附錄三:期中摘要報告及研究內容

AESIEAP TC Working Group II

"Performing Carbon Trading: A Multiple-Case Study"
Progress Report by Taiwan Power Company
Technical Committee Meeting, July 19-20, 2010

1. Introduction

This report discusses the progress of the AESIEAP Technical Committee Working Group II (WG2) project, entitled "Performing Carbon Trading: A Multiple-Case Study", under the first of the four micro-topics assigned to WG2, "Carbon Trading – mechanism and structure". This progress report outlined the work achieved so far from the preliminary survey, first meeting of WG2, and members consultation, as well as the completion of the project terms of reference, annotated outline, and WG2 website.

2. Preliminary Survey

At the beginning of the project, Taiwan Power Company (Taipower) distributed a survey to WG2 members to obtain a preliminary understanding of the degree of participation by members in the carbon market to reduce greenhouse gas (GHG) emissions, in order to better determine the organization of the study. The survey questions included:

- (1) What mechanism did you / are your going to implement to meet your GHG abatement target:
- (2) Have you ever obtained any tradable carbon credits?
- (3) Have you ever conducted any carbon trading?
- (4) What are your motives for carrying out GHG abatement programs?
- (5) What are the expected achievements of the GHG abatement programs?
- (6) What advantage does your company have regarding GHG mitigation and carbon trading?

The result of the survey was presented at the first meeting of WG2.

3. 1st Meeting of Working Group II

The first meeting of WG2 was held at the Howard Plaza Hotel Taipei on September 24, 2009. Representatives from Kyushu Electric Power Co., Inc. (Japan), Tenaga Nasional Berhad Research, TNBR (Malaysia), Electricity Generating Authority of Thailand, EGAT (Thailand), and Taiwan Power Company (Chinese Taipei) attended the meeting. Taipower gave a presentation on the plans for the study project and the WG2 website, and then the participating members presented their company background on GHG

mitigation and project proposals for the study. An open discussion was held at the end to discuss the draft outline and schedule of the study, as well as the contents of the WG2 website. A summary of the meeting is included in Attachment 1.

4. Members Consultation

After the first WG2 meeting, further consultation on the carbon trading study was held during the Roundtable Forum of the 2009 CEO Conference in October 2009 to solicit comments from the council members. Afterwards, the terms of reference of the study was drafted and circulated to members for comments. In addition, the draft outline of the study was revised based on comments from members in the first WG2 meeting. Taipower then held additional consultation with Datuk Md. Sidek Ahmad, former Chairman of the Technical Committee Executive Team, as well as all participating WG2 members, to refine the scope of the study. An annotated outline detailing the contents of the study was drafted and circulated to members for additional comments. Both the terms of reference and annotated outline have been finalized at the time of this progress report.

5. Terms of Reference

The terms of reference outlining the background, objectives, roles and responsibilities, project implementation and schedule, and deliverables has been completed (see Attachment 2).

6. Annotated Outline

After several consultations with WG2 members, the outline of the study has been revised eight times and the latest version is presented in Attachment 3. Contribution by participating WG2 members have all been confirmed, with the exception of KEPCO and EPRI, for which confirmation is still pending. Participating members have been asked to make submissions in accordance with the outline, and Taipower will be responsible for compiling the submissions, as well sections that will require additional literature search, into the draft final report. In addition, several references on the carbon market have been identified (see Attachment 4), and will be used in the corresponding sections of the report.

7. Working Group II Website

The website of the WG2 (http://aesieap.taipower.com.tw) has been completed and gone online (see Attachment 5), and it will be continuously updated. It includes the following sections and functions:

- (1) About Us: Background on WG2
- (2) News and Events: Latest WG2 announcements and archived materials from past events
- (3) <u>Study Project Documents</u>: Interactive site allowing members to upload and download materials for the study projects
- (4) <u>Knowledge Center</u>: Links to internet resources related to the carbon market
- (5) <u>International Carbon News</u>: Continuous update of links to the latest international news in the carbon market
- (6) <u>WG2 Members</u>: Points of contact of WG2 members and their latest submissions
- (7) Contact Us: Point of contact for the WG Secretariat

8. Conclusions

With the kind assistance of the participating WG2 members, Taipower is pleased to inform the AESIEAP Technical Committee that the project on "Performing Carbon Trading: A Multiple-Case Study" is proceeding on schedule. Members will be asked to continually update their submissions to the study project through the website, where members can also share the progress of the study. The next progress report will be submitted to the Technical Committee in July 2010, and we aim to complete a draft report completed by mid-August. After one month of review and comments, we plan to hold a second WG2 in Taipei in mid-September 2010 and finalize the report by early October, with a view to present the final report to the CEPSI 2010 meeting in October 25-28, 2010.

1st Meeting of AESIEAP TC Working Group II Meeting Summary

- I. Date: September 24, 2009, 9:00-12:00.
- II. Venue: The Howard Plaza Hotel Taipei, Osmanthus Hall, B2
- III. Chairman: Dr. Kwang-Lu Koai, Deputy General Manager, Taiwan Power Research Institute (TPRI), Taiwan Power Company (Taipower)
- IV. Attendee: Kyushu Electric Power Co., Inc. (Japan), Tenaga Nasional Berhad Research, TNBR (Malaysia), Electricity Generating Authority of Thailand, EGAT (Thailand), and Taiwan Power Company (Chinese Taipei).

V. Meeting summary:

Dr Kwang-Lu Koai, the Chairman of Working Group II (WG2), opened the meeting by welcoming all participating members from Japan, Malaysia and Thailand. He highlighted the strong evidence of global climate change and the need to take mitigation actions. He described the current global framework under the UNFCCC and the Kyoto Protocol, and the trend of energy consumption worldwide, making carbon reduction a major challenge in the future. He also noted the market mechanisms of emissions trading that would assist in the deployment of low-carbon technologies worldwide. Finally, he thanked all the participants and wished the meeting a success.

A. Presentation of the study project and WG2 Website

Mr. Shao-Pin Hung, the Honorary Secretary of WG2 and Director of Electric, Economic & Social Research Office, TPRI, Taiwan Power Company, described the background and the members of WG2. He pointed out that "carbon trading- mechanism and structure" was one of the four micro topics under WG2 and outlined the objectives and scope of the proposed project, "Performing Carbon Trading: a multiple-case study", to share experiences of emission reduction among WG2 members. He also presented the draft timetable and deliverables for the project, with the plan to submit progress reports in December 2009 and March 2010, the draft report by August 15, 2010, and the final report by October 7, 2010. Based on the results of questionnaire forwarded to WG2 members, he presented a summary of members' response on mechanisms applied to mitigate GHG emission (CDM, JI, ETS, VCS etc.), experience in carbon trading; motives for GHG abatement, and achievements of GHG abatement programs in terms of tons per year, and company's advantages. Finally, he presented the draft website of WG2 that would be improved to provide an interactive forum for members to discuss and share information on topics covered by WG2.

B. Presentation of project proposals and experience exchange

1. EGAT

Ms. Napaporn Phumaraphand, Director, Demand Side Management and Planning Division, Electricity Generating Authority of Thailand (EGAT), described energy efficiency and renewable energy programs promoted by EGAT. She pointed out the energy efficiency labeling program plan (2010-2020) is expected to reduce a total of 1,666 GWh in energy consumption, and the EGAT's renewable energy program to promote small hydro, wind, solar and MSW project is expected to generate total of 1,301,610,680kWh/yr of renewable energy by 2022. Overall, EGAT's EE & RE Plan GWh/yr is expected to reduce CO2 emissions by 382,419 ton/yr, CH4 emissions by 27,298 ton/yr, and N2O emissions by 1,549 ton/yr. In addition, she also introduced the CDM project approval procedures and the current CDM situation in Thailand, with LoA having been issued for 88 projects with expected 5.04 million CERs per year.

2. Kyushu

Mr. Shigehiro Matsueda, Environmental Affairs Department, Global Environment Group of Kyushu Electric Power Co., introduced the background of Kyushu Electric Power and its generation facilities, with a total installed capacity of 19,716 MW. Then he explained the current status and outlook for CO2 emissions in the world, as well as the developments in the international negotiation process and policy progress in Japan, noting that the new Prime Minister has announced a new target of reducing to 25% below 1990 level by 2020. He showed that Japan's current GHG emissions are well above the Kyoto target and that 9.6% reduction is needed domestically to reach the target between 2008-2012, in addition to the 5.4% reduction planned through Kyoto Mechanisms (1.6%) and sink (3.8%). Japan's approaches to reduce GHG emissions are mainly through voluntary targets, but such are treated as binding by industries. For Kyushu Electric Power, the target is to reduce CO2 emissions intensity by 20% below 1990 level (to 0.348kg-CO2/kWh) between 2008-2012. In addition to optimal combination of power sources and diversification of energy sources, it has implemented supply-side and demand-side initiatives to reduce GHG emissions. By 2008, its emissions intensity has reached 0.374kg-CO2/kWh, and after accounting for carbon credits, the target of 0.348kg-CO2/kWh has already been met. He explained how Japan's firms utilize the Kyoto mechanisms to meet reduction target and introduced examples of two CDM projects by Kyushu Electric Power. He also described Japan's experimental market for domestic emissions trading and Kyushu Electric's participation.

3. TNB

Mr. Mohd Noh Ahmad, Senior Manager, Environment Unit, TNBR, gave an overall explanation of the Clean Development Mechanism (CDM), including CDM impact at project level, baseline and calculation of emission reduction. He then showed an overview of CDM project potential and possibilities for CDM projects in TNB, with potential CDM projects in generation activities and their potential CERs revenues, such as energy efficiency improvement (3,897,068 RM/yr), conversion from open cycle to combined cycle (25,351,987RM/yr), mini hydro power plants (2,404,044RM/yr), and co-firing project (102,784,829RM/yr), as well as reducing transmission losses and distribution losses. TNB has developed ranking criteria and weightings for CDM projects, such as additionality, baseline methodology, investment requirement, etc., based on workshop discussions among power companies. As a result, it has ranked SF6 reduction, rehabilitation projects for large and mini hydro power plants as the top three projects with the highest CDM potential. Overall, the estimated CDM projects potential in TNB amounted to 53 million RM of revenue annually.

4. Taipower

Ms. Olga Kuo of Electric Economic & Social Research Office, TPRI, introduced the GHG reduction goal announced by the government of Taiwan to return to 2008 level (257 million tons) between 2016 and 2020, and to 2000 level (214 million tons) by 2025. She described the national CO2 emissions trend from 1988 to 2008, by which has reached 257 million tons. Taipower emitted about 83.5 million tons of CO2-equivant in 2008, accounting for about 1/3 of national emission, and most of the emissions are from thermal plants. Its emissions are projected to increase to 108 million tons by 2020, but the emissions intensity would decrease to 0.479 Kg/kWh. In order to reduce GHG emission, Taipower is implementing various control measures in supply-side management, such as adopting best available technologies, improve generation efficiency, increase natural gas use, renewable energy, and nuclear power, as well as efforts to improve transmission and distribution systems and demand-side management. Taipower plans to have 200 units (300MW) of wind power by 2012 and 10 MW of photovoltaic generation by 2010, in addition to purchasing green electricity from independent power producers. Taipower has one of the lowest line loss rate compared to other countries and is developing a smart grid system. For the WG2 study, Taipower has identified a short list of VCS projects, including a 28 MW wind power project, power plant efficiency improvement, and a submarine cable to connect Peng-Hu island to Taiwan's grid.

C. Open Discussion

In order to finalize the discussions of this meeting, Mr. Hung of TPRI presented a draft outline of the study and went through the content of each section to seek comments from the attending members. The following points were discussed:

- 1. The scope of the study would not be limited to only the members participate in this WG2 meeting, and Taipower will contact other members to solicit their interests in this study. It was suggested that the list of projects (CDM, VCS, etc.) should not be limited to only those taking part in this study. The report should at least compile a list from all member of the working group and perhaps sum up the total amount of reduction expected to be achieved by the list of projects.
- 2. In terms of outlines of the study report, the members agreed on the first three sections (background introduction, the goal and time schedule of GHG mitigation and GHG abatement programs).
- 3. On Section 3.1 on project-based programs, in order to make the compiled report manageable, it was suggested that the members can provide a case study of the project with a 10-15 page summary of the Project Design Document (PDD), because most PDDs are very lengthy.
- 4. As for other parts of the study (applications of the carbon credits, cost-benefit analysis and strategic implications), some members expressed concerns that some information are considered confidential and cannot be made public. It was agreed that it would up to each member's discretion to decide on the level of detail for the information.
- 5. On the study theme selection, TNB and EGAT will select CDM projects, and Taipower will select voluntary projects like the VCS or the Gold Standard. In addition to CDM projects, it was suggested that Kyushu Electric also provide its experiences on emissions trading. However, since information on international emissions trading is considered confidential, Kyushu Electric would be glad to share its experiences on the voluntary domestic trading scheme.
- 6. As for the timeline of the study, the participating members should submit

its study proposal and web materials by October 10, 2009, and progress reports in December 2009 and March 2010. The draft of the final report by should be submitted in mid-August of 2010, with the review and comments of the draft report by early September. The members will then discuss the draft report in the second WG2 meeting, tentatively scheduled for September 15, 2010. The report should be finalized in early October before the CEPSI 2010 meeting in October 25-28, 2010.

- 7. On the issue of WG2 website, Taipower presented a draft site as a reference and will further modify it according to various functions, such as an open forum for discussion and special areas for members to upload and download photos and documents for information sharing. The website will also provide links to relevant international organizations such as the IPCC, UNFCCC, and CDM sites.
- 8. It was suggested that the information on the website should be open to all members of AESIEAP, not just the members of WG2, and Taipower will update the contact details of the WG2 members. Also, the presentations from today's meeting will be uploaded to the WG2 website, after the presenters have approved the contents to be made public.

After the meeting, Taipower will e-mail to every member any new information and keep everyone updated of the progress of the study. The Chairman thanked everyone for participating in this first WG2 meeting and closed the meeting at 12:00.

Terms of Reference "Performing Carbon Trading: A Multiple-Case Study" Working Group II, TC, AESIEAP

Background

In accordance with the proceedings of the first AESIEAP Technical Committee Executive Team Meeting, three Working Groups (WGs) were formed to undertake the respective studies and project assignments. Taiwan Power Company (Taipower) was nominated as the Chair of the Working Group 2 (WG2), "Environment Issues and Energy Efficiency", and will coordinate WG2 members' efforts to carry out related studies.

Among the four micro-topics proposed to WG2 in the last Technical Committee Executive Team Meeting, micro-topic #1 "Carbon tradingmechanism and structure" was considered by Taipower as the top priority. Climate change is a very serious global environmental issue, and the electricity sector bears the major burden in addressing greenhouse gas (GHG) reduction. Carbon trading is considered an effective economic instrument for reducing GHG emissions, and national as well as regional schemes are emerging worldwide. Because of its characteristics of international trading and cooperation, studying this topic requires lots of ideas and experience exchanges among AESIEAP members. Therefore, it would be a suitable subject of study for an international association like AESIEAP.

Objectives

The study aims to collect information on various projects and mechanisms which power companies or energy-intensive firms in different countries use to seek clean energy finance or meet their emission reduction goals. Such mechanisms include the Clean Development Mechanism (CDM), Joint Implementation (JI), Emissions Trading (ET), Voluntary Carbon Standard (VCS), Gold Standards, etc. Through the exchange of information and experiences, members would learn and get insight into new resolutions and opportunities in climate change issues and the emerging global carbon market.

Roles and Responsibilities

The project will be implemented based on voluntary participation by WG2 members, and other interested AESIEAP members will also be invited to join WG2 and contribute to the study as it progresses. The tasks for the study will be shared as follows:

1. As the Chair of WG2, Taipower will coordinate the efforts to implement the study, including to set up a website, host WG2 meetings, draft study outline,

- compile information provided by members, coordinate analysis and comments, submit progress reports to the TC Executive Team, complete study report, and present the final report to CEPSI.
- 2. Participating members will contribute to the study by taking part in WG2 meetings, submit information in accordance with the study outline, participating in online forum for study discussions, and commenting on study outline and draft report.

Project Implementation

A questionnaire will be distributed to all members of WG2 to survey their intention of joining this study. The questionnaire will also ask the members to indicate the type(s) of mechanism, such as CDM, JI, VCS, ET, which they plan to implement or are implementing for mitigating GHG emission. Then a project outline which describes the requirements will be sent to participating members for them to provide input to be included in the study report. The Chair of WG2 will report to the TC Executive Team on the progress and project deliverables. The participating members of this study shall meet 2 times within the project duration, once in the beginning and the other before the report being finalized. The final project report will be presented at CEPSI in Oct.25-28, 2010. The schedule for completing the study is as follows:

Actions	Date
Develop project proposal, survey questionnaire and report template	2009.4~2009.5
Present project proposal to AESIEAP TC	2009.6
Email all AESIEAP members to invite them to join Working Group 2 and nominate representatives	2009.7
Circulate the proposal, questionnaire and report template	2009.7
Finalize the list of WG2 participants	2009.8.25
Email all WG2 participants invitations to the 1st meeting	2009.8.25
Website online	2009.9.1
1st WG2 meeting	2009.9.24
Submission of proposal and web materials	2009.10.10
CEO conference	2009.10.14-16
Submission of final TOR to the Technical Committee	2010.4.9
Submission of Draft Final Report	2010.8.15
Review and comments on the draft report	2010.9.1
2nd WG2 meeting*	*to be determined
Finalize the report	2010.10.7
Present the report at CEPSI 2010	2010.10.25

Deliverables

The study will produce the following deliverables:

- 1. WG2 website, which will include:
 - (1) background of WG2 and its members,
 - (2) news and events of WG2 and latest international carbon market news,
 - (3) area for members to share documents and information related to the study,
 - (4) knowledge center to disseminate information on the carbon market mechanisms, including links to related reports and websites.
- 2. Report on "Performing Carbon Trading: A Multiple-Case Study", including:
 - (1) Introduction
 - (2) GHG mitigation policies and measures
 - (3) Mitigation project case studies
 - (4) Application of carbon credits
 - (5) Emerging schemes and international linkage
 - (6) Lessons learned and strategic implications
 - (7) Conclusions

<u>Performing Carbon Trading: A Multiple-Case Study</u> Annotated Outline (revised April 8, 2010)

- 1. Introduction
 - **1.1Background** (Climate change and carbon market, AESIEAP, technical committee, WG2, etc.)
 - 1.2Project Objectives and Scope
- **2. GHG Mitigation Policies and Measures** (This section will describe the overall role of the electricity sector in GHG mitigation with input by CRIEPI and EPRI– and then describe various policies and measures taken by members to reduce GHG emissions, including reduction targets, voluntary actions, project-based reductions, etc.)
 - 2.1CLP (Hong Kong)
 - 2.2EGAT (Thailand)
 - 2.3KEPCO (Korea)
 - 2.4Kyushu (Japan)
 - 2.5TNB (Malaysia)
 - 2.6 Taipower (Chinese Taipei)
 - ...other WG2 members to be confirmed
- 3. Mitigation Project Case Studies (This section will provide an overview of the Kyoto Mechanisms and CDM/VCS project development process with input and references by CRIEIPI and EPRI), and then describe in detail a case study of CDM, VCS, or other projects provided by each member. Since the projects are at various stages of development, it should include at least project description, baseline and monitoring methodology, and application process; validation, registration, verification, and credit certification are optional)
 - **3.1Biomass CDM project (CLP)**
 - 3.2Energy Efficiency Light Bulb CDM project (EGAT)
 - **3.3Wind Power CDM project (KEPCO)** to be confirmed
 - 3.4Power Plant Turbine Retrofit CDM project (Kyushu)
 - 3.5Hydroelectric CDM project (TNB)
 - **3.6Solar Power VCS project (Taipower)**
 - ...other WG2 members to be confirmed
- **4. Applications of Carbon Credits** (This section will describe current developments in the carbon market, with specific examples by members who are planning or have completed carbon transactions, either in the voluntary or mandatory market)
 - **4.1Global Carbon Market** (use World Bank, ADB, and EPRI reports as

- reference)
- **4.2Carbon Transactions** (various types of contracts forwards, primary, secondary)
- **4.3Trading Platforms** (bilateral, brokers, auction, exchanges)
- **4.4Case Studies** (examples from members who have completed project-based transactions, e.g., Japan, Korea, etc.)
- 5. Emerging Schemes and International Linkage
 - **5.1Japan** (experiences in the voluntary domestic credit system Kyushu)
 - **5.2Korea** (experiences in the domestic GHG reduction record registry and credit generation (KCERs), and plans for voluntary emissions trading under the new voluntary reduction target with references from KEMCO) to be confirmed
 - **5.3Chinese Taipei** (intensity target and sectoral crediting before a cap-and-trade system, as planned under the draft GHG Reduction Bill)
 - **5.40thers** (Australia, New Zealand, China, India, etc. to be included if other members join the study in the future, or use references from existing studies)
 - 5.5Linkage of Carbon Markets in the Post-2012 World (latest progress from the international negotiation and literature review of the most current studies in the area of international linkage)
 - **5.6Sector-Based Approach for the Electricity Sector** (national sectoral crediting and sectoral benchmark CDM approach)
- **6. Lessons Learned and Strategic Implications** (This section will compile lessons from each member in implementing reduction projects and emissions trading and the implications for their strategies in the current and post-2012 carbon market)
- **7. Conclusions** (including a compilation of quantified reduction efforts by members and the potential emissions reduction of the electricity sector in the Asia-Pacific region; outlook for the global and regional carbon market, with input by CRIEIPI and EPRI)

Study project references identified so far:

- 1. CCAP, "A Bottom-Up Sector-Based Approach to the Post-2012 Climate Change Policy Architecture", June 29, 2008.
- 2. CEPS, "Transnational Sectoral Industry Agreements (TSIA)", June 30, 2008.
- 3. ECN, "Tradable Carbon Allowances: The experience of the EU and lessons learned," November 2009.
- 4. Ecosystem Marketplace & New Carbon Finance, "Building Bridges: State of the Voluntary Carbon Markets 2010", June 14, 2010.
- 5. EPRI, "A Comprehensive Overview of Project-Based Mechanisms to Offset Greenhouse Gas Emissions", December 2007.
- 6. EPRI, "A Comparison of Greenhouse Gas Emissions Offsets Project Development and Approval Processes", June 2010.
- 7. EPRI, "Sectoral and other International Mechanisms Designed to Scale up Offset Supply: An Overview of Key Issues", February 2010.
- 8. International Emissions Trading Association, "State of the CDM 2009: Reforming the Present and Preparing for the Future".
- 9. International Energy Agency, "Sectoral Approaches in Electricity: Building Bridges to a Safe Climate", 2009
- 10.International Energy Agency, "World Energy Outlook 2009", 2009.
- 11.Mark Lazarowicz, "Global Carbon Trading: A framework for reducing emissions", 2009.
- 12. Axel Michaelowa, Benito Muller, et. al., "The Clean Development Mechanism in the Future Climate Change Regime", 31 May 2009.
- 13.UNEP Riso Center, "Electricity sector crediting mechanism based on a power plant emission standard", July 2009.
- 14. World Bank, "State and Trends of the Carbon Market 2010", May 2010.

Working Group II Website: http://aesieap.taipower.com.tw/

