CB(1)539/12-13(02)

敬啟者：

綠色和平對《管制計劃協議》中期檢討的意見書

《管制計劃協議》是政府與兩間電力公司之間的合約，當中列明了電力公司的利潤計算方法、服務表現及排放表現的要求。在《管制計劃協議》中期檢討內，政府應回應社會在這幾方面的訴求，爭取修改有關協議，或在協議內加入新條文，令《管制計劃協議》更有利香港社會整體需要。

近年香港市民一直為電價上升所困擾，每年兩電按《管制計劃協議》，將全部減排成本轉嫁市民，兩電的利潤就持續高企，其實是「扮環保打劫」。綠色和平認為電力公司身為污染者，是有責任攤分當中的成本，緩減電費的增幅。

然而，在《管制計劃協議》中目前是將電費分為「基本電價」及「燃料價條款」。要緩減電費增幅，必須控制用電量的增長，減少新增固定資產投資的需要，以限制「基本電價」的上升空間；同時減少燃料的消耗總量，控制「燃料價條款」的上升幅度。要達到上述兩項目標，節能是唯一方法，而且亦是最有效達至減排的方法。

因此，綠色和平對 2013 年進行的《管制計劃協議》中期檢討，特別準備了一份名為《電力維新》的建議書(詳細內容可見附件)。建議書內有三項建議措施，包括：

1. 兩電承諾每年強制節能 1%目標，由兩電資助用戶節能，並以扣減准許利潤作為未能達標的罰則；
2. 分拆可再生能源作獨立銷售，向大量用電客戶銷售；
3. 全面實行累進制電價機制。

三項建議中，本會認為節能 1%的強制目標尤為重要，因為此措施有助抑制未來電費不斷上升的趨勢，而且同類型政策在海外已取得莫大的成功，例如英國近年不單成功控制用電量，更在 2004 至 2010 年間，令用電總量下降 3%，成績有目共睹。以強而有力的節能措施，控制用電量，減少燃料消耗，是最有效減排及紓緩未來電費加幅的方法。本會認為設定強制的節能目標是《管制計劃協議》中期檢討的首要任務。

目前廣大市民都無法參與《管制計劃協議》中期檢討的談判進程，被兩電和政府蒙在鼓裡。因此，綠色和平在此要求兩電在《管制計劃協議》中期檢討，公開承諾實行以上三項措施，履行身為污染者的企業社會責任。

此致
立法會經濟事務委員會全體議員

綠色和平資深項目主任
古偉牧謹啟
2013 年 2 月 6 日

附件 一. GP_SOC_SUGGESTION_FINAL_CHI
附件 二. GP_SOC_SUGGESTION_FINAL_ENG

GREENPEACE 綠色和平

電力維新

綠色和平對《管制計劃協議》中期檢討的建議

2012 年 7 月

前言:

自 2008 年與中央政府簽訂《能源合作備忘錄》後，香港特區政府確立未來增加使用天然氣的政策方向，藉以幫助減低溫室氣體排放，同時改善空氣質素。然而，增加使用天然氣，無可避免令燃料成本上漲，提高電價。因此，把市民的電費支出控制於可負擔的水平，就成為新一屆特區政府除了兼顧環境、經濟外的另一施政要務，以達至真正的可持續發展。

目前本港的電力市場在《管制計劃協議》下，側重經濟表現，令兩電的准許利潤在 08 年生效的新協議中，連年上升，合計由 2009 年的 128 億增加至 2011 年的 138 億[1]。但《管制計劃協議》在社會和環境的表現上並未如理想，因為《管制計劃協議》不單無法平抑市民的電費支出，更無法促進本港的節能表現，應對氣候變化，只有兩電的利潤不斷增加。

綠色和平分析香港過往用電情況，發現如香港能將 2020 年的本地耗電量控制在 2010 年的水平，再配合特區政府計劃中增加天然氣的計劃，香港毋須增加核電亦能達到聯合國對發達地區的減排要求，應對氣候變化。所以，綠色和平認為，政府必須於 2013 年的《管制計劃協議》中期檢討中加入修補條文，確保香港的電力市場發展兼顧環境、社會及經濟三個範疇，並達到：

1) 聯合國要求的減排目標；
2) 維持本港電價於可負擔的水平；
3) 保持電力公司可賺取合理利潤的營商環境。

本文歸納外國政府在減排的世界潮流中，監管當地電力公司的經驗，希望尋找切合香港電力市場的案例，作為 2013 年的《管制計劃協議》中期檢討的建議條文。綠色和平希望政府能把握 2013 年的《管制計劃協議》中期檢討的機遇，令兩電股東、香港市民，以及本港企業共同承擔保護氣候的責任，杜絕兩電現時「借減排發財」的不公情況。

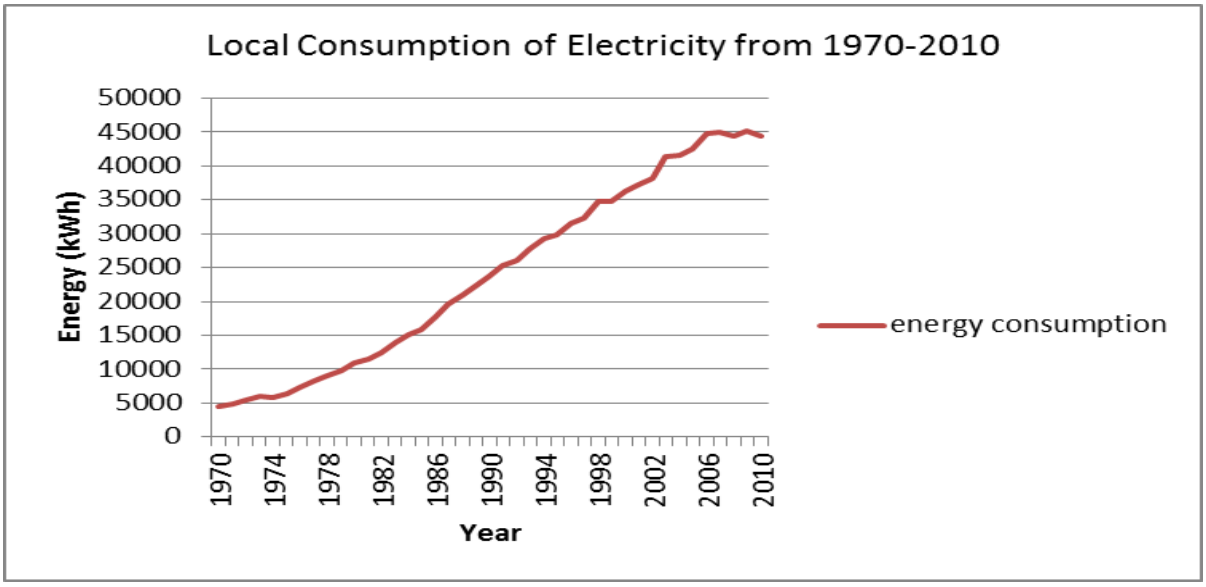
[1] 兩電 2011 年財務摘要

香港電力市場現況

由於行業的門檻甚高，全球電力市場不但都出現不同程度的壟斷情況，亦需要依賴政府作出有效監管以平衡電力公司的商業利益，及社會的整體利益。回顧香港現時的電力市場，分別由香港電燈有限公司(下稱：港燈)和中華電力有限公司(下稱：中電)壟斷香港島和南丫島、以及其餘地區的發電、輸配電、電力零售服務，及整個產業鏈的業務。自 1978 年起，兩電與政府達成《管制計劃協議》，目的是透過引入固定的准許利潤回報，吸引股東投資，以應付當時社會上急速增長的電力需求。

《管制計劃協議》實行至今已接近 35 年，時而勢易，本港目前的電力需求增長已經大幅放緩(見下圖)，再無需要大量投資電力基建以應付需求。香港電力市場的挑戰，目前是在於轉型至一個可持續發展的市場模式，急需加入節能的推動力，令香港 2020 年的用電量的以維持在 2010 的水平，應對氣候變化。

綠色和平建議，政府在短期內先要推動一場「電力維新」，修改有效至 2018 年的《管制計劃協議》部份條文，並加入新元素以平衡環境、社會及經濟利益，長遠需要籌備廠網分家及兩電聯網，扭轉現時電力市場的壟斷狀況。



Sources: Hong Kong Energy Statistics (1970-2002), annual reports of CLP and HEC, Power Assets Holdings Limited Annual Report 2011

《管制計劃協議》3 大不足:

1. 兩電無承擔:

應對氣候變化雖是全人類的責任，而電力公司作為本港最大的排放源頭，理應擔起部份責任。不過，現時兩電的所有開支，都可獲平均 9.99%的准許利潤回報，意味著當中所有減排的成本均轉嫁在消費者身上。除此之外，電力公司部份有助減排的項目，更會獲得額外利潤作為獎勵。如此說來，所有減排責任變相全由市民承擔。

因此，《管制計劃協議》中期檢討，應列明兩電作為電力市場的唯一服務提供者，理應履行的減排責任。政府大可配合含罰則的修補條文，並以實報實銷的形式，規定兩電不可在節能項目中獲取額外利潤，只可收回成本，確保兩電負起作為本港最大排放源頭的減排責任。

2. 慳電無保證:

中電及港燈在 2011 年的本地售電量分別高達 312 億及 109 億度電，但《管制計劃協議》中訂明的慳電標準僅為 1200 萬度電及 300 萬度電，只屬售電量的 0.04%及 0.03%。這對香港節能的發展僅起聊勝於無的作用，對應對氣候變化的幫助不大。

因此，《管制計劃協議》必須加大節能的力度，把標準提升至有效應對氣候變化的水平，令 2020 年的用電量維持在 2010 年的水平，每年的節能目標應為售電量的 0.5% - 1%。確保香港能充分利用電力市場的特點，提升兩電的環保表現。

3. 基層無保障:

電力是生活的必須品，電費開支是基層市民生活中無法避免的負擔。在改革能源架構，政府提出增加天然氣時以助減排，然而，現行的《管制計劃協議》卻將所有減排成本轉嫁在消費者身上，不但沒有考慮基層市民的負擔能力，亦沒有任何緩衝機制，最後令基層市民首當其衝。

因此，政府在保障電力公司的股東得到合理回報之餘，同樣需要確保基層市民的整體電費開支處於合理水平。故綠色和平認為，引入新機制調節基層市民的減排負擔，就成為中期檢討不可或缺的一部份。

電力維新

– 《管制計劃協議》中期檢討的建議修改原則

1. 確立兩電作為本港最大排放源頭的減排責任
2. 以節能作為主要目標
3. 確保基層市民的整體電費開支處於可負擔的水平

特區政府可以在《管制計劃協議》中期檢討中，參考現時在世界上廣泛應用的兩項政策，並實行電價改革，以達成以上三項原則。這兩項政策分別為

一.《能源效益責任制》(Energy Efficiency Obligation)
二.《綠電認證》(Green Electricity Certificates)

這兩項政策具有適度的彈性，可以調節至切合香港電力市場的特殊情況。而電價改革(Tariff Reform)則需要政府官員更大的決心去落實。在《管制計劃協議》加入以上三個措施內，將令本地的電力市場健康發展。

《能源效益責任制》

源自歐洲的《能源效益責任制》(Energy Efficiency Obligation / Energy Efficiency Resource Standards)，是歐盟各國其中一項重要減排政策。這個政策的原則是，電力企業(或更廣義的能源企業)有責任從電力消費者的產業或居所中節省能源，而電力企業亦可充分利用與客戶的聯繫，以及本身對節能資訊的掌握，比政府更有效地向不同的電力消費者推廣節能措施。

《能源效益責任制》自九十年代開始應用，各國政策的施行大同小異，基本上先由政府為電力企業訂立節能目標，再向企業實行的節能措施發出減排證書，最後就計算財政年度內的節能份額，如企業未能達標，將面對財務處分。以英國為例，電力公司在 2005-2008 年間就直接投放了 7.75 億英鎊[2]於節能設備上，令節能產業得以在當地蓬勃發展，創造就業。

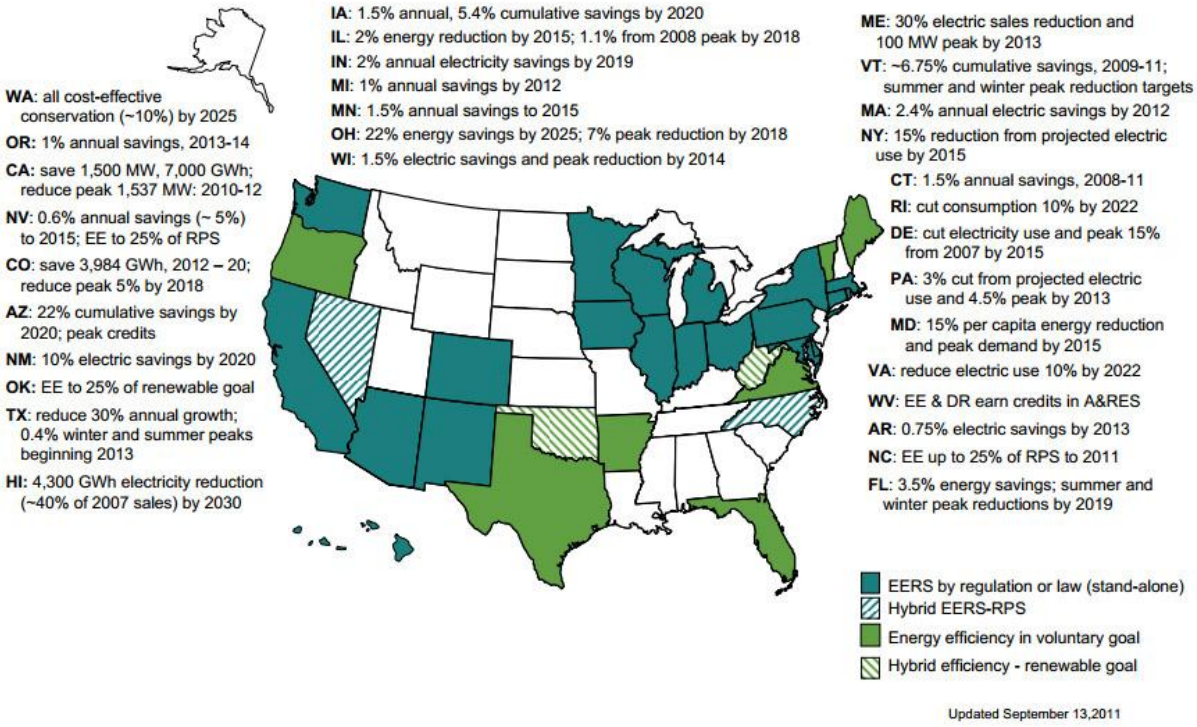
2011 年歐洲各國實行《能源效益責任制》的情況(只列部份)：

國家	節能目標 (限期)	全國用電量 (2009 年)[3]	節能成本(每度電)[4]	節能成效 (100%為達標)
英國	186 百萬噸二氧化碳 (2008 至 2011)	3224 億度電	05-08 年 – 0.016 歐元 (約 0.16 港元)	144% (2005 - 2008)
法國	345 億度電 (2010 至 2013)	4234 億度電	06-09 年 – 0.033 歐元 (約 0.33 港元)	121% (2006 - 2009)
意大利	5.3 百萬噸石油等量	2900 億度電	08 年 – 0.019 歐元 (約 0.19 港元)	140% (2007)
丹麥	1.7 億度電 (每年)	315 億度電	09 年– 0.05 歐元[5] (約 0.5 港元)	N/A
比利時 (佛蘭德地區)	2.6 億度電 (每年)	772 億度電	03 年 – 0.015 歐元[6] (約 0.15 港元)	306% (2008)

[2] P.35, Energy Saving Obligations And Tradable White Certificates, The Joint Research Centre of the European Commission, 2009
[3] http://www.iea.org/countries/
[4] Table 3, European and South American Experience of White Certificates, Eoin Lees, 2010
[5] P.34, Energy efficiency obligations – the EU experience, Eoin Lees, 2012
[6] P.29 Evaluation of rue obligations of electricity distribution grid managers in Flanders, Nicola Labanca, 2006

美國實行《能源效益責任制》：

美國的《能源效益責任制》與歐洲略有不同，由各州份自行決定節能的份額，部份更加入可再生能源目標，令美國的經驗比較難以歸納。

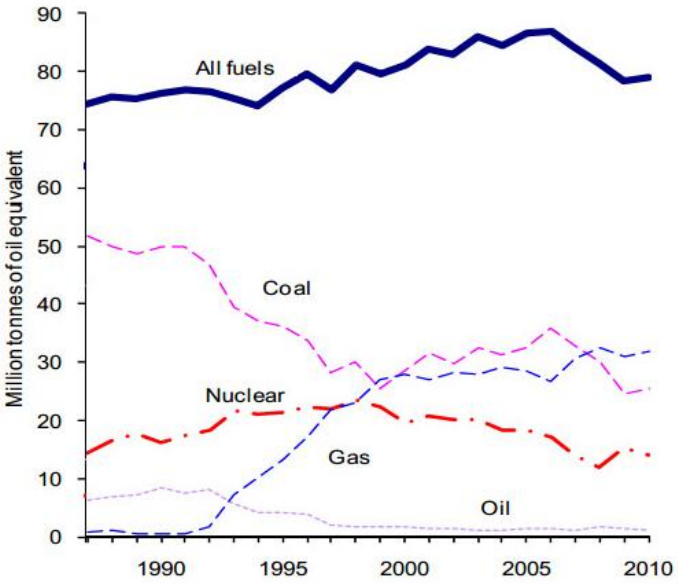


成效:

目前歐洲有英國、法國、意大利、丹麥、比利時(佛蘭德地區)、波蘭、愛爾蘭，而美洲就有巴西、以及美國 22 個州份[7]都正實行《能源效益責任制》，各地政府不但都同樣能達到節能目標，有的甚至超額完成。而且，由於節能成本遠較市場電價為低 (節省每度電成本由 0.15 港元 – 0.5 港元不等)，消費者亦受惠於節能措施，減少整體電費開支。

以英國為例，由 2004 至 2010 年間[8]，全國天然氣消耗由 1,124,996 GWh 減少 2010 年 1,073,770 GWh，減幅 5%；而全國的電力消耗亦同樣由 3396 億度減少至 3287 億度，節省了 3%，是八十年代以來首次出現用電量下降的情況。而在 2011 年英國《能源效益責任制》的政策檢討[9]中，接近八成(79%)消費者認同參與《能源效益責任制》的主要目的是減少電費的整體開支。

1987 – 2010 英國電力供應統計



鑑於《能源效益責任制》在全球不同的電力市場上都取得成功，香港在《管制計劃協議》中期檢討，就可借用當中的經驗，彌補條款一直以來的不足。以下是不同地方值得香港的借鏡的經驗：

[7] http://www.ferc.gov/market-oversight/othr-mkts/renew/othr-rnw-eers.pdf
[8] Digest of UK Energy Statistics 2011, http://www.decc.gov.uk/assets/decc/11/stats/publications/dukes/2311-dukes-2011-long-term-trends.pdf
[9] Figure 11, P.52, Evaluation of the delievery and uptake of the Carbon Emissions Reduction Target, Ipsos MORI, CAG consultants and BRE, 2011

經驗一：嚴選節能目標客戶群

不同的國家在電力消耗的分佈上，會隨著其經濟結構、氣候條件而具有各自的特色。因此，各國的《能源效益責任制》會選定不同的群體，繼而分配不同的節能目標，引導電力公司將節能措施集中於特定客戶群，既可擴大節能效果，亦可扶助弱勢社群。目前大部份的國家，都主要針對處理住宅的耗能情況。因為，對住宅而言，由於節能設備的初期投資相對高昂，往往令住宅用戶卻步。《能源效益責任制》有效協助住宅用戶節能，所以歐洲各國的主要節能比例亦是以住戶為先，見下表[10]：

國家	年度	住宅佔整體節能比例
英國	2005 - 2008	100%(法定比例)
法國	2006 - 2009	87%
意大利	2005 - 2008	83%
丹麥	2008	42%
比利時 (佛蘭德地區)	2008	58%(法定比例)

英國政府針對當地住宅隔熱措施普遍不足的現象，在《能源效益責任制》中明文規定電力公司必須在住宅客戶群履行其節能責任，規定他們把其中 40%的節能責任用作幫助低收入家庭，並把他們列為「優先節能用戶」(Priority Group)。而這些「優先節能用戶」的節能份額，亦會再特別預留 1600 萬噸二氧化碳的減排目標，予生活條件更緊拙的「最優先節能用戶」(Super Priority Group)，確保社會的弱勢社群在能源價格上升的趨勢中，得到適度的援助。

英國政府對不同用戶的定義	
「優先節能用戶」 (Priority Group)	the 'Priority Group' are the customers who are in receipt of certain income related benefits, tax credits (where the consumer's income is under £16,040) or are 70 years old or over.[11]
「最優先節能用戶」 (Super Priority Group)	Super Priority Group which includes people claiming specific credits and benefits income-related Employment and Support Allowance, income-based Job Seeker's allowance, Income Support and State Pension Creditor or who have parental responsibility for a child under 5 years of age who lives with them.[12]

[10] Table 3, Energy efficiency obligations – the EU experience, Eoin Lees, 2012

[11] http://www.ofgem.gov.uk/Sustainability/Environment/EnergyEff/InfProjMngrs/Documents1/CERT%20supplier%20guidance.pdf

[12] http://www.ofgem.gov.uk/Sustainability/Environment/EnergyEff/Pages/EnergyEff.aspx

如何在香港應用:

回顧香港，特區政府在樓宅節能的措施亦甚受住宅大廈業主歡迎。自2009年開始的《建築物能源效益資助計劃》，現已全數撥出4.5億的資金，合共資助770項計劃[13]。現時已沒有新資助計劃和資金，可見香港社會在提升能源效益上需要更多資助的投入。《能源效益責任制》下，藉著電力公司豐厚的資本，攤分節能設備的初期投資成本，免卻住戶一筆過付出大量資金，電力公司及後再從電價收回全部/部份成本，對消費者達到一個近似免息分期的效果。由於大部份節能措施相對發電措施普及，市場資訊充裕，壟斷程度較低，所以，各國政府在控制節能成本上相對輕易，而且有效。所以，香港政府當中只需監察節能措施的成本。

特區政府在引入《能源效益責任制》時，亦應鎖定客戶群。目前香港有接近 9 成用電消耗於建築物之中，因此特區政府應集中在樓宇節能。政府在容許家庭用戶成為《能源效益責任制》的受惠對象之外，亦需要預留一定的節能比例予低收入家庭，務求令基層市民在節能減排的社會趨勢中得到適度的保障，並推廣節能的應用層面。而由於本港多層式樓宇眾多，當中涉及大量的公共空間(如大堂、走廊、會所等設施)，所以政府亦可考慮鎖定樓宇管理人為對象，鼓勵他們為樓宇的公眾空間節能。

經驗二: 節能措施標準化

所有推行《能源效益責任制》的國家都有一個共通點：建立一套有效評估節能成效的機制，去計算電力公司的節能成果。目前歐洲國家，大多同樣採用**節能措施標準化**(Deemed Savings)的做法。標準化，是指先由政府指定部門訂立節能目錄，列出如改換慳電膽，加裝隔熱玻璃等若干項節能措施，預先評估平均節能成效。然後，電力公司只需按目錄上選取措施，提交計劃書，再經有關部門審批，就可以獲得節能證書。這種做法有利降低行政成本，加快節能措施的推廣，比較適合住宅樓宇中較小型和普及的標準化節能措施。

相反，如電力公司希望在大型商業樓宇、工業大廈或公共設施中，度身訂造節能工程，則需要在工程完成後逐項工程評估，並經事實驗證，方可獲得節能證書。由於逐項工程評估需要較多的人力資源，以確認節能成效，因此只有大型工程才可以合理化有關程序。

根據法國的經驗， 在 2006-2009 年間由 the French Agency for Environment and Energy Management (ADEME)及 the Association Technique Energy Environment (ATEE)預先批核 182 項節能措施(standard operation)，其中包括約 60 項住宅措施，80 項商業措施。批核節能

[13] http://www.building-energy-funds.gov.hk/tc/approved/EEP.html

證書的最低門檻為 100 萬度電，約為當地 170 個家庭的平均總用電量，亦大概相等於在住宅樓宇內安裝 3000 個慳電膽的工程節能量。

值得注意的是，法國政府容許電力公司把多個項目的節能措施合併計算，以便電力公司達至節省 100 萬度電的最低門檻。法國經濟部簽發的節能證書有效期為 9 年，電力公司如在該年度超額完成節能目標，可保留在未來使用。除了法國電力公司外，其他能源服務公司(例如 ESCO)亦可與電力公司合作承辦節能工程，以獲取節能證書。法國現正考慮參考意大利的做法，容許經登記的能源服務公司(ESCO)自行申請節能證書，開放節能市場。

法國政府標準化節能措施(只列部份)[14][15]	
住宅	A 級能源標籤照明系統或雪櫃
	隔熱雙層玻璃
	太陽能電熱水爐
	隔熱外牆
商業(面積少於 5000 平方米)	隔熱外牆
	隔熱天台
	安裝變頻摩打
	熱泵熱水器

法國 214 項節能措施標準化的分佈：

	建築物表面	煮食/加溫	燈光及照明用具	其他設備	服務	總計
住宅	7	48	6	0	4	65
商業樓宇	14	55	19	0	1	89
工廠	2	0	6	18	0	26
通訊	0	5	5	1	0	11
運輸	0	0	0	13	3	16
農業	0	3	0	3	1	7
總計	**23**	**111**	**36**	**35**	**9**	**214**

[14] http://www.fedarene.org/documents/projects/EESI/Contractual_Issues/white_certificates_epc_manual.pdf
[15] Table 8, http://www.ea-energianalyse.dk/reports/710_White_certificates_report_19_Nov_07.pdf

如何在香港應用：

基於香港有大量設計相近的大型屋苑，當中潛在的節能空間亦頗為相似。所以，推動**節能措施標準化**，非常切合香港的現實環境。此外，特區政府過去亦有計劃拓展能源效益標籤計劃，加上在香港綠色建築評級標準 BEAM+中又已初步掌握不少節評估節能成效的資料，這都有助列出優先節能項目，降低推廣節能的行政成本。

舉例而言，香港政府大可利用《能源效益責任制》，把為住宅「更換隔熱玻璃」列為優先節能項目之一。目前香港的樓宇絕大部份只講求景觀，濫用大面積的玻璃。由於玻璃過度傳熱，增加空調負荷，造成不必用的耗電。除此之外，香港在**節能措施標準化**中，亦適宜計算其累積節能成效(至少 5 年)，以確保回本期相對較長的節能措施亦同樣得到採納。

經驗三：具阻嚇力的罰款

《能源效益責任制》中的「責任」一詞，是源自電力公司在推動社會節能上有**不可推卸的責任**。因此，這項政策中不是以**誘因**鼓勵電力公司推動節能，而是以**罰則**去促使電力公司履行節能責任。罰則普遍分為定額及浮動兩種，其中最主要的原則是必須比節能的成本、或者節能證書在市價交易的價格為高，確保具足夠的阻嚇力。

國家	定額/浮動	未達標罰則
英國	浮動	視乎未達標程度而定
法國	定額	20 歐元 / 每 1000 度
意大利	浮動	視乎未達標程度而定
丹麥	浮動	視乎未達標程度而定
比利時 (佛蘭德地區)	定額	10 歐元 / 每 1000 度

現時意大利政府就採用浮動罰則，則令電力及天然氣監管局(The Regulatory Authority for Electricity and Gas, AEEG)可因應電力公司的節能表現、市場佔有率、以及市場最新的節能成本來調整罰則。電力及天然氣監管局的罰款由最低 2 萬 5 千歐元至最高 1 億 5500 萬歐元(港元 25 萬至 15 億)[16]，表現越差，罰款越高，如電力公司的節能表現至少達到目標的 60%，未能完成的節能目標則可享一年的緩衝期。浮動罰則能避免定額罰則可能因通脹等問題而影響阻嚇力，或者危及電力公司日常資金流的情況。

[16] Tradable energy efficiency certificates: the Italian experience. Marcella Pavan

如何在香港應用：

由於本地電力公司的利潤是根據《管制計劃協議》而定，現行的平均准許利潤為 9.99%。所以，這個「准許利潤水平」就成為最理想的罰則。只要將節能表現與准許利潤水平掛勾，未能達標就扣減准許利潤，且在節能表現越差時扣減更多利潤，就能令電力公司履行節能責任。而且，由於扣減利潤水平只會改變電力公司的利潤，不會危及電力公司的日常運作資金，所以，以扣減准許利潤作為罰則，並不會對香港的電力市場構成潛在的風險。

《管制計劃協議》中加入《能源效益責任制》

現行《管制計劃協議》有獎勵兩電節能的機制，容許中電及港燈在節省 1200 萬及 300 萬度電後獲取額外 0.01%的准許利潤。不過，此措拖純屬獎勵性質，兩電不但欠缺實行的動機，而且兩電執行減排措施時會把成本轉嫁市，未能成功讓電力公司負起作為污染源頭的責任。

縱合上述三項經驗，特區政府可參考外國的《能源效益責任制》，在 2013 年的《管制計劃協議》中期檢討制定相關條文推動全城節能。雖然《能源效益責任制》在現行《管制計劃協議》的框架下，無可否認會輕微推高基本電價，但從全球的經驗中，《能源效益責任制》能有效協助電力用戶透過樓宇節能、提升電器效益等，大幅減少用電。因此，對於控制整體電費支出的影響是正面的。

最後，《能源效益責任制》亦能透過在本地推動節能措施，加速節能產業發展，創造不同技術需要的就業機會，因而推動本土經濟。這遠勝於在內地建造核電站供電與香港，因後者只造成本地資金外流，無法創造本地就業。因此，綠色和平認為從加入《能源效益責任制》來控制本地能源需求，對本地的就業市場亦屬百利而無一害。

綠色和平建議特區政府考慮以下《能源效益責任制》的措施：

節能目標
1. 以電力公司的 **0.5% - 1%**售電量為節能目標，達到控制香港用電量「零增長」，減少兩電固定投資的目標
2. 制定節能目標時，一定比例的份額必須源自住宅或大廈管理人；其中固定數目的節能項目必須源自綜援或公屋家庭，以保障基層市民

成本攤分
1. 將電力公司在節能措施的開支，設立一類似燃料帳的實報實銷帳目，保障消費者以成本價獲得節能措施；
2. 節能措施的減排成效至少以 **5** 年為計算單位，平均按年入帳

節能措施標準化
1. 由機電工程署預先批核部份住宅用及商業用的最高能效的節能措施，並評估成效
2. 每年更新預先批核節能措施的目錄
3. 容許經登記的能源服務公司**(ESCO)**申請節能證書

罰則
1. 將節能表現與准許利潤掛勾，節能表現越差，扣減利潤越多；
2. 確保平均每度電之罰款高於該年基本電價

《綠電認證》(Green Electricity Certificate)

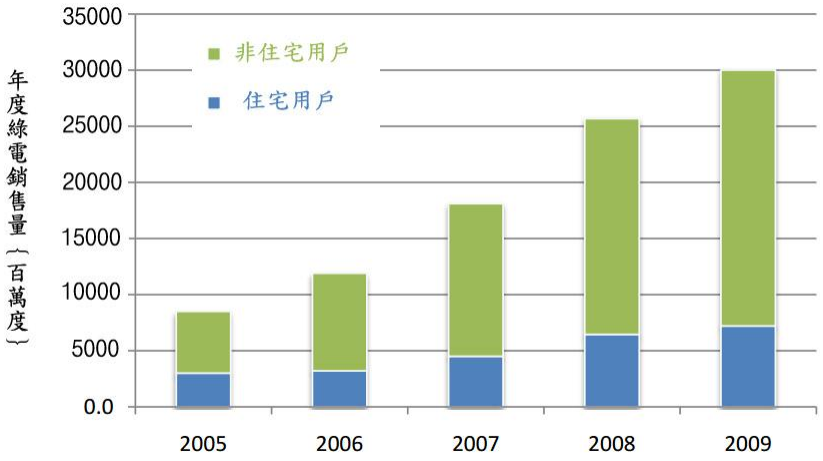
在節能以外，電力公司在應對氣候變化的大趨勢中，可選擇以可再生能源發電，減少碳排放。不過，可再生能源一般而言成本較高。因此，政府或電力公司可以按能者多付、多用多付的原則改革電費機制。無奈的是，現時本港的電價制定權並不在政府手上，而是由兩電以企業利益為大前提下釐定。就這樣，兩電令大量用電用戶得以享有較住宅及中小企用戶較低的電費，加重基層市民的電費負擔，造就了電費不公的情況。假如政府無力收回電價制定權，大可考慮學習美國的經驗，透過發行《綠電認證》作為一種折衷機制，在電價制定權旁落下，平衡基層市民應用可再生能源的負擔。

《綠電認證》就是由政府部門根據電力公司的可再生能源發電量發行的證書，供電力公司向客戶出售，讓客戶可以證書達到公關、宣傳，以及履行企業社會責任的效果。它的作用近似「碳交易」(Carbon Trading)中減排證書的運作模式。《綠電認證》的客戶包括住宅用戶、企業、非政府組織、地區政府等。而它的的行使權，在於買入認證的一方：買入者可藉此宣傳自家的產品和服務由可再生能源提供，令消費者可以辨別。除美國以外，英國、澳洲、印度多國都有《綠電認證》的政策，而英國、瑞典、比利時、波蘭、意大利等，更有購買《綠電認證》的法定要求，值此促進應用可再生能源，鼓勵能者多付之餘，同時減輕基層負擔。

成效:

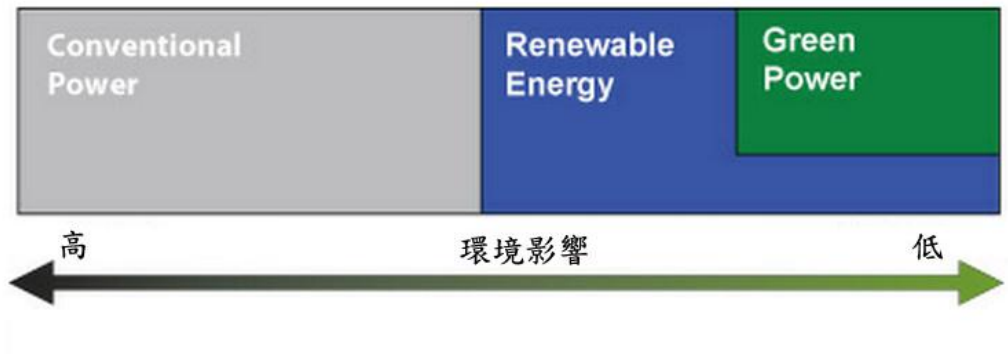
縱使國際間認為美國民眾對氣候變化抱有較懷疑的態度，但美國的《綠電認證》市場卻依然不斷擴大。根據 2009 年美國國家可再生能源實驗室的統計，《綠電認證》的銷售 5 年間持續增長超過 5 倍(見下圖)[17]，其中以非住宅用戶的增長尤為強勁，可見在商業市場上，《綠電認證》的市場價值與日俱增，市值約 1 億 3600 萬至 2 億 3600 萬美元之間。

[17] Green Power Marketing in the United Satates: A Status Report (2009 Data), 2010.



經驗一：確立綠電運作規則

要成立《綠電認證》制度，先要由一政府部門確立綠電的定義。所謂「綠電」就是對環境影響最低的能源，不過亦跟廣義的可再生能源有所分別。由於一般的大型水電項目會對生態造成破壞，所以不會獲《綠電認證》。所以，《綠電認證》一般只包括風能、太陽能、生物質能、沼氣(甲烷)及小規模水電，而證書上亦需要列明發電的類型、發電機組的位置和型號，以及《綠電認證》的年份，供消費者辨認綠電的來源。



除了定義能源外，政府亦需要為售賣《綠電認證》的方式寫下清晰的定義。由於《綠電認證》需要一定的行政程序，所以要設有指定的銷售方法，以免認證成本過高。美國現時有主要有三種《綠電認證》的購買方法：定量購買、按比例購買，以及長期購買合約。

A) 定量購買 (Fixed energy quantity block)：

以每 100 度電為單位的《綠電認證》，每月以定價向用戶銷售，用戶可自由選擇認購量。此做法最為靈活，亦可跨過電網的限制銷售《綠電認證》，但卻未能為電力公司提供穩定的收入來源。

B) 接比例購買 (Percentage of monthly use)：

用戶按需求買電，只需預先輸入每月購買綠電佔總用電的比例，然後由電力公司計算用戶該月需額外付出的電費，再在每期的帳單內支付。運用此做法的用戶需要受電網限制，由固有電力供應商購買《綠電認證》，而電力公司就享有較高的財政穩定性。

C) 長期購買合約 (Power Purchase Agreement)：

用戶每月在指定綠電項目發電量中，承包一定比例的電力，按供應買電，雙方簽訂長期的綠電購買合同，多用於大用電量用戶之上。此做法可為大型綠電項目提供穩定的資金投入，對於發展新項目最為有利。

如何在香港應用：

過去廿多年，要求兩電聯網、引入競爭的聲音不絕。《綠電認證》如包括定量購買的做法，容許用戶跨電網購買證書，至少用戶在綠電市場上就能享受競爭所帶來的好處，亦可間接促使兩電控制綠電項目的成本，提升《綠電認證》的價格競爭力。另外，由於香港未來將可能有兩個大規模的離岸風場落成，長期購買合同的安排將可為風場提供穩定的資金投入，減少市民對風電價格的憂慮，有助促進綠電在本港應用。

經驗二：開放《綠電認證》的申請資格

綠色電力有別於傳統集中發電的模式，不少屬於分散的電力來源，令《綠電認證》不獨是傳統電力公司的專利。所以，《綠電認證》的申請資格需要開放予不同的機構，令電力擺脫電網的限制獨立出售，使分散式可再生能源的市場得以局部開放。不少非傳統電力公司就採用長期購買合同形式合作，自行與工業用戶發展分散式可再生能源項目，以《綠電認證》作為交易平台，減本初次資本投入，令電力市場的發展長遠更為多元。美國政府甚至為分散式可再生能源項目，提供技術支援服務和稅務寬減優惠，務求加速市場的發展。

美國辦公室文儀用品公司 Staples[18]自 2005 年起，就利用《綠電認證》長期購買合同的形式，與可再生能源公司合作，在全國的門市、分銷中心及辦公大樓加裝太陽能板，每年產

[18] Guide to Purchasing Green Power, U.S. Department of Energy, 2010

生約 400 萬度綠電。而美國聯邦政府部份分散式可再生能源項目，亦申請《綠電認證》，減輕初次資本投入，見下圖[19]。

美國 2005-2009 年綠電銷售量：

美國聯邦政府部份申請《綠電認證》的項目
• **14.2 megawatt (MW) photovoltaic (PV) array at Nellis Air Force Base (the largest Federal PV system in the U.S.)**
• **2 MW PV system at U.S. Army Fort Carson**
• **2.3 MW from four PV systems at the National Renewable Energy Laboratory (NREL)**
• **500 kilowatt (kW) PV rooftop system on the General Services Administration's (GSA) Sacramento Federal Building**
• **850 kW PV system at the U.S. Coast Guard Petaluma site**

如何在香港應用：

香港目前的綠電發展完全依賴機構自行籌集資金，欠缺一個開放的市場機制。於 2012 年 6 月落成，位於九龍灣的零碳天地[20](ZCB)，將會由生物柴油及太陽能發電供整幢建築使用，預計更有能力提供額外的綠電供應電網。可惜，現是香港的電網由兩間電力公司擁有，未有任何機制協助其他機構出售電力，零碳天地亦未能獨立向公眾出售綠電。因此，特區政府應開放《綠電認證》予不同機構申請，以綠電市場作為一個起步點，令兩電以外的機構參與「售電」。

零碳天地用電情況[21]：	生物柴油	太陽能	合共
每年預計發電量	145,000 度電	80,000 度電	225,000 度電
每年預計用電量			143,000 度電
剩餘電力			82,000 度電

[19] http://www1.eere.energy.gov/femp/pdfs/ppa_guide.pdf
[20] http://www.hkcic.org/chi/zcb/aboutzcb.aspx?langType=1028
[21] http://news.sina.com.hk/news/2/1/1/2504311/1.html

經驗三：建立高透明資料庫

由於現時用戶無法分辨家中的電源是來自傳統火電還是綠電，所以若《綠電認證》要在用戶中建立信心，就需要於有大量的公開資訊及全面的統計數字，確保每一度綠電的真確性，建立一個健全可信的市場。因此，官方監管機構有責任向消費者提供《綠電認證》供應商的名單，避免出現濫竽充數的情況。

印度政府在推行《綠電認證》時，在網上建立了一個全面的資料庫[22]，每月公布《綠電認證》的發行數量及已獲認購數量；公布各個已獲批准綠電項目的詳細資料；提供所有登記《綠電認證》相關官方表格；以及注冊認可的供應商，供公眾核實所購買的《綠電認證》。

印度最新綠電項目(只列 2012 年 6 月最新十項)[23]：

Total Capacity (MW) = 2672.158 | Number of Projects = (446)							
Sr. No.	State	Energy Source	RE Generator	Project No.	Capacity (MW)	Date of Registration	Date of Accrediation
1	Tamil Nadu	Wind	Beta Wind Farm Private Limited	007	3.6	08-06-2012	24-05-2012
2	Tamil Nadu	Wind	BASANTH WIND FARM	002	2	07-06-2012	20-04-2012
3	Maharashtra	Wind	Aurangabad Electricals	001	2	30-05-2012	22-03-2012
4	Maharashtra	Wind	Menon & Menon Limited	001	1.25	30-05-2012	18-04-2012
5	Tamil Nadu	Wind	PGSD ENGINEERING LLP	002	1	28-05-2012	31-03-2012
6	Tamil Nadu	Wind	PGSD ENGINEERING LLP	001	2.5	28-05-2012	31-03-2012
7	Maharashtra	Wind	Sheela Shivaraj	001	0.6	28-05-2012	25-10-2011
8	Maharashtra	Wind	Rocket Engineering Corporation	001	0.35	25-05-2012	18-04-2012
9	Tamil Nadu	Wind	Beta Wind Farm	006	27	25-05-2012	30-04-2012
10	Uttar Pradesh	Biomass	UTTAM SUGAR MILLS LTD, SHERMAU	002	8	25-05-2012	17-01-2012

[22] https://www.recregistryindia.in/index.php/general/publics/index
[23] https://www.recregistryindia.in/index.php/general/publics/registered_regens

如何在香港應用：

香港地理環境較小，綠電起步較遲，而且整個電力市場都為兩電所壟斷，所以香港的綠電項目暫時都非常有限。因此，特區政府要建立完整資料庫的難度不大，只是香港市民及企業對於本地《綠電認證》的理解不深。其實目前香港已經不少企業有購買「碳中和」(如匯豐銀行[24])，或者協助顧客執行「碳補償」(如國泰航空[25])，甚至有人舉辦「碳中和」的婚禮[26]，其實《綠電認證》的原理跟以上的大致相同，無奈本地未有供應，企業亦要向外採購。

所以，特區政府在建立《綠電認證》資料庫時，首要加強《綠電認證》的推廣，增加企業及市民對《綠電認證》的認受性。特區政府亦可以考慮將《綠電認證》列為政府的環保採購項目，甚至在個別高用電量行業如數據中心，將認購《綠電認證》列為批地的要求之一。

與此同時，資料庫將紀錄《綠電認證》的銷售情況，特區政府亦可以考慮將兩電的准許利潤水平與《綠電認證》的銷售量掛勾，促使兩電協助推廣《綠電認證》。長遠政府亦可考慮將《綠電認證》的機制，擴展至粵港區域合作的層面上，推動區域綠色電力發展。

《管制計劃協議》中加入《綠電認證》

鼓勵可再生能源的方法，現行的《管制計劃協議》中，是向兩電提供較高的准許利潤水平(達 11%)予其可再生能源的固定資產，鼓勵發展可再生能源。不過，這個安排有兩大缺陷。首先，較高的准許利潤水平雖為電力公司提供了充足的經濟誘因發展可再生能源，但卻令成本轉嫁市民，令市民對可再生能源卻步。特區政府在《管制計劃協議》的談判中，未有收回電價制定權，失去了控制基層市民電費開支的主導權。另外，特區政府 2008 年將可再生能源的投資納入《管制計劃協議》中，亦顯得間接加強了兩電壟斷市場的優勢。

不少海外政府都只是透過立法，要求電網公司優先義務接納可再生能源(同為特區的澳門政府亦已實行)。這種做法至少令可再生能源市場，成為一個容許投資者自由進出的市場：既可引入競爭，有利控制可再生能源的投資成本，又可推動電力市場的長遠改革。

2013 年的中期檢討《管制計劃協議》時，正可加入《綠電認證》，因為兩電目前正有計劃爭取在 2015 及 2016 年間落成離岸風場，加價壓力將再次上升，是之為需要；而香港本土亦將有綠電項目落成，率先出現的就是香港建造業議會的零碳天地，每年將會有額外八萬度綠電供應電網，是之為條件；而隨著特區政府積極推動數據中心的發展，當中亦有

[24] http://www.hsbc.com/1/2/carbonneutrality
[25] http://www.cathaypacific.com/cpa/en_BH/manageyourtrip/travelextras/flygreener
[26] http://www.carboncareasia.com/eng/about_us/news/press_clippings/120310_press_clipping.php

跨國 IT 企業已承諾優先購買綠電，例如 Google[27]過去已簽下兩份長達 20 年，合共 215 兆瓦的綠電購買合同，其規模已超過中電計劃興建的風場，是之為市場。由此可見，《綠電認證》在 2013 年，已經是既有需要，又有條件，更有市場，在香港的《管制計劃協議》中落實。

本會建議特區政府應考慮以下《綠電認證》的措施：

定義
1. 將風能、太陽能光伏、生物柴油(需經獨立審批)列為本港的綠電項目，由環保署負責批發證書
2. 採用定量購買及長期採購合同的形式，容許客戶跨電網購買《綠電認證》

《綠電認證》運作
1. 開放《綠電認證》的申請資格，不限於兩間《管制計劃協議》的電力公司，並規定兩電有義務容許綠電連接至電網
2. 每張《綠電認證》的申請以 1000 度電為單位
3. 規定兩電的可再生能源項目，必須銷售 50%《綠電認證》，否則只可獲 9.99%的准許利潤
4. 在數據中心的發展中，優先撥地予承諾認購《綠電認證》的 IT 企業

公開資料庫
1. 環保署設立網上《綠電認證》資料庫，供公眾隨時查閱
2. 需提供《綠電認證》每月批核量、銷售量，以及平均價格的資訊
3. 在粵港聯席會議上研究成立區域《綠電認證》的可行性

[27] http://www.google.com/green/energy/use/#purchasing

《電價改革》(Tariff Reform)

香港兩間電力公司在定價時擁有自主權，現時都傾向為大量用電戶提供折扣優惠，當中尤以中電為甚，降低大量用電戶的節能意欲，有違能者多付，多用多付的環保原則。因此，政府可以考慮參考澳門在 2010 年時的做法，收回供電定價權，再為電價的釐定諮詢公眾，瞭解公眾對制定電力價格的要求。

澳門在 2010 年前，同樣由電力公司掌有定價權。因此，沿用 25 年的供電價目，同樣向大量用電戶提供優惠，以較低的售價向用電大戶傾銷電力，與香港現時的電價機制所差無幾，有著鼓勵耗電的弊端。

表3.1 澳門現行的A組收費

組別	分組	功率費		電能費	備註/適用條件
		等級 (千伏安)	價格 (澳門幣)	(澳門幣/千瓦時)	
A組	A1	不超過 3.4	8.224	0.963	一般用戶適用
		3.4以上至 6.9	18.796		
		6.9 以上	3.372/千伏安		
	A2	不超過 6.9	0	0.858	1.訂定功率在6.9仟伏安或以下 2.最近六個月內每月耗電量在120度或以下
	A3	不超過 3.4	8.224	0.884	1.從事社會活動的非牟利公營或私營機構 2.需附有由澳門社會工作局發出的有關從事非牟利及社會活動性質文件
		3.4以上至 6.9	18.796		
		6.9 以上	3.372/千伏安		
	A4	不超過 6.9	0	0.429	1. 被澳門社會工作局列入社會援助計劃的住宅客戶 2. 訂定功率在6.9千伏安或以下及最近六個月內的每月耗電量在120度或以下 3. 需提供由澳門社會工作局發出的有效社會援助卡

表3.2 澳門現行的B組收費

組別	分組	功率費	電能費用				備註/適用條件
			有功電能 (澳門幣/千瓦時)		無功電能 (澳門幣/千乏時)註3		
		澳門幣/千瓦	繁忙時間 註1	非繁忙時間 註2	繁忙時間 註1	非繁忙時間 註2	
B組	B1	19.797	0.874	0.767	0.348	0.116	1. 一般客戶適用 2. 功率費按公式：0.2訂定功率 + 0.8最大功率計算
	B2	21.484	0.874	0.767	0.348	0.116	1. 以中壓供電，低壓計算 2. 功率費按公式：0.2訂定功率 + 0.8最大功率計算 3. 需繳付最大功率值的1%附加費以彌補相關的損耗 4. 需繳付在同一時段內應付的有功電能10%等值的無功電能，以補償相關的損耗
	B3	21.484	0.874	0.767	0.348	0.116	1. 以低壓供電，低壓計算 2. 功率費按公式：0.2訂定功率 + 0.8最大功率計算 3. 需繳付最大功率值的2%附加費以彌補相關的損耗 4. 需繳付在同一時段內應付的有功電能10%等值的無功電能，以補償相關的損耗

註：1. 09:00-20:00
2. 20:00-24:00；00:00-09:00
3. 若無功電能超過在同一時段內應付的有功電能的60%，則需繳付超出之部份

表3.3 澳門現行的C組收費

電壓等級	用電季節	分組	功率費	電能費用						備註/適用條件
				有功電能(澳門幣/千瓦時)			無功電能(澳門幣/千乏時)註1			
			澳門幣/千瓦	滿負荷時間 註2	繁忙時間 註3	非繁忙時間 註4	滿負荷時間 註2	繁忙時間 註3	非繁忙時間 註4	
低壓至中壓	高用電季節 (6月至9月)	C1	19.797	1.432	0.885	0.749	0.348	0.348	0.116	1. 一般客戶適用 2. 功率費按公式：0.2訂定功率 + 0.8最大功率計算
		C2	21.484	1.432	0.885	0.749	0.348	0.348	0.116	1. 以中壓供電，低壓計算 2. 功率費按公式：0.2訂定功率 + 0.8最大功率計算 3. 需繳付最大功率值的1%附加費以彌補相關的損耗 4. 需繳付或減收同一時段內應付有功電能10%等值的無功電能，以補償相關的損耗，此部份將於滿負荷及繁忙時間內繳付，於非繁忙時間內減收。
	低用電季節 (10月至5月)	C1	19.797	0.776	0.776	0.724	0.348	0.348	0.116	1. 一般客戶適用 2. 功率費按公式：0.2訂定功率 + 0.8最大功率計算
		C2	21.484	0.776	0.776	0.724	0.348	0.348	0.116	1. 以中壓供電，低壓計算 2. 功率費按公式：0.2訂定功率 + 0.8最大功率計算 3. 需繳付最大功率值的1%附加費以彌補相關的損耗 4. 需繳付或減收同一時段內應付有功電能10%等值的無功電能，以補償相關的損耗，此部份將於滿負荷及繁忙時間內繳付，於非繁忙時間內減收。

註： 1. 在滿負荷及繁忙時間內，若無功電能超過同一時段內應付有功電能的60%，則需繳付超出之部份。所有非繁忙時間內的無功電能，需予繳付。
2. 10:30-13:00 ; 14:30-16:00
3. 09:30-10:30 ; 13:00-14:30 ; 16:00-20:30
4. 00:00-09:30 ; 20:30-24:00

澳門政府能源業發展辦公室就委任國際顧問公司，評估澳門電費制度與最新市場環境的適應性。並於 2011 年尾推出諮詢文件，希望改革電價機制以達至三個政策目標：

1. 無礙居民用電，關顧低收入家庭
2. 減輕一般用戶的電費負擔
3. 促進合理用電，提高能源效益

根據顧問公司的意見，一些與用電量或用電時段無關的固定成本分攤(如電網的維護、專營公司的回報和人員開支等)，並非經濟理論可公平解決的問題，因為有關的固定成本一直存在，沒有必然的標準，不可客觀地定出不同用戶組別之間應分攤的比例。問題更多是涉及相對公平性，需要從利益分配及政治角度作出考慮。因此，此類別的成本就成為了改革電費的契機。澳門政府建議調高不足 500 個大用電量用戶的電費約 5%，令其餘 99%用戶得享較可負擔的電價，同時推行累進制，以鼓勵節能。

成效:

在澳門政府的諮詢檔中，就列明 99%的客戶，包括中小企及住宅用戶的電費負擔都可獲減輕，減幅由 2 -28%不等。而根據過去美國的對電力需求彈性的研究，亦指出在電力的需求會隨價格上升而減少。所以，將累進制推廣至用電大戶之上，就有效透過價格控制減少用電(見後圖)。

Table 1. Summary of Price Responses in the NEMS *AEO2003* and *AEO99* Residential and Commercial Buildings Models

Sector and Fuel	NEMS Model Year	Short-Run Own-Price Elasticity 1-Year	2-Year	3-Year
Residential				
Electricity	*AEO2003*	-0.20	-0.29	**-0.34**
Commercial				
Electricity	*AEO2003*	-0.10	-0.17	**-0.20**
Commercial Electricity by End Use				
Core End Uses	*AEO2003*	-0.17	-0.29	**-0.36**
Other End Uses	*AEO2003*	-0.03	-0.05	**-0.06**

Sources: ***AEO2003:*** Energy Information Administration, calculated from the following price path scenarios using NEMS *AEO2003*: regeneration of the reference case price path, ELAST03.D121203B; electricity price increase case, ELAST03.D121203G; natural gas price increase case, ELAST03.D121203H; distillate fuel price increase case, ELAST03.D121203I. ***AEO99:*** S.H. Wade, "Price Responsiveness in the NEMS Building Sector Models," in Energy Information Administration, *Issues in Midterm Analysis and Forecasting 1999*, DOE/EIA-0607(99) (Washington, DC, August 1999).

而本會過去聯同城市大學鍾兆偉博士研究改革中電的電費機制，發現當中有極大的節能及利民紓困空間，預計可推動香港每年節省 9-12 億度電力，等同 20 萬戶家庭使用，同時避免增加基層市民的電費負擔[28]。

經驗一: 實行高跨度的階梯式收費

在澳洲新南威爾斯省，自 2004 開始引入一套簡單的兩層式階梯收費制度，以每季的用電量為計算單位，電價的差別為 49%。而美國加州有電力公司更採用最高差額達 200%以上的價格去訂立階梯式收費，務求提供足夠誘因令用戶減少用電。

表8　新南威爾士省Energy Australia公司的階梯式收費制度

住宅			工商業		
級別	每季的用電量 (千瓦時)	基本電價註 (澳洲元/千瓦時)	級別	每季的用電量 (千瓦時)	基本電價註 (澳洲元/千瓦時)
I	≦1750	0.13970	I	≦2500	0.1364
II	>1750	0.20845	II	>2500	0.2035

註：不含系統接入費及其他附加費

[28] http://www.greenpeace.org/hk/press/releases/climate-energy/2011/11/pricing-reform-pc/

表9　加州PG&E電力公司的住宅階梯式收費制度

級別	每月的用電量	基本電價註 (美元/千瓦時)
I	基準線(約每日12千瓦時)	0.11559
II	達到基準線的101%-130%	0.13142
III	達到基準線的131%-200%	0.22580
IV	達到基準線的201%-300%	0.31304
V	達到基準線的301%及以上	0.35876

註：不含調整費及其他附加費

如何在香港應用：

香港現時僅有的階梯式收費，包括中電的住宅價目及港燈的商業、工業及雜項供電價目，相對下都顯得跨度不足。港燈的商業、工業及雜項供電價目最高階的電力收費較最低階的電力收費，相差不足 14%[29]；而中電的住宅價目最低階和最高階的用電量相差達 550%，但價格相差就僅 66%[30]。所以，香港不單要全面推行累進制電費價目，更必須擴大不同收費階梯的跨度，更有效促進用戶節能。

經驗二：實行分時段收費

要避免電力公司增加發電機組，達到控制電費升幅的目標，就必須控制整個電力系統的最高需求。所以，全球趨向實行分時段收費， 澳門新建議的電費機制，亦有近似的安排。針對最高用電量的 D 組客戶，將高用電量用戶的收費分為繁忙時段及非繁忙時段，其中電價的相差達 66%，令用戶改變用電模式，減少對供電系統所造成的負荷。

表4.9　D組新收費：高壓用戶註：

功率費	有功電能(澳門幣/千瓦時)		無功電能(澳門幣/千乏時)	
澳門幣/千瓦	繁忙時間	非繁忙時間	繁忙時間	非繁忙時間
21.98	0.85	0.51	0.35	0.12

註：以上僅列出功率費和電能費

[29] http://www.hkelectric.com/web/CommercialAndIndustrialServices/BillingPaymentAndElectricityTariff/TariffTable/Index_zh.htm

[30] https://www.clponline.com.hk/Documents/Tariff%20Table%20-%20Chinese%20_2012_%20v20111230_.pdf

另外，本港亦可參考內地(特別是廣東省)應付缺電問題的經驗，內地對於作為最大用電戶的工業用戶，採取了分時段收費(見下圖)，在高峰時段用電於低谷時段用電價格相差超過200%，以促使工業更有效管理用電時段的分配，減低對發電機組的要求。

廣州、珠海、佛山、中山、東莞五市大工業用電峰谷電價表		
（從 2009 年 11 月 20 日起執行）　　單位：分／千瓦時（含稅）		
峰谷時段	用電分類	電度電價
高峰	1-10 千伏	108.09
	35-110 千伏	103.97
	220 千伏及以上	99.84
平段	1-10 千伏	65.51
	35-110 千伏	63.01
	220 千伏及以上	60.51
低谷	1-10 千伏	32.76
	35-110 千伏	31.51
	220 千伏及以上	30.26
備註：1、該價目表執行範圍為廣州、珠海、佛山、中山、東莞市城鄉地區。		
2、大工業基本電價為 23 元／KVA.月（變壓器容量）和 32 元/KW.月（最大需量）。		

如何在香港應用:

分時間收費在香港的應用並未普及，缺乏有力的價格訊號改變用電大戶的用電模式，因為在最大用電戶而言，不同時段用電的差額最多不過 25%[31]，欠缺改變誘因。近年來，香港電力系統最高需求的升幅已顯著放緩，過去十年增長不足 11%[32]，比香港政府的預測下降了三分一。因此，香港政府可考慮加大推行分時段收費的力度，進一步控制本港電力系統的最高需求，以避免兩電增加任何新的發電機組投資。

[31] https://www.clponline.com.hk/MyBusiness/CustomerService/TariffOverview/LargePowerTariff/Pages/default.aspx

[32] 2001 實際最高電力需求為 8,360 兆瓦，當年預測 2010 年最高電力需求為 9,795 兆瓦，但 2010 年實際最高電力需求為 9,276 兆瓦，

《電價改革》加入《管制計劃協議》

《管制計劃協議》中現時只對兩電的利潤設置上限，未有賦予香港政府釐訂電價機制的權力，結果，民生尤關的電價制定就旁落在兩電手中，形成了現行鼓勵耗能的電費機制。

2011 年年底，中電曾建議將累退制電費機制，微調為劃一收費，開展《電價改革》的一小步，但最終決定放棄改革。由此可見，依賴兩電自行改革電費機制是個奢望，所以，香港政府必須收回電費機制的制定權，超越現時的局限。

成功收回電費制定權以後，特區政府就必須以公眾利益為前題，制定新電費機制的方案供市民選擇，當中應該是以鼓勵節能，控制最高需求量為政策目標，可輕市民電費開支。澳門既同為特區政府，相信香港政府亦有能力做得到。

本會建議特區政府應考慮以下《電價改革》的措施：

權責
1. 政府收回電價機制的主導權
2. 政府需就電價機制諮詢公眾

階梯式收費
1. 擴大現時階梯式收費的跨度，令用戶節能的誘因更大
2. 於各用戶群中全面應用階梯式收費

分時段收費
1. 在非住宅用戶中，引入分時段收費
2. 按季度、平日/假日，以及一般上班時間，去劃分收費時段

總結:

香港電力市場的《管制計劃協議》已沿用多年，已經明顯跟不上社會的轉變步伐，未能迎接應對氣候變化，燃料價格急升的挑戰。在新挑戰，舊協議下，社會上浮現了不少改革的聲音。社會在過去二十年間，電力市場的結構一直都為市民所詬病，社會不斷要求落實廠網分家及兩電聯網，扭轉兩電壟斷的情況。但以上兩項遠景，都需要特區政府在法例及基礎建設上，投放大量政府資源，方可完全市民期望，本會應為屬長遠的電力政策規劃，新一屆政府必須盡快籌備相關的立法過程、電力基建，甚至重新制定電力公司的利潤計算方法。

在長遠的電力規劃以外，新一屆政府亦需把握 2013 年的《管制計劃協議》中期檢討，以及審批兩電《五年發展計劃》的契機，短期內在現時的電力市場上推動維新，令電力市場的運作更有效照顧民生及環境的需要，在能源價格不斷上揚的年代，履行應對氣候變化的減排責任。

本會綜合海外各種不同類型的電力市場經驗，發現《能源效益責任制》及《綠電認證》均可適應香港現時的電力市場，並改善現行《管制計劃協議》的漏洞，而香港政府亦可仿傚澳門特區的做法，收回電價的制定權，落實《電費改革》，加強政府在電力市場上的角色。

故特此向特區政府及社會各界人士提出，希望可集思廣益，將最理想，最切合香港目前需要的條文，把握 2013 年的機遇引入香港，令電力市場邁向可持續發展的道路。

如閣下對此文件內容有任何意見或查詢，本會非常期待所有形式的意見交流。
請聯絡：綠色和平資深項目主任古偉牧
電郵：wkoo@greenpeace.org
電話：2854 8303
地址：西環德輔道西 410-418 號太平洋廣場 8 樓

GREENPEACE 綠色和平

Power Reform

Greenpeace Policy Recommendations on

the Scheme of Control Agreement Mid-Term Review

July, 2012

Foreword：

The Memorandum of Understanding of Energy Co-operation, signed by the Hong Kong SAR Government and the Central People's Government in 2008, stipulates that Hong Kong will endeavor to use more natural gas. The agreement was aimed at reducing greenhouse gas emissions and air pollution. However, if more natural gas is used, more fuel is used and more tariffs are paid. Therefore, while the HKSAR Government wants to sustainably manage its natural resources, it also has to keep tariffs at an affordable level for Hong Kong residents.

The Scheme of Control Agreement (hereafter called the Scheme) has helped to boost combined profits for the Hongkong Electric Co. Ltd (HEC) and CLP Power Hong Kong Ltd. (CLP) from HKD 1.28 billion in 2009 to HKD1.38 billion[1] in 2011. Apart from improving the financial results of these two major power companies, the Scheme has failed to offer any benefit to society and the environment - it has neither reduced energy consumption nor helped with measures to combat climate change. Simply put, the Scheme has increased profits for the two power companies and nothing more.

According to Greenpeace's analysis, Hong Kong can attain the UN-recommended greenhouse gas reduction targets without expanding the nuclear power uptake. If the government can keep electricity consumption to within 2010 levels and start using more natural gas in the energy mix it can reach those targets. Greenpeace is urging the government to complement the Scheme with reforms during the mid-term review in 2013. Hong Kong's power sector should have space to develop while at the same time Hong Kong's environment, society and economy should benefit. In this review, we suggest adding three more targets to the Scheme.

1) UN recommended greenhouse gas reduction target;
2) Reduce electricity tariffs to an affordable level;
3) Create a business environment where the power companies can make their profits fairly.

1.The Financial Highlights of HEC and CLP Power in 2011

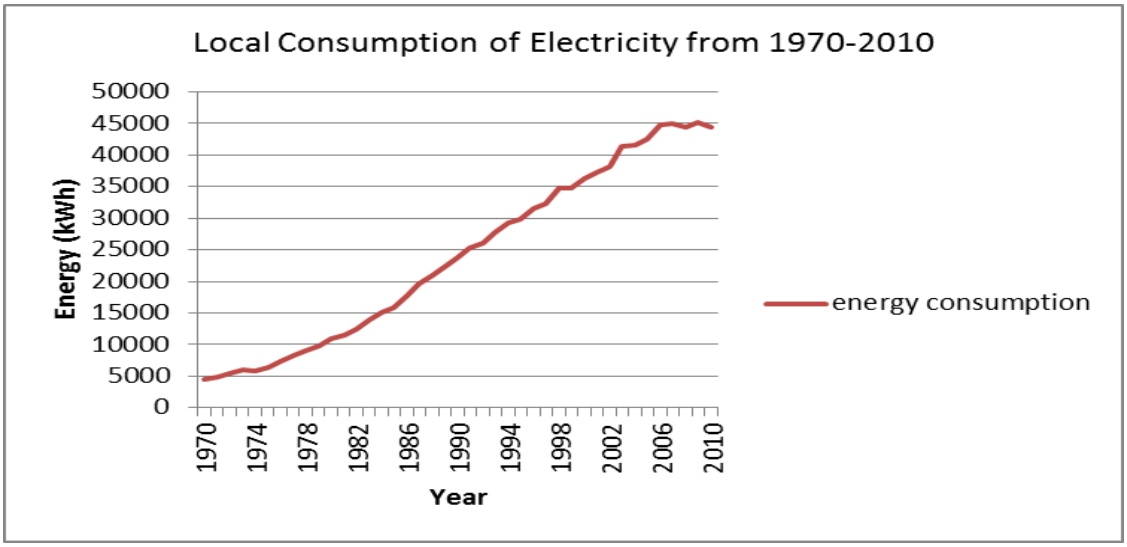
Greenpeace's policy recommendations on the mid-term review of the Scheme have been written with reference to energy-saving policies employed overseas. We hope these references will be useful for the Scheme. The Scheme should not simply be used to generate profits for the power companies but instead be used to protect our natural resources. Greenpeace hopes that the HKSAR Government, HEC, CLP, other companies and Hong Kong residents will jointly undertake the responsibility of protecting our environment.

Hong Kong's Electricity Market

In many countries, the power sector is dominated by a small number of companies because of the difficulty in running a power company. Governments usually intervene to balance benefits between the company and society. In Hong Kong, HEC and CLP control the entire supply chain of the power sector. In 1978, the two power companies and the government at the time signed the Scheme because of a rapid increase in electricity demand. It was originally designed to attract investors into the sector.

The Scheme has now been around for 35 years, but the growth in electricity demand has slowed significantly. Hong Kong no longer needs to make big investments into power infrastructure. But the government does need to make Hong Kong's power market self-sustaining and promote energy conservation. Hong Kong should also aim to keep electricity consumption to 2010 levels because of climate change.

Greenpeace is therefore urging the government to urgently instigate energy reform. As part of this reform, we are recommending the modification of several existing items and the addition of several new items in the Scheme, which will last to 2018. These recommendations will help benefit Hong Kong's environment, society and economy and they will also help to destroy the monopoly HEC and CLP hold over Hong Kong's power market.



Sources: Hong Kong Energy Statistics (1970-2002), CLP and HEC annual reports, Power Assets Holdings Limited Annual Report 2011

Three weaknesses of the Scheme of Control Agreement

1. Evades all responsibility for environmental protection:

Everyone has the responsibility to take measures to stop climate change. HEC and CLP, in particular, are two of Hong Kong's top emitters of greenhouse gases. They have no excuse not to take action on climate change. However, to date any expenses these two companies have incurred in the name of reducing greenhouse gas emissions are offloaded onto their customers. Furthermore some of the schemes these two companies have launched in the name of reducing emission have even generated extra profits for them. And so Hong Kong residents have borne all the costs so far of carbon reducing measures.

Greenpeace recommends that in the mid-term review of the Scheme, the two power companies should be required to undertake the responsibility of reducing greenhouse gas emissions. Penalties and reimbursement can be built into the Scheme. Or in other words, the two companies can make back the money they spend on reducing greenhouse gas emissions but they will not be able to make profits from those reductions.

2. No guarantee that the climate will be saved:

In 2011, CLP sold 312 million kWh and HEC sold 109 million kWh. However, the Scheme only required CLP to save 12 million kWh and HEC 3 million kWh. The saved energy made up 0.04% and 0.03% respectively of all sales. Clearly the amount of electricity saved was vastly inadequate to tackle climate change.

To effectively tackle climate change the Scheme should require the two power companies to keep power consumption to 2010 levels by 2020. The energy conservation target should be raised to 0.5-1% of total electricity consumption. This will push the two power companies to improve their environmental performance.

3. The lower class suffers the most:

In today's modern society, electricity bills have become an inescapable burden for many people. Although the government is trying to make natural gas take a bigger share of the energy mix in Hong Kong, the cost of this transfer is being passed onto the consumers. The Scheme does not take into account that many people are struggling with their power bills and there is no buffer scheme to help protect some sectors of society from these extra costs. Therefore the people have suffered because of the failure of the Scheme.

While we accept the government must ensure that these two companies are able to earn a profit, it also has to take measures so that power bills remain affordable for all sectors of society. Greenpeace believes the government should carry out such a structural change to the Scheme to protect the people of Hong Kong.

Power Reform:

Guiding Principles behind Greenpeace Recommendations

1. **HEC and CLP are two of Hong Kong's top emitters of greenhouse gases and so they should shoulder the responsibility of reducing these emissions.**
2. **Reduction of energy consumption will be the major objective;**
3. **Electricity tariffs will be affordable for the people.**

For the mid-term review of the Scheme, the HKSAR government can refer to successful tarrif schemes in other countries to reform Hong Kong tariffs. There are two policies in particular that have been adopted by many other countries:

A. **Energy Efficiency Obligation**

B. **Renewable Energy Certificates**

These two policies are both very flexible and can easily be modified to suit Hong Kong. However, in comparison, it is much more of a challenge to launch a tariff reform. Greenpeace is convinced that Hong Kong's power sector will be much healthier if our recommendations can be adopted for the new Scheme.

Energy Efficiency Obligation

This European Union's Energy Efficiency Obligation (or Energy Efficiency Resource Standards) is one of the most important energy-saving schemes in Europe. It forces power companies to reduce energy consumption in commercial and residential buildings. It assumes that power companies are much more effective in promoting energy conservation than the government because they have close connections with their customers and they possess up-to-date information on energy conservation.

The Energy Efficiency Obligation has been around since the 1990s and all countries run the scheme in a similar way. In most cases, the government sets an energy-saving target for the power companies. A certificate is issued to those who reach the target, while those that fail to reach the target are fined. In the United Kingdom, for example, power companies have invested 77.5 million pounds[2] on energy conservation. In this way, energy conservation becomes an industry in itself and has created a significant number of jobs.

Energy Efficiency Obligation in Europe in 2011 (partly listed):

Country	Energy saving target (due date)	Electricity consumption (2009) [3]	Cost of energy saving (per kWh)[4]	Result of energy saving (100% as the unit of completion)
The United Kingdom	186 million ton of Carbon Dioxide (2008 to 2011)	322.4 billion kWh	05-08 – €0.016 (Around HK $0.16)	144% (2005 - 2008)
France	34.5 billion kWh (2010 to 2013)	423.4 billion kWh	06-09 – €0.033 (Around HK $0.33)	121% (2006 - 2009)
Italy	5.3 million ton of Oil	290 billion kWh	08 – €0.019 (Around HK $0.19)	140% (2007)
Denmark	170 million kWh (per year)	31.5billion kWh	09– €0.05[5] (Around HK $0.5)	N/A
Belgium (Flanders)	260 million kWh (per year)	772billion kWh	03 – €0.015[6] (Around HK $0.15)	306% (2008)

[2] P.35, Energy Saving Obligations And Tradable White Certificates, The Joint Research Centre of the European Commission, 2009

[3] http://www.iea.org/countries/

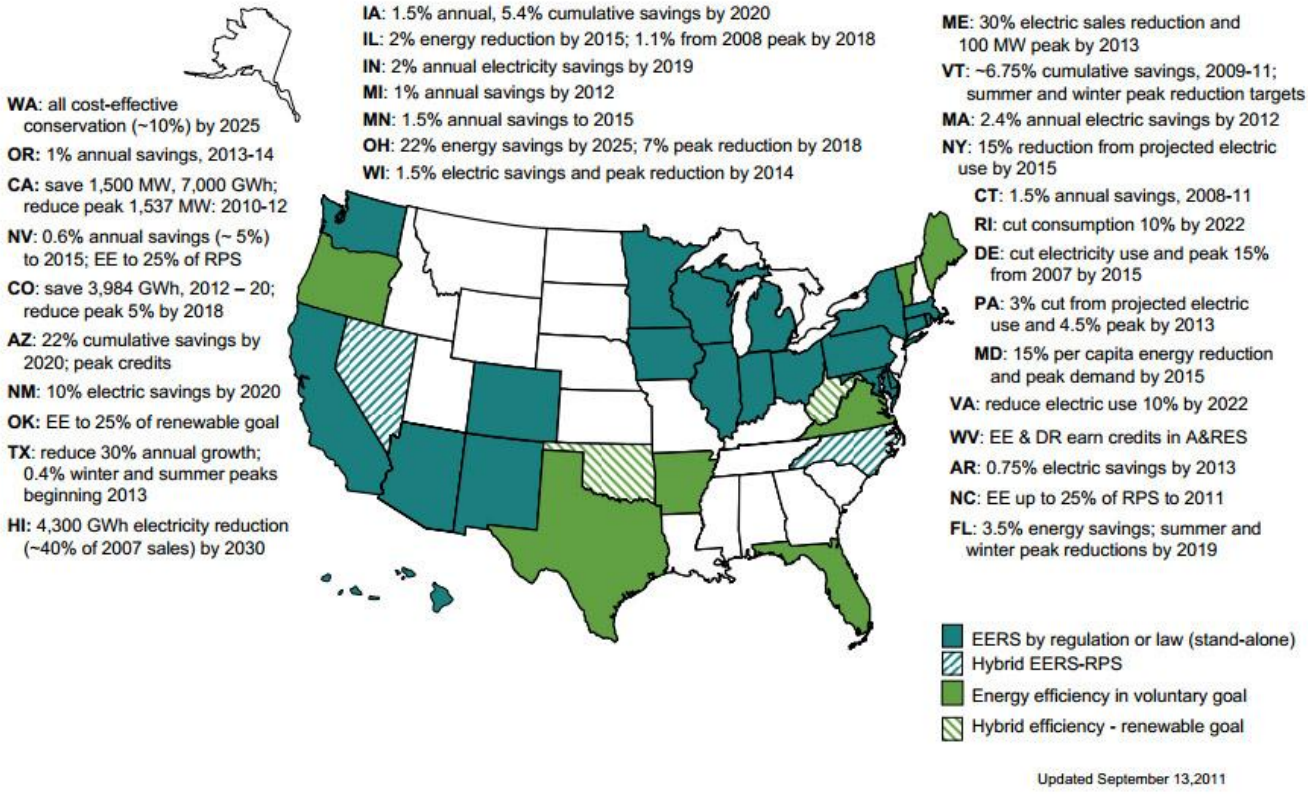
[4] Table 3, European and South American Experience of White Certificates, Eoin Lees, 2010

[5] P.34, Energy efficiency obligations – the EU experience, Eoin Lees, 2012

[6] P.29 Evaluation of rue obligations of electricity distribution grid managers in Flanders, Nicola Labanca, 2006

Energy Efficiency Obligation in the United States:

The Energy Efficiency Obligation in the United States differs from that in Europe. It is difficult to generalize all the different schemes in the United States for this paper because each state has the freedom to decide its own energy reduction and renewable energy targets.



Results：

The Energy Efficiency Obligation is used in the United Kingdom, France, Italy, Denmark, Belgium (Flanders), Poland, Ireland, Brazil and in 22 states[7] of the United States. All these countries or regions either meet or exceed their own targets. Because the cost of reducing energy is much lower than the market price of electricity (each kWh saved costs between HK $0.15 and $0.5), these savings can be passed on to the customers.

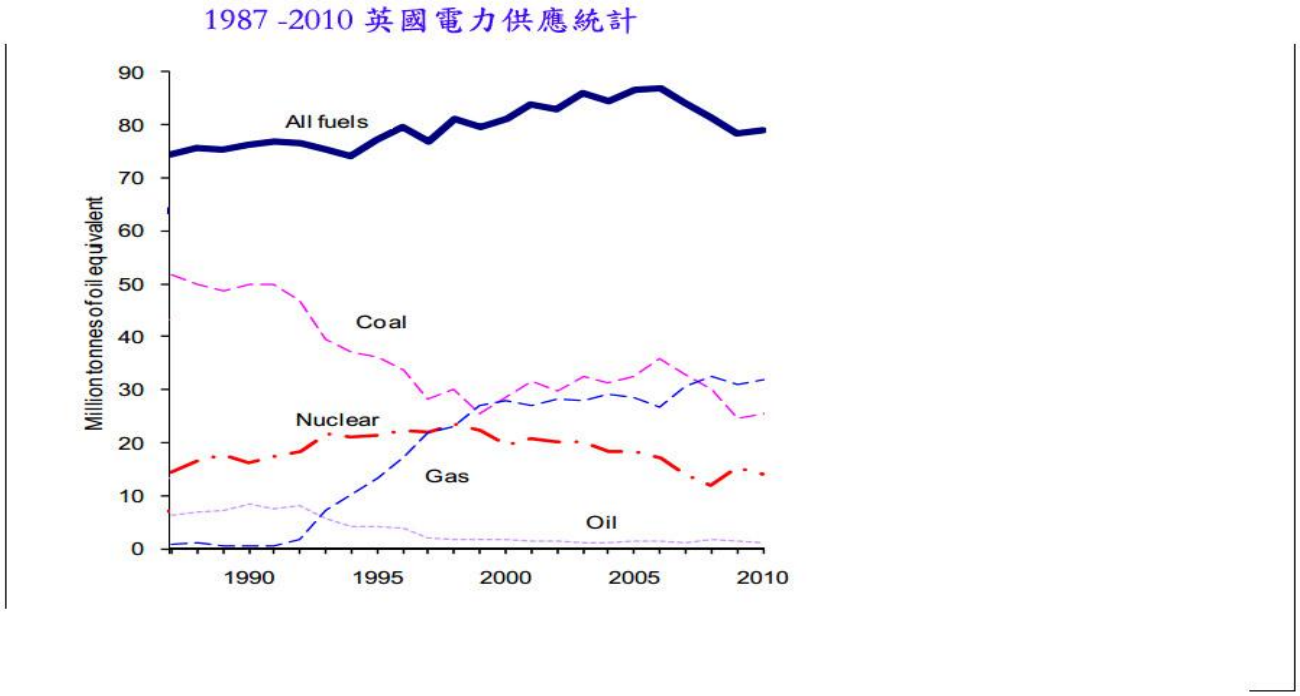
Take the United Kingdom for example. The consumption of electricity has been cut between 2004 and 2010 by 3%, from 339.6 to 328.7 billion kWh[8]. This was the first time the United Kingdom cut its energy

7 http://www.ferc.gov/market-oversight/othr-mkts/renew/othr-rnw-eers.pdf

8 Digest of UK Energy Statistics 2011, http://www.decc.gov.uk/assets/decc/11/stats/publications/dukes/2311-dukes-2011-long-term-trends.pdf

consumption since the 1980s. A public opinion survey on the Energy Efficiency Obligation conducted in 2011 [9] showed that 79% of consumers wanted to take part in the scheme because they wanted lower energy bills.

The U.K.'s Electricity Consumption of UK from 1987-2010



Most of these Energy Efficiency Obligation schemes around the world have proved very successful. We advise the HKSAR government to examine these in reference to the mid-term review of the Scheme. Following are some Greenpeace suggestions:

1. Tailor the Policy for Customers

Electricity consumption varies from country to country depending on its economy and natural conditions and so on. Any Energy Efficiency Obligation, therefore, will have different targets for different types of consumers. This will make it not only more efficient but also help those who are underprivileged. Many countries with an Energy Efficiency Obligation focus on reducing energy consumption in residential areas

9 Figure 11, P.52, Evaluation of the delivery and uptake of the Carbon Emissions Reduction Target, Ipsos MORI, CAG consultants and BRE, 2011

where the people can ill afford the extra costs of energy saving.[10] As shown below, in European countries, energy conservation efforts target residential users:

Country	Year	Percentage of residents taking part in energy saving efforts
U.K.	2005 – 2008	100% (statutory ratio)
France	2006 – 2009	87%
Italy	2005 – 2008	83%
Denmark	2008	42%
Belgium (Flanders)	2008	58% (statutory ratio)

The U.K. government concluded that most residential properties had inadequate heat insulation and so the U.K.'s Scheme of Control Agreement obligates all power companies to invest 40% of the total electricity saving target to helping low-income families – the Priority Group and Super Priority Group – save up to 16 million tons of carbon dioxide emissions in each obligation period, which is 3 years in the U.K..

Different types of consumers in the U.K.	
Priority Group	Consumers in this group will be in receipt of certain income related benefits, tax credits (where the consumer's income is under £16,040) or are 70 years old or over.[11]
Super Priority Group	Consumers in this group include those who are claiming specific credits and benefits income-related Employment and Support Allowance, income-based Job Seeker's allowance, Income Support and State Pension Creditor or who have parental responsibility for a child under 5 years of age who lives with them.[12]

10 Table 3, Energy efficiency obligations – the EU experience, Eoin Lees, 2012

11 http://www.ofgem.gov.uk/Sustainability/Environment/EnergyEff/InfProjMngrs/Documents1/CERT%20supplier%20guidance.pdf

12 http://www.ofgem.gov.uk/Sustainability/Environment/EnergyEff/Pages/EnergyEff.aspx

Application to Hong Kong：

Hong Kong people have welcomed projects that saved energy in the past. For example, the Building Energy Efficiency Funding Scheme (2009) gave out HK $450 million for 770 projects. [13] However, there has been no other similar scheme or investment in energy-saving since then. If Hong Kong also had an Energy Efficiency Obligation, power companies could invest part of their substantial capital on energy-saving measures. Consumers should not have to put up the money for this. Later on, the power companies will regain part of or all of the initial investment from tariffs. It can be viewed as a system in which consumers pay back in instalments the cost of the energy-saving measures via an interest-free loan. There is a lot of information on energy saving available and thus the government can help to keep the costs down.

The HKSAR government should tailor the Energy Efficiency Obligation according to the type of consumer. Buildings consume almost 90% of Hong Kong's generated electricity and so the government should focus on this area. We also urge the government to pay special attention to low-income families. Because there is also a significant area of public space (for example concourses and corridors) the government should also target property managers and encourage energy-saving in these public spaces.

2. Deemed Savings

All countries with Energy Efficiency Obligations also use standardised applications to gauge the energy-saving performances of power companies. Most European countries use a system called Deemed Savings. Governments create a directory of energy saving applications, such as using compact fluorescent lamps and installing insulated glass. Power companies must draw up their energy-saving proposals from the applications in this directory and submit them to the government. Companies are awarded an Energy Saving Certificate once they pass several assessments. This reduces unnecessary administration costs and is effective at promoting energy-saving applications. Deemed Savings is suitable for small residential buildings and for standardising energy-saving measures. From 2006 to 2009, the French Agency for Environment and Energy Management (ADEME) and the Association Technique Energy Environment (ATEE) pre-assessed 182 standard applications, including 60 household applications, and 80 commercial applications.

However, when power companies want to design a set of energy-saving measures for commercial buildings, industrial buildings, and public facilities, they need to assess every single item of the project before being awarded an Energy Saving Certificate. Because this kind of assessment requires considerable human resources this is only used for large-scale projects. The Energy Saving certificate was issued once the power company saved 1 million kWh.

France allows power companies to group their energy-saving projects together in order to meet the minimum threshold of 1 million kWh. The Energy Saving Certificate, issued by the Ministry of the Economy, Industry and Employment of France, is valid for nine years. Other energy service companies (like ESCO) can also get an Energy Saving Certificate by cooperating with power companies on large-scale projects. Currently, France is trying to open up the energy conservation market in a similar way to Italy, which allows registered energy service companies to apply for the certificate independently.

13http://www.building-energy-funds.gov.hk/tc/approved/EEP.html

Energy-saving standardization in France[14][15]	
Residential	Grade A Energy Efficiency Labeled Lighting and Refrigerator Double glazing Solar Water Heaters External Insulation Wall
Commercial (less than 5,000 sqm)	External Insulation Wall Insulated Roof Installing Drive Motor Heat Pump Water Heater

Distribution of 214 standardized energy-saving applications in France:

	Building Surface	Cooking	Lighting	Other facilities	Service	Total
Residential	7	48	6	0	4	65
Commercial	14	55	19	0	1	89
Factory	2	0	6	18	0	26
telecoms	0	5	5	1	0	11
Transportation	0	0	0	13	3	16
Agriculture	0	3	0	3	1	7
Total	**23**	**111**	**36**	**35**	**9**	**214**

14

14 http://www.fedarene.org/documents/projects/EESI/Contractual_Issues/white_certificates_epc_manual.pdf

15 Table 8, http://www.ea-energianalyse.dk/reports/710_White_certificates_report_19_Nov_07.pdf

Application to Hong Kong：

There are many large-scale properties that are similarly designed in Hong Kong and so there is plenty of scope for energy-saving in the territory. Greenpeace believes that Deemed Savings is appropriate for Hong Kong. The HKSAR government has previously run an Energy Efficiency Labelling Scheme and the BEAM + under the Hong Kong Green Building Council has collected some basic information on energy conservation in Hong Kong. These experiences can help the government draw up an energy-saving directory and thus minimize administration costs.

For example, the HKSAR government could make the installation of insulated glazing as a priority for the Energy Efficiency Obligation. Many Hong Kong properties were designed with only appearance in mind and so many buildings use an excessive amount of glass. This wastes a lot of energy because it makes rooms warmer than they need to be and so air conditioner use is higher. Through Deemed Savings, Hong Kong could make sure that all energy-savings measures can be implemented, even those that require a longer time period to earn back the initial investment.

3. Fines The Energy Efficiency Obligation means power companies have an obligation to save energy. This scheme pushes companies to do so with the threat of fines. There are two kinds of fines: a fixed and a floating fine. Irrespective of the type of fine used, it must be higher than the original cost of energy-saving and also higher than the market price of the energy saving certificate.

Country	Fixed/Floating Fines	Nonattainment Penalty
The United Kingdom	Floating	Depends on the level of non-attainment
France	Fixed	€20/1000 kWh
Italy	Floating	Depends on the level of non-attainment
Denmark	Floating	Depends on the level of non-attainment
Belgium (Flanders)	Fixed	€10/1000kWh

Italy employs a floating fine, which means that the Regulatory Authority for Electricity and Gas (AEEG) can adjust the fine in accordance with the energy-saving performance of the power company, the market share of the power company, and the current cost of energy-saving in the market. According to AEEG, the fine starts from €25,000 to €155 million (HK $250,000 to HK$1.5 billion).[16] The fine is higher the further the power company is from the target. If the power company can reach 60% of the target it is given a buffer year to complete the final 40%. Floating fines are not affected by inflation and so they do not endanger the power companies' funds.

16 Tradable energy efficiency certificates: the Italian experience. Marcella Pavan

Application to Hong Kong:

The Scheme of Control Agreement allows the two power companies to make a capped 9.99% rate of return. This can be the perfect penalty to force Hong Kong power companies to save energy. If they do not meet energy-saving targets then this allowed rate of return can be reduced. The wider the gap between the actual performance and the targets, then the smaller that rate of return could be. And because this only affects the companies' annual profits it will not affect their daily operations.

Including Energy Efficiency Obligation in the Scheme of Control Agreement

The Scheme encourages energy saving by allowing the two companies to make larger profits – 0.01% extra profit when CLP saves 12 million kWh and HEC saves 3 million kWh. Firstly, that increase is not large enough to act as an incentive, furthermore, the two companies also pass down the extra costs incurred from introducing energy-saving measures onto their customers. Neither company has shouldered the responsibility to pay for their own pollution.

The HKSAR government can study how the Energy Efficiency Obligation works in other countries. Although an Energy Efficiency Obligation in Hong Kong would slightly increase tariffs, it could make huge cuts in electricity consumption through introducing energy-saving measures in residential buildings and upgrading the efficiency of electronic appliances. In the end, an Energy Efficiency Obligation will be able to help control electricity costs. In conclusion, the Energy Efficiency Obligation can push forward energy-saving measures, accelerate the sector's growth and create jobs. If the government only buys more nuclear power from mainland China it just means more money will leave Hong Kong and no local jobs will be created. Therefore, Greenpeace believes that an Energy Efficiency Obligation is suitable for local needs in Hong Kong and would also benefit the territory by creating jobs.

The following are Greenpeace suggestions on an Energy Efficiency Obligation:

Goal:
1. Target energy savings of 0.5% to 1% of total electricity consumption, (so 'zero growth') and reduce HEC's and CLP's fixed investment
2. **When setting the energy-saving target, a certain percentage of the projects must be aimed at residential properties, and help must be given to those families that are recipients of the Comprehensive Social Security Assistant Scheme and families living in public housing**

Cost-Sharing:
1. Arrange a complete reimbursement of the cost that the power companies pay for energy-saving, and thereby, ensuring that consumers are getting the service at cost price
2. **Make five-year assessments of the effectiveness of energy-saving measures with annual data collected**
3. **Registered energy services companies (ESCO) should be allowed to apply for an Energy Saving Certificate**

Penalties:
1. Link energy-saving performance with the permitted rate of return. The worse the performance then the smaller the permitted rate
2. **Ensure that the penalty per kilowatt is higher than the basic tariff of that year**

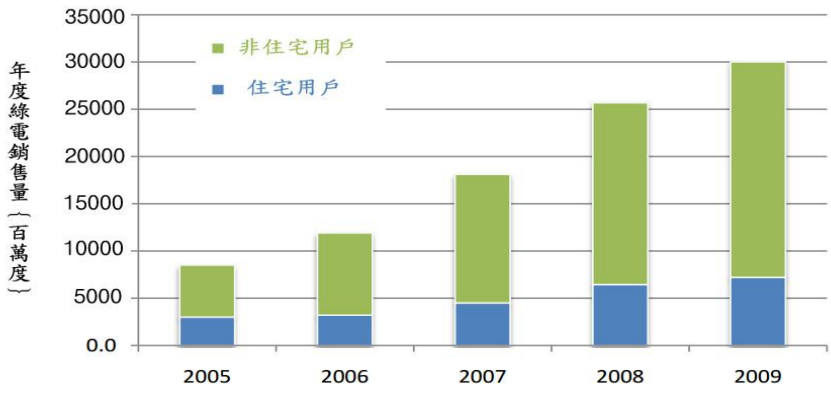
Renewable Energy Certificates (Green Certificates)

As well as saving energy, power companies should try to use more renewable energy, as this is an effective way of reducing greenhouse gas emissions. However, the cost of generating renewable energy is generally higher than energy generated via conventional means. Greenpeace believes that consumers should pay higher tariffs if they use more electricity. Currently in Hong Kong, the government does not control how electricity tariffs are calculated, HEC and CLP have the freedom to decide this and they design tariffs to maximise their own profits. That's why bulk users are charged lower tariffs, while residential and SME users pay higher tariffs. This policy creates a heavier burden on the people of Hong Kong and is unfair. If the government does not take control of tariffs then it should look to America where low-income families can reduce their electricity bills if they choose to buy renewable energy with Renewable Energy Certificates.

The government issues renewable Energy Certificates after it has assessed the power companies' performance in generating renewable energy. This certificate can then be issued to consumers so it is a useful tool in public relations, CSR, and marketing. This certificate works in a similar way to certificates used in carbon trading. Renewable Energy Certificates are issued to residential consumers, corporations, non-government organizations, and national governments and so on. The certificate helps consumers identify which products are derived from renewable energy. Renewable Energy Certificates are used by America, the United Kingdom, Australia, and India among others. The United Kingdom, Sweden, Belgium, Poland, and Italy make it compulsory for companies to obtain the certificate. This system forces companies to buy renewable energy, makes bulk users pay for what they have used and lessens the burden on the people.

Results:

Although many people are sceptical about America's commitment to tackle climate change, the Renewable Energy Certificates is a system which has expanded rapidly. According to a survey conducted by the National Renewalable Energy Laboratory, sales of Renewable Energy Certificates have multiplied by five times in five years.[17] A big part of this growth has come from non-residential consumers. The market price of this certificate is now around US $136 million to 236 million.



17

Green Power Marketing in the United States: A Status Report (2009 Data), 2010.

1. Principles of Renewable Energy Certificates

A Renewable Energy Certificates scheme first needs the government to define the term ‘renewable energy'. In general, the certificate will be given to projects of wind power, solar energy, Biomass, Biogas, and hydroelectric energy. But in some of the cases, the Green Certificate will not be given to large-scale hydro projects. In order to help consumers, companies are required to clearly list out the form of electricity, the location and the model of electric generator, as well as the awarding year of the Green Electricity Certificate.

The government should also plan carefully how the certificate can be sold so as to prevent it being too costly. In America, there are three ways of obtaining a Renewable Energy Certificate: Fixed energy quantity block, Percentage of monthly use, and Long-term fixed price contracts.

Fixed energy quantity block:
A unit of energy – or block – here 100 kWh – is purchased at a fixed monthly price. Consumers are free to sign up for as many blocks as they want. This is the most flexible type of transaction. The only issue is that it does not provide a stable source of income for the power company.

Percentage of monthly use:
Here, consumers agree to buy a certain percentage of their monthly power use as green power. The power company charges the customer the extra tariff in the next billing phase. This kind of transaction is constrained by the grid, but it does give the power companies a higher degree of financial stability.

Long-term fixed price contracts:
The buyer and seller sign a long-term contract on buying green power and is usually used by bulk users. This gives the power company the most stable form of funding and is therefore ideal for supporting new green power initiatives.

Application to Hong Kong:

Over the last twenty years, many people have suggested merging the two power companies or allowing new competitors to enter the market. Renewable Energy Certificates in practice benefit consumers by indirectly pushing power companies to control the cost of green energy and lowering the market price of the certificate. Since there are also plans to build two large offshore wind farms in Hong Kong, long-term fixed price contracts under this scheme would help to provide a stable investment environment for projects like this. They would also ease concerns about the high cost of renewable energy and encourage its uptake in Hong Kong.

2. Eligibility of Renewable Energy Certificates

Green Electricity generally comes from a variety of sources and this helps to remove the monopoly of conventional power companies, opening – at least to some extent – the market for renewable energy. Many non-conventional power companies can pursue long-term fixed price contracts with industrial customers on developing renewable energy projects. Those non-conventional power companies will not only reduce the

cost in the initial investment, but also diversify the electricity market. The U.S. government helped accelerate growth of the market providing technical support and tax refunds for renewable energy projects.

Since 2005, Staples, [18] a U.S. office supplies company has been using a Power Purchase Agreement to buy energy from renewable energy companies. Staples has installed photovoltaics in their stalls, distribution centres, and office buildings around the U.S., generating around 4 million kWh of green electricity annually. Some of the U.S. federal government's renewable energy projects also applied for the Certificate, to the initial investment. See below: [19] **Total consumption of power in the US 2005-09:**

U.S federal government projects that applied for a Renewable Energy Certificate (list incomplete):
• **14.2 megawatt (MW) photovoltaic (PV) array at Nellis Air Force Base (the largest Federal PV system in the U.S.)**
• **2 MW PV system at U.S. Army Fort Carson**
• **2.3 MW from four PV systems at the National Renewable Energy Laboratory (NREL)**
• **500 kilowatt (kW) PV rooftop system on the General Services Administration's (GSA) Sacramento Federal Building**
• **850 kW PV system at the U.S. Coast Guard Petaluma site**

Application to Hong Kong: Green electricity in Hong Kong is mostly self-funded. There isn't any means to raise funds for renewable energy projects. The Zero Carbon Building (ZCB) [20] in Kowloon Bay was completed in June 2012. It derives its energy from biodiesel and solar power. It also can supply excess energy to Hong Kong's grid but it could not sell it to the public to raise funds because Hong Kong's electricity grid is owned by HEC and CLP. The HKSAR government should start issuing Renewable Energy

18

Guide to Purchasing Green Power, U.S. Department of Energy, 2010

19

http://www1.eere.energy.gov/femp/pdfs/ppa_guide.pdf

20

http://www.hkcic.org/chi/zcb/aboutzcb.aspx?langType=1028

Certificates as a way to open up the energy market. It will allow renewable projects to start 'selling' electricity in an unconventional way.

ZCB Electricity Consumption[21]	Biodiesel	Solar Energy	Total
Expected annual generating capacity	145,000 kWh	80,000kWh	225,000kWh
Excess Power			82,000kWh

3: Build a Transparent Database

Currently, consumers don't know how the energy they are buying is generated. They do not know if they are using conventional power or green electricity. To make sure that Renewable Energy Certificates will be credible, the government should make data on the Certificates open to the public.

When India introduced Renewable Energy Certificates, the government prepared a comprehensive database online.[22] It clearly listed all those consumers who had bought a Renewable Energy Certificate, details on various approved green power projects, and so on.

Green power projects in India (the latest 5 projects of June 2012):[23]

Total Capacity (MW) = 2672.158 | Number of Projects = (446)							
Sr.No.	State	Energy Source	RE Generator	Project No.	Capacity (MW)	Date of Registration	Date of Accreditation
1	Tamil Nadu	Wind	Beta Wind Farm Private Limited	007	3.6	08-06-2012	24-05-2012
2	Tamil Nadu	Wind	BASANTH WIND FARM	002	2	07-06-2012	20-04-2012
3	Maharashtra	Wind	Aurangabad Electricals Limited	001	2	30-05-2012	22-03-2012
4	Maharashtra	Wind	Menon & Menon Limited	001	1.25	30-05-2012	18-04-2012
5	Tamil Nadu	Wind	PGSD ENGINEERING LLP	002	1	28-05-2012	31-03-2012

21 http://news.sina.com.hk/news/2/1/1/2504311/1.html

22 https://www.recregistryindia.in/index.php/general/publics/index

23 https://www.recregistryindia.in/index.php/general/publics/registered_regens

Application to Hong Kong: Green electricity projects in Hong Kong are greatly restrained because of the lack of renewable resources, by the dearth of geographical resources, the late start of green electricity, and the dominance of HEC and CLP in the market. But this also makes it easier for the government to draw up a database. While Hong Kong residents may not be familiar with Renewable Energy Certificates some companies in Hong Kong are using 'Carbon Neutral', (like HSBC[24]), or working on 'Carbon Offset' (like Cathay Pacific[25]). Some couples are also having a 'carbon neutral'[26] wedding. These are not so different from Renewable Energy Certificates. Until today, however, they are not available in Hong Kong. Companies need to purchase them from overseas.

The HKSAR government should create this database and also encourage consumers to purchase this Certificate. It could even require companies that are bulk users – such as data centres – to buy a Certificate as one of the requirements of land tenure.

The government could consider linking the Certificate with HEC's and CLP's permitted rate of return, which would encourage the two companies to help promote the Certificates. In the long-term, Hong Kong could extend the use of this Certificate via a regional cooperation between Guangdong and Hong Kong, thus promoting the regional expansion of green electricity.

24 http://www.hsbc.com/1/2/carbonneutrality

25 http://www.cathaypacific.com/cpa/en_BH/manageyourtrip/travelextras/flygreener

26 http://www.carboncareasia.com/eng/about_us/news/press_clippings/120310_press_clipping.php

Incorporating Renewable Energy Certificates in the Scheme of Control Agreement

The Scheme encourages HEC and CLP to generate more renewable energy by offering a higher rate of return (11%) in their investment on renewable energy. The public will pay 11% for the total amount of their investments in renewables projects every year. However, this policy has two flaws. First, although the higher rate of return is an incentive to develop more renewable energy, the power companies pass on the extra cost to consumers and of course consumers don't want to pay extra for using green power. Second, the government still does not have the power to fix tariffs so they can't help Hong Kong people keep their power bills affordable. In trying to incorporate renewable energy into the Scheme, the government has merely strengthened the monopoly of the two power companies.

Many overseas governments, including the Macau government, have used legislation to make grid companies accept renewable energy. This approach at least gives investors access to renewable energy markets, introduces competition and helps to control the cost of renewable energy as well as promotes the long-term reform of the electricity market.

Renewable Energy Certificates should be incorporated into the Scheme during its mid-term review (2013). HEC and CLP are planning to bid for an offshore wind farm in 2015 and 2016, which is also putting some pressure on increasing electricity tariffs. There will also be an additional 80,000 units of green power from ZCB. Globally, some international IT companies have already bought up green energy. For example, Google[27] has already signed a contract agreeing to buy 215 MW of green power in the next 20 years globally. This is more than the expected scale of CLP's wind farm. By 2013, Hong Kong will have the demand and the conditions for a green power market.

27http://www.google.com/green/energy/use/#purchasing

Greenpeace has the following suggestions for adopting Renewable Energy Certificates in Hong Kong:

Definitions
1. **Renewable Energy Certificates should be available via a Fixed Energy Quantity Block or a Power Purchase Agreement, and customers should be allowed to buy the certificate from different power companies.**

Operation
1. The grids shall be mandatorily open for other renewables projects **2. Consumers can buy blocks of 1,000kWh as a unit.** **3. At least 50% of the electricity generated by renewables should have the Certificate sold, or else the permitted rate of return will be lowered to 9.99%.** **4. Those IT corporations who have promised to purchase Renewable Energy Certificates should be given priority in the process of land tenure data centre development in Hong Kong.**

Open Database
1. The Environment Protection Department should set up an online database on the Renewable Energy Certificates that is open to the public. **2. Information on the monthly issue, sale and prices of Certificates should be made available to the public.** 3. **The Hong Kong-Guangdong Cooperation Joint Conference should investigate the feasibility of setting up a regional Renewable Energy Certificate scheme.**

Tariff Reform

HEC and CLP hold the power to set tariffs. Nowadays, the two companies, especially CLP, tend to offer discounts to bulk users. These discounts encourage consumers to use more and make them less inclined to save energy because the more power they consume, the bigger the discount they are awarded. We believe the HKSAR government should learn from the Macau government which took back control of tariff-setting in 2010. Thereafter, the Macau government consulted with the people about tariff levels before making any decisions.

Before 2010, the power to set tariffs was in the hands of the power companies. For 25 years, the companies gave discounts to bulk users, similar to the current situation in Hong Kong.

Tariff A in Macau

Tariff Group	Tariff class	Subscribed demand charges Subscribed demand (kVA)	 mand Charge(MC	Energy charges (MOP/kWh)	Notes/ conditions
A	A1	Up to 3.4	8.224	0.963	Customers who do not fulfil the criteria of tariff classes A2, A3 and A4
		From 3.4 to 6.9	18.796		
		Above 6.9	3.372/kVA		
	A2	Up to 6.9	0	0.858	1. Subscribed demand up to 6.9 kVA
					2. Monthly consumption over the last six months does not exceed 120 kWh
	A3	Up to 3.4	8.224	0.884	1. Non-profitable public or private institutions that develop and organise relevant social
		From 3.4 to 6.9	18.796		activities
		Above 6.9	3.372/kVA		2. Customers should present a specific document issued by the Social Welfare Institute (IAS)
	A4	Up to 6.9	0	0.429	1. Entitled to public assistance
					2. With a subscribed demand up to 6.9 kVA and monthly consumption over the last six months that does not exceed 120 kWh
					3. Customers should present a valid social assistance card issued by the Social Welfare Institute (IAS)

Tariff B in Macau

Tariff Group	Tariff class	Subscribed demand charges	Energy charges Active energy (MOP/kWh)		Reactive energy (MOP/kvarh) Note 3		Conditions
		MOP/kW	Full-load hours Note1	Low-load hours Note 2	Full-load hours Note1	Low-load hours Note 2	
B	B1	19.797	0.874	0.767	0.348	0.116	1. Apply to most customers
							2. Demand in kW calculated by 0.2 subscribed demand + 0.8 highest measured demand
	B2	21.484	0.874	0.767	0.348	0.116	1. MV supply and LV metering
							2. Demand in kW calculated by 0.2 subscribed demand + 0.8 highest measured demand
							3. 1% of the highest measured demand is charged to recover the related loss
							4. 10% of active energy in the same tariff period is charged to recover the transformer reactive energy loss
	B3	21.484	0.874	0.767	0.348	0.116	1. LV supply and metering
							2. Demand in kW calculated by 0.2 subscribed demand + 0.8 highest measured demand
							3. 2% of the highest measured demand is charged to recover the related losses
							4. 10% of active energy in the same tariff period is charged to recover the transformer reactive energy loss
	Note:	1. 0900-2000					
		2. 2000-2400 ; 0000-0900					
		3. Only the portion of reactive energy that exceeds 60% of active energy in the same tariff period is charged					

Tariff C in Macau										
Standard voltages	Tariff seasons	Tariff class	Subscribed demand charges MOP/kW	Energy charges Active energy (MOP/kWh) Peak-load hours Note 2	Full-load hours Note 3	Low-load hours Note 4	Reactive energy (MOP/kvarh) Note 1 Peak-load hours Note 2	Full-load hours Note 3	Low-load hours Note 4	Conditions
Low to medium voltage	High season (June to September)	C1	19.797	1.432	0.885	0.749	0.348	0.348	0.116	1. Apply to most customers
										2. Demand in kW calculated by 0.2 subscribed demand + 0.8 highest measured demand
		C2	21.484	1.432	0.885	0.749	0.348	0.348	0.116	1. MV supply and LV metering
										2. Demand in kW calculated by 0.2 subscribed demand + 0.8 highest measured demand
										3. 1% of the highest measured demand is charged to recover related loss
										4. 10% of active energy in the same tariff period is considered to recover related loss. It is added to the measured reactive energy peak-load and full-load hours, and subtracted in low-load hours.
	Low season (October to May)	C1	19.797	0.776	0.776	0.724	0.348	0.348	0.116	1. Apply to most customers
										2. Demand in kW calculated by 0.2 subscribed demand + 0.8 highest measured demand
		C2	21.484	0.776	0.776	0.724	0.348	0.348	0.116	1. MV supply and LV metering
										2. Demand in kW calculated by 0.2 subscribed demand + 0.8 highest measured demand
										3. 1% of the highest measured demand is charged to recover related loss
										4. 10% of active energy in the same tariff period is considered to recover related loss. It is added to the measured reactive energy peak-load and full-load hours, and subtracted in low-load hours.
		Note:	1. In peak-load and full-load hours, only the portion of reactive energy that exceeds 60% of active energy in the same tariff period is charged. Reactive energy measured in low-load hours is fully charged.							
			2. 1030-1300; 1430-1600							
			3. 0930-1030; 1300-1430; 1600-2030							
			4. 0000-0930; 2030-2400							

Macau's Office for the Development of the Energy Sector appointed an international consultancy firm to assess its electricity tariff system and power market. The government also launched a public consultation on tariff reform in 2011. Three objectives were set in the reform:

1. No barriers to electricity consumption, care for low-income families
2. Reduce the tariff burden for general users
3. Promote appropriate electricity consumption, increase energy efficiency

According to the consultancy firm, it is not possible to have a fair tariff system with different classes of consumers when using a fixed cost allocation (such as the maintenance of the power grid, the return of the franchisee and personnel expenses, etc.). Therefore, there is no objective standard to apportion it among different groups of consumers. Rather than fairness, the main concerns of fixed cost allocation are the benefit the society and political needs. Therefore, there is room for the tariff reform. For example, the Macau government suggested increasing tariffs for 500 bulk users, while the remaining 99% of users would keep enjoying affordable tariff. The Macau government has also proposed a progressive tariff mechanism system to encourage energy conservation.

Results:

This consultation found that the tariffs of 99% of consumers, including SMEs and residential users, could be reduced from 2% to 28%. However, research from the U.S. shows that when the cost of electricity rises, then the demand falls. So Hong Kong could use cost as an effective weapon to control electricity consumption by bulk users by adopting progressive tariffs (as shown in the graph below).

Table 1. Summary of Price Responses in the NEMS *AEO2003* and *AEO99* Residential and Commercial Buildings Models

Sector and Fuel	NEMS Model Year	Short-Run Own-Price Elasticity 1-Year	2-Year	3-Year
Residential				
Electricity	*AEO2003*	-0.20	-0.29	**-0.34**
Commercial				
Electricity	*AEO2003*	-0.10	-0.17	**-0.20**
Commercial Electricity by End Use				
Core End Uses	*AEO2003*	-0.17	-0.29	**-0.36**
Other End Uses	*AEO2003*	-0.03	-0.05	**-0.06**

Sources: ***AEO2003:*** Energy Information Administration, calculated from the following price path scenarios using NEMS *AEO2003*: regeneration of the reference case price path, ELAST03.D121203B; electricity price increase case, ELAST03.D121203G; natural gas price increase case, ELAST03.D121203H; distillate fuel price increase case, ELAST03.D121203I. ***AEO99:*** S.H. Wade, "Price Responsiveness in the NEMS Building Sector Models," in Energy Information Administration, *Issues in Midterm Analysis and Forecasting 1999*, DOE/EIA-0607(99) (Washington, DC, August 1999).

Research conducted by Greenpeace and Dr. William Chung of City University shows that there is a lot of room for CLP to promote energy saving and help reduce people's power bills with its current tariff system. Our suggestions for changes to the tariff system would save 90-120 kWh million every year.(equivalent to the power use of 200,000 families)[28] without making people pay more for their power bills.

1. The implementation of high-span ladder progressive tariffs

New South Wales in Australia has started to use a simple two-level progressive tariff system since 2004. There is a 49% tariff discount for the customers who use less than 1750 units of electricity in their seasonal tariff bill. Some power companies in California even use the highest difference of 200% to set up ladder charges, separating out those customers who consume a large amount of electricity from those who use much less as an incentive for users to reduce electricity consumption.

Ladder progressive tarriff of Energy Australia in New South Wales					
Residential			Business		
Level	Energy consumption per season(kWh)	Charges Note (AUD/kWh)	Level	Energy consumption per season(kWh)	Charges Note (AUD/kWh)
I	≤ 1750	0.1397	I	≤ 2500	0.1364
II	> 1750	0.20845	II	> 2500	0.2035
Note: System connection charges and other extra charges are not included					

28http://www.greenpeace.org/hk/press/releases/climate-energy/2011/11/pricing-reform-pc/

Ladder progressive tarriff by PG&E to residents in California		
Class	Energy consumption per month	Charges Note (USD/kWh)
I	Reference line (about 12 kWh daily)	0.11559
II	101%-130% of reference line	0.13142
III	131%-200% of reference line	0.2258
IV	201%-300% of reference line	0.31304
V	Above 301% of reference line	0.35876
Note: Adjustment fee and other extra charges are not included		

Application to Hong Kong:

The tariff mechanism in Hong Kong, including all the items of CLP's residential price and HEC's commercial, industrial and miscellaneous tariffs, are less effective in promoting energy-saving. The differences in electricity unit price for different users are insignificant. In 2012, there was less than a 14%[29] difference between the highest and the lowest electricity consumption in HEC's commercial, industrial and miscellaneous tariffs; while there was a 550% difference between the highest and the lowest electricity consumption from CLP, while the difference in tariffs was only 66%[30]. Therefore, Hong Kong does not only have to implement a comprehensive progressive electricity tariff, but it also has to expand the span of different ladder tariffs so as to effectively promote energy conservation.

2. Implementing periodic charges

If we want to stop the power companies increasing tariffs because of an increase in demand for power, then Hong Kong has to control the maximum power demand. Periodic tariffs are a popular solution around the world. Macau has also proposed a similar tariff system. Focusing on the bulk users, the difference in tariffs between on-peak and off-peak hours is 66%. This kind of tariff system encourages users to alter the times they use power and it can reduce the peak load on the power supply system.

Proposed tariff D for high voltage users Note				
Subscribed demand charges	Active energy (MOP/kWh)		Reactive energy (MOP/kvarh)	
MOP/kW	Full-load hours	Low-load hours	Full-load hours	Low-load hours
21.98	0.85	0.51	0.35	0.12
Note: only include subscribed demand charges and energy charges above				

[29] http://www.hkelectric.com/web/CommercialAndIndustrialServices/BillingPaymentAndElectricityTariff/TariffTable/Index_zh.htm

[30] https://www.clponline.com.hk/Documents/Tariff%20Table%20-%20Chinese%20_2012_%20v20111230_.pdf

Hong Kong can also look at how mainland China (especially Guangdong province) deals with power shortages. Industrial customers are charged using a periodic tariff system (see below). The difference in cost between peak rate and off peak rate is more than 200%. A periodic tariff system encourages industry to more effectively manage their electricity use and reduce the peak load.

Guangzhou, Zhuhai, Foshan, Zhongshan, Dongguan –industrial electricity consumption		
(Implemented from 20th November 2009) Unit：Min／KV（tax included）		
Period	Electricity consumption	Tariff
Peak	1-10KV	108.09
	35-110 KV	103.97
	220 KV or above	99.84
Average	1-10 KV	65.51
	35-110 KV	63.01
	220 KV or above	60.51
Off-peak	1-10 KV	32.76
	35-110 KV	31.51
	220 KV or above	30.26
Remarks: 1. This price list is implemented in the urban and rural areas of Guangzhou, Zhuhai, Foshan, Zhongshan, Dongguan City.		
2. The demand charge of large industry is $23/KVA. Month (capacity transformer) and $32/KW.month (maximum amount)		

Application to Hong Kong:

Periodic tariffs are not popular in Hong Kong. In 2012, the biggest difference between the on-peak and off peak tariffs for heavy users was only 25%[31] at most, and this is not enough to be an incentive for change. Over the past few years there has been a slowdown in the growth of the peak load in Hong Kong. There has been less than 11%[32] growth over the past decade, and is one-third lower than the HKSAR government's forecast. We believe the government should use a periodic tariff to control peak demand. The power companies would fail to justify any investment in generation capacity if the peak demand is under control.

[31] https://www.clponline.com.hk/MyBusiness/CustomerService/TariffOverview/LargePowerTariff/Pages/default.aspx

32 The maximum electricity demand was 8360MW in 2001. It was expected that in 2010, the expected demand was 9795MW, yet the real demand in 2010 was 9276MW.

Including Tariff Reform in the Scheme of Control Agreement

The Scheme has set maximum profits for the two power companies, but did not give any power to the HKSAR government to set tariffs. Because of this it is difficult for the government to effectively launch or run any energy-saving policy.

At the end of 2011, CLP suggested that regressive tariffs should be converted into a flat rate. Although this could have signalled the start of tariff reform, it was abandoned. From this, it is clear that neither power company wants to implement tariff reform. So the government should take back control of the tariffs.

The government should then reform the tariff system in the public interest, to encourage energy conservation, control peak demand, and control the people expenses on tariff. Hong Kong could copy Macau in launching its own tariff reform.

The following are Greenpeace's recommendations on tariff reform:

Responsibility
1. The government should take back control of tariffs
2. **The government should consult the public on tariff reform**

High-Ladder Progressive Tariff
1. Expand the scheme and encourage energy conservation
2. **Start using ladder tariff for all consumers**

Periodic Tariff
1. Charge non-residential users with a periodic tariff
2. Divide the tariff period based on season, working days, as well as general working hours

Conclusions：

The Scheme of Control Agreement has been around for many years and it is now clear that it cannot help Hong Kong tackle issues such as climate change and the rapid rise in the cost of energy. The Scheme is in urgent need of reform. Over the past 20 years the public has frequently voiced its dissatisfaction with HEC and CLP. The public also want to see an end to the monopoly held by HEC and CLP. They would like the power grid and the power companies to be separate. These changes would require substantial investment from the government. Greenpeace believes that a better solution is for the government is to create new laws, invest in infrastructure, and reform the way the maximum rate of return is calculated for the two power companies.

The government should use the mid-term review of the Scheme in 2013 and the approval of power companies' Five-year Development Plan as opportunities to implement a reform of the power sector. Due to the rising cost of fuel and the lowering of people's livelihoods, we wish the reform could drive HEC and CLP cut down emissions by taking the needs of their customers and energy conservation into account. Greenpeace believes that two schemes used effectively overseas – Energy Efficiency Obligation and the Renewable Energy Certificate – could be implemented in Hong Kong. Furthermore the tariff structure could be modified in a similar way to Macau's current system. The HKSAR government should take back control of deciding tariffs and strengthen its own role in the electricity market.

This paper is meant to offer the HKSAR Government suggestions for changes that could be implemented during the mid-term review of the Scheme of Control Agreement. Greenpeace believes its recommendations are both effective and practical for Hong Kong. We should take 2013 as a great opportunity to guide Hong Kong's power sector towards sustainable development.