



(出國類別：開會)

# 亞洲生產力組織(APO)再生能源研討會 (Workshop on Renewable Energy) 出國報告

服務機關： 行政院環境保護署  
出國人 職 稱： 技正 技佐  
姓 名： 石秉鑫 陳彥男  
出國地點： 斐濟群島共和國(Republic of the Fiji Islands)  
出國時間： 100年6月18日至6月25日  
報告日期： 100年9月16日

## 摘 要

亞洲生產力組織(Asian Productivity Organization, *APO*)是一個非政治性、非盈利性的、非歧視性的區域政府間組織，其成立於 1961 年，總部設在日本東京。截至目前為止，*APO* 的會員有中華民國、印度、日本、韓國、尼泊爾、巴基斯坦、菲律賓、泰國、孟加拉、斐濟、香港、印尼、伊朗、馬來西亞、蒙古國、新加坡、斯里蘭卡、越南及寮國。該組織的目標在促成會員國“相互合作”，及藉由提高生產力，改善亞太地區及其成員國家的社會和經濟發展。

本次會議主題為「Renewable Energy (再生能源)」，透過 *APO* 會員國之間，不同國家間對於再生能源法規政策推動及經驗分享，針對再生能源之學理、技術、應用及管理進行研討，藉由學習最新之整合性再生能源政策、管理制度與知識，以期對目前溫室氣體減量、節能減碳政策推動、節能減碳技術發展、推動碳市場之國際接軌、再生能源之環境影響評估等議題能有更佳之解決方案。

此外，本次會議更實地參訪斐濟當地最大之風力發電設施，實際瞭解斐濟再生能源、溫室氣體減量、節能減碳政策推動及具體措施，並針對其實際執行之方式、作法及遭遇問題進行交流，由各國代表提供相關意見。

綜覽溫室氣體減量、節能減碳政策之推動，再生能源之應用及發展已扮演舉足輕重、不可或缺之重要關鍵，藉由本次會議與各國交流溫室氣體減量、節能減碳之政策及具體措施、碳足跡與碳交易市場之推動、再生能源之環境影響評估等，學習其他國家對於再生能源之政策推動、具體配套措施、管理制度、環境影響評估、遭遇困境等議題，不僅能有效提升行政效率，更能收整合政策及法令、簡政便民之效，更期盼藉由環境影響評估法及相關規定，能夠將再生能源對於環境之影響與衝擊降至最低，維護我國環境品質，達成「藍天綠地、青山淨水、健康永續」之願景。

# 目 錄

摘要	2
目錄	3
第一章、緣起及出國目的	4
第二章、開會行程	6
第三章、會議概要	10
第四章、心得與建議事項	14
附錄一：會議議程及資料	
附錄二：照片集錦	
附錄三：我國發表之簡報資料	

# 第一章、緣起及出國目的

## 1.1、緣起：

亞洲生產力組織（APO）為提升各會員國對於再生能源之政策推動，強化溫室氣體減量、節能減碳、降低再生能源之環境影響等議題，尤其針對再生能源之技術、應用及管理制度，汲取先進已開發國家對於再生能源發展技術及管理制度，期望藉由各會員國代表之學習及經驗交流，有效提升或改善再生能源管理及措施。

## 1.2、出國目的：

本次會議主題為「Renewable Energy（再生能源）」，透過 APO 會員國之間，不同國家間對於再生能源法規政策推動及經驗分享，針對再生能源之學理、技術、應用及管理進行研討，藉由學習最新之整合性再生能源政策、管理制度與知識，以期對目前溫室氣體減量、節能減碳政策推動、節能減碳技術發展、推動碳市場之國際接軌、再生能源之環境影響評估等議題能有更佳之解決方案。

此外，本次會議更實地參訪斐濟當地最大之風力發電設施，實際瞭解斐濟再生能源、溫室氣體減量、節能減碳政策推動及具體措施，並針對其實際執行之方式、作法及遭遇問題進行交流，由各國代表提供相關意見。

同時，我國行政院環境保護署刻正積極推動「溫室氣體減量」、「節能減碳」、「碳足跡」、「碳交易市場」及「再生能源環境影響評估」等相關制度，

藉由本次會議報告，與 APO 各會員國代表分享我國相關政策推動之經驗與成果，亦期盼藉由政策成果分享與不同文化思維之交流衝擊，學習各國於「再生能源」及「環境影響評估」之辦理推動情形及優點，作為我國推動溫室氣體減量、節能減量、再生能源環境影響評估之參考依據，更突破目前的瓶頸與困境，有效提高為民服務知能與效能。

## 第二章、開會行程

2011年6月18日(六) 啟程，出發經香港轉機至斐濟

2011年6月19日(日) 抵達斐濟南迪(Nadi)國際機場

2011年6月20日(一)

<i>&lt;Day 1&gt; 20 June 2011, Monday</i>	
<i>Time</i>	<i>Agenda</i>
08:30 – 09:30	Registration of Participants
09:30 - 10:30	<b>Opening Ceremony</b> <ul style="list-style-type: none"> <li>• Welcome Remarks by Head, NTPC</li> <li>• Remarks by APO Officer – K D Bhardwaj</li> <li>• Opening Speech by the Guest of Honor and /or the APO Director for Fiji</li> </ul> <b>• Introduction of Experts and Participants</b> <b>Group Picture</b>
10:30 – 11:00	<b>Coffee Break</b>
11:00 - 11:30	<i>APO Activities in Renewable Energy and Objectives of the Workshop</i> <b>(K D Bhardwaj, APO)</b>
11:30 - 12:30	Renewable Energy and Climate Change & Global Initiatives <b>(Dr. Jong-dall Kim, Korea)</b>
12:30 - 13:30	<b>Lunch Break</b>
13:30– 14:15	<i>Technologies for Electricity Generation from Renewable Energy Sources: Scope and Relevance for Fiji</i> <b>(Mr. Surendra Prasad, FNU)</b>
14:15– 15:15	<i>Waste to Energy - Concepts, Principles and Opportunities</i> <b>(Mr. S.P. Chandak, UNEP)</b>
15:15 – 15:45	<b>Coffee Break</b>
15:45 – 16:45	<i>Renewable Energy Status, Policies and Programs in Republic of China (Taiwan)</i> <b>(Dr. Keng-Tung Wu, ROC)</b>
16:45 – 17:45	<i>Renewable Energy Status, Policies and Programs in India</i> <b>(Dr. R. N. Batta, India)</b>
19:00	APO Welcome Dinner

2011年6月21日(二)

<i>&lt;Day 2&gt; 21 June 2011, Tuesday</i>	
<i>Time</i>	<i>Agenda</i>
09:00 – 10:00	<i>Solar, Wind Energy, and Geo-thermal Energy Application-Fundamentals and Case Studies from Korea (Dr. Jong-dall Kim, Korea)</i>
10:00 – 10:30	<b>Coffee Break</b>
10:30 – 11:30	<i>Converting Waste Agricultural Biomass into Energy -- Overview of Technologies and Technology Selection (Mr. S.P. Chandak, UNEP)</i>
11:30 – 12:30	<i>Biomass Energy Applications via Thermo-chemical Conversion Technology: Concept, Principles and Case Studies (Dr. Keng-Tung Wu, ROC)</i>
12:30 – 13:30	<b>Lunch</b>
13:30 – 14:30	<i>Hydro power and Biogas from Food Waste (Dr. R .N. Batta, India)</i>
14:30 – 15:30	<i>Renewable Energy Status, Policies and Programs in ROK (Dr. Jong-dall Kim, Korea)</i>
15:30 – 16:00	<b>Coffee Break</b>
16:00 – 17:30	<b>Country Paper Presentation – Session I</b> <i>(Participants to present their country papers with focus on best practices in renewable energy. The names of countries and order of presentations to be decided a day before)</i> <b>(APO Resource Speakers to Participate, Review and Examine Issues from Each Country)</b>

2011年6月22日(三)

<i>&lt;Day 3&gt; 22 June 2011, Wednesday</i>	
<i>Time</i>	<i>Agenda</i>
09:00 – 10:00	<i>Waste Agricultural Biomass --Methodology for Assessment of Quantities and Characterization (Mr. S.P. Chandak, UNEP)</i>
10:00 – 10:30	<b>Coffee Break</b>
10:30-12:30	<b>Country Paper Presentation - Session II</b> <i>(Participants to present their country papers with focus on best</i>

	<i>practices in renewable energy. The names of countries and order of presentations to be decided a day before)</i> <b>(APO Resource Speaker to Participate, Review and Examine Issues from Each Country)</b>
12:30 – 13:30	Lunch
13:30 - 17:30	<b>Site Visit</b> ( <i>The objective of the site visit is to observe the best practices in renewable energy in Fiji</i> ) <b>The APO Resource Speakers to join site visit and interact with participants to clarify their points/queries</b>

2011年6月23日(四)

<b>&lt;Day 4&gt; 23 June 2011, Thursday</b>	
<b>Time</b>	<b>Agenda</b>
09:00 – 10:30	<i>Interactive Session and Q&amp;A</i> <b>(The resource speakers and participants to express their views and raise/ask issues of concern/questions based on Day-I, II &amp; III proceedings/site visit and Open discussion)</b> <b>(All APO Resource Speakers to join)</b>
10:30 – 11:00	<b>Coffee Break</b>
11:00 – 12:00	<i>Institutionalization Issues for Renewable Energy</i> <b>(Dr. Jong-dall Kim, Korea)</b>
12:00 – 12:30	<i>Kick off Session to Develop National Action Plan and the Workshop Recommendations for Promotion of Renewable Energy</i> <i>(Understanding issues, identification of stake holders, role of stake holders, resources required, time frame etc.</i>  <b>(Explanation by the APO Resource Speakers on how to approach development of action plans and the workshop recommendations)</b>
12:30 – 13:30	<b>Lunch</b>
13:30 – 15:30	<i>Group Work on Development of <u>National</u> Action Plans:</i>  <i>Participants in the same group will discuss and help each other in the same group to develop national action plans for respective countries and also take help of the resource speakers. The group with the best action plans will be ranked number 1 on Day 5 after presentations.</i>  <b>(Guided and Advised by the APO Resource Speakers)</b>



15:30 - 16:00	<b>Coffee Break</b>
16:00 – 18:00	<p><i>Group Work on Development of <u>the Workshop Recommendations</u></i></p> <p><i>Each group will come up with the workshop recommendations in consultation with the group members and the APO resource speakers. The group with the best feasible recommendations will be ranked number 1 on Day 5 after presentations. The resource speakers will then compile and finalize the recommendations on Day 5 of the workshop. The recommendations will be used by the APO on its Web site/APO News</i></p> <p><b>(Guided and Advised by the APO Resource Speakers)</b></p>
19:00	<b>Farewell Dinner</b>

2011年6月24日（五）

<b>&lt;Day 5&gt; 24 June 2011, Friday</b>	
<b>Time</b>	<b>Agenda</b>
08:30 – 09:30	<p><b><i>Presentations on Renewable Energy Best Practices including: Why it is the Best Practice, Process/Technology Details, Input/Output, Investment, and Overall Social, Environmental, Economic Benefits</i></b></p> <p><i>(APO Resource Speakers to Present ONE REAL/EXISTING Best Practice from any country in the world, however preferably from the Asia Pacific. In total 3-4 best practices on 1) Bio-fuel by Dr. Wu, 2) Waste to Energy by Mr. Chandak, and 3) Mini hydro/biogas by Dr. Batta will be presented)</i></p>
09:30-10:30	<p><i>Finalization of Presentations by Each Group of National Action Plans &amp; Recommendations</i></p> <p><b>(Facilitated by the APO Resource Speakers)</b></p>
10:30 – 11:00	<b>Coffee Break</b>
11:00– 12:45	<p><i>Presentations by Each Group</i></p> <p><b>(Reviewed by the APO Resource Speakers)</b></p>
12:45 – 13:45	<b>Lunch</b>
13:45 – 15:00	<p><i>Distribution of Paper on the Workshop Recommendations, Workshop Evaluation, Closing &amp; Certificate Presentation</i></p>

2011年6月25日（六） 經香港轉機返國。

## 第三章、會議概要

### 3.1、本次會議主題：

本次會議主題為「再生能源 (Renewable Energy)」，藉由多篇主題演講、座談及各國代表發表之文獻，探討及分享最新最新之整合性再生能源政策、管理制度與知識，以期對目前溫室氣體減量、節能減碳政策推動、節能減碳技術發展、推動碳市場之國際接軌、再生能源之環境影響評估等議題能有更佳之解決方案。

### 3.2、主題論壇 (Theme Forums)：

本次主題論壇之內容係由本次會議主題「再生能源 Renewable Energy」延伸而來，包括亞洲生產力組織 (APO) 對於再生能源之目標、再生能源與環境影響 (變遷) 之探討、APO 各會員國關於再生能源之政策與計畫、再生能源之關鍵技術與議題、各種再生能源 (如太陽能、風力、水利、地熱、生質能、海流等) 最新發展技術與困境……等主題。並透過論文發表及討論方式，交換意見與進行經驗交流。

APO 鼓勵各會員國之政府部門、企業決策者，將環境、社會、經濟及健康等多面向之影響，整合至再生能源之政策決策過程中，發展負責任之環境政策、能源政策、基礎能源設施、商業和工業活動，以達提昇人類福祉之終極目標。

### 3.3、分組論壇（Group Work）：

亞洲生產力組織（APO）為提升各會員國對於再生能源之發展政策、環境政策之推動，並透過會員國成員合作之方式，相互學習優缺點，以分組討論合作之方式發展各國之行動計畫（Group Work on Development of National Action Plans）。

我國與日本、韓國為一組，藉由各國代表之討論，並將我國、日本及韓國目前對於再生能源之發展政策、政策目標、發展綱領、環境影響議題、進口能源比例、關鍵再生能源技術、發展困境及國家行動計畫進行研討，並將我國對於再生能源環境教育之政策、方式進行說明，獲得全體代表一致好評，獲得最佳簡報之榮譽。



圖 3-1 我國代表論文發表情形



圖 3-2 我國代表論文發表情形 2

### 3.4、現地參訪 (Site Visit)：

本次會議主辦單位亦實地參訪斐濟當地最大之風力發電設施，實際瞭解斐濟再生能源、溫室氣體減量、節能減碳政策推動及具體措施，並針對其實際執行之方式、作法及遭遇問題進行交流，由各國代表提供相關意見。

### 3.5、會議參與情形摘述：

本次會議 APO 各會員國，除新加坡未出席外，其他會員國均有派員出席。我國與日本、韓國為推動再生能源政策、技術、配套措施及環境評估較為進度之會員國，其中日本主要將持續以提高再生能源收購價格、降低進口能源比例，持續發展再生能源。在韓國部分，韓國政府刻正推動「萬戶綠色家庭計畫 (Million Green Home Program)」，公共建築物取得省能源

建築認證及強化再生能源市場機制作為推動主軸，其中「萬戶綠色家庭計畫（Million Green Home Program）」預計將在韓國境內，補助 1 萬戶以上家戶裝設太陽能發電或小型風力發電設施，有效提高其再生能源普及率，展現該國政府施政決心。

此外，菲律賓政府充分掌握其地利之便及再生能源潛力，充分開發使用該國之風力發電，已使菲律賓成為 APO 會員國中，風力發電裝置容量最大之國家。

印度亦以新興國家之姿，急起直追，除積極補助、發展該國太陽能產業外，因印度目前廢棄物妥善處理率仍低，該國已積極開發適合該國生質能應用技術，期望同時有效妥善處理生活廢棄物，並發展再生能源技術。

最後，主辦單位持續強調再生能源政策形成與技術發展，應須將環境影響與衝擊納入決策評估中，務必使再生能源發展對於環境朝正面方向發展，此一觀點並獲各國代表一致通過採納。

## 第四章、心得與建議事項

### 4.1、心得

本次會議主題為「Workshop on Renewable Energy (再生能源研討會)」，透過 APO 會員國之間的分享，就不同國家對於再生能源之政策、法令規定、發展現況等進行研討與經驗交流，同時學習最新之再生能源技術、制度與知識，藉以瞭解目前亞洲各國再生能源發展之趨勢及潛能，可資做為我國發展再生能源及其環境影響評估之參考，包括：

- (一) 各國再生能源發展現況：經由此次會議，各個與會國發展再生能源之技術多利用該國之天然資源進行發展；水力能在日本為該國最主要之再生能源技術，韓國則利用廢棄物轉化成再生能源之生質能為主，至於印度則為風力能等等；我國目前則以水力能佔再生能源比例約有 65%為最多，其次為太陽熱能，未來則將致力於地熱能之應用。
- (二) 生質能之推動與技術：生質能是目前國際上最廣泛使用的一種再生能源之一，本次與會各國中，有許多國家為農業生產大國，包括斐濟、泰國等，這些國家將農業廢棄物或能源作物藉由焚化、氣化、裂解、發酵等技術轉換成燃油、燃氣與電力等可用能源，已發展出相當純熟的技術，而我國目前利用廢食用油進行酯化反應產製生質柴油，作為汽車替代燃料，並已實際應用於公共交通運輸工具之經

(三) 另就再生能源之推廣與實施環境影響評估部分，與會各國中，包括日本、斐濟等國家，在設置再生能源設施或工廠時(如風力發電等)，如達一定規模或位於特定區位時，亦先需實施環境影響評估，以減輕對環境之衝擊。

## 4.2、建議事項

- (一) 國際組織之研討會或相關會議，多以英文進行相關簡報及說明，建議與會代表除可於會前多加練習外，亦可將我國「觀光客倍增計畫」相關介紹短片適時於會議中展現，協助推動觀光外交，讓更多外國代表認識到臺灣的好山好水。
- (二) 斐濟共和國位於南太平洋，領土面積約為 194,000 平方公里，且領土擁有多達 322 個島嶼，該國政府藉著此種天然優勢，積極推動包括太陽能及風力能等再生能源之應用，此兩種能源分別佔該國再生能源比例之 50% 及 30% 以上。另一方面，蔗糖產業在該國經濟中亦具有舉足輕重的地位，其產值甚至達該國 GDP 的 10% 以上，且蔗糖亦是該國重要的出口農產品，故該國政府亦充份利用此種產業特性，將生產蔗糖過程剩餘之農業廢棄物，利用生物技術轉化為再生能源。建議我國亦可利用不虞匱乏天然資源，積極發展再生能源為自產能源，且因再生能源之生產成本受國際能源價格波動有限，加以其分散之特性，對提升台灣能源安全有極大的潛力。
- (三) 亞洲生產力組織（APO）常舉辦大型之國際研討會議或訓練課程，並提供相關經費補助予各會員國代表，建議本署可多參與該組織所舉行之國際會議，學習他國成功經驗，亦可將我國相關制度與措施分享於其他會員國，強化國際環保合作與外交關係。



正本

## 亞洲生產力組織中華民國理事辦公處 函

10042

台北市中正區中華路一段 83 號

受文者：行政院環境保護署

地址：221 新北市汐止區新台五路一段 79 號 2 樓

聯絡人：薛夙晴

聯絡電話：02-26982989 #2433

電子郵件：2433@cpc.tw

發文日期：中華民國 100 年 6 月 7 日

發文字號：中亞字第 1000006744 號

速別：普通件

密等及解密條件或保密期限：普通

附件：如文

主旨：頃接亞洲生產力組織(APO)接受書，同意 貴署石技正秉鑫，參加於本(100)年 6 月 20 日至 6 月 24 日在斐濟南迪舉辦之「Workshop on Renewable Energy」研習會，請石技正儘速辦理出國相關事宜並務期於 6 月 19 日抵南迪參加該研討會，請 查照。

說明：檢陳 APO 2011 年 5 月 30 日 11-IN-05-GE-SEM-B-960 接受書影本，敬請 參閱；正本逕寄參加人。

正本：行政院環境保護署

副本：石技正秉鑫

抄本：財團法人中國生產力中心 APO 業務小組

亞洲生產力組織中華民國理事辦公處

正本

## 亞洲生產力組織中華民國理事辦公處 函

10042

台北市中正區中華路一段 83 號

受文者：行政院環境保護署

地址：221 新北市汐止區新台五路一段 79 號 2 樓

聯絡人：薛夙晴

聯絡電話：02-26982989 #2433

電子郵件：2433@cpc.tw

發文日期：中華民國 100 年 6 月 7 日

發文字號：中亞字第 1000006745 號

速別：普通件

密等及解密條件或保密期限：普通

附件：如文

主旨：頃接亞洲生產力組織(APO)接受書，同意 貴署陳技佐彥男，參加於本(100)年 6 月 20 日至 6 月 24 日在斐濟南迪舉辦之「Workshop on Renewable Energy」研習會，請陳技佐儘速辦理出國相關事宜並務期於 6 月 19 日抵南迪參加該研討會，請 查照。

說明：檢陳 APO 2011 年 5 月 30 日 11-IN-05-GE-SEM-B-961 接受書影本，敬請 參閱；正本逕寄參加人。

正本：行政院環境保護署

副本：陳技佐彥男

抄本：財團法人中國生產力中心 APO 業務小組

亞洲生產力組織中華民國理事辦公處

# Asian Productivity Organization

Hirakawa-cho Dai-ichi Seimei Bldg. 2F  
1-2-10, Hirakawa-cho, Chiyoda-ku  
Tokyo, 102-0093 Japan



Tel:(81-3)5226-3920 Fax:(81-3)5226-3950  
E-mail: apo@apo-tokyo.org  
URL: www.apo-tokyo.org

## PROJECT NOTIFICATION

18 January 2010

1. **Project Code** : 11-IN-05-GE-WSP-B
2. **Title** : Workshop on Renewable Energy
3. **Duration & Timing** : 20 – 24 June, 2011 (5 Days)
4. **Venue** : Nadi, Fiji
5. **Implementing Organizations** : National Training & Productivity Centre (NTPC), Fiji  
National University  
Address: P.O. Box 6890 Nasinu Fiji  
Phone : 679-3392000  
Fax : 679-3340184, 3398973  
e-Mail:alumita\_t@tpaf.ac.fj; yogesh\_k@tpaf.ac.fj  
[info@tpaf.ac.fj](mailto:info@tpaf.ac.fj)  
  
The Colombo Plan Secretariat (CPS)  
31 Wijerama Road  
Colombo 07, Sri Lanka  
Phone: + 94 112 684188  
Web: [www.colombo-plan.org](http://www.colombo-plan.org)  
e-Mail:[muhamad.ghopran@colombo-plan.org](mailto:muhamad.ghopran@colombo-plan.org);  
[savinis@colombo-plan.org](mailto:savinis@colombo-plan.org)
6. **Number of Overseas Participants** : Up to 18 qualified participants from Republic of China, India, Indonesia, Japan, Republic of Korea, Malaysia, Philippines, Singapore, Sri Lanka, Thailand, and Vietnam. Other member countries with particular interest in the topics may nominate candidate upon consultation with the Secretariat.
7. **Number of Local Participants** : Up to six participants
8. **Closing Date for Nominations** : 06 May 2011

## **9. Objective:**

To build the capacity of energy professionals in the productive use of renewable energy as well as to discuss the latest issues and developments in renewable energy and advanced technologies to use abundant renewable resources to protect the environment and supplement its energy requirements.

## **10. Background:**

Most of the energy sources we use today come from fossil fuels such as oil, coal, and natural gas. But the rate at which we consume energy restricts the lifespan of these fossil fuels to an estimated 50-100 years at the most. It is well known that when we use these non-renewable sources of energy, we deteriorate and harm our ecology because when we use coal, oil and gas for energy, they release 'greenhouse gases,' such as carbon dioxide, methane and nitrous oxide.

Renewable energy is the way to go. Though, all forms of such renewable energy are expensive today, but as time progresses; renewable energy is expected to get cost effective. This is because once the renewable energy installations are placed and requisite infrastructure is built, the fuel becomes almost free. The renewable energy sources such as wind, the sun and the earth provide energy that is free and abundant.

Especially for the developing APO member countries, renewable energy is very important. In rural and far off areas, transmission and distribution of electricity generated from fossil fuel based power plants can be very costly whereas producing renewable energy locally can offer a feasible and acceptable alternative. Additionally, renewable energy also contributes to poverty alleviation by generating business and employment opportunities locally.

Renewable energy has received worldwide attention including the APO member countries along with national energy security and environmental concerns. This workshop will provide an excellent opportunity for renewable energy professionals to discuss the updated status and future of renewable energy development projects in the region and examine best practices in the host country. The APO will also share its publication on the best practices of renewable energy with all participants in this workshop.

## **11. Scope and Methodology**

### **Scope**

- 1) Overview of renewable energy issues in APO member countries;
- 2) Institutional support from government and local technical enterprises;
- 3) Development of renewable energy projects;
- 4) Best practices; and
- 5) Case studies of organizations with successful experience in the use of renewable energy.

### **Methodology**

The workshop will consist of lectures by local and international resource persons, country paper presentations, case studies, group discussions to share experiences and opinions among participants, and field visits.

## **12. Qualifications of Participants:**

- (a) Present Position: Energy professionals from public and private sectors, senior officials of ministries or department of energy, representatives of energy management-related institutions, industry manager specially from SMEs, and energy experts.
- (b) Age: Preferably between 30 and 50 years.
- (c) Education: University degree or equivalent qualification from a recognized institute.
- (d) Experience: At least five years of experience in the above-mentioned fields
- (e) Language: Proficient in written and spoken English.
- (f) Health: Physically and mentally fit to attend an intensive program requiring strenuous travel and several plant/field visits.

## **13. Financial Arrangements**

### **(a) To be borne by the APO**

- i)* Round-trip economy-class international airfare by the most direct route between the international airport nearest to the participant's place of work and Nadi, Fiji, for all participants except for those supported by the CPS. As far as practicable, all participants are strongly encouraged to purchase and use discounted tickets (following IATA PEX or other applicable discount fares). Please note that arrangements for the purchase of air tickets should be in accordance with the "Guide on Purchases of Air Tickets for APO Project Participants" dated 7 July 2006, which will be sent to the selected participants and is available from APO Liaison Officers in member countries.
- ii)* All deputation costs of overseas resource persons.

### **(b) To be borne by the CPS**

The CPS will bear round-trip economy class international airfare by the most direct route between the international airport nearest to the participant's place of work and Nadi, Fiji for participants from CPS developing member countries with total airfare amount not exceeding USD20,000.

### **(c) To be borne by the host country-Fiji**

- i)* Hotel accommodations and appropriate per diem allowances for 18 overseas participants for up to six days.
- ii)* Other local implementing costs in the Fiji.

### **(c) To be borne by participants or participating countries**

- i)* Participants must be fully insured against accident and illness (including hospitalization) for a principal sum of US\$10,000.00 for the entire duration of the project and travel and must submit to the APO a copy of the comprehensive travel insurance certificate before participation. Such insurance must be valid in the countries to be visited. If a participant is unable to arrange for insurance coverage in the host country at the start of the project, he/she must pay the premium

himself/herself out of the per diem allowances provided. Neither the APO nor the implementing organization will be responsible for any eventuality arising from accident or illness.

- ii) Any expenses incurred by participants for stopovers on the way to and from the project venue as well as for extra stay at the project venue before and/or after the official project period on account of early arrival or late departure, for example, due to either limited available flights or any other reason whatsoever.
- iii) Any expenses related to visa fees and airport taxes.

#### **14. Actions by Member Countries:**

- (a) Each member country is requested to nominate three or more candidates for selection. Please ensure that candidates nominated meet the qualifications specified.
- (b) We will not accept any form of self-nomination. All nominations must be endorsed and submitted by an APO Director, Alternate Director, Liaison Officer, or their designated officer.
- (c) Kindly note that nomination does not necessarily guarantee that a candidate will be selected. Selection is at the discretion of the APO Secretariat. A basic criterion for selection is the homogeneity of the participants in terms of qualifications and work experience. Non-selection therefore does not mean that the candidates concerned are not competent. Sometimes candidates are not selected because they are overqualified.
- (d) Each nomination should be accompanied by the documents listed below. A nomination lacking any of these documents may not be considered:
  - i) Two copies of the candidate's bio-data on the APO bio-data form together with passport sized photograph. The bio-data form can be downloaded from the APO Web site. Information can also be downloaded from [www.apo-tokyo.org](http://www.apo-tokyo.org). We encourage submitting the bio-data form to the APO Secretariat in electronic form as an attachment to a cover e-mail message from the APO Director, Alternate Director, or Liaison Officer.
  - ii) APO Medical and Insurance Declaration/Certification Form. Every candidate must complete and submit a copy of the APO Medical and Insurance Declaration/Certification Form with his/her bio-data at the time of nomination. Please note that for this particular project self-declaration is sufficient for candidates without any of the health conditions or illnesses enumerated on the reverse side of the medical form. However, for all others, medical certification by a recognized physician on the reverse side of the medical form is required.
- (e) Member countries are encouraged to submit the necessary documents electronically as mentioned in (d)-i). In that case, there is no need to send a hard copy by postal mail. However, if the documents are submitted by fax, member countries are requested to mail the originals of the documents to the APO as well. If a digital photograph of a nominee is not attached to the electronic biodata form, a hard-copy photograph should be sent to the APO Secretariat by postal mail. Please specify the candidate's name and the project code on the reverse side of the photograph.
- (f) Member countries are requested to abide by the nomination deadline specified in Section 8 on the first page. The APO may not consider late nominations as they have in the past

resulted in considerable difficulties to the implementing organization in its preparatory work for the project.

- (g) Under normal circumstances, candidates who are selected after the initial screening will be informed of their acceptance at least four weeks prior to commencement of the project.
- (h) Member countries are requested to inform candidates that, once selected, they are not to bring family members or to engage in any private business activities during the entire duration of the project. Further, if they should become unable to take part, the NPOs concerned are requested to inform the APO and the host country promptly of their reason for withdrawal.
- (i) Each selected candidate is required to arrive at the venue one day before the start of the official program. Also, he/she is expected to return home upon completion of the official program because he/she is visiting the host country for the specific purpose of attending this APO program.

## **15. Preparatory Work by Participants**

The selected participants will be required to present a technical paper explaining the status of renewable energy in their countries. The paper should also include institutional capacity-building measures required for the promotion of renewable energy and initiatives undertaken by industry and government so far.

The paper should not exceed 8-10 pages. In addition, the participants should prepare PowerPoint slides for up to 10 minutes of individual country presentations. The paper and PowerPoint slides should reach the APO Secretariat and NTPC, Fiji by the deadline to be set later.

## **16. Guide for Participants**

Other conditions for participation are given in the *APO Guide for Participants*, which is available from APO Liaison Officers/NPOs in member countries and on the APO homepage ([http://www.apo-tokyo.org/05part\\_guide.htm](http://www.apo-tokyo.org/05part_guide.htm)).



Ryuichiro Yamazaki  
Secretary-General

**APO PROJECT NO.: 11-IN-05-GE-WSP-B**  
**Workshop on Renewable Energy**  
*(20-24 June 2011, Nadi, Fiji)*

<b>&lt;Day 1&gt; 20 June 2011, Monday</b>	
<i>Time</i>	<i>Agenda</i>
08:30 – 09:30	Registration of Participants
09:30 - 10:30	<b>Opening Ceremony</b> <ul style="list-style-type: none"> <li>• Welcome Remarks by Head, NTPC</li> <li>• Remarks by APO Officer – K D Bhardwaj</li> <li>• Opening Speech by the Guest of Honor and /or the APO Director for Fiji</li> <li>• Introduction of Experts and Participants</li> </ul> <b>Group Picture</b>
10:30 – 11:00	<b>Coffee Break</b>
11:00 - 11:30	<i>APO Activities in Renewable Energy and Objectives of the Workshop</i> <b>(K D Bhardwaj, APO)</b>
11:30 - 12:30	<i>Renewable Energy and Climate Change &amp; Global Initiatives</i> <b>(Dr. Jong-dall Kim, Korea)</b>
12:30 - 13:30	<b>Lunch Break</b>
13:30– 14:15	<i>Technologies for Electricity Generation from Renewable Energy Sources: Scope and Relevance for Fiji</i> <b>(Mr. Surendra Prasad, FNU)</b>
14:15– 15:15	<i>Waste to Energy - Concepts, Principles and Opportunities</i> <b>(Mr. S.P. Chandak, UNEP)</b>
15:15 – 15:45	<b>Coffee Break</b>
15:45 – 16:45	<i>Renewable Energy Status, Policies and Programs in Republic of China (Taiwan)</i> <b>(Dr. Keng-Tung Wu, ROC)</b>
16:45 – 17:45	<i>Renewable Energy Status, Policies and Programs in India</i> <b>(Dr. R. N. Batta, India)</b>
19:00	APO Welcome Dinner
<b>&lt;Day 2&gt; 21 June 2011, Tuesday</b>	
<i>Time</i>	<i>Agenda</i>
09:00 – 10:00	<i>Solar, Wind Energy, and Geo-thermal Energy Application- Fundamentals and Case Studies from Korea</i> <b>(Dr. Jong-dall Kim, Korea)</b>
10:00 – 10:30	<b>Coffee Break</b>
10:30 – 11:30	<i>Converting Waste Agricultural Biomass into Energy -- Overview</i>



	<i>of Technologies and Technology Selection</i> <b>(Mr. S.P. Chandak, UNEP)</b>
11:30 – 12:30	<i>Biomass Energy Applications via Thermo-chemical Conversion</i> <i>Technology: Concept, Principles and Case Studies</i> <b>(Dr. Keng-Tung Wu, ROC)</b>
12:30 – 13:30	<b>Lunch</b>
13:30 – 14:30	<i>Hydro power and Biogas from Food Waste</i> <b>(Dr. R .N. Batta, India)</b>
14:30 – 15:30	<i>Renewable Energy Status, Policies and Programs in ROK</i> <b>(Dr. Jong-dall Kim, Korea)</b>
15:30 – 16:00	<b>Coffee Break</b>
16:00 – 17:30	<b>Country Paper Presentation – Session I</b> <i>(Participants to present their country papers with focus on best practices in renewable energy. The names of countries and order of presentations to be decided a day before)</i> <b>(APO Resource Speakers to Participate, Review and Examine Issues from Each Country)</b>
<b>&lt;Day 3&gt; 22 June 2011, Wednesday</b>	
<b>Time</b>	<b>Agenda</b>
09:00 – 10:00	<i>Waste Agricultural Biomass --Methodology for Assessment of Quantities and Characterization</i> <b>(Mr. S.P. Chandak, UNEP)</b>
10:00 – 10:30	<b>Coffee Break</b>
10:30-12:30	<b>Country Paper Presentation - Session II</b> <i>(Participants to present their country papers with focus on best practices in renewable energy. The names of countries and order of presentations to be decided a day before)</i> <b>(APO Resource Speaker to Participate, Review and Examine Issues from Each Country)</b>
12:30 – 13:30	<b>Lunch</b>
13:30 - 17:30	<b>Site Visit</b> <i>(The objective of the site visit is to observe the best practices in renewable energy in Fiji)</i> <b>The APO Resource Speakers to join site visit and interact with participants to clarify their points/queries</b>

<b>&lt;Day 4&gt; 23 June 2011, Thursday</b>	
<b><i>Time</i></b>	<b><i>Agenda</i></b>
09:00 – 10:30	<b><i>Interactive Session and Q&amp;A</i></b> <i>(The resource speakers and participants to express their views and raise/ask issues of concern/questions based on Day-I, II &amp; III proceedings/site visit and Open discussion)</i> <b>(All APO Resource Speakers to join)</b>
10:30 – 11:00	<b>Coffee Break</b>
11:00 – 12:00	<i>Institutionalization Issues for Renewable Energy</i> <b>(Dr. Jong-dall Kim, Korea)</b>
12:00 – 12:30	<i>Kick off Session to Develop National Action Plan and the Workshop Recommendations for Promotion of Renewable Energy (Understanding issues, identification of stake holders, role of stake holders, resources required, time frame etc.</i>  <b>(Explanation by the APO Resource Speakers on how to approach development of action plans and the workshop recommendations)</b>
12:30 – 13:30	<b>Lunch</b>
13:30 – 15:30	<i>Group Work on Development of <u>National</u> Action Plans:</i>  <i>Participants in the same group will discuss and help each other in the same group to develop national action plans for respective countries and also take help of the resource speakers. The group with the best action plans will be ranked number 1 on Day 5 after presentations.</i> <b>(Guided and Advised by the APO Resource Speakers)</b>
15:30 - 16:00	<b>Coffee Break</b>
16:00 – 18:00	<i>Group Work on Development of <u>the Workshop Recommendations</u></i>  <i>Each group will come up with the workshop recommendations in consultation with the group members and the APO resource speakers. The group with the best feasible recommendations will be ranked number 1 on Day 5 after presentations. The resource speakers will then compile and finalize the recommendations on Day 5 of the workshop. The recommendations will be used by the APO on its Web site/APO News</i> <b>(Guided and Advised by the APO Resource Speakers)</b>
19:00	<b>Farewell Dinner</b>
<b>&lt;Day 5&gt; 24 June 2011, Friday</b>	
<b><i>Time</i></b>	<b><i>Agenda</i></b>

08:30 – 09:30	<p><b><i>Presentations on Renewable Energy Best Practices including: Why it is the Best Practice, Process/Technology Details, Input/Output, Investment, and Overall Social, Environmental, Economic Benefits</i></b></p> <p><i>(APO Resource Speakers to Present ONE REAL/EXISTING Best Practice from any country in the world, however preferably from the Asia Pacific. In total 3-4 best practices on 1) Bio-fuel by Dr. Wu, 2) Waste to Energy by Mr. Chandak, and 3)Mini hydro/biogas by Dr. Batta will be presented)</i></p>
09:30-10:30	<p><i>Finalization of Presentations by Each Group of National Action Plans &amp; Recommendations</i></p> <p><b>(Facilitated by the APO Resource Speakers)</b></p>
10:30 – 11:00	<p><b>Coffee Break</b></p>
11:00– 12:45	<p><i>Presentations by Each Group</i></p> <p><b>(Reviewed by the APO Resource Speakers)</b></p>
12:45 – 13:45	<p><b>Lunch</b></p>
13:45 – 15:00	<p><i>Distribution of Paper on the Workshop Recommendations, Workshop Evaluation, Closing &amp; Certificate Presentation</i></p>



圖 1 亞洲生產力組織代表致詞



圖 2 地主國斐濟代表致歡迎詞



圖 3 會議貴賓合影



圖 4 會議情況



圖 5 我國代表-石秉鑫



圖 6 我國代表-陳彥男



圖 7 出席代表大合照



圖 8 歡迎餐宴



圖 9 我國代表簡報情形



圖 10 參訪斐濟風力發電設施





圖 11 斐濟風力發電設施



圖 12 現地參訪解說



圖 13 與解說人員合影



圖 14 與會議代表合影



圖 15 技術人員解說颱風時之應變對策



圖 16 會議結束與 Resource Speakers 合影



# The National Action Plans - Taiwan, Korea & Japan-

Toru Nagao

永尾 徹 (Japan)

Ping-Hsin Shih

石 秉鑫 (Taiwan)

Wei-Chun Chiang

江 威君 (Taiwan)

Yen-Nan Chen

陳 彥男 (Taiwan)

Wang Yong Peel

王 龍沁 (Korea)

**June 24, 2011 in Fiji**

# ***BULA!!***



# Outline


- **Background**
- **Barriers**
- **Mission Statement/Policy Objective**
- **Possible Targets**
- **Enabling Measures to Tackle Barriers**
- **Action Plan with Responsible Stake Holders for Each Target**
- **Conclusions**



# Background

Taiwan	Korea	Japan
RE : 1% (2009)	RE : 2% (2008)	RE : 6% (2007)
<p><b>Hydro : 65%</b>  <b>Solar thermal : 18%</b>  Solar PV:6%  Wind : 11%</p> <p><u>Developing Geothermal</u></p>	<p><b>Waste : 77.0%</b>  <b>Hydro : 13.9%</b>  Biomass : 6.6%  Wind : 1.4%  Solar PV : 0.3%  Fuel Cell : 0.1%</p>	<p><b>Hydro : 17</b>  <b>Other Heat : 6</b>  Biomass : 2  Biomass Elec. : 2  Wind : 0.7  PV : 0.5  Geothermal : 0.7</p> <p>(Oil Equivalent Million Kilo Liter)</p>

# Barriers

Taiwan	Korea	Japan
<b>High Population Density and Land Limits</b>	<b>Institutional Barriers</b>	Unstable Policy
Insufficient Cooperation between Research and Industries	<b>Financial Barrier and Lack of Investor Confidence</b>	Low Incentives
Lack of Coordination of Inter-governmental Agencies	Lack of Social Awareness	Lack of Public Consensus
<b>EIA and Other Regulations</b>		<b>Strong Power Companies (10)</b>
Nature Resources		<b>Environmental Issues</b>
		Competitive Power of Industries to Other Countries (China、Korea、Taiwan)



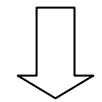
# Mission Statement/Policy Objective

Taiwan	Korea	Japan
Enhance Energy Security	Energy-Efficient Society	Enhance Energy Security
<b>Develop “Low Carbon Community” and “Low Carbon Cities”</b>	Sustainable Energy System	Stop Global Warming
Development Project on off-shore Wind Energy	Overseas Energy Development	<b>Keep Economic Growth</b>
	<b>Open Policy Framework</b>	



# Possible Targets

Taiwan			Korea			Japan			
	2015	2025		2010	2030		2007	2020	2030
Hydro	5.1	4.4	Solar thermal	0.5	5.7	Other Heat	6	7	6
Wind	3.4	5.3	PV	1.8	4.1	Biomass Heat	2	3	4
Solar PV	0.7	1.8	Wind	2.9	12.6	Biomass Elec.	2	2	3
Geothermal	0.1	0.3	Bio energy	13	31.4	Geothermal	0.7	0.8	2
Biomass	1.9	2.5	Hydro	12.8	4.4	Hydro	17	19	24
Fuel Cell	0.1	0.4	Geothermal	0.6	3.8	Wind	0.7	2	4
Ocean Energy	0.1	0.4	Waste	67.4	33.4	PV	0.5	7	13
Ratio	11%	15%	Ratio	2%	11%	Ratio	4.7%	7.4%	20%



10%

# Enabling Measures to Tackle Barriers

Taiwan	Korea	Japan
Motivating the Deployment through the RES Development Act	Industrialization - TRM/PRM - Export Industry	Increase incentives RPS to FIT 50 Cent (USD)/kW for all RE
Rationalizing the energy use, reforming the energy structure.	Large deployment - Million Green Home - Larger Role of Local Autonomies	Public Agreement
Develop RE Industry.	Infra structure Finance mechanism and funding	Environment Assessment
Strengthening R&D	Market Mechanism - RPS/RFS <- FIT - Green Price	Price reflection to Elec. Retailing price from consumers
Enhancing the International Cooperation on the Field of Energy		Technology Development Elec. Stability On matured RE (Tide, Temp...)
Financial Supports		Relax Regulations

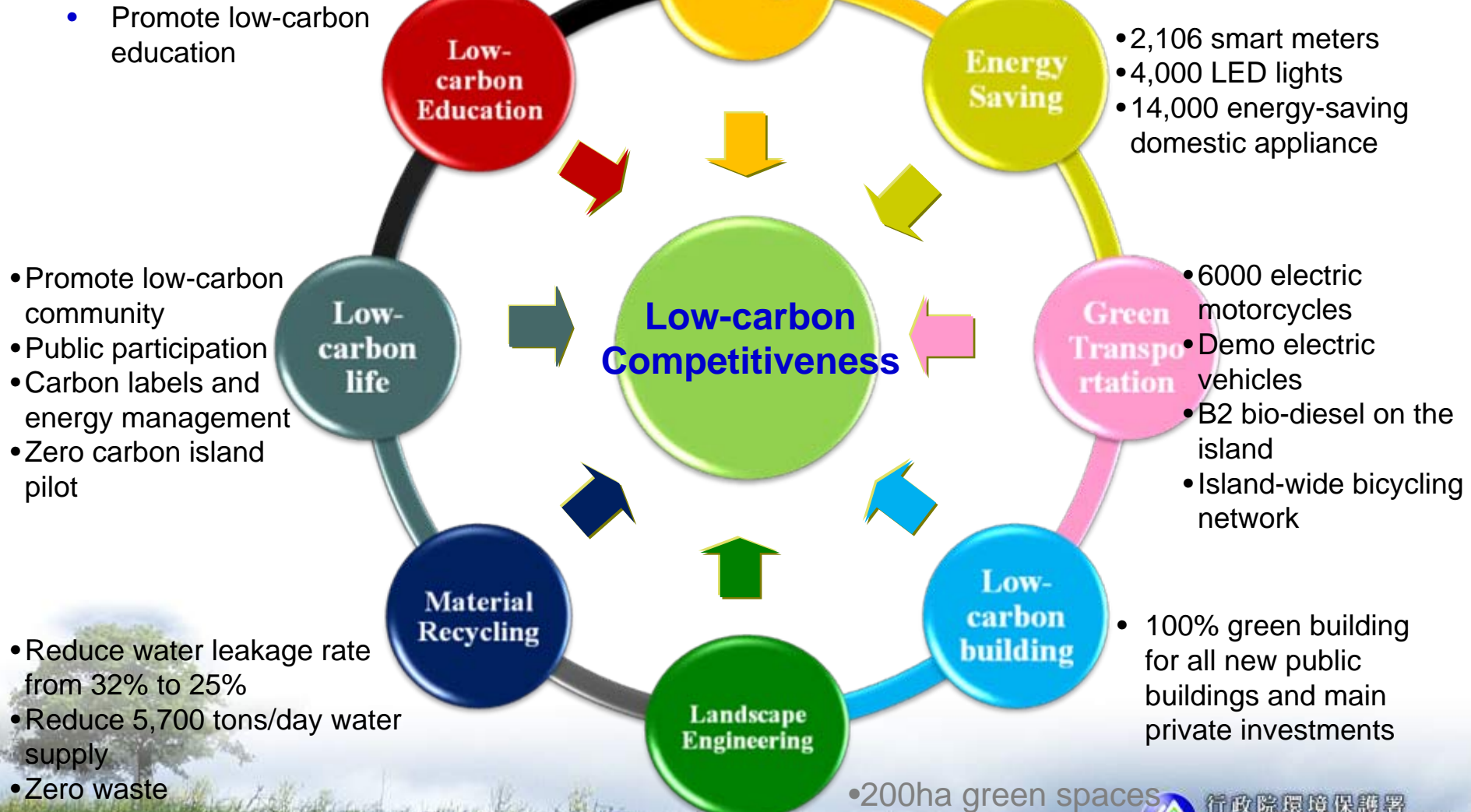
# Action Plan with Responsible Stake Holders for Each Target

Taiwan	Korea	Japan
<u>Low Carbon Communities and Cities</u>	Subsidy program	Government under discussion/ Aug. 2011
Feed in Tariffs and Certifications	<u>1 million green homes program</u>	Gov (Environment, METI), NEF,NEDO/Press TV
Support Mechanisms to trigger investments	Regional deployment subsidy program	Regulations for Assessment (Gov. Academy Ind.)
Transform for Reducing energy demand voluntarily	Loans and tax incentive program	Industries, Publicity, Cabinet (~2015)
Enlarge RE market and improve technology capability	NRE mandatory use for public building	
Fund for technologies further cost efficient and facilitate the deploying targets	Renewable Energy Service Companies	
Relax the EIA regulations		

# Contents of the Plan

## Comprehensive Framework

(complete all tasks by 2014)



# 1 million green homes program



# Conclusions

- Three countries are lack of energy resources. Self-sufficiency is almost zero,
- The RE is major key for energy security and sustainable development.
- Three countries have considerable amount of renewable resources.
- The governments of three countries should enhance the promotion for RE and international cooperation.



Vinaka, 謝謝、有難

