized by: World Bank
Chair: **Francoise Clottes**, World Bank Country Director for Sri Lanka and the Maldives
Venue: Committee Room B

ESMAP fuel efficiency pilots with city bus services in Indian cities	**Nupur Gupta** and **Sudhakara Rao Uppada**, World Bank
Cleaning Pakistan's air	**Ernesto Sanchez-Triana, Javaid Afzal, Akiko Nakagawa** and **Asif Shuja Khan**, World Bank
Electric vehicle program in Bhutan	**Da Zhu**,World Bank
Accessing and utilizing climate finance for renewables - a case from Sri Lanka	**Zhuo Cheng**, World Bank
SLCP mitigation from the transport sector of India	**Jie Li**, World Bank's India-California Air Pollution Mitigation Program (ICAMP) and **Prof. S. Sundar**, TERI

19 November 2014 (Wednesday) I 17:15-18:45

BAQ Stream: Air Quality Management and Climate Change Mitigation

Cities and Mountains

Organized by: ICIMOD
Chair: **Arun B. Shrestha**, Programme Manager, ICIMOD
Venue: Committee Room A

Cities and Mountains: processes, challenges, interconnections and opportunities	**Amico Panday**, ICIMOD
Lessons from Mexico City	

Panel discussion
- **Dorji Tshewang**, National Environment Commission, Bhutan
- **Arjun B. Karki**, Ministry of Urban Development, Nepal
- **J.S. Kamyotra**, Central Pollution Control Board, India

BAQ Stream: Air Quality Management and Climate Change Mitigation

Communicating Air Quality

Organized by: Clean Air Asia
Chair: **Dr. Mukesh Khare**, Professor of Environmental Engineering, Civil Engineering Department, India Institute of Technology - Delhi
Venue: Committee Room D

Communicating air quality - status and Clean Air Asia experience	**Maria Preclosa Benjamin**, Clean Air Asia
Emission inventory for an air quality early warning system in Wuhan – Hubei, PR China	**Dam Thanh Vo** and **Li Liu**, Norwegian Institute of Air Research (NILU)
New tools for estimating the human health benefits of reducing short-lived climate pollutants	**Neal Fann**, US EPA
AirNow and AirNow-International update	**Phil Dickerson**, US EPA and **Timothy Dye** and **Alan Chan**, Sonoma Technology, Inc.
Using cardiovascular impact pathway to accelerate air quality improvements in South Asia	**Prakash Bhave, Bhupesh Adhikary, Bidya Banmali Pradhan** and **Amico Panday**, ICIMOD

BAQ Stream: Low Emissions Urban Development

Green Freight Progress in Asia

Organized by: Clean Air Asia, German International Cooperation (GIZ) and Asian Development Bank Greater Mekong Subregion's Environmental Operation Centre
Chairs: **Robert Earley**, Program Manager, Clean Air Asia and **Sophie Punte**, Executive Director, Smart Freight Centre
Venue: Committee Room B

Green freight and logistics for Asia: setting the scene	**Robert Earley**, Clean Air Asia
State of Play: Smart Freight in PR China and India	**Sophie Punte**, Smart Freight Centre
Developing a national green freight program in PR China: The China Green Freight Initiative	**Fu Lu**, Clean Air Asia
Developing a national action plan for green freight and logistics in Indonesia	**Tory Damantoro**, Indonesia Transport Society
'Green Freight India' – overview of the initiative, current status and the way forward	**Kartik Kumar**, GIZ
Finance options for greener freight in the GMS region	**Naseda Crishna**, ADB GMS Environment Operations Centre
Panel discussion on the role of finance in national green freight program development	
Launching the US EPA SmartWay Training package	**Jim Blubaugh** and **Buddy Polovick**, US Environmental Protection Agency

BAQ Stream: Management of Emissions from Power, Industry, and Other Sources

Reducing Emissions from Power Plants

Organized by: Clean Air Asia
Chair: **S. Chander**, Special Senior Advisor, Asian Development Bank
Venue: Committee Room C

Keynote presentation: Strategies for reducing emissions from power plants	**S. Chander**, Asian Development Bank
Strategic Use of Coal and Sustainable Development of Natural Gas Market in the EAS Region	**Yanfei Li**, Economic Research Institute for ASEAN and East Asia (ERIA)
Air Quality Control: Technological solutions for power sector	**Preeti Malhotra**, Alstom India Ltd.
Mercury emissions from power plants	**Krish Vijayaraghavan**, ENVIRON International Corporation
Control process for stationary sources permits in New Taipei	**Hsin-Han Chiou**, New Taipei City Environmental Protection Department

Pioneer. Leader. Commitment. These are the words that best describe **Dr. B.M.S. Batagoda**, currently the Deputy Secretary to the Treasury in the Ministry of Finance and Planning in Sri Lanka—and winner of the Clean Air Asia's Kong Ha Award 2014.

Dr. Batagoda's work in air quality management helped Sri Lanka to achieve tremendous results in improving air quality through wider and effective stakeholder participation. Back in 1998 when he was appointed as Director for air quality management in Sri Lanka's Ministry of Environment, air quality was not a priority in the government's action plans. One of his most significant contributions was the development of the Air Resource Management Center ("AIRMAC"), an organization in the Ministry of Environment which is comprised of key stakeholders from the public and private sector related to air quality management. Dr. Batagoda was appointed as the first Director of the AIRMAC. Under his leadership, the AIRMAC became an effective platform for multiple stakeholders to develop policies, strategies and action plans. As these plans and concepts were implemented and achieved results, his work and his team garnered commendations from higher authorities, international policy experts and organizations.

Milestones achieved under Dr. Batagoda's public service include policies for cleaner fuels, vehicles and transport such as standards for vehicular emission, fuel quality and vehicle importation, the elimination of lead gasoline in fuels in the country, the banning of 2-stroke wheelers and spare parts, the reduction of sulphur content in diesel fuel from 8000ppm to 3000 ppm and the introduction of 500 ppm and 10 ppm super diesel in 2004 and 2014, respectively. He established concessions for private bus operators to import buses to substitute the existing fleets and had a tax reduction established hybrid and electric vehicles scheme as well as implemented the Vehicular Emission Testing (VET) program.

Dr. Batagoda was also key in establishing "Clean Air Sri Lanka" which now facilitates and coordinates air quality management programs and activities. He led the development of strategies, policy and activities to curb indoor air pollution and ambient air pollution, leading to the mainstreaming of air quality management and environmentally sustainable transport in national development planning. The most significant of such developments includes: the National Air Quality Management Strategy for Sri Lanka, Clean Air 2007 & 2015 Action Plans, and the introduction of the air quality research and symposium series Air that We Breathe, among other activities. Dr. Batagoda also established the Climate Change Secretariat, the Sri Lanka Carbon Fund and Sri Lanka Vehicle Emission Test Trust Fund, and was instrumental in setting up the Environmental Convention Reference Centre, and other centers of learning in the field. He is also a consistent supporter of the Better Air Quality Conference.

Dr. Batagoda has authored and published several academic publications in air quality management, such as Urban Air Quality Management in Sri Lanka, Fiscal Policies on Fuel and Vehicles in Sri Lanka, Vehicle Emission Reduction in Sri Lanka, Motor Fuel Quality Improvements in Sri Lanka, and the Theoretical Manual for Environmental Valuation in Sri Lanka. He shares his knowledge with the next generation of air quality managers in the University of Colombo, University of Sri Jayewardenepura, University of Moratuwa and University of Peradeniya.

Such is the dedication of Dr. Batagoda in his field that even after he was promoted to the post of Deputy Secretary to the Treasury, Ministry of Finance and Planning, he voluntarily involved himself in most of the air quality management activities implemented in Sri Lanka, regionally and internationally.

Sri Lanka has achieved tremendous results in improving air quality in the country through wider and effective stakeholder participation of the AIRMAC, Clean Air Sri Lanka and Sri Lanka VET Trust Fund due to the above innovative and dedicated partnership work done by Dr. B.M.S Batagoda. Most importantly the institutional framework that he developed in partnership with his team has been able to effectively link all stakeholders of air quality management and to draw the attention of political leadership including His Excellency the President on key issues such as sustainable transport, climate change, carbon trading and sustainable development.

19 December 2014 (Wednesday) I 19:00-21.00

Welcome reception hosted by the Ministry of Environment and Renewable Energy, Sri Lanka
Presentation of Clean Air Asia's Kong Ha Award

Venue: Waters Edge

20 November 2014 (Thursday) I 9:00-10:30

BAQ Sri Lanka Plenary

Programs and Measures to Reduce Air Pollution for a Healthy Nation

Organized by: Sri Lanka Ministry of Environment and Renewable Energy and Clean Air Asia
Chair: **Dr. B.M.S. Batagoda**, Deputy Secretary, Ministry of Finance
Venue: Committee Room B

Sri Lanka roadmap for low-sulphur fuels and vehicle emission standards	**Dr. R.H.S Samarathunga**, Ministry of Petroleum Industries
Clean air action plan and programs	**Dr. Thusitha Sugathapala**,Sri Lanka Sustainable Energy Authority
Sri Lanka Vehicle Emission Testing (VET) Programme	**A.W Dissanayake**, VET Trust Fund
Towards cleaner air - contribution of the City of Colombo	**Dr. Ruwan Wijayamuni**, Colombo Municipal Council
Economic impact and managing Sri Lanka's air quality thru fiscal policies	**Dr. Don Jayaweera**, Clean Air Sri Lanka
Indoor air pollution research findings and indoor air quality management in Sri Lanka	**Anura Jayatilake**, South Asia Co-operative Environment Programme (SACEP)

20 November 2014 (Thursday) I 11:00-13:00

BAQ 2014 Transport Debate Plenary

Organized by: German International Cooperation (GIZ) and Clean Air Asia
Chairs: **Cornie Huizenga**, Secretary General, Sustainable Low Carbon Transport (SLoCaT) Partnership and **Robert Earley**, Transport Program Manager, Clean Air Asia
Venue: Committee Room B

The objective of the transport debate is to highlight a controversial contemporary issue that needs to be resolved, to bring forth evidence for and against the resolution, and to test the mettle of each of the debaters to come to a conclusion on the best pathway forward for the transport concept.

Transportation is something that many people take for granted. While making our contemporary lifestyle possible, transport shapes our cities and towns, and has important and controversial impacts on our health, environment, lifestyles, culture and economic opportunities.

The topic of the transport debate will be chosen by BAQ 2014 participants and argued by some of the top thinkers in the field. The three potential resolutions of the debate will be:
- Be it *resolved* that motorcycles are bad for Asian cities, and should be banned from Asian cities immediately.
- Be it *resolved* that in the interest of sustainable transport, that Asian cities should provide public transportation at no cost to public transport users.
- Be it *resolved* that in order to achieve sustainable transport across Asia, national and local governments should invest 25% of total annual budget in transportation systems.

Please note that the final debate topic will be chosen on 19 November, after the Clean Air Plenary at 12:30 pm, outside Committee Room B. Pay attention for announcements during the Clean Air Plenary for mechanics.

20 November 2014 (Thursday) I 11:00-13:00

BAQ Stream: Air Quality and Impacts

From Awareness to Action on SLCPs in Asia

Organized by: Climate and Clean Air Coalition (CCAC), ICIMOD, Institute for Global Environment Strategies (IGES), Stockholm Environment Institute and Clean Air Asia
Chairs: **Bidya Banmali Pradhan**, Associate Coordinator - Atmosphere Initiative, ICIMOD
Venue: Committee Room A

Introduction to Short-Lived Climate Pollutants (SLCPs)	**Harry Vallack**, Stockholm Environment Institute
Climate and Clean Air Coalition and results of intergovernmental consultations in Asia	**Martina Otto**, Climate and Clean Air Coalition
Cookstoves and Health	**Bidya Banmali Pradhan**, ICIMOD
Co-benefits and Asian Co-Benefits Partnership	**Eric Zusman**, Institute for Global Environment Strategies
Update from the consultation meeting on Joint Forum on Clean Air and 5th Governmental Meeting on Urban Air Quality in Asia	**Glynda Bathan**, Clean Air Asia

Panel discussion
Brick Kiln: **J.S. Kamyotra**, Central Pollution Control Board, India
Cookstoves: **Md. Mominur Rahman**, Bangladesh University of Engineering and Technology
Health: **Dr. Lanka Jayasuriya Dissanayake**, World Health Organization
Transport: **Dr. Wang Yanjun**, Vehicle Emission Control Center, Ministry of Environmental Protection China
Waste: **Nida Cabrera**, Cebu City, Philippines

BAQ Stream: Air Quality Management and Climate Change Mitigation

Improving Air Quality Monitoring in Asian Cities

Organized by: Asian Development Bank and Clean Air Asia
Chairs: **Vijay Joshi**, Senior Environment Specialist, Asian Development Bank
Venue: Committee Room D

Keynote address	**Vijay Joshi**, Asian Development Bank
Status of air quality monitoring in Asian cities	**Shun-cheng Lee**, Hong Kong Polytechnic University
Launch of 'Good Practice Guidance in Improving Air Quality Monitoring in Asian Cities'	**Kaye Patdu**, Clean Air Asia
A comparative analysis of ambient air quality standards setting in PR China and the US	**Judith Chow**, Desert Research Institute
Using low-cost sensors for air quality monitoring and management applications: review of technology and demonstration of applications	**Tim Dye**, Sonoma Technology Inc.

Panel discussion

BAQ Stream: Management of Emissions from Power, Industry, and Other Sources

Household Air Pollution (HAP) - The Silent Killer

Organized by: German International Cooperation (GIZ)
Chair: **Santosh Kumar Singh**, Technical Expert, GIZ India
Venue: Committee Room C

Relevance of the new WHO indoor air quality guidelines and challenges for national stakeholders	**Terrence Thompson**, World Health Organization
Country case Sri Lanka: national situation of household air pollution and plans to develop and adapt the indoor air quality guidelines	**Dr. Sumal Nandasena**, National Institute of Health Sciences, Sri Lanka **Dr. Thusitha Sugathapala**, Sri Lanka Sustainable Energy Authority
Solutions to reduce household air pollution	**Dr. Kapil Goel**, Global Alliance for Clean Cookstoves **Dr. Martis Kees**, GIZ

20 November 2014 (Thursday) I 15:30-17:00

BAQ Stream: Air Quality and Impacts

Cities' Solutions for Clean Air Part 1

Organized by: Clean Air Asia
Chair: **Fu Lu**, Director, Clean Air Asia China Office
Venue: Committee Room B

Developing an urban air quality management program in Jakarta	**Alan Gertler**, Desert Research Institute
Air quality monitoring in Beijing	**Zhang Dawei**, Beijing Environment Monitoring Center
Experiences of air quality forecast in Shanghai and Yangtze River Delta	**Wang Qian**, Shanghai Environmental Monitoring Center
Estimating air pollutant emissions in Metro Manila	**Candy Tong**, Clean Air Asia

BAQ Stream: Transport Emissions Management

Cleaner Fuels and Light-Duty Vehicles

Organized by: UNEP Partnership for Clean Fuels and Vehicles (PCFV) and Clean Air Asia
Chair: **Bert Fabian**, UNEP Transport Unit
Venue: Committee Room C

Global status of low-sulfur fuels and cleaner light-duty vehicles (new and in-use)	**Bert Fabian**, UNEP Transport Unit
Key priorities for fuel quality development in Asia	**Nurfarahlslinda Binte Mohamed Ismail**, Asian Clean Fuels Association
India's Auto-Fuel Roadmap	**K K Gandhi**, Society of Indian Automobile Manufacturers

Role of private sector in reducing emissions from in-use light-duty vehicles:
- PR China Vehicle Emissions Standards and the City Network of Vehicle Emission Control
  Dr. Wang Yanjun, Vehicle Emission Control Center – MEP PR China
- OBD vs Tailpipe Testing: The Future for Modern Emission Control System for In-Use Vehicles
  Klaus Burger, MAHA Maschinenbau Haldenwang GmbH & Co. KG
- Vehicle Safety and Emission Testing: Lessons Learned in Chile
  William Gaillard, SGS Testing & Control Services Singapore

BAQ Stream: Low Emissions Urban Development

Livable Cities are Pedestrian- and Bicycle- Friendly Cities

Organized by: Walk21 and Clean Air Asia
Chair: **Naini Jayaseelan**, Member Secretary, NCRPB India
Venue: Committee Room D

An era of walkability and bikeability in Asian cities	**Parthaa Bosu**, Clean Air Asia
Walking as the foundation of urban transport	**Bronwen Thornton**, Walk21
Diu Cycle Tracks	**Anuj Malhotra**, Centre for Green Mobility
Creating low emission zones in Medan, Indonesia	**Fael Zufa**, Institute for Transportation and Development Policy
Revitalizing Nehru Place in Delhi, India	**Ashish Rao-Ghorpade**, ICLEI South Asia
Non-motorized transport for last mile connectivity	**Vedant Goyal**, GIZ
Non-motorized transport aspects in transit-oriented development	**Ashok Bhattacharjee**, Centre for Science and Environment - New Delhi
Reframing the way we look at traffic in Metro Manila	**Trina Tolentino**, Inclusive Mobility Network

Participants are invited to download the Clean Air Asia Walkability App and join the Colombo City walking tour that follows this session.

20 November 2014 (Thursday) I 15:30-17:00

BAQ Stream: Management of Emissions from Power, Industry, and Other Sources

Triple Green: Sustainable Cities, Ports and Marine Transport

Organized by: GIZ and US Environmental Protection Agency
Chair: **Franca Sprong**, Project Director, GIZ Sustainable Port Development
Venue: Committee Room E

Experiences and success stories from the US EPA and US West Coast Ports	**Mark Kasman**, US EPA
Global city indicators for green port cities	**Dr. Nguyen Van Thanh**, Haiphong City
Overview of the range of solutions to reduce the emissions from maritime transport	**Dr. Axel Friedrich**, Independent Consultant
Panel discussion on how economic benefits, environmental protection and human health can be integrated into the business of goods movement and sustainable cities. The panelist consists of 5 candidates with different expertise: environmental authorities, scientists, experts in goods movement, as well as shipping lines and cargo owners.	Moderated by **Simon Ng**

20 November 2014 (Thursday) I 17:15-18:45

BAQ Stream: Air Quality and Impacts

Cities' Solutions for Clean Air Part 2

Organized by: Clean Air Asia
Chair: **Fu Lu**, Director, Clean Air Asia China Office
Venue: Committee Room B

A study on the effectiveness for the application of infrared thermal imaging camera in air pollution control	**Jui-Hsiang Wu**, Environmental Protection Bureau of Taoyuan County Government
Master plan for mobile vehicle management and green transportation in Taipei	**Dr. Kao Wei Yu**, Department of Environmental Protection of Taipei City
Public transport - a sustainable clean air solution in General Santos, Philippines	**Jude Defensor**, Clean Air Transport Solutions
Assessment of ambient air quality in Lumbini Protected Zone	**Terrence Thompson**, World Health Organization

BAQ Stream: Low Emissions Urban Development

Climate Financing and Green Cities

Organized by: Institute for Global Environmental Strategies (IGES), Cities Development Initiative in Asia (CDIA) and Clean Air Asia
Chair: **Eric Zusman**, Area Leader/ Integrated Policies for Sustainable Societies, IGES
Venue: Committee Room C

Opening presentation	**Alvin Mejia**, Clean Air Asia
Global climate finance and agreements: status and updates	**Eric Zusman**, IGES
Transport MRV/NAMAs	**Sudarmanto Nugroho**, IGES
MDB perspective on climate financing	**Zhou Cheng**, World Bank
Climate financing in Asian cities	**Balakrishnan Elangovan**, CDIA

Panel discussion:
Sri Hari Kiran, Vijayawada Municipal Corporation
Rizki Budi Utomo, Transportation, Communication and Informatics - Yogyakarta
Jesus Melchor Quitain, Davao City Administrators Office

20 November 2014 (Thursday) I 17:15-18:45

BAQ Stream: Air Quality and Impacts

Climate and Clean Air Coalition to Reduce Short-Lived Climate Pollutants: Urban Health Initiative

Organized by: World Health Organization, Clean Air Asia and Climate and Clean Air Coalition (CCAC)
Chairs: **Dr. Carlos Dora**, Coordinator for Department of Public Health and Environment, World Health Organization and **Bjarne Pedersen**, Executive Director, Clean Air Asia
Venue: Committee Room D

Introduction to CCAC Urban Health Initiative	**Carlos Dora**, World Health Organization
Towards a plan to reduce SLCPs in Kathmandu, Nepal	**Amico Pandey**, ICIMOD
Sustainable transport initiatives in Asian cities – opportunities for improved collaboration with the health sector	**Bjarne Pedersen**, Clean Air Asia
Quantifying health benefits from reducing SLCPs using the CCAC SLCP Toolkit	**Amanda Curry Brown**, US Environmental Protection Agency
Open discussion to provide input and shape outcome of initial scoping phase of the CCAC Urban Health Initiative	Moderated by **Martina Otto**, CCAC

BAQ Stream: Air Quality Management and Climate Change Mitigation

Diesel At Crossroads: Charting the Roadmap for Co-Benefits of Health and Climate Mitigation

Organized by: Centre for Science and Environment - New Delhi
Chair: **Sunita Narain**, Director General, Centre for Science and Environment (CSE)
Venue: Committee Room E

Diesel at crossroads: addressing challenges of air quality, public health, climate impacts	**Anumita Roychowdhury**, Centre for Science and Environment - New Delhi
Diesel emissions reduction strategy in the transport sector in Beijing/ PR China for health and climate co-benefit	**Dr. Wang Yanjun**, Vehicle Emission Control Center, Ministry of Environmental Protection PR China
How Sri Lanka has addressed the problem of dieselization with fiscal measures and fuel standards roadmap to curb diesel pollution	**Dr. Don Jayaweera**, Clean Air Sri Lanka
Science of diesel black carbon and diesel black carbon reduction programme in the US	**Ray Minjares**, International Council on Clean Transportation
Challenges of diesel black carbon mitigation in Europe and the emerging roadmap to address this problem	**Axel Friedrich**, International Consultant

20 November 2014 (Thursday) I 19:00-21.00

Dinner reception hosted by the Ministry of Transport, Sri Lanka

Venue: Hilton Hotel

21 November 2014 (Friday) I 9:00-10:30

BAQ Country Roundtable Discussion

Country Roundtables will discuss what is needed to improve urban air quality, reduce GHG emissions and make cities more livable in different Asian countries. The Country Roundtables are organized by Clean Air Asia Country Networks, and recommendations will help to determine priorities for 2015 and 2016.

BANGLADESH
Coordinator: **Md. Mominur Rahman**, Clean Air Partnership (CAP) Bangladesh
Rapporteur: **Chandramallika Ghosh and Sk. Salahuddin Ahammad**, CAP Bangladesh
Venue: Committee Room B

MALAYSIA
Coordinator: **Noor Zaitun Binti Yahaya**, Clean Air Malaysia Society
Rapporteur: **Candy Tong**, Clean Air Asia
Venue: Cinema Hall

THAILAND
Coordinator: Pollution Control Department, Thailand
Rapporteur: **Dang Espita** and **Precious Benjamin**, Clean Air Asia
Venue: Committee Room E

PR China
Coordinator: **Fu Lu**, Clean Air Asia China Office
Rapporteur: **Zhang Weihao**, Clean Air Asia China Office
Venue: Committee Room C

NEPAL
Coordinator: **Prashanta Khanal**, Clean Air Network Nepal
Rapporteur: **Narayan Dhital**, Clean Air Network Nepal
Venue: Committee Room B

SRI LANKA
Coordinator: **Sampath Ranasinghe**, Clean Air Sri Lanka
Rapporteur: **Ashoka Samanmali** and **Harichandra**, Clean Air Sri Lanka
Venue: Committee Room A

INDIA
Focal person: **Parthaa Bosu**, Clean Air Asia India Office
Rapporteur: **Jyoti Gopinathan** and **Rajan Thapa**, Clean Air Asia India Office
Venue: Committee Room B

PAKISTAN
Coordinator: **Ahmad Saeed**, Pakistan Clean Air Network
Rapporteur: **Sameera Kumar**, Clean Air Asia
Venue: Committee Room B

VIETNAM
Coordinator: **Phan Duynh Nhu**, Vietnam Clean Air Partnership
Rapporteur: **Van Bui Duc**, Vietnam Clean Air Partnership
Venue: BCIS Auditorium

INDONESIA
Coordinator: **Dollaris (Waty) Suhadi** and **Puput Saifrudin**, Forum Udara Bersih Indonesia (FUBI)
Rapporteur: **Mark Tacderas**, Clean Air Asia
Venue: BCIS Auditorium

PHILIPPINES
Coordinator: **Juliet Manlapaz**, Partnership for Clean Air
Rapporteur: **Nathaniel dela Cruz** and **Kathleen Dematera**, Clean Air Asia
Venue: BCIS Auditorium

21 November 2014 (Friday) I 11:00-12:30

BAQ Country Roundtable Plenary Presentation

Organized by: Clean Air Asia
Chairs: **Mary Jane Ortega**, Chair and **Dr. Wing-tat Hung**, NGO representative of the Clean Air Asia Partnership Council
Venue: Committee Room A

In this session, the results of the Country Roundtable Discussions are reported to the Plenary.

Bangladesh
report to be given by Clean Air Partnership for Bangladesh

PR China
report to be given by Clean Air Asia China Office

India
report to be given by Clean Air Asia India Office

Indonesia
report to be given by Forum Udara Bersih Indonesia (FUBI)

Malaysia
report to be given by Clean Air Malaysia Society

Nepal
report to be given by Clean Air Network Nepal

Pakistan
report to be given by Pakistan Clean Air Network

Philippines
report to be given by Partnership for Clean Air (PCA)

Sri Lanka
report to be given by Clean Air Sri Lanka

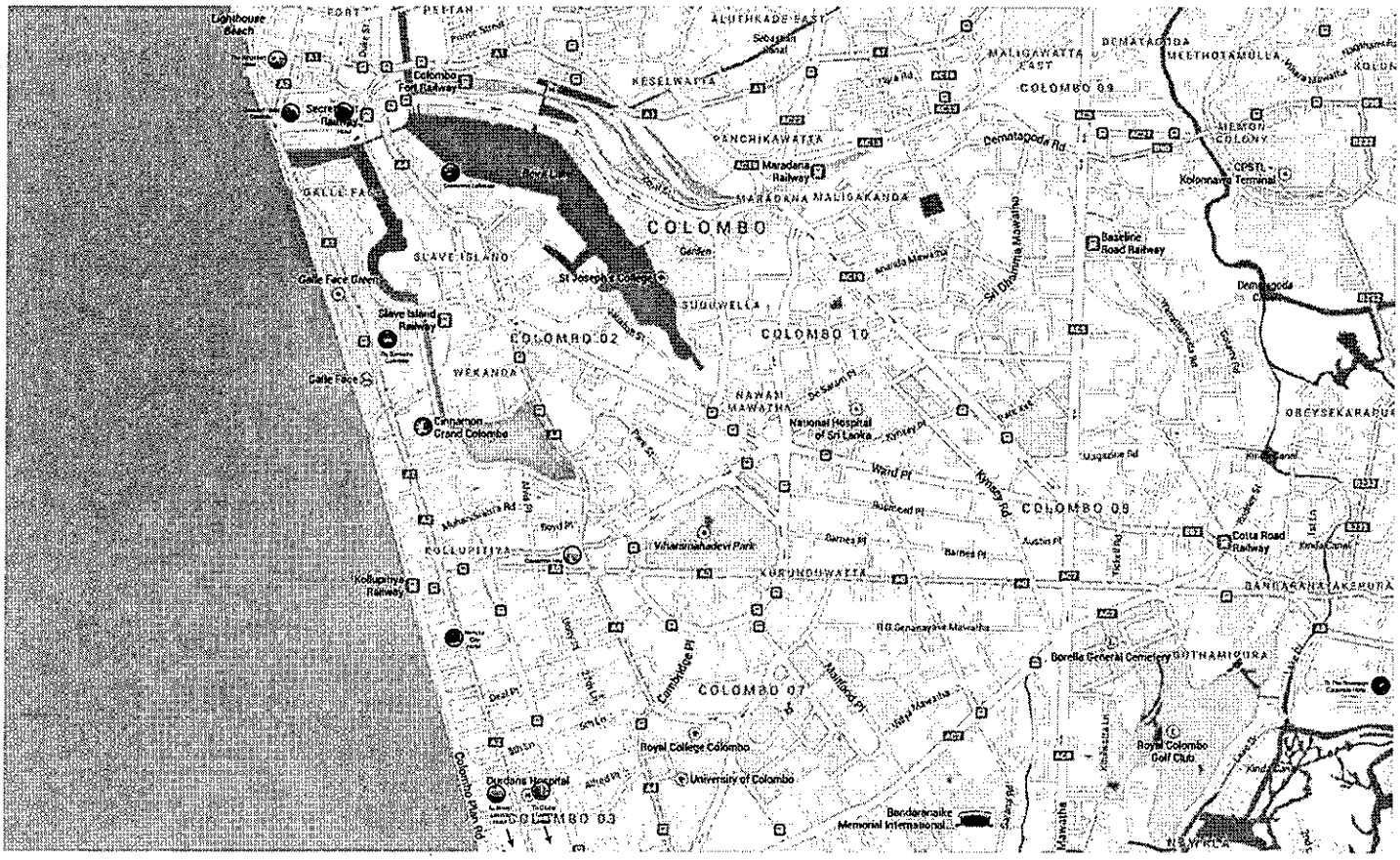
Thailand
report to be given by Pollution Control Department, Thailand

Vietnam
report to be given by Vietnam Clean Air Partnership (VCAP)

21 November 2014 (Friday) I 19:00-21:00

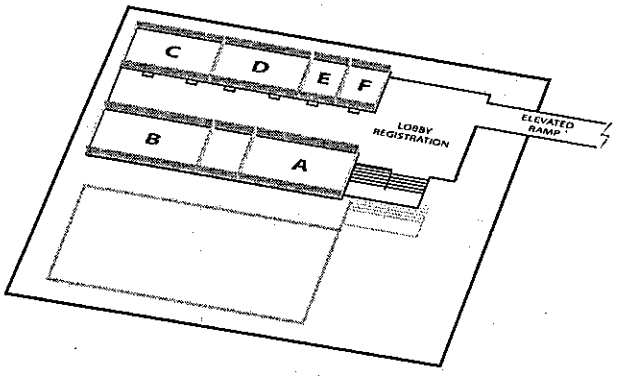
Farewell reception hosted by the Ministry of Environment and Renewable Energy and BAQ 2014 Awards Night

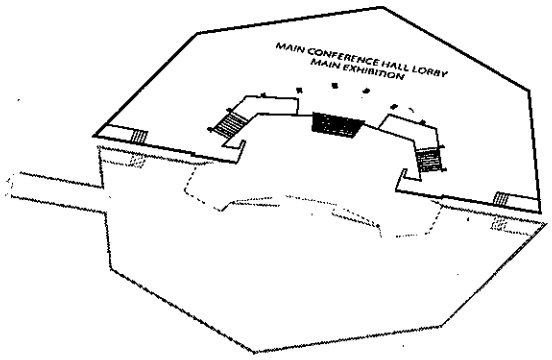
Venue: Mount Lavinia Hotel



2nd FLOOR

Committee Rooms A to E – Breakout Sessions
Committee Room F - Secretariat Room
Committee Rooms Hallway - Poster Exhibition





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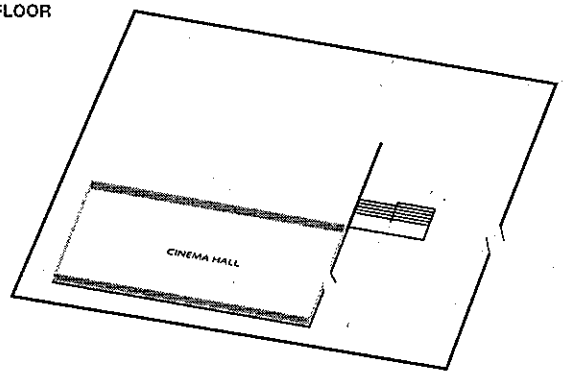

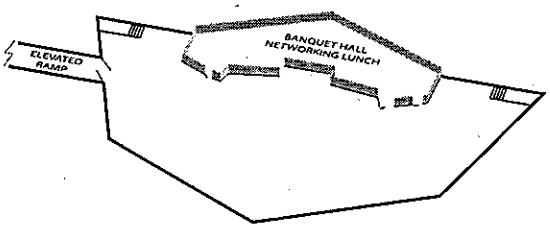

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All poster presenters are requested to be at the Committee Room Hallway during session breaks to interact with conference participants.

- **A. Enkhjargal, Health Science University**
  Acute and chronic RSD and CVD impact of ambient air PM10 and PM 2.5 of Ulaanbaatar city.
- **Adelaida B. Roman, Regional Resource Centre for Asia and the Pacific**
  Regional Initiatives on Air Pollution in Asia.
- **Ahmad Safrudin, Komite Penghapusan Bensin Bertimbel**
  Baseline of Fuel Economy in Indonesia.
- **Ahmad Safrudin, Komite Penghapusan Bensin Bertimbel**
  Health Effect of Lead Exposure of ULAB Recycling.
- **Ahmad Safrudin, Komite Penghapusan Bensin Bertimbel**
  Low Sulfur Fuels.
- **Ahmad Safrudin, Komite Penghapusan Bensin Bertimbel**
  How Effective Scrapped Car Program To Reduce Emissions?
- **Akshima T. Ghate, The Energy and Resources Institute (TERI)**
  Electric-rickshaws in Delhi: An informal low cost and low emission last mile mobility solution.
- **Amit Arora, School of Planning and Architecture**
  Low Emission Urban Development: A Critical Analysis of Residential Neighbourhoods in Delhi, India.
- **Anjum Rasheed, Fatima Jinnah Women University**
  Measurements and Analysis of Ambient Air Quality in Islamabad, Pakistan.
- **Anmesh Gaire, Institute of Engineering, Pulchowk Campus**
  Design, Modeling and Testing of High Efficiency Cyclone Separator.
- **Anuj Malhorta, Clean for Green Mobility**
  The Crosswalk Lab.
- **Arun Kanchan, Trinity Consultants, Incorporated**
  Continuous Emissions Monitoring Systems - Considerations for Successful Deployment, Operations, and Maintenance.
- **Ashoka Samanmali, Clean Air Sri Lanka/ Sri Lanka Vehicular Emission Testing Programme**
  Health Impact of public bus driver's exposure to air pollution in Colombo city - Sri Lanka.
- **Ashutosh Atray, Ace Driving & Road Safety Education**
  Effective Driver's Training To Improve Transportation & Emission.
- **Badar Ghauri, Institute of Space Technology, Karachi Campus**
  Satellite as Most Economical Tool of Monitoring Particulate Pollution at Local and Regional Levels.
- **Beena George, Evangelical Social Action Forum (ESAF)**
  Bridging Microfinance with Clean Energy - A Case of ESAF.
- **Chalaka Fernando, University of Moratuwa**
  LCSA tool to evaluate prospective transport fuel sources: introducing 'PROSUITE' as the sustainability impact assessment model.
- **Chatchawan Vongmahadlek, King Mongkut Institute of Technology Ladkrabang (KMITL)**
  Model of Deterministic Road and Intersection.
- **Chung-Tien Huang, Environment Protection Bureau**
  Emissions Management of Electricity and Steel Industries' PM2.5 over Metropolitan Taichung.
- **Debasis Bhattacharya, Institute of Corporate Sustainability Management**
  Renewable Energy for Rural Livelihoods (Public Private Public model project supported by UNDP under Ministry of New and Renewable Energy, Govt. of India and implanted through Confederation of Indian Industry).
- **Dilip Chate, Indian Institute of Tropical Meteorology**
  Evaluating population exposure to air pollutants: a case study for Indian megacities.
- **Dwiyanti Arimbi Jinca, TUM CREATE**
  Selecting Suitable Traffic Emission Models for a Particular Application.
- **Dwiyono Yanuar, Ministry of Environment**
  Air Quality and Green House Gases Management.
- **Edgardo G. Alabastro, Kalbigan ng Kaunlaran at Kalikasan ("Friends of Development and Environment)**
  Motor Vehicle Emissions and Fuels Challenges in the Philippines.
- **Eng K Jayantha Sirikumara, Sri Lanka Standards Institution**
  Sri Lanka Biodiesel Standard: A roadmap for quality assurance.
- **Fengchao Liang, Peking University**
  Comparative study for the Different Air Temperature Indicators and Respiratory Mortality of the Population.
- **Fitri Harwati, Ministry of Environment**
  PROPER as a tool for Improving Environmental Compliance.
- **Francis Aldrine Uy, School of Civil, Environmental and Geological Engineering, Mapua Institute of Technology**
  The Need for a Sustainability-Oriented & Performance-Based Green Building Framework for the Philippines & the ASEAN Community.
- **Gang He, Renewable and Appropriate Energy Laboratory, University of California**
  The transition to a low carbon power system for China financed with health and environmental co-benefits.
- **Hwang-Jen Chang, Environmental Protection Bureau**
  Tainan City Successful Experience for the Promotion of Vehicle Anti-Idling Control.
- **Ian Longley, National Institute of Water & Atmospheric Research Ltd**
  Hierarchical distributed monitoring to manage hot-spot impacts of diesel transport in a growing CBD.
- **Ian Longley, National Institute of Water & Atmospheric Research Ltd**
  Exposure of urban transport system users to air pollutants.
- **Imran Shahid, Department of Space Science, Institute of Space Technology**
  GIS based vehicular emission inventory of mega cities of Pakistan.
- **Isha Khanna, Indian Institute of Technology**
  Chemical Characterization of Fine Particulate Matter at a Kerbside of National Highway in Delhi, India.
- **Ittipol Paw-armart, Automotive Emission Laboratory (AEL) Pollution Control Department (PCD)**
  Estimating Greenhouse Gas Emissions from Dual fuel vehicle in Bangkok, Thailand.
- **Javeria Abbas, National University of Science and Technology**
  Exploring the Formaldehyde Concentrations over Islamabad, Pakistan by using Mini Max-DOAS Instrument.
- **Jeevan Lal Matawle, School of Studies in Chemistry, Pt. Ravishankar Shukla University**
  Characterization of PM2.5 source profiles for different vehicular exhaust emissions in India.
- **Jens Froese, Jacobs University**
  Reduction of Emissions caused by Truck Traffic feeding Container Terminals.
- **John G. Watson, Desert Research Institute**
  Real-World Emission Characterization for Mining Trucks.
- **Jyoti Gopinathan, Clean Air Asia**
  Air Quality and Walkability Environment.
- **Jyoti Gopinathan, Clean Air Asia**
  Public Perception Survey Study on NMT
- **K Jayantha Sirikumara, Sri Lanka Standards Institution**
  Role of standards in sustainable transport.
- **Kavitha Ravinder, Transport Planning Division, CSIR-Central Road Research Institute**
  Road Sector Vehicular Emissions Based on Vehicle Kilometres Travelled at National Level in India.
- **Kiyoung Lee, Seoul National University**
  Need of Research on Biomass Combustion on Indoor Air Quality.

- **L. Drew Hill, Department of Environmental Health Sciences, University of California**
  Health Impacts of Air Pollution Policy Pathways through 2024 in Ulaanbaatar, Mongolia.
- **Le Anh Tuan, Hanoi University of Science and Technology and Hanoi University of Industry**
  Exhaust After Treatment Solution for In-Used Diesel Engine Buses in Hanoi.
- **Lubaina Rangwala, EMBARQ**
  Rethinking Off-street Parking in Transit Oriented Development Zones in Mumbai.
- **M.A.M. Asri, University Malaysia Terengganu**
  Spatial and Temporal Variability of Big Ozone Dataset Applicable Using R Software.
- **Malti Goel, Climate Change Research Institute**
  Understanding Role f Black Carbon In Climate Change: Indian Studies and Perspectives.
- **Manju George, Evangelical Social Action Forum (ESAF)**
  Role of Community Engagement and Knowledge Management in creation of a Better policy environment - A case of ESAF.
- **Manju George, Evangelical Social Action Forum (ESAF)**
  Facilitating sustainable urban development through network forum.
- **Manoj Kumar Teotia, Centre for Research in Rural and Industrial Development (CRRID)**
  Air Pollution and Urban Mobility in Four Metropolitan Cities in North-western India: Trends, Status and Emerging Issues (Some evidence from recent studies).
- **Masud Rana, Clean Air and Sustainable Environment Project, Department of Environment**
  Study of Vehicular Emission as a Source of Air Pollution in Dhaka City.
- **Mitali Parvin, Ghent University**
  Indoor-Outdoor Volatile Organic Compounds (VOCs) levels in Urban and Industrial Area of Dhaka City, Bangladesh.
- **Mohammad Arif, Department of Environment Science, School of Basic Sciences and Research, Sharda University**
  Black carbon emissions from biomass and fossil fuels: Indo-Gangetic Plains, India.
- **Mihir Das, CEPT University**
  Balancing environment & growth in a port freight transport system – effectiveness of environment management in Major and Private Indian Ports.
- **Muhammad Qasim, World Vision International (WVI)**
  Exploring the Methane Concentrations in the Skies of Pakistan by Using Satellite Observation.
- **N. Jayaraju, Yogi Vemana University**
  Impact of Air Pollution in Cement Industry in Kadapa region, India: The Socio- Economic Perspective.
- **N.Z. Yahaya, University Malaysia Terengganu**
  Seasonal Variability and Characteristics of Particles (PM10) Along Coastal Environment in Malaysia.
- **N.Z. Yahaya, University Malaysia Terengganu**
  Novel Method to Analyse Atmospheric Data Using an Artificial Intelligence Approach (Boosted Regression Trees, BRT).
- **Narayan Babu Dhital, Clean Air Network Nepal and The Hong Kong Polytechnic University**
- Air quality and drivers' health in public buses of Kathmandu Valley.
- **Nathaniel Dela Cruz, Norwegian Institute of Air Research (NILU)**
  Brick Kiln Emissions and Health Impacts in Dhaka, Bangladesh.
- **Neha G. Tripathi, Department of Environment Planning, School of Planning and Architecture**
  Resilient cities through integration of air quality management and urban green spaces.
- **Noor-E-Alam, Greater Dhaka Sustainable Urban Transport Project, Roads and Highways Department, Ministry of Communication**
  Clean air initiatives for Dhaka: Introducing Bus Rapid Transit.
- **Pallavi Pant, University of Birmingham**
  Chemical Characterization of Particulate Matter in New Delhi, India.
- **Perera G.B.S, University of Moratuwa**
  Transport induced Volatile Organic Compound concentration at seven junctions in the city of Colombo.
- **Pham Ngoc Dang, Hanoi Civil and Engineering University**
  Proposed Calculation Model of Aggregated Air Quality Index for Vietnam.
- **Premasiri, National Building Research Organization**
  Influence of Vehicular Emission on Deterioration

of Ambient Air Quality in Major Cities in Sri Lanka.

- **Premasiri, National Building Research Organization**
  Air Pollutant Exposure Levels of Public Bus Passengers Reach to Colombo City from Suburban Areas in Sri Lanka.
- **Rabindra Nath Bhattarai, Pulchowk Campus, Institute of Engineering, Tribhuvan University**
  High Efficiency Cyclone Separator to Control.
- **Ramachandran Prasannavenkatesh, Centre for Climate Change & Adaptation Research, Anna University**
  Dynamics and origin of Coarse and the fine particulates in Urban Channai.
- **Ranasinghe R.S.A., Air Resources Management Center, Ministry of Environment and Renewable Energy**
  Modeling Vehicular Air Pollution: An Evaluation of Emission Changes of Motorized Vehicles Based On Main Criterion.
- **Rati Sindhwani, Center for Atmospheric Sciences, Indian Institute of Technology Delhi**
  Assessment of Gaseous and Respirable Suspended Particulate Matter (PM10) Emission Estimates over Megacity, Delhi (2000-2010).
- **Red Constantino, Institute for Climate and Sustainable Cities**
  RE-Charge Tacloban: An Integrated Solar and Transport Response Project for Post-Yolanda (Haiyan) Leyte.
- **S. D. Sanap, Indian Institute of Tropical Meteorology**
  On the response of Indian summer monsoon to aerosol forcing in CMIP5 model simulations.
- **S.M. Shiva Nagendra, Indian Institute of Technology**
  NO2 forecasting using Artificial Neural Network for development of early warning system for Manali Industrial area in Chennai, India.
- **S.M.D.J.T. Jayatilake, Vehicle Emission Test Trust Fund, Department of Motor Traffic**
  Vehicle Emission Testing Programme - Reducing Vehicle Emission for a Healthy Nation
- **Sanjeev Agrawal, Pollution Assessment Monitoring and Survey Division, Central Pollution Control Board, Ministry of Environment and Forests**
  Health Effects of Chronic Exposure to Biomass Emission in Rural Household.
- **Sanjeev Agrawal, Pollution Assessment Monitoring and Survey Division, Central Pollution Control Board, Ministry of Environment and Forests**
  National Ambient Air Quality Monitoring – Status & Trend in India.
- **Sateesh S Kannegala, PAQS Pvt. Ltd.**
  A Hybrid Model for Participative Real Time Environment Monitoring.
- **Satish Chandra Sharma, IOCL**
  Fuel Economy Norms for Trucks and Buses in India.
- **Saurabh Kumar, Center for Atmospheric Sciences, Indian Institute of Delhi**
  Effect of Ambient Air Pollution on Respiratory and Tuberculosis Hospital Admissions in New Delhi, India.
- **Sayantani Mitra, Center for Urban Science + Progress, New York University**
  Some Analysis of Air Quality Data of Kolkata City Compared to National Standards.
- **Scott Randall, Norwegian Institute of Air Research (NILU)**
  Influence of Traffic Volume Reductions on Ambient Air Quality in Dhaka, Bangladesh.
- **Shan Huang, Leibniz-Institute for Tropospheric Research**
  The variation of PM2.5 size distribution in the North China Plain and its impact on meeting national air quality standard.
- **Sharad Shrestha, Kathmandu Sustainable Urban Transport Project (KSUTP)**
  Air Quality and GHG Management.
- **Shengyang Sun, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and Shenzhen Urban Transport Planning Center Co. Ltd**
  Modeling Emissions in the Road Transport Sector in Chinese Cities.
- **Shu Tao, College of Urban and Environmental Sciences, Peking University**
  Global Ambient Polycyclic Aromatic Hydrocarbon Exposure and Lung Cancer Risk.
- **Shuai Ren, World Bank**
  Obstacles of TOD Implementation in Urban China: Planning Codes and Design Standards.
- **Siddiq Khan, American Council for an Energy-Efficient Economy (ACEEE)**
  Freight Energy Efficiency Improvement in United States.

- **Siddiq Khan, American Council for an Energy-Efficient Economy (ACEEE)**
  Vehicle Electrification in Asia: Learning from U.S. Experiences.
- **Siva Sai Ande, National Institute of Technology-Warangal**
  Bikeability Index for Indian Cities.
- **Sk. Salahuddin Ahammad, Norwegian Institute of Air Research (NILU)**
  Air Quality Impacts of Reduced CNG Availability for Vehicles in Chittagong, Bangladesh.
- **Su Song, Young Crane Consulting and World Resources Institute**
  Ship Emission and Social Cost in Shanghai Yangshan Port.
- **Sumal Nandasena, WHO Collaborating Centre for Public Health Workforce Development, National Institute of Health Sciences**
  Black Carbon Emissions from Sri Lankan Households.
- **T.K.I.G Kumari, Ministry of Environment & Renewable Energy**
  Impacts of Electronic Waste (e-waste) on Polycyclic Aromatic Hydrocarbons (PAHs) exposure in children.
- **Tarun Darbari, Pollution Assessment Monitoring and Survey Division, Central Pollution Control Board, Ministry of Environment and Forests**
  The Health effects of indoor air pollution: A study in Northern and Eastern India.
- **Tran Thu Trang, Department of Civil Engineering, Kyung Hee University**
  Emission Inventory of Passenger Transport Fleet in Hanoi to Assess Air Quality and Climate Co-benefits Associated with Various Technology Scenarios.
- **Vartika Gokhale, Centre for Development of Advanced Computing**
  Scenario analysis of vehicular sources control strategy for air quality improvement of Pune City.
- **Viknasvarri Ayerdurai, University Malaysia Terengganu**
  Transportation and Fuel Economy: Case Study in Malaysia.
- **Vu Ngoc Khiem, University of Transport Technology**
  Assessing the Status of Existing Vehicle Fleet and Proposing a New Emission Standard.
- **Xuying Wang, Peking University**
  Short-term effects of extreme temperatures on risk of cardiovascular and cerebrovascular diseases mortality in Beijing and Shanghai, People's Republic of China.
- **Young Sunwoo, Department of Environmental Engineering, Konkuk University**
  Evaluation on the air quality and environmental impact in tunnels in Seoul, Republic of Korea.
- **Zaim Fachmi Andrianto, KPBB**
  An Environmental Movement: Jakarta Car Free Day.
- **Zeeshan Javed, National University of Science and Technology**
  Extensive Use of CNG and its Impact on Atmospheric NO2 over Punjab Pakistan.
- **Zia Wadud, Centre for Integrated Energy Research, University of Leeds**
  CNG conversion of Vehicles in Dhaka: An analysis of air quality, GHG and congestion impacts.
- **Zohir Chowdhury, Division of Environmental Health, Graduate School of Public Health, San Diego State University**
  Seasonal Ultra Fine and Fine Particulate Matter Monitoring in Dhaka, Bangladesh.
- **Zohir Chowdhury, Division of Environmental Health, Graduate School of Public Health, San Diego State University**
  Winter Season Ambient Fine and Ultrafine Particulate Measurement in Various Locations of Mumbai, India.

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World Health Organization

WLPGA

出國報告摘要

壹、 出國會議名稱：赴斯里蘭卡參加「2014 更好空氣品質」研討會

貳、 出國人員：

服務單位		姓名	職稱	備註
行政院環境保護署	空氣品質保護及噪音管制處	謝炳輝	副處長	團長
		莊訓城	簡任技正	
		陳惠琦	視察	
		戴忠良	高級環境技術師	
		楊佳樺	約聘人員	
	環境監測及資訊處	陳香宇	環境監測技術師	
地方環保機關	臺北市	高薇喻	股長	
	新北市	邱信翰	股長	
	桃園縣	吳瑞祥	專員	
	臺中市	柯宏黛	股長	
	臺南市	林界宏	專員	

參、 出國日期：103 年 11 月 17 日至 11 月 22 日

肆、 行程/課程：

日期	說明
11 月 17 日(一)	■ 啟程(臺北－香港)
11 月 18 日(二)	■ 因不可抗力之因素，滯留香港一天 ■ 啟程(香港－斯里蘭卡可倫坡)

11 月 19 日(三)	■ 新北市環保局代表上台報告。 ■ 參與城市清潔空氣夥伴計畫專題 ■ 根據大會議程，參與會議及討論。
11 月 20 日(四)	■ 臺北市環保局、桃園縣政府環保局代表上台報告 ■ 永續港口議題 ■ 根據大會議程，參與會議及討論 ■ 與美國環保署代表會談
11 月 21 日(五)	■ 圓桌會議 ■ 與美國環保署代表、亞洲空氣清潔中心會談
11 月 22 日(六)	■ 返程(斯里蘭卡可倫坡－臺北)

一、 背景說明

(一) 本署受美國環保署及主辦單位亞洲空氣清潔中心(Clean Air Asia, CAA)邀請，於 103 年 11 月 17 至 22 日赴斯里蘭卡參加「2014 年更好空氣品質研討會(Better Air Quality, BAQ)」，本次研討會係「國際環境夥伴計畫『小型贊助計畫』」之「城市清潔空氣夥伴計畫（Cities Clean Air Partnership）」相關活動。我國代表團除了參與大會研討會議議程，分享我國自身成功的環境保護經驗及吸取空氣品質管理技術新知外，亦與美國環保署及亞洲空氣清潔中心（Clean Air Asia，以下簡稱 CAA）夥伴團體間彼此協商與討論，建立合作默契，奠定未來執行城市清潔空氣夥伴計畫之基礎。

(二) 我國代表團由本署空保處謝副處長炳輝擔任團長，率領本署空保處及監資處同仁、臺北市、新北市、臺中市及臺南市等地方環保局同仁以及技術顧問機構人員，共計 14 人參與該研討會。美國環保署則為國際事務辦公室(Office of International and Tribal Affairs, OITA)亞太區企畫高級顧問(Senior Advisor) Mr. Mark Kasman、臺灣地區企劃經理(Taiwan Program Manager) Mr. Justin J. Harris 及空氣品質規劃與標準辦公室(Office of Air Quality Planing and Stadards, OAQPS) AirNow 計畫經理 Mr. Phil Dickerson 等參與研討會或內部協商會談。

(三) 本次出國計畫主要參與活動涵蓋研討會開幕式、專題討論（城市清潔空氣夥伴計畫與永續港口）、我國城市管理經驗之成果發表(發電廠污染物質排放減量與城市清潔空氣解決方案)、海報展示、臺美環保署兩方代表會談、臺美與 CAA 三方代表會談與圓桌會議等。

二、 會議內容及成果說明

(一) 研討會說明

有關更好的空氣品質研討會(Better Air Quality, BAQ)，係由 CAA、美國環保署(USEPA)與世界銀行(World Bank)等共同主辦，我國首次以贊助者角色參與該研討會。該研討會為兩年一次重大國際型會議，今年度已邁入第八屆，該屆舉行地點為斯里蘭卡可倫坡紀念班達奈克國際會議大廈 (Bandaranaike Memorial International Conference Hall, BMICH)。大會議題涵蓋交通、能源、

工業和氣候變化領域，側重於政府的政策與措施，參與者包含各國專家學者、政策制定者、決策者及執行者，在此建立聯繫網絡，相互學習並分享經驗，進行空氣品質管理學習及經驗交流，為亞洲空氣品質議題盛會。相關參與重點與成果說明如下:

1. 「研討會開幕式」

本署受邀參與研討會開幕式之觀禮，並由CAA 董事會主席 Mr. Robert O'Keefe、聯合國經濟與社會事務部門執行長 Mr. Nikhil Seth、斯里蘭卡交通部部長 Hon., Mr. Kumara Welgama、斯里蘭卡環境與再生能源部部長 Hon., Mr. Susil Premajayantha、日本環境部部長秘書長 Mr. Teruyoshi Hayamizu 等人依序開幕致詞，最後本署空保處謝副處長炳輝代表上台與主辦單位、與會之各國貴賓合影，為「2014 更好空氣品質研討會」揭幕。

2. 「城市清潔空氣夥伴專題（CCAP Session）」

有關城市清潔空氣夥伴專題，目的係期望亞洲城市能夠成為空氣品質改善之示範城市。透過城市間締結姊妹市之方式，彼此交流觀摩與學習，達到亞洲城市空氣品質改善之目的。該活動由 CAA 執行長 Mr. Bjarne Pedersen 與副執行長 Ms. Glynda E. Bathan-Baterina 及美方代表 Mr. Mark Kasman 及 Mr. Justin J. Harris 等人為主談人，目的在於向各界說明有關 CCAP 計畫之未來城市認證之方向以及宣佈示範城市(pilot cities)。藉由邀請其他環保團體

如氣候及清潔空氣聯盟(climate and clean air coalition)、斯德哥爾摩環境機構(Stockholm Environment Institute)、城市網(Citynet)、挪威空氣研究機構(Norwegian Institute for Air Research)等進行說明,作為後續 CCAP 認證制度建置之參考。另美方與 CAA 為感謝本署為該 CCAP 計畫最大支持者,邀請本署代表團團長謝副處長炳輝為該活動上台致詞。此外,我國桃園縣及臺中市代表亦應邀以潛在成為示範城市之身分參與該活動。

3. 「我國城市空氣品質維護成效發表與經驗分享」

本次新北市、桃園縣及臺北市三個縣市環保局受大會邀請分別於發電廠污染物質排放減量(Reducing Emissions from Power Plants)以及城市清潔空氣解決方案(Cities Solution for Clean Air)兩個活動場次上台發表與分享成功經驗。

(1) 臺北市環保局由高股長薇喻為代表，發表臺北市推動零污染的公共自行車(YouBike)以及低污染巴士，提供民眾節能、省時且對環境更友善的運輸選擇等成果。

(2) 新北市環保局由邱股長信翰代表，以「新北市固定污染源管制歷程」(Control process for stationary sources permits in New Taipei city)為題進行發表。發表內容包括：新北市背景資料說明、比較亞洲國家主要城市之空氣污染物濃度、空氣污染管制交流經驗分享、我國固定污染源許可管制歷程、北部空品區許可審議原則

訂定、相關執行成效以及分享困難挑戰與解決策略等。

(3) 桃園縣環保局由吳專員瑞祥為代表，分享「紅外線熱顯像儀應用於空氣污染防制工作之成效」。首先介紹桃園縣地理環境及區域特性，引入桃園縣近年來空氣品質狀況及空氣污染防制工作之分析及策略擬定，並說明紅外線熱顯像儀等科技儀器之特性及運用在稽查工作上之效益。透過案例介紹，說明科技儀器與桃園縣空污稽查作業之緊密結合關係，及如何有效降低稽查人力負荷及釐清污染排放事實。

4. 「海報展覽」

大會現場共有 34 個海報發表，我國臺中市及臺南市環保局亦受大會邀請於會場展覽轄內成果，臺中市展現針對電力業及鋼鐵業進行調查及推動管制措施,以改善 $PM_{2.5}$ 之成果;另臺南市則以低碳生活(Low Carbon Life Style)為主題分享其成功經驗。其他參展海報，多數為南亞地區國家，主要議題集中在交通移動源污染排放及區域空氣品質成因調查的研究，均係個案，較少有各級政府之空污管制政策。

5. 「圓桌會議(BAQ Country Roundtable Discussion)」

圓桌會議活動方式係以國家別分組，進行討論，包含孟加拉、中國、印度、印尼、馬來西亞、尼泊爾、巴基斯坦、菲律賓、泰國(含寮國、柬埔寨、緬甸)、斯里蘭卡及越南，共計 11 組。透過分組討論方式，

探討各國政府針對「空氣污染物」及「溫室氣體減量」的議題所採取的措施與管制辦法。

考量因我國與中國大陸間空氣污染傳輸與地緣關係，旁聽中國大陸地區主要城市之空氣污染防制問題、現行管制策略及未來管制方向之相關議題，以了解其中國大陸城市空污管制現況，會議重點如下:

(1) 有關中國大陸城市之空氣污染和溫室氣體減量工作重點為「嚴格的排放許可制度及有效查核」、「設備效能驗證」、「污染減量」、「原物料檢核」及「污染地圖建置與動態管理」等 5 項。

(2) 城市分享說明：北京係以文化、科技及外交為主軸發展，並對對交通車輛數量及通行予以管制，以此控制移動污染源產生之污染；上海方面則提出季節因素，氣象擴散條件不佳，預報準確率須相對應提高，氣象及空氣品質預報等模擬仍須加強;另大連市為大陸貨物吞吐量劇增之港口城市，逐步重視港區及船舶空氣污染問題，因此如何有效控制進出港區重型車輛產生之廢氣排放，為大連港區現階段探討的重要課題。

(3) 有關中國大陸城市對於空氣污染管制工作及遭遇之困難，仍面臨許多的整合性問題：

(a)各城市型態與發展差異，影響其空污管制策略。

(b)有關大方向的執行目標，各城市仍需擬定有效管制策略，以達到減量目標。

(c)有關固定、移動及逸散源管制尚無整合性的管制策略。

(d)有關蒐集監測數據與擬定管制策略之間重要關聯性。

6. 「永續港口」

有關永續港口議題，本研討會上主要透過下列兩個主題之專案分享以達到交流研商之目的。

(1) 三方綠色：永續城市、港口及海運(Triple Green：Sustainable Cities, Port and Marine transport)議題將港口及城市的綠色運輸做結合，美國環保署（Mark Kasman）分享西岸港口成功經驗；德國專家（Dr. Axel Friedrich）以船舶排放量的觀點，分析了船舶排放減量技術、減量實質意義及減量成本效益，並分享德國公務船「Polarstern」成功經驗，為世界第一艘具觸媒及微粒過濾設備之科學船舶。此外，該主題會議透過小組座談的方式，邀請五位專家（環境、科學、貨物運輸、航運及貨主）以不同觀點針對主題提出不同領域之看法，且以互動的方式讓與會成員諮詢相關問題。

(2) 改善空氣品質的效益評估（Estimating the Benefits of Improved Air Quality）議題分別包含了「馬摩拉海及土耳其海峽納入排放控制區之環境與健康效益評估」及「澳洲雪梨船舶排放對人體健康之衝擊評估」等專案研究與永續港口有直接之關聯性。透過該會議，了解到未來國際海事組織若將馬尼拉那海及土耳其海峽納入排放控制區在環境的效益上以排放量（環境效益）而言，船舶排放之懸浮微粒貢獻比例由 5%下降至 1.7%；而二氧化硫比例由

46%降至 4.6%，在健康效益的方面上，將可降低約 77%-93%伊斯坦堡之風險值；另一方面也了解到如何應用 BenMAP 於船舶排放效應評估及其操作上須面臨的各項挑戰。

三、 與美國環保署及 CAA 之會談

另受美國環保署及 CAA 邀請，本署分別於 11 月 20 日及 21 日參與兩場會談，討論明年度實施 CCAP 及 IA11 計畫工作內容。兩次會談重點如下：

(一) 美方代表 Phil Dickerson 感謝本署監資處提供監測資料於美國環保署參考。有關於明年度(104)「ABACAS 與 BenMap workshop」相關活動，該代表預計六月來臺，並邀請國外專家學者一同分享相關經驗，共襄盛舉。

(二) 美方得到消息，有關亞洲發展銀行(Asian Development Bank, ADB)似乎有我國代表於該單位服務，因該銀行為主辦單位亞洲清潔空氣中心(Clean Air Asia, CAA) 執行 CCAP 專案主要合作夥伴之一，建請確認該消息是否屬實。倘若消息屬實，美方建議主動聯絡該單位之我國代表，俾利於未來執行 CCAP 專案之相關內容。

(三) 藉由 CCAP 專案執行與實施，美方希望提供一個網絡平台，整合空污防制及改善相關專家們的聯繫方式，建立完善的專家清冊。未來民眾若有相關需求，則逕自搜尋該網絡平台之專家學者聯繫方式，節省因聯繫困難所耗費的時間。透過該平台，民眾也能

清楚了解到各個專家學者們不同的專業與能力，達到擴大因應不同需求之選擇性。

(四) 有關明年度 8 月「Global Partnership Conference or International Environmental Conference」本署署長出訪華府 DC 之活動，預計召開第一屆 IEP 及 CCAP 會議。本署贊助 CAA 之經費將規劃為邀請 25 個發展中城市及美國 2 個城市(BayArea 與加州南岸)之差旅費。另美方建請地方環保局一同參與該活動。

(五) 有關未來計畫推廣「城市認證」，我國除了扮演經費贊助角色外，美方與 CAA 期待我國能夠提供專家學者及相關技術，協助其他國家推動認證制度，規劃我國政府、學界或技術機構成為核心諮詢單位之一。另可透過我國地方城市參與，利用 CCAP 成為夥伴城市，無論是在國際交流及環境領域上之國際能見度亦有幫助。

四、 心得與建議

(一) 更好空氣品質研討會為亞洲國家針對空氣污染防制工作之交流平台，對於國家與國家間，城市與城市間，實為一個促進國家或城市間之交流機會，本次活動參與，除能分享我國自身成功的環境保護經驗及吸取空氣品質管理技術新知外，亦增加我國環保機關於國際間環境保護知名度

(二) 透過該研討會活動設計，本署與美國環保署及 CAA 夥伴團體間彼此協商與討論，共同擬定明年度合作夥伴目標，建立合作默契，實有助於推動國際相關業務之發展，並奠定未來計畫執行之基礎。

(三) 綜觀本次參與發表之各城市簡報資料，臺灣空氣污染防制經驗、技術、思維及空氣品質管制法令與策略已相較完整且具體，未來倘有相關國際研討會，我國亦可積極爭取發表或主辦之機會。

(四) 各國對於空污管制及各項環境議題重視度已大幅提升，尤其是污染跨域傳送之議題甚表重視，更投入許多研究、監測與管制工作。本署多年來亦持續執行國內環境監測工作，監控大區域範圍之空氣品質狀況及長期趨勢，對於國內環境現況已有相當掌握。我國因受地形及氣候的因素，環境污染物跨境傳輸的問題日益嚴重，例如東亞沙塵或東南亞生質燃燒等，其中因中國大陸因主要以燃煤主要能源，造成影響最為嚴重，每年秋天至隔年春天最易受境外污染影響；另我國因地理位置處於這些空氣污染物的傳輸路徑上，受到最直接影響，而對於境外污染物的傳輸現象監測與預測顯得相當重要。

(五) 有關臺美計畫永續港口之議題，透過該研討會建立起多元溝通管道，除俾利後續辦理相關專家會議外，也能增加不同領域專家之諮詢窗口。另國內港區之推動，現階段因我國港區空氣污染管制專案尚未應用過 BenMAP 模式來評估船舶排放減量對於人體建康效益之影響，因研討會中充分獲得 BenMAP 應用於船舶減量效益的案例，建議國內未來可應用 BenMAP 模式研擬港區空氣污染減量策略，建立更完整之決策參考依據。