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【城市評論】

〈台南市政府、雲林縣政府、高雄市政府〉專訪特稿

藍色經濟？綠色經濟？城市的永續發展規範

許文英

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在全球化競爭壓力下，城市同時面臨經濟與環境永續發展的治理議題，城市治理者如何適切地衡平經濟發展與環境永續之間的關係，已成爲全球地方治理者的重要議程。環境權概念業已成爲國際人權規範的重要原則，企業承擔污染成本與社會責任（Corporate Social Responsibility, CSR）正成爲全球日益倡議的規範價值。爲保障城市居民的永續發展權益，臺灣一些城市爭取地方自治立法，例如推動制定汙染者付費的相關環境徵稅法案，但未能獲得中央主管機關同意。該些城市推動相關環境自治立法遭遇哪些實際困境？城市居民、地方議會、企業產業是否存在什麼樣的期待與落差問題？未來有哪些因應作爲？目前的中央政策與相關法令是否有助於城市發展上的實際需要？原因爲何？地方政府有哪些具體的政策建言？或創意的政策措施或國內外跨域合作策略？目前臺灣的城市主要面臨哪些經濟發展與環境永續問題？對於城市治理發展產生哪些衝擊與影響？面對全球化的經濟競逐與生態文明建立需求，城市如何看待藍色經濟或綠色經濟？如何進行城市永續發展之抉擇？此誠爲城市總體發展所不可迴避之重要課題。

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「都市發展需要空間，但無秩序的都市擴張將破壞自然景觀與生態環境……。面對氣候變遷下的環境劇變與各種災害威脅，在城市空間治理上須有更前瞻性的具體作為，針對市中心及郊區不同特性，採取適合的發展模式與規劃策略。」

（臺南市長 賴清德，2013/9/9）

臺灣在進入WTO後，國內產業面對全球企業的競爭更為激烈，臺南市產業結構以中小企業為主，[①] 城市經濟發展主要面臨海外行銷能力薄弱、國際水準會展場所缺乏、產學人力資源落差等問題。同時，臺南市面臨如何藉由「綠色經濟」概念尋求整合與突破的環境永續發展治理重要課題，亦即如何以消除貧窮、實踐環境永續發展兩者所衍生出之經濟政策，強調追求具包容性與公平性之經濟成長，最終達至兼顧永續環境之經濟發展目標。此外，臺南市尚面臨縣市合併後如何因應龐大人口之水資源需求、隨著城市人口增加所面臨與日俱增的廢棄物管理、海岸地區面臨重大開發計畫之威脅、如何兼顧工業與農業不同產業需求之水資源分配、如何提高附加價值與環境保護功能之綠能產業轉型、如何活絡在地產業發展提供中小企業融資之經濟措施，以及如何兼顧環境衛生改善與古都觀光發展的低碳商圈管理等城市永續發展議題。

都市發展需要空間，但無秩序的都市擴張將破壞自然景觀與生態環境，侵蝕周邊農地，而擴張都市規模亦會增加旅運距離，更加消耗能源及排放二氧化碳，加深全球暖化對人類生存的威脅。臺南擁有豐富的景觀資源，西拉雅國家風景區、雲嘉南濱海國家風景區及台江國家公園在此匯聚，卻因臨近海洋及平原地勢低窪，導致面對天然災害時的環境脆弱度升高。為保障市民生活空間及生命財產安全，面對氣候變遷下的環境劇變與各種災害威脅，在城市空間治理上須有更前瞻性的具體作為，針對市中心及郊區不同特性，採取適合的發展模

① 臺南市境內中小企業家數逾10萬家，占全台中小企業比例之7%，占臺南市全部企業比例達98%以上，年營收達1,031,318百萬元。

式與規劃策略。是以，臺南市採取舊城區再生政策，結合大眾運輸系統的緊密都市發展模式（TOD），透過調整容積上限及都市更新，提升土地利用效率及改善市區環境，並配套提供便捷的大眾運輸系統，增加公園綠地，串連道路系統、綠帶系統與市民活動空間，減少城市緊湊發展可能造成的負面影響。另一方面，城市外圍的新社區開發（例如安南區），朝向低密度、低碳、綠能的生態社區方向發展，土地利用或建築開發須盡量減少改變原有地形地貌，以保護當地特有的優美農漁業地景與台江內海生態文化資源，降低對周邊農漁業生產環境、生態資源及水土保持之負面影響。

臺南係臺灣工業重鎮之一，製造業生產總額曾位居五都之冠（2006年工商普查），南部科學園區與工業技術研究院南部分院於2000年完成後，已逐步轉型爲高科技產業。然而，臺南亦屬臺灣重要糧倉之一，但城市自身糧食供給遠低於需求，② 遑論供給其他城市。工業是本市經濟發展重要基礎，提供眾多就業機會，但現況發展已對周邊農地產生負面衝擊。③ 就都市計畫地區來說，臺南境內農地資源多分布都市計畫外圍地區，一方面作爲都市發展腹地，一方面作爲都市綠地，但長期發展的結果卻與當初的規劃意旨產生相當大的差異，因爲農地之土地成本較低，常被作爲製造業的生產基地，造成都市農地無法發揮其應有功能。在農地總量不足的情況下，面對農地轉用或違規作工業使用等問題，中央及地方農業、工業主管機關皆在政策面及執行面加強管制與輔導，區域計畫及都市計畫主管機關則在國土保安與糧食安全的前提下，配合檢討農地變更應遵循的原則。如何透過嚴格土地使用分區管制及彈性化的都市設計規

② 目前臺南市都市計畫農業區加計非都市土地之特定農業區及一般農業區共98,452公頃，依照農委會的試算公式（農地面積×每單位耕地之稻米產量×每單位稻米可產生之熱量＝人口數×每人每日所需熱量），臺南市現況人口有188萬人，但農地僅能供給約118萬人。

③ 臺南市所轄工業區計67處，總面積約7,052.54公頃，都會型工業區進駐率幾近額滿，而郊區型工業區進駐率也多在七成以上，衍生出利用周邊農地擴大工業區之需求。經發局2012年6月公告未登記工廠舉發件數計872件，以安南區169件、永康區142件、歸仁區109件及仁德區78件居前四位，其中安南區未登記工廠62%位於住宅區，23%位於農業區，永康區則45%位於住宅區，40%位於農業區。

範，在環境保護的基礎上，讓居住空間能與當地資源特色相結合，以降低環境衝擊，並形塑良好都市意象，打造城市觀光新亮點，已成爲臺南在因應氣候變遷衝擊下的工業發展與都市農地功能與價值保存定位之重要政策思考方向。

臺南境內的中石化安順廠爲國內外罕見污染場址，其主要污染物戴奧辛更有「世紀之毒」之稱，污染整治作業爲當務之急。藉由當地居民及環保局嚴格監督管理，臺南針對市內指標性場址要求污染整治過程加入環境友善之綠色整治技術，並採污染移除與褐地綠美化併同方式進行整治，使污染褐地重生，帶給當地居民新希望，開啓臺灣土壤及地下水污染場址綠色整治之新頁。2012年爲臺南市低碳元年，市府成立低碳城市專案辦公室、率先訂定《臺南市低碳城市自治條例》、簽署加入聯合國規劃的城市環境協定會員聯盟、打造雲端四省管理平台，並推動陽光電城計畫。《臺南市低碳城市自治條例》明確規範低碳生活、低碳教育之理念，並詳列低碳城市推動與管理規範，以及明確行政裁罰，使其成爲全國第一個以低碳城市爲施政規範的直轄市。④

溫室效應引發氣候變遷等生態環境危機，有鑑於此，世界各國簽訂《京都議定書》，並於2005年2月16日生效，臺灣亦配合訂出國家溫室氣體減量目標，承諾於2020年回到2005年排放標準，並於2009年全國能源會議上具體提出「打造低碳家園」十年推動期程。然而，臺南市長認爲，中央雖然通過再生能源法，但推動決心不足，未能寬列預算推動執行，是以即使臺南被遴選爲南部低碳示範城市，臺南打造太陽光電城之低碳城市目標仍難有效達成。此外，在中央長期重北輕南治理格局思維下，南臺灣公共基礎建設不足，臺南作爲五都之一，長期面臨治水、淹水嚴重問題，影響城市永續發展。換言之，臺南在面臨綠色經濟或藍色經濟發展之際，尚需面臨水資源與災害嚴峻課題。如何尋求中

④ 《臺南市低碳自治條例》經臺南市議會三讀通過、行政院核定，於2012年12月22日以府法規字第1011084760A號令公告實施。條例共分六章38條，涵蓋食、衣、住、行、、育樂、宣導補助、行政裁罰七大面向，應訂定子法或公告之列管條文共10條，其中2條已完成公告、3條公告草案，餘持續辦理中。

央與地方有效協力合作，以逐步推動包含易淹水地區水患治理計畫、水資源回收中心、滯洪池景觀綠美化、市管區域排水應急整治工程、自動化防洪監控等環境相關調適作法， 已成爲包括臺南在內的諸多城市無可迴避之治理要務。

「徵收碳費正凸顯稅額分配不公的問題，並強調污染者與使用者必須付費原則，透過要求污染者將對於環境衝擊（空氣污染、水污染與溫室氣體等）等所造成的外部成本予以內部化，而以稅費方式反映。」

（雲林縣長 蘇治芬，2013/9/27）

「台灣經濟發展的意識形態邏輯結果，受傷最多的是農業城市，但雲林不把自己視爲悲情城市，因爲在整個都市化的擴大過程中，許多台灣傳統文化逐漸在都市化過程中從都市消失，而農業城市雖然看似相對弱勢，但卻因其邊陲地位而得以將台灣即將消失的文化累積起來，變成農業城市的另一種實力。」

（雲林縣副縣長 施克和，2013/9/27）

雲林縣爲一傳統農業縣，素有「台灣穀倉」之稱，縣境內產業經營型態多爲初級產業，農林漁牧從業人口占有極大之比例。以農業城市爲定位的雲林，但同時雲林有全東亞最大的石化工業區（六輕），其與農業高度仰賴的陽光、空氣、水等環境資源存在緊張關係。

位於雲林麥寮地區的台塑六輕離島工業區產值佔全國GDP十分之一比重，每年上繳國稅新台幣470億元，但地方稅收僅5億元，二氧化碳年排放量則占全國總量26%之高。雲林縣府委託國內專業研究團隊針對台塑六輕鄰近10鄉鎮進行健康風險評估，研究發現六輕20公里內空氣含大量致癌物，且麥寮、崙背、

⑤ 本項委託研究係由台大公衛學院副院長詹長權研究團隊執行，係由台大公衛學院、台大醫院雲林分院、工業技術研究院共同組成，自2009年起針對六輕鄰近10鄉鎮進行3年採樣、問卷調查，共獲得3,230樣本。

台西、四湖、東勢五鄉居民，罹癌率明顯升高。[5] 針對台塑六輕對雲林環境造成之嚴重汙染，基於使用者付費原則，雲林縣政府正式訂出「雲林縣碳費徵收自治條例」，但未獲環保署予以核定。雲林縣長認爲，雲林縣府徵收碳費正凸顯稅額分配不公的問題，並強調污染者與使用者必須付費原則，透過要求污染者將對於環境衝擊（空氣污染、水污染與溫室氣體等）等所造成的外部成本予以內部化，而以稅費方式反映，一旦徵收碳費付諸實現，將爲雲林增加30餘億元稅收。

雲林縣府基於「回饋法制化」、「環境修補」之精神，及「污染者付費」原則，於2011年3月25日經雲林縣議會議決，完成立法制定「雲林縣碳費徵收自治條例」，經行政院環境保護署於2011年8月31日以「溫室氣體減量排放管理非屬地方自治事項，且無法律授權徵收碳費依據」爲由，不予核定。雲林縣府乃於2011年12月20日依地方制度法第30條第5項規定：「自治法規與憲法、法律、基於法律授權之法規……有無牴觸發生疑義時」，向司法院聲請大法官解釋。案經司法院大法官於2012年11月12日第1396次會議決議「應不受理」，其內容略謂：「……系爭自治條例僅屬未完成立法程序之草案而已， 不生法定效力，尚無與憲法、法律或上位規範發生牴觸疑義之可能……是本件聲請，核與地方制度法第30條第5項規定不合，應不受理。……至於行政院或中央各該主管機關對報請核定之自治條例不予核定，地方自治機關如何救濟，地方制度法並未明文，宜由立法解決之。」有鑑於此，爲避免中央對地方行政機關之權限恣意監督，雲林縣府業於2013年4月18日於立法院舉辦地方制度法修正案公聽會時，提出書面資料陳請立委諸公提案修正地方制度法，增訂地方制度法第26條第5項：「自治條例經各該地方立法機關議決後，報經行政院、中央各該主管機關不予核定時，得聲請司法院解釋之。」俾自治條例未獲核定時，有其救濟管道。針對中央與地方政府特別公課徵收權限之法律問題，縣府刻正進行研究，俾利提供立委諸公推動碳費徵收合法化之依循。雲林縣副縣長認爲，企業責任當然不只是一個道德上的議題，社會責任如果只是道德層次，推動是有困

難的，對於諸多獲得國家特許的企業而言，必須有更具體的責任規範要求。

此外，雲林縣養豬將近140萬頭，位居台灣第二大養豬縣市，過去三、四十年間，養豬產業爲城市創造諸多農業收入，但因過度畜養結果，豬隻產生之排泄物未能妥善處理，造成城市各河川長期遭受其污染，除影響附近住戶生活品質，也使城市河川及大排水質不佳。面對新世紀台灣養豬業面臨轉型之趨勢，雲林必須朝向節能減碳、豬糞「零廢棄」、豬糞尿綠能發電的方向發展，以同時解決環境污染、能源、經濟、就業等問題，並創造城市產業文化與特色。

中央政府自2002年起推動「平地景觀造林及綠美化方案」，希望透過全面造林提升農地利用效率，改善生活環境品質。但因配套措施不足，產生許多問題，且因中央財政不足，農委會林務局2013年起停止辦理平地造林補助。雲林縣長卻認爲，從國土復育觀點看，平地造林確有其必要性，不宜因噎廢食。依據國家氣候變遷調適政策綱領，應優先推動造林地區包括嚴重地層下陷地區。雲林縣沿海各鄉鎮均有地層下陷地下水鹽化等問題，將這些農地轉化爲林地，應可有效涵養水源，減緩地下水過度抽用、地層下陷等問題，落實國土保安。雲林縣適合平地造林之區位，除生產環境受外在因素干擾的第三種農業區，第二種農業區的一般農業區，經改善完成之重金屬汙染農地或經濟部公告之嚴重地層下陷區外，灌溉供水超出負荷的高耗水作物區以及淹水潛勢地區，皆被列爲優先實施平地造林區位。

雲林縣府鼓勵縣內企業協助推動平地造林，並鼓勵減少碳排放及申請國際碳權認證，不僅有助於企業形象，亦有助各級產業均衡發展（以工商助農）。雲林縣府已爭取台塑企業承諾造林二千六百公頃，並比照平地造林獎勵辦法，對等補助十年。每公頃廿年內除可領取原來林務局之240萬元獎勵金外，並可領取台塑對等補助十年130萬元，大幅增加造林誘因，並減輕造林補貼壓力。於此同時，推動平地造林政策亦須考量糧食安全與造林對農業產生負外部性之因素，應保留一定比例農地，且應於造林區與鄰近作物生產區之鄰接地帶保留

適當緩衝空間。

中央政府於2010年8月公告之《農村再生條例》第七條規定，中央主管機關爲推動農村永續發展及活化再生相關事項，應設置農村再生基金新臺幣一千五百億元，並於本條例施行後十年內分年編列預算。對農業首都的雲林縣來說，農村和農地的面積居全國的前茅，爲促進農村永續發展及農村活化再生，改善基礎生產條件，維護農村生態及文化，提升生活品質，建設富麗新農村，確爲契機。然而，雲林在推動城市經濟及環境永續發展過程中，卻面臨更爲嚴峻之水患治理問題。依據農委會統計，2002至2012年這十年中，因豪雨等天災造成的農產損失將近一千億元。面對台灣諸多城市治水預算嚴重不足現況，中央是否正視水患整治迫切性並儘速研擬後續方案厥爲關鍵。

此外，面對氣侯變遷造成之強降雨單純之水利工程已無法有效、完整治理水患，惟有效法先進國家治理水患之方式，在國土規劃架構下，以「上游保水、中游減洪、下游洩洪」爲概念推動「總合治水」。基此，雲林縣府以河川流域爲計畫範圍，結合各項改善水患的方法和建設之總合治水理念，推動雲林縣區域計畫方得進行空間的治理、國土保育、產業發展及土地利等實質規劃，並呼籲中央儘速通過「國土計畫法」及成立一千億「國土保育發展基金」，並儘速成立「環境資源部」整合事權與資源，以國家永續發展的高度，支持並指導地方進行國土規劃下之總合治水。

除了積極研擬農業發展改革的新方向，雲林縣府同時致力於工商業發展。雲林農業發展改革新方向正從初級產業朝向創造產業新價值的方向邁進。透過轉型後的基礎產業，如精緻農業、石化產業高值化、高科技紡織業、與優質機能食品業的發展，穩定地方就業與經濟產出，現階段並開始擴展產業項目到高附加價值金屬材料與光電材料的領域，同時透過公部門的力量及地方產業發展基金資源的挹注，輔導轉型地方產業，讓雲林在地產業能永續發展，再造生機，將一級產業進化，擺脫傳統的刻板印象，朝向二、三級產業邁進，並同時持續輔導農業農產品加工及紡織業，希望藉由推動地方產業創新研發推動計畫

（地方型SBIR），提升本縣中小企業的研發能力、創新性及技術水準，以創造產業創新附加價值，達到永續發展經營之目的。

面對農業首都城市的發展現況與困境，雲林致力發展農產品電子商務化並培養智慧資本，其策略首先就城市特色產業發展作有效的區別及建設，在同質性高的農林畜牧養殖業中，發展出相同卻不相似並具有獨特性的區域產業或亮點產業，不僅可以由一個特色產業、亮點產業（點）建設出一個產業鏈（線），進而將城市各產業作系統性、異業結盟式的活絡化（面），以活化城市發展並使城市財政自足。同時，於發展特色產業之際，並配合培育相關的人力資源，以支應產業發展中所需人力，最大效益更在於人力培育下所產生的「智慧資本」，具體政策規劃包括辦理「農業大學」、「有機專班」、「安全農業教育訓練」，以培育城市未來產業人力所作的前瞻性。另一方面，雲林縣副縣長認爲，台灣長期以來忽視農業對人類的影響，雲林農業博覽會以一種友善的介面讓人民了解台灣的農村之美。台灣經濟發展的意識形態邏輯結果，受傷最多的是農業城市，但雲林不把自己視爲悲情城市，因爲在整個都市化的擴大過程中，許多台灣傳統文化，包含宗教、藝術或者是生活型態逐漸在都市化過程中從都市消失，而農業城市雖然看似相對弱勢，但卻因其邊陲地位而得以將台灣即將消失的文化累積起來，變成農業城市的另一種實力。

總結而言，健全財政是地方自治永續發展之基礎。中央長期於資源分配時「重直轄市、輕縣市」的思維與做法，造成目前「富6都、窮16縣」的現象持續且越來越嚴重。[6] 修法中的財劃法行政院版草案，中央規劃增加給地方的財源438億元，6都即囊括413億元（94%），城鄉差距與失衡情形持續存在。現行財政收支劃分法修法無法完全解決貧窮城市財政問題。雲林縣長認爲，中央財政單位應納入雲林縣府主張之「每戶可支配所得」、「農林漁牧產值」等因子與指標試算35種版本，以使地方政府獲配財源能達到實質增加。

[6] 以2011年決算數爲例，6都分配到的補助財源3,336億元是16縣市1901億元的1.8倍（臺北市814億元是雲林縣179億元的4.5倍）。

「高雄市追求低碳效能的行動，不應該只是一種被動性的危機因應，而應該是一種主動的強化都市對抗環境災變和危機之韌性的積極作爲。高雄市生態城市發展邁向綠色首都，因此也必須是邁向『韌性城市』（Resilient City）努力。」

（高雄市長 陳菊，2013/9/30）

「事業單位有必要與高雄市共同承擔氣候變遷之責任，而爲因應未來及不確定的氣候變遷衝擊，城市迫切需要發展一套符合地方需求的創新財務機制。」

（高雄市環保局科長 林燦銘，2013/9/30）

邁向亞熱帶綠色首都的高雄，都市發展轉型所要面對的挑戰，顯然具備著一種類型上的獨特性，也就是傳統產業之重工業都市的轉型。在城市轉型邁向綠色首都的進程上，對下世代好生活的期待，無疑是所有行動者的依歸。對高雄市而言，四個關鍵的問題及課題，幾乎也是大部分城市改造轉型之行動所必須面對的。

第一個關鍵課題是環境汙染和高度碳排放。在台灣上個世紀展現世界性的經濟發展奇蹟中，是台灣納入世界經貿體系，透過國際分工所帶動的工業發展。由於中央政府主觀的國家發展雙核心戰略布局，當臺北形成行政與商務的中心時，高雄卻被定位成爲台灣工業發展的中心。整個城市（**縣市合併前的高雄市轄區**）**有近60%的土地成爲工業區，高雄因此成爲台灣的工業都市。**

傳統工業在高雄的聚群，帶來巨大的影響。傳統產業帶來大量的環境污染以及高度的二氧化碳排放，[7] 加上其他包括土地、河川等環境污染，動輒成爲社會抗爭的議題，這些被高度污染所破壞的環境，成爲都市未來轉型過程的沉

[7] 依2012年所進行的二氧化碳盤查報告顯示，高雄市溫室氣體排放淨總量爲6,150萬公噸；其中工業排放量佔淨總排放量的81.82%，住商部門排放量佔7.34%，運輸部門排放量佔6.74%。

痾。高雄期待透過低碳效能改造行動，追求城市的轉型、環境的改造，以及碳排放的改善，特別是工業部門在社會變遷過程中，系統性的減碳，顯然是所必須面對的沉重而核心的挑戰。

第二個關鍵課題是一種深刻社會轉型的需要。作爲台灣的工業首都，連帶其他深刻的社會結構困境，同時影響著高雄未來的轉型。工業都市的社會制度脈絡、社會結構、生活模式與空間、教育及就業系統，以及工業生產的經濟思維等等，皆連帶成爲深沉的結構性制約，不僅是影響都市碳排放整體脈絡的重要關鍵因素，也綑綁著城市之中的社會改造機會和動能。生態城市推動從工業首都邁向綠色首都，低碳效能追求的行動，顯然必須連帶著也是一種社會工程。

第三個課題是關係到高雄永續發展最關鍵的經濟與就業。高雄作爲工業首都係扣連在全球分工的經濟體系中。全球經濟結構的轉型，給高雄工業首都帶來的是傳統產業的外移以及經濟的蕭條。從世界性的都市轉型經驗來看，傳統重型工業城市的轉型，在如何提振經濟並引進新的產業上，有其高度困難。除了進行傳統產業的加值型改造以外，新產業的引進必須有新的視野與策略。在高度的國際和區域競爭脈絡下，經濟再發展期待外造的力量，等待來自外部的投資，往往緩不濟急而成爲空談。永續的發展策略反而是利用現有條件和力量，以內需市場爲基礎，利用觀念和戰略視野的翻轉，重新策略性定義發展行動的內容和指標，轉劣勢爲優勢，轉困境爲都市發的新動能。這種都市轉型期待了突破格局的創新思維和作爲。高雄市邁向綠色首都，各種有關低碳效能創造的行動，因此也必須視爲一種經濟再造發展的行動。

第四個課題牽涉到高雄在未來環境和氣候變遷趨勢中的生存機會。自2011年縣市合併後，高雄掌管38個行政區，人口約277萬人，面積約2,946平方公里；地理空間東起與花蓮、臺東相鄰，西至臺灣海峽，南與屏東相接，北鄰嘉義與台南，無論行政面積、幅員、土地利用、產業發展複雜度等，均爲全臺之冠。目前在氣候變遷衝擊的影響之下，部分極端氣候對於高雄境內部分行政區

已造成嚴重威脅，例如暴雨後對山區造成的土石流災害、洪水災等。若排碳量持續上升，地球暖化造成海平面持續上升，將對整個沿岸市區造成更巨大的損失。高雄市邁向綠色首都追求低碳效能的行動，當然是系統性地回應這種都市發展的危機，然而各種行動本身，也是在改善及增強城市再面對這種高度環境危機的抗阻。高雄市長認爲，高雄市追求低碳效能的行動，不應該只是一種被動性的危機因應，而應該是一種主動的強化都市對抗環境災變和危機之韌性的積極作爲。高雄市生態城市發展邁向綠色首都，因此也必須是邁向「韌性城市」（Resilient City）努力。

上述這些關係高雄都市轉型之關鍵問題和課題，必須被積極的面對。這些問題的內在糾結邏輯，也構成了問題被解決的視野和策略性思考的基礎，決定了高雄各種未來城市建設行動的方向及邏輯。

面對全球氣候變遷對於城市發展造成之重大影響，高雄市亦面臨溫室氣體排放量居高之問題，並以工業部門占最大宗，高雄市環保局科長認爲，事業單位有必要與高雄市共同承擔氣候變遷之責任，而爲因應未來及不確定的氣候變遷衝擊，城市迫切需要發展一套符合地方需求的創新財務機制，以因應氣候變遷所需之支出，因此高雄市研訂「高雄市事業氣候變遷調適費徵收自治條例（草案）」，擬向事業收取所謂「事業氣候變遷調適費」，主要用以補助事業執行溫室氣體減量及因應氣候變遷調適之支出。

「高雄市事業氣候變遷調適費徵收自治條例（草案）」自2010年底開始研擬，期間召開專家諮詢會議、市府研商會議、工業區座談會，以及公聽會後，於2011年8月經市政會議審議通過，惟因行政院環保署於2012年5月以二氧化碳等溫室氣體業經公告爲空氣污染物並已受空污法之規範，認爲相關費用之徵收方式、計算方式及收費辦法等其他應遵行事項，應由中央主管機關根據空污法授權訂定，而非得由地方政府制定自治條例課徵之事項。另一方面，高雄市議會議員度對於高雄市徵收事業氣候變遷調適費亦尚未達成共識，指本案未能續行討論。

爲推動城市永續發展，提升環境品質，防治環境污染，維護市容，高雄市未來將推動訂定「高雄市環境維護管理自治條例」作爲城市推動環境管理之執法依據。高雄市重工業林立，2011年全市總排碳量爲6,567萬公噸，工業部門即占83.9%，造成城市人均排放量高達23.1公噸，遠超過臺灣平均值10.9公噸及聯合國2010年公布之全球平均值的4.39公噸，爰有削減工業部門溫室氣體排放量之必要，並促使高耗能生產工業降低單位產品碳排放量及發電排碳係數，以因應未來國際溫室氣體管制協議對我國產業之衝擊。加以高雄市懸浮微粒及臭氧濃度過高，致城市長期遭公告未符合空氣品質標準之空氣品質三級防制區，顯見採取排放標準之管制手段，已不足以防止空氣污染總量之增加，爰有參照空氣污染防制法第六條第三項規定，而規定既存固定污染源應削減空氣污染物排放之必要。另爲加強水污染及環境清潔管理，爰明確規定專責人員水污染防治責任、課予河川流域管理機關協助管理排放源責任，以及公私有土地或建築物所有人、管理人、使用人與夜攤之環境清潔責任。

總結而言，面對城市發展經濟同時的環境永續性，地方與中央應更有智慧及效率的討論出合作方式，在稅收的分配上創造新的操作方式，地方招商投資之稅收應就地方面積及人口做適當分配，而非全數上繳中央，才能讓地方政府能有運用空間。

當前的生態城市發展需要中央與地方政府共同努力，然而地方政府將扮演更爲重要之角色。高雄在立志從一個工業都市轉型成爲一個綠色的宜居首都，有其自身想法與政策方針，期望透過由下而上的推動方式，貫徹低碳生活回到生活面上執行的精神意涵，而這仍需要在透過機制與平台的整體性運作，除了寄望中央能夠給予政策之支持與肯定外，亦希望納入民間的配合與企業的跨域合作。

City Review: Tainan City Government, Yunlin County Government, Kaohsiung City Government

Blue Economy? Green Economy? Norms for Sustainable Urban Development

Elsa Wen-Ying Hsu

With increasing competitive pressures arising from globalization, cities are facing governance issues related to both economic and environmental sustainability. The challenge of balancing economic development and environmental sustainability in urban governance is now a key agenda for local governance actors across the world. At the same time, the concept of environmental rights has become an important principle in international human rights norms, and initiatives surrounding corporate social responsibility (CSR), including requiring enterprises to shoulder the costs of pollution, are increasing becoming a global norm.

To protect the rights to sustainable development of urban residents, some cities in Taiwan have sought to introduce local government legislation, including polluter pays environmental levies. However, the central government has yet to agree to these proposals. What practical difficulties have cities faced in promoting local environmental laws? What are the expectations of urban residents, local representatives, and enterprises, and how can the gap between them be bridged? What responses will be available in the future? Do current central government policies and regulations contribute to actual urban development needs? For what reasons? What actual policy proposals have local governments made? Can we find any innovative policy initiatives or strategies for cross-boundary cooperation domestically or with foreign partners? Currently, what major economic development and environmental sustainability issues are cities in

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Taiwan facing? What challenges do these issues present for the development of urban governance? Faced with the challenges of globalized economic competition and building an ecological civilization, how do cities view the blue economy and the green economy? How do they make sustainable urban development decisions? These questions are vital for the future of overall urban development.

"Urban development needs space, but disorderly urban expansion will destroy the natural landscape and ecological environment... With climate change, massive environmental change and threats from many different types of disaster mean that governance of urban spaces needs specific forward-looking action. Suitable development models and planning strategies are required to meet the different needs of urban centers and suburban areas."

(Ching-Te Lai, Tainan City Mayor, September 9th,2013)

After Taiwan's entry into the WTO, its domestic industry has faced even greater global competition. Tainan industrial structure is dominated by small and medium-sized enterprises (SME),① and the city's economic development faces challenges including weak foreign marketing, a lack of international standard exhibition facilities, and a lack of human resource capacities. At the same time, Tainan City faces the issue of how to use the concept of the "green economy" to produce integrated and ground breaking sustainable development governance, and create economic policies that can both eradicate poverty and achieve sustainable development of the environment, emphasizing the pursuit of fair and inclusive economic growth that ultimately achieves a sustainable growth environment. In addition, following the merger between Tainan City and Tainan Country, the enlarged Tainan City is facing the challenge of responding to the water demands of its enlarged population, increasingly serious waste management issues that come with a growing population, and the threat of major development projects in coastal areas. Tainan City must find a way to balance the needs of industry and agriculture in the distribution

① There are currently over 100,000 SMEs within Tainan City, accounting for 7% of the SMEs in Taiwan and more than 98% of the enterprises in Tainan City, and earning annual revenues of more than NT$1,031 billion.

of water resources, improve the added value and environmental protection function of green energy industrial transformation, encourage local industrial development and provide financing for SMEs, as well as achieve sustainable development goals such as environmental health improvement and the low carbon development of tourism in Taiwan's ancient capital.

Urban development needs space, but disorderly urban expansion destroys the natural landscape and ecological environment, threatens surrounding agricultural land, increases the scale of the city and travel distances, and raises energy consumption and carbon dioxide emissions, deepening the threat of global warming to human survival. Tainan has rich landscape resources: the Siraya National Scenic Area, Southwest Coast National Scenic Area, and Taijiang National Park are all found in the vicinity. However, due to its location near the ocean and its low lying plains, the environment is vulnerable to natural disasters. To protect urban living spaces and the lives and property of citizens in the face of climate change, massive environmental change, and threats from many different types of disaster, governance of urban spaces requires specific forward-looking action. Suitable development models and planning strategies are required to meet the different needs of urban centers and suburban areas. Therefore, Tainan City has adopted an old town regeneration policy, combined with transit oriented development (TOD). By adjusting limits on the size of buildings and promoting urban renewal, the city aims to increase land use efficiency and improve the urban environment, supported by the provision of a convenient public transport system, increased parkland, a linked road system, greenbelt areas, and activity spaces for residents, reducing the negative impact caused by dense urban development. In addition, the development of new residential areas on the outskirts of the city (for instance in the Annan District) will be based on low density, low carbon, and green energy communities. Land use or building development should minimize changes to the original topography to protect the local agricultural and fishery landscape and the ecological and cultural resources within the Taijing National Park, reducing the negative impact on surrounding agricultural and fisheries production, ecological resources, and soil and water conservation.

Tainan is one of Taiwan's major industrial cities, and at one point had the highest manufacturing output of the current special municipalities (2006 Industry Census). The Southern Taiwan Science Park (STSP) and Industrial Technology Research Institute's South Campus opened in 2000 have gradually been transformed into centers for high-

tech industry. At the same time, Tainan is also one of Taiwan's major producers of food, although its food production is far below the level of demand from the city itself,[②] let alone that of other cities. Industry is an important foundation for the city's economic development, and provides numerous employment opportunities. However, industrial development has produced a negative impact on surrounding agricultural land.[③] From an urban planning perspective, agricultural land resources within the boundaries of Tainan are situated in outlying areas of the plan. As well as acting as an urban hinterland, these areas also provide the city with green space. However, the results of long term development have differed considerably from the original intentions of the plan. As agricultural land costs are lower, this land is often used for manufacturing, meaning that urban agricultural land is unable to play its proper function. With an insufficient volume of agricultural land combined with changes in its land use or illegal use for industrial activities, central and local agricultural and industrial authorities are strengthening policy and implementation guidance and enforcement. With the provision that land resource and food security are ensured, regional and urban planning authorities have reviewed principles for changing land use of agricultural areas. The challenge of using strict land zoning and flexible urban design, so that living spaces can be combined with local features on the basis of environmental protection, reducing environmental impact and creating a positive image for the city as well as producing new tourist hotspots, have become important policy directions for industrial development and agricultural land preservation under the impact of climate change.

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② Currently, the total area of urban agricultural zones, non-urban special agricultural zones, and general agricultural zones in Tainan City is 98,452 hectares. According to the Council of Agriculture's formula (area of agricultural land × rice production per unit of cultivated land = population × daily caloric needs per person), Tainan City's current agricultural land can only supply food for around 1.18 million of the total population of 1.88 million.

③ Tainan City has a total of 67 industrial districts covering a land area of 7,052.54 hectares. Existing urban industrial zones are almost full, while suburban industrial zones are at least 70% occupied, creating demand to expand industrial zones into surrounding agricultural areas. In June 2012, the Economic Development Bureau of Tainan City reported 872 unregistered factories, led by Annan District with 169 cases, followed by Yongkang District with 142 cases, Gueiren district with 109 cases, and Rende District with 78 cases. In Annan District 62% of unregistered factories were located in residential areas, and a further 23% in agricultural areas; in Yongkang District, 45% of factories were located in residential areas, and a further 40% in agricultural areas.

The China Petrochemical Development Corporation Anshun Site has created serious pollution rarely seen domestically or abroad. The main pollutant dioxins found at the site are also known as the "poison of the century," and remediation work is imperative. Through strict supervision and management carried out by local residents and the Environmental Protection Agency, Tainan City has required that the pollution remediation process at specified sites within the city includes environmentally friendly remediation technologies, and carries out pollution cleanup and beautification of brownfield sites at the same time, delivering the regeneration of contaminated brownfield sites and bringing new hope to local residents, and opening a new page in the environmentally friendly remediation of contaminated soil and groundwater in Taiwan. The year 2012 marked the start of a low carbon Tainan City with the establishment of the city's low-carbon city project office, taking the lead to establish the "Tainan City Self-Government Ordinance for a Low Carbon City," joining the Urban Environmental Accords Members Alliance (UEAMA) planned by the United Nations, establishing the "Energy Saving Management Cloud-Based Platform," and promoting the Solar City of Tainan project. The "Tainan City Self-Government Ordinance for a Low Carbon City" clearly establishes a philosophy of low carbon living and low carbon education, and outlines the process and management practices necessary to promote a low carbon city as well as administrative sanctions, making it the first special municipality in the country to establish a low carbon city as a governance norm.④

The greenhouse effect has caused climate change and other ecological and environmental crises. In view of this, countries from around the world signed the "Kyoto Protocol," which went into effect on February 16, 2005. In response, Taiwan has also produced national targets for reduction in greenhouse gas emissions, and has committed to return to 2005 emissions levels by 2020. In 2009, the National Energy Conference established a ten-year program to construct a "low carbon homeland." However, the Tainan City mayor believes that although the central government has passed a renewable

④ The "Tainan City Low Carbon Self-Government Ordinance" was passed on the third reading by the Tainan City Council and promulgated by the Executive Yuan, and announced on December 22, 2012 as Executive Yuan Regulation No. 1011084760A. The regulations contain a total of six chapters and thirty-eight articles, covering food, clothing, housing, transportation, entertainment, subsidies, and administrative penalties. The regulations also call for a total of ten separate provisions, of which two are already in place, and three are still at the drafting stage.

energy law, it has lacked the determination to promote green energy and failed to provide sufficient funding to implement the law. As a result, although Tainan was selected a model low carbon city for South Taiwan, the city's low carbon city goal of building the Solar City of Tainan has still yet to achieve concrete results. In addition, as a result of the government's long-term governance approach of emphasizing the development of the North and the expense of the South, public infrastructure in southern Taiwan remains inadequate. Although it is a special municipality, Tainan has faced long term problems of water management and flood control, negatively impacting the city's sustainable development. In other words, at the same time as the challenge of developing a green economy or blue economy, the city still has to address serious water resources and disaster issues. For instance, the question of how to seek effective cooperation between central and local governments to gradually promote flood control projects in areas subject to flooding, water recycling centers, landscaping and beautification of flood detention pools, emergency engineering work for drainage systems, automatic flood monitoring and other environmental adaptation measures, have already become unavoidable challenges for many cities including Tainan.

"Imposing a carbon levy reveals the issue of the unfair distribution of tax revenues and highlights the principle that the polluter or user pays. Requiring the polluter to internalize the external costs of the environmental impact they produce (for instance air pollution, water pollution, and greenhouse gas emissions) is reflected in how taxes are collected."

(Chih-Fen Su, Yunlin County Magistrate, September 27th, 2013)

"The logical outcome of Taiwan's economic development ideology is that agricultural cities suffer the most. However, Yunlin does not regard itself as a tragic city, because in the process of growing urbanization, much of Taiwan's traditional culture disappeared. Although agricultural cities seem quite weak, as peripheral areas, they are the accumulators of Taiwan's vanishing culture, becoming another source of strength."

(Keh-Her Shih ,Yunlin County Deputy Magistrate, September 27th, 2013)

Yunlin County is a traditional agricultural county, known as "the granary of Taiwan." Most industry in the county belongs to the primary sector, with agriculture, forestry, animal husbandry, and fisheries occupying a large proportion of the working population. Yunlin is regarded as an agricultural city, but at the same time it has the largest petrochemical industrial zone in East Asia (the Sixth Naphtha Cracking Plant), causing tensions with an agricultural sector that is heavily reliant on environmental resources such as sunlight, air, and water.

The output of the Sixth Naphtha Cracking Plant and the Yunlin Offshore Industrial Park account for 10% of national GDP, and contributes NT$47 billion annually to the national treasury in tax payment. However, local tax payments amount to only NT$500 million, with carbon dioxide emissions accounting for 26% of the national total. The Yunlin County country government commissioned a professional research team to carry out a health risk assessment for settlements near the plant. The study found a large amounts of carcinogens in the air across a radius of 20km from the plant, and significant increases in cancer rates for residents in the townships of Mailiao, Lunbei, Taixi, Sihu, and Dongshi.⑤ On the basis of the user-pays principle, the Yunlin County has responded to the serious environmental pollution caused by the Formosa Plastics Sixth Naphtha Cracking Plant by formally establishing the "Yunlin County Carbon Levy Self-Government Ordinance." However, this proposal has not received approval from the Environmental Protection Administration.

The Yunlin County magistrate believes that imposing a carbon levy reveals the issue of the unfair distribution of tax revenues and highlights the principle that the polluter or user pays. Requiring the polluter to internalize the external costs of the environmental impact they create (for instance air pollution, water pollution, and greenhouse gas emissions) is reflected in how taxes are collected. As soon as the carbon levy is put in place, Yunlin County's tax revenues will increase by more than $3 billion.

Based on the spirit of "providing a legal compensation mechanism" and

⑤ This study was carried out a research team led by the Associate Dean at the National Taiwan University College of Public Health, Prof. Chang-Chuan Chan consisting of the National Taiwan University College of Public Health, the National Taiwan University Hospital Yunlin Branch, and the Industrial Technology Research Institute. Beginning in 2009, the team carried out sampling and questionnaire surveys in ten townships neighboring the Sixth Naphtha Cracking Plant. In total, 3,230 samples were collected.

"environmental remediation," and the "polluter pays" principle, on 25 March 2011 the Yunlin County Council passed a motion to complete legislative enactment of the "Yunlin County Carbon Levy Self-Government Ordinance." However, on August 31, 2011, the Environmental Protection Agency of the Executive Yuan refused to approve the motion on the grounds that "management of reduction in greenhouse gas emissions is not a matter for local self-government, and there is no legal authority to collect a carbon levy."

In accordance with Article 30 Section 5 of the Local Government Act that states "[i]n the event of doubts on whether a self-government ordinance or regulation is contradictory to the Constitution, laws, regulations promulgated in accordance with law...a motion for interpretation by the Judicial Yuan may be filed," on December 20, 2011 requested an interpretation from the Judicial Yuan. However, on November 12, 2012, the 1396th meeting of the Judicial Yuan refused to admit the case, stating that "[t]he Self-Government Ordinance is unfinished draft legislation and does not have legal effect. There is no possible conflict with the constitution, laws, or higher norms...This claim does not meet the regulations set out in Article 30 Section 5 of the Local Government Act and is therefore not admitted...As for Self-Government Ordinances submitted for approval but not approved by the Executive Yuan or competent central competent authority, the Local Government Act does not provide a specific resolution for self-governing bodies. Therefore, this question should be resolved by legislative means." In view of this, in order to avoid arbitrary supervision of central government over local administrative authority, on April 18, 2013, the Yunlin County government held a public hearing in the Legislative Yuan concerning revisions to the Local Government Act, providing a written submission to legislators requesting a revision to the Local Government Act with the addition of Article 26 Section 5: "After self-government ordinances are approved by the relevant local legislative body, they should be reported to the Executive Yuan. If the competent central government authority refuses approval, it should request an interpretation from the Judicial Yuan." The Yunlin County government hoped to establish a remedial process for cases where self-government ordinances had not been approved. The county government is currently undertaking research on the legal authority of central and local government to collect environmental levies. It is hoped that this can evolve into a legislative proposal to provide a legal basis for the collection of a carbon levy. The Yunlin County deputy magistrate believes that corporate responsibility is not just a moral issue. If there was only a moral level to corporate social responsibility, it would be difficult to advance. For many

state franchise companies, more specific norms and responsibilities are required.

Nearly 1.4 million pigs are farmed in Yunlin County, ranking the county second in Taiwan for pig farming. Over the past three or four decades, the pig industry has created significant agricultural income for the city. However, excessive expansion of the industry has made it impossible to adequately handle pig excrement, causing long term pollution problems for the city's rivers. In addition to affecting nearby residents' quality of life, this has also caused poor rivers and drainage water quality. Faced with the transition of Taiwan's pig industry in the new century, Yunlin needs to move towards energy conservation and carbon reduction, pig excrement "zero waste," and green energy production using pig manure to simultaneously provide solutions for environmental pollution, energy, economic, and employment issues, and produce a unique industrial culture for the city.

Since 2002, the government has promoted the "Plains Landscape Afforestation and Beautification Program," hoping to encourage afforestation to increase land use efficiency of agricultural land, and improve the quality of the living environment. However, the lack of supporting measures has generated many problems. In addition, due to insufficient central government funding, from 2013 the Forestry Bureau of the Council of Agriculture has stopped handling afforestation subsidies for plains areas. However, the Yunlin County magistrate believes that from a land restoration perspective, plains afforestation is essential and should not be abandoned due to the obstacles. According to the National Climate Change Adaptation Framework, areas with serious land subsistence should be a priority for afforestation. Coastal areas in Yunlin Country face major issues of land subsidence and groundwater salinization. Converting agricultural land into forestry land can promote effective water conservation, mitigate excessive pumping of groundwater and land subsistence, ensuring land resource security. Priority locations for plains afforestation in Yunlin County include type 3 agricultural zones which are subject to interference from external factors, general agricultural type 2 agricultural zones, agricultural land restored following heavy metal pollution and areas listed by the Ministry of Economic Affairs as suffering from serious land subsidence, as well as high consumptive water crop areas where irrigation systems are overloaded and areas with high flood potential.

The Yunlin County Government has encouraged businesses to sponsor plains afforestation, reduce carbon emissions and apply for international carbon credit

certification. This not only benefits corporate image, but will also contribute to the balanced development of industry at all levels (industry and commerce assisting farmers). The Yunlin County government has already won an agreement from Formosa Plastics to plant 2,600 hectares of forest, and according to measures to encourage plains afforestation, provided matching funding for ten years. Aside from the NT$2.4 million subsidy per hectare over twenty years from the Forestry Bureau, a further NT$1.3 million per hectare is available from Formosa Plastics, substantially increasing afforestation incentives, and reducing pressure on government subsidies. At the same time, the plains afforestation policy should consider the issue of food security and potential negative externalities for agricultural production. A proportion of agricultural land should be retained, and an appropriate buffer space should be retained where forested areas border agricultural land.

According to Article 7 of the "Rural Regeneration Act" approved by the central government in August 2010, in order to promote rural sustainable development and regeneration, the central government authorities should establish a rural regeneration fund to the tune of NT$150 billion, and allocate the funds within ten years of the passage of the act. For an agricultural capital like Yunlin County, with the highest area of agricultural villages and land in the county, this represents an opportunity to promote the sustainable development and regeneration of rural communities, improve basic production conditions, maintain rural ecology and culture, improve quality of life, and create prosperous rural communities. However, in the process of promoting the city's economic and environmental sustainable development, Yunlin faces an acute flood control problem. According to Council of Agriculture statistics, in the decade between 2002 and 2012, natural disasters such as heavy rains caused the loss of nearly NT$100 billion in agricultural production. Faced with a serious underfunding for flood control across many cities in Taiwan, the key is whether the central government recognizes the urgency of flood control measures and develops follow-up measures as soon as possible.

In addition, simple water conservancy projects are unable to effectively and comprehensively control flooding in the face of heavy rainfall brought by climate change. The only effective method is to follow the example of flood control measures used in advanced countries, promoting integrated flood management based on the concept of "upstream water retention, midstream flood mitigation, and downstream flood discharge." Based on this, Yunlin County has established river basins as the plan area, bringing

together flood control measures that use improved methods and infrastructure, promoting spatial governance, land conservation, industrial development, and land use planning in the Yunlin County Regional Plan. Yunlin County has also called on the central government to quickly pass the "National Land Planning Law" and establish a NT$100 billion "Land Conservation Development Fund," as well as expediting the establishment of a "Ministry of Environment and Natural Resources" to integrate duties and resources, using the principle of national sustainable development to guide and support integrated flood control in local land use planning.

Asides for actively developing a new direction for agricultural reform, the Yunlin County government is also committed to industrial and commercial development. Agricultural reform in Yunlin aims to move from primary production to creating new value. The transition of key industries, such as high quality agriculture, high value petrochemical industries, high-tech textiles, and high quality functional food can stabilize local employment and economic output. At this stage, industry has begun to expand into high value-added metallic and optoelectronic materials, while also using the strengths of the public sector and resources from local industrial development funds to guide local industrial restructuring, achieving the sustainable development of local industry, creating new business opportunities, developing first-level industry, moving away from traditional stereotypes, and working toward second and third-level industry at the same time as continuing to provide guidance to the agricultural processing and textile industries. It is hoped that promotion of local small business innovation research (SBIR) can enhance the research and development capabilities of SMEs within the county, raise innovation and technical standards, create innovative added-value for industry, and achieve sustainable development objectives.

In response to the current development status and challenges as an agricultural capital, Yunlin is committed to the development of e-commerce for agricultural products and strengthening intellectual capital. The first part of the strategy is to create effective discrimination and infrastructure based on the unique characteristics of the city's industrial development, developing similar but not identical industry clusters or showcase industries. Distinctive industries or showcase industries (points) can be linked together to form a chain (line), creating a dynamic system of horizontal alliances between industries (dimension), revitalizing urban development and enabling the city to achieve financial self-sufficiency. At the same time as developing distinctive industries,

combined with appropriate manpower resources to provide the talent human necessary for industrial development, the maximum benefit is achieved by creating "intellectual capital" through manpower development. Specific policy proposals include establish an agricultural university, special organic classes, and safe agricultural education and training, to nurture the forward-looking talent the city requires in the future. At the same time, the Yunlin County deputy magistrate believes that Taiwan has long neglected the impact of agriculture on humans. The Yunlin Agricultural Expo provides an accessible interface for citizens to appreciate the beauty of rural Taiwan. The logical outcome of Taiwan's economic development ideology is that agricultural cities suffer the most. However, Yunlin does not regard itself as a tragic city, because in the process of growing urbanization, much of Taiwan's traditional culture, including religion, arts, and way of living gradually disappeared. Although agricultural cities seem quite weak, as peripheral areas, they are the accumulators of Taiwan's vanishing culture, becoming another source of strength.

In conclusion, sound finances are the basis for the sustainable development of local self-government. The long term practice and logic of "favoring the special municipalities at the expense of the cities and counties" has made the "rich six municipalities, poor sixteen counties" phenomenon increasingly serious.[6] The Executive Yuan's draft revisions to the Act Governing the Allocation of Government Revenues and Expenditures proposes that the central government allocates an additional NT$43.8 billion to local governments, of which NT$41.3 billion (94%) is granted to the six municipalities, maintaining the urban-rural gap and unbalanced development situation. The current revisions to the Act Governing the Allocation of Government Revenues and Expenditures are unable to comprehensively resolve the financial problems of the less wealthy cities. The Yunlin County magistrate believes that the central government financial authorities should include "household disposable income," the "value of agriculture, forestry, animal husbandry, and fishery production" variables and indicators to trial thirty-five different versions and achieve an actual increase in the financial resources allocated to local governments.

[6] Taking the 2011 as an example, the total financial grants allocated to the six municipalities of NT$333.6 billion was 1.8 times the NT$190.1 billion allocated to the sixteen cities and counties (Taipei City received NT$81.4 billion, 4.5 times more than the NT$17.9 billion received by Yunlin County).

"Kaohsiung City's actions in pursuit of low carbon efficiency should not simply be a passive response to crisis, but should include positive action to strengthen the city's resilience in the face of environmental disasters and crises. The development of Kaohsiung City is moving towards a green capital, therefore it must also strive to become a resilient city."

(Chu Chen, Kaohsiung City Mayor, September 30th, 2013)

"Business units must collectively shoulder responsibility for climate change with Kaohsiung City. However, in order to respond to the highly unpredictable impact of future climate change, the city needs to develop a set of innovative financial mechanisms that meet local needs."

(Tsan-Min Lin, Kaohsiung City Environmental Protection Bureau Division Chief September 30th, 2013)

As a city that is developing towards a subtropical green capital, the challenges Kaohsiung City faced in economic development and transformation are of a unique type, that is the transformation of a city dominated by the traditional heavy industry. In the process of urban transformation towards a green capital, the hope of a good life for the next generation is something that all actors have in mind. For Kaohsiung City, four key issues and challenges are also encountered when taking measures for urban renewal and transformation.

The first key issue covers environmental pollution and high carbon emissions. In the last century, Taiwan's economic development propelled the island's economy into the global economic system through industrial development driven by the global division of labor. Due to the central government's national development strategy based on two distinctive cores, as Taipei developed into an administrative and commercial center, Kaohsiung was defined as Taiwan's industrial center. Nearly 60% of the land in the city (the area under the jurisdiction of Kaohsiung City prior to the municipal merger) became industrial zones, and Kaohsiung therefore became an industrial city.

The clustering of traditional industries in Kaohsiung had a major impact. Traditional industries bring considerable environmental pollution and high carbon dioxide

emissions,[7] as well as the contamination of the land and rivers, which frequently became a target for social protests. Areas where the environment has suffered high levels of pollution have become a serious issue for the urban transition process. Kaohsiung hopes that its actions towards low carbon efficiency can act as a basis for urban transformation, environmental restoration, and reductions in carbon emissions. In particular, the systematic reduction of carbon emissions by the industrial sector during the process of social change is vital challenge.

The second key issue is the need for a profound social transformation. The city's status as Taiwan's industrial capital also brought deep rooted structural issues for society, as well as influencing Kaohsiung's future transformation. The social context, social structure, living patterns and space, education and employment systems, and economic thinking based on industrial production have created fundamental constraints that that are both a key factor in the context of the city's carbon emissions but also tied into the opportunities and momentum for social transformation within the city. Achieving the transformation of the city from an industrial capital to a green capital and actions in pursuit of low carbon efficiency clearly also requires some social engineering.

The third issue relates to key economic and employment questions in Kaohsiung's sustainable development. As an industrial capital, Kaohsiung is linked to the global division of labor. The transformation of the global economic structure means that the industrial capital of Kaohsiung is facing the outflow of traditional industries and economic depression. Looking at global experiences of urban transformation, the transition of traditional heavy industry cities has met considerable difficulties in reviving the economy and attracting new industries. In addition to the value-added transformation of traditional industries, a new vision and strategy is required to attract new industries. In the context of high levels of international and regional competition, further economic development requires outside support. However, investment from outside is often slow to arrive or fails to materialize. Instead, sustainable development strategies make use of existing conditions and strengths. These approaches are based on demand from the domestic market, using

[7] According to the 2012 carbon dioxide inventory report, Kaohsiung City's emitted a total of 61.5 million tons of greenhouse gases; industrial emissions accounted for a net 81.82% of total emissions, emissions from the residential and commercial sector accounted for 7.34% of total emissions, while emissions from the transport sector accounted for 6.74% of total emissions.

conceptual and strategic vision strategically redefining the contents and indicators of development actions, turning weakness into strength, using difficulties as a new force to drive urban development. This type of urban transformation requires innovative thinking and action that transcends existing patterns. Kaohsiung City's evolution into a green capital and actions to create low carbon efficiency should be considered as actions for economic reengineering and development.

The fourth issue involves Kaohsiung's future survival in the face of changes in climate and the environment. Following the 2011 municipal merger, Kaohsiung now has 38 administrative districts, with a total population of 2.77 million covering an area of 2,946 square kilometers. Geographically, it borders Hualien and Taitung to the east, the Taiwan Strait to the west, Pingtung to the south, and Chiayi and Tainan to the north. It leads Taiwan in terms of total area, land use, and complexity of urban development. Faced with the impact of climate change, extreme climate events have already posed severe threats to administrative districts within Kaohsiung City's borders. Threats include landslides and flooding in mountainous areas follow torrential rains. If carbon emissions to continue to increase and global warming causes further rises in sea levels, this will cause enormous losses for urban areas along the coast. Kaohsiung City's actions to become a low carbon efficiency green capital are a systematic response to the development crisis facing the city. However, each action, is also about improving and strengthening the city's ability to resist this type of environmental crisis. The Kaohsiung City mayor believes that the city's actions in pursuit of low carbon efficiency should not simply be a passive response to crisis, but should include positive action to strengthen the city's resilience in the face of environmental disasters and crises. The development of Kaohsiung City is moving towards a green capital, therefore it must also strive to become a resilient city. The key issues related to Kaohsiung's urban transformation discussed above must be met with positive action. The internal logic of these issues also provides a vision and strategic thinking for their potential solutions, determining the various directions and logic for city building initiatives.

Along with the serious impact on urban development caused by climate change, Kaohsiung City also faces the problem of extremely high greenhouse gas emissions. With the city dominated by industry, the Kaohsiung City Environmental Protection Bureau Division Chief believes business units must collectively shoulder responsibility for climate change with Kaohsiung City. However, in order to respond to the highly

unpredictable impact of future climate change and its associated financial costs, the city needs to develop a set of innovative financial mechanisms that meet local needs. Therefore, Kaohsiung City has drawn up the draft "Self-Government Ordinance for the Collection of Climate Change Adaptation Fees from Enterprises in Kaohsiung City," proposing to collect a so-called "climate change adaptation fee" from enterprises in the city, which will be mainly be used to subside businesses to reduce greenhouse gas emissions and climate change adaptation expenditures.

Work on the "Self-Government Ordinance for the Collection of Climate Change Adaptation Fees from Enterprises in Kaohsiung City" began at the end of 2010. Following expert consultations, study meetings organized by the city government, seminars in industrial zones, and public hearings, in August 2011 the city government approved the measures. However, in May 2012, the Environmental Protection Administration announced that greenhouse gases including carbon dioxide were to be classified air pollutants under the control of the Air Pollution Control Act. On this basis, the levies applied, calculation methods, and collection of levies should be established by the central government as the competent authority authorized by the Air Pollution Control Act. In other words, local governments did not have the authority to determine such levies through a self-government ordinance. The Kaohsiung City council is yet to reach a consensus on the collection of collection of climate change adaptation fees from enterprises, so this proposal has not advanced any further.

To promote sustainable urban development, improve quality of life, prevent environmental pollution, maintain the city's appearance, Kaohsiung City has proposed the "Kaohsiung City Self-Government Ordinance for Environmental Protection" as a basis for the implementation of environmental protection. Kaohsiung City has a large amount of heavy industry. In 2011, the city's total carbon emissions were 65.67 million tons, of which industry accounted for 83.9%, meaning Kaohsiung City's per capital carbon emissions of 23.1 tons were far in excess of the 10.9 tons per capita for the whole of Taiwan and the global per capita average of 4.39 tons announced by the United Nations in 2010. Therefore, there is a clear need to reduce greenhouse gas emissions from industry and encourage manufacturing industries with high energy consumption to reduce carbon emissions in product manufacturing and the emissions produced during power generation to respond to the impact on Taiwan's industry of future international agreements on controlling greenhouse gas emissions. In addition, Kaohsiung City's

high levels of suspended particles and ozone concentration mean that the air quality has for a long period been classified as Class 3, meaning that it does not meet air quality standards. Clearly, the use of emissions standards as a regulatory instrument has been insufficient to prevent an increase in overall levels of air pollution. Article 6 Item 3 of the Air Pollution Control Act, requires that existing stationary pollution sources shall reduce pollutant emissions quantities. In addition, to strengthen water pollution and environmental management, responsibilities for prevention of water pollution are clearly defined, with river management authorities responsible assisting the control of emissions sources, and owners, managers, users, and night-time vendors using public or private land or buildings for ensuring a clean environment. In conclusion, to ensure environmental sustainability combined with economic development, local and national governments should work towards smarter and more effective methods of cooperation, and new innovative approaches to the distribution of tax revenues. Local tax on investment should be distributed according to the area and population of the administrative region, rather than being remitted to the center. This will ensure that local governments have more policy flexibility.

Currently, the development of an ecological city requires central and local government to work together. However, local governments hope to play a more prominent role. Kaohsiung aspires to transform itself from an industrial city to become a green livable capital. To achieve this, Kaohsiung has a number of ideas and policy approaches, with the expectation that change can be driven in a bottom-up manner, putting the idea of low carbon living back into people's everyday lives. However, this approach still requires an integrated operating mechanism and platform. It is hoped that the central government will provide policy support and approval. At the same time, the city is also seeking private sector support to allow cooperation with enterprises.