

**Greater Mekong Subregion**  
**Seventh Meeting of the Experts Group on Power Interconnection and Trade (EGP-7)**  
**Chiang Mai, Thailand**  
**29-30 May 2002**

**Summary of Proceedings**

**Introduction**

1. The Seventh Meeting of the Experts Group on Power Interconnection and Trade (EGP-7) was held in Westin Riverside Plaza Hotel, Chiang Mai, Thailand, on 29-30 May 2002. The Meeting was co-organized by the National Energy Policy Office (NEPO) of Thailand, and the Asian Development Bank (ADB).
2. The participants included delegations from Kingdom of Cambodia, the People's Republic of China (PRC), the Lao People's Democratic Republic (Lao PDR), the Kingdom of Thailand, and the Socialist Republic of Viet Nam. Representatives from the ASEAN Secretariat, KfW, Tokyo Electric Power Co. (TEPCO), Swedpower International AB, Vattenfall Group, Japan Bank for International Cooperation (JBIC), JBIC Institute, the Advisory Panel (AP), Norconsult and ADB also attended. The list of participants is attached as Appendix 1.
3. The Meeting's Session II presented and reviewed Norconsult's second Draft Final Report for the Study on the Regional Indicative Master Plan on Power Interconnection in the GMS (the "Master Plan Study"). Session III discussed the establishment of the Regional Power Trade Coordinating Committee (RPTCC), including updates on the Inter-Governmental Agreement on Regional Power Trade (IGA) and the Regional Power Trade Operating Agreement (PTOA).
4. The Agenda and Program of the Meeting is attached as Appendix 2.

**I. Opening Session**

5. Mr. Prutichai Chonglertvanichkul, Assistant Director of EGAT (Thailand) and the Chairman of the EGP, introduced the distinguished guests of the EGP-7 meeting to deliver the opening remarks, namely, Mr. Chavalit Pichalai, Director of Power Division, National Energy Policy Office (NEPO), Thailand, and Mr. Khalid Rahman, Director, Infrastructure Division (MKID), Mekong Department, ADB.
6. Mr. Chavalit warmly welcomed the participants to the Meeting and expressed appreciation to ADB and WB for their continuing support to the GMS Program. He recalled the distinct activities in the past years which favored regional power trade and transmission interconnection in the GMS. These included the Policy Statement on Regional Power Trade, endorsed by GMS Ministers in January 2000, and the IGA, the draft of which was endorsed by EPF-8 in Hanoi last December 2001. He outlined the tasks for the current EGP meeting, such as revisions on the draft final report, and actions required to prepare for the IGA signing in the next GMS Ministers Meeting. He then shared briefly the progress of liberalization of the power sector in Thailand. He said NEPO was reviewing the plan for power sector reform, to be capped by the enforcement of the Energy Industry Act by 2<sup>nd</sup> Q 2003, followed by privatization of EGAT,

MEA and PEA. He hoped that recent setbacks would be overcome so retail competition could be promoted. He hoped the participants take the opportunity to enjoy their stay in Thailand.

7. Mr. Khalid Rahman recalled the activities in the preceding EGP meetings in Kunming (June 2001) and Hanoi (December 2001), namely, the adoption of the IGA and review of the first draft Final Report of the Master Plan Study. He noted the three major tasks of EGP-7, namely: the review of the second draft of the Master Plan; discussion of the guidelines for establishment of the RPTCC; and review of the progress towards the signing of the IGA. He thanked JBIC, Swedpower and Vattenfall for their separate presentations meant to further enlighten the group on arrangements for interconnection of power networks and establishment of the RPTCC. He then briefed on the activities under the GMS Program, such as the adoption of the GMS Program strategy and ten flagship programs, one of which was Regional Power Interconnection and Power Trade Arrangements. He cited the convening of the first-ever GMS Summit of Leaders in Cambodia in November 2002 that would signal political commitment to the GMS Program at the highest levels. He concluded by thanking the Royal Thai Government (particularly NEPO) for the excellent arrangements made for the meeting.

### **Objectives of the Meeting**

8. Mr. Prutchai welcomed the participants and thanked the NEPO and ADB for support in hosting the meeting. He enumerated the activities of the EGP and achievements according to its work plan, and thanked ADB for making possible the aforementioned activities. He outlined the plan for EGP activities after the IGA signing, especially the guidelines for the establishment of the RPTCC and preparation of the PTOA. He enjoined everyone to have a pleasant stay in Chiang Mai.

### **Overview of the Draft Guideline for Establishment of Regional Power Trade Coordination Committee (RPTCC)**

9. Ms. Diane Minogue presented the objective of the RPTCC, which was to develop institutional/ physical infrastructure for successful implementation of power trade in the GMS, considering possible stages of trade. She noted that the guidelines provided broad outline of tasks, structure and procedure for establishment of the RPTCC. She enumerated the RPTCC's primary tasks, which were to oversee and participate in the study of options for the structure of the GMS power market and the drafting of the PTOA. Contents of the draft guidelines, which consisted of initiation/ duration, objectives, functions, membership, decision-making, etc., were presented, along with the institutional framework for drafting the PTOA. Ms. Minogue then gave an overview of the discussion points for the RPTCC (for discussion in day 2), such as representation to the RPTCC, national coordinators, PTOA project manager, working groups, and financing/ other support.

10. Mr. Rahman clarified that the presentation was intended to initiate thinking on the RPTCC process. Mr. Chavalit asked about the use of installed capacity as basis for financial contributions to the Secretariat. Ms. Minogue replied that installed capacity was one of possible equitable measures for determining level of contributions. In response to query of Mr. Hoang Viet Khang (Vie), Ms. Minogue said determination of budget/ financial requirements was one of the first tasks of the RPTCC. Mr. Kim noted that a PTOA project manager was provided so that one person would be in charge of drafting the PTOA from start to finish.

## **II. Draft Final Report: Regional Indicative Master Plan on Power Interconnection in the GMS**

### **Presentation of Overall View of the Study/ Demand Forecasts/ Technical Coordination**

11. Mr. Lars Fosser (Norconsult), team leader, presented an overall view of the Master Plan Study and outlined the sections covered in the review of the draft final report. He then introduced his Norconsult colleagues: Mr. Gerard Doorman, and Mr. Hans Woldstad. He enumerated the milestones in the preparation of the Master Plan study report, leading to the Final Report and emphasised that the recommended Indicative Master Plan was purely based on technical and economical considerations.

12. Mr. Fosser informed that no major changes have been made in the Power Demand Forecast Report since the draft report was presented in Hanoi. He then presented a summary of the energy requirement, the peak load forecast and the potential peak load reduction through interconnection in the GMS region.

13. Changes related to technical coordination were then presented. The recommended maximum frequency deviation allowed in normal operation had been increased to become equal to the most stringent value presently used in GMS countries. Regarding load shedding, the specific setting of 49 Hz as the first step of the load shedding scheme was no longer recommended. Proper adjustments to each national under frequency load shedding scheme should be carefully studied. The need for a defence plan to cope with very severe contingencies was emphasised.

14. Among observations/ comments on the preceding presentation were the following:

- a. Mr. Nguyen Manh Hien (Vie) asked about the basis for national demand forecasts. Mr. Prutichai clarified that consultant used its own model for extending the forecasts beyond the time frame projected by the country.
- b. On Mr. Chavalit's comment about the scenarios used, Mr. Prutichai suggested that the group utilize the scenarios used by the consultant and that in the event that new forecasts arise, updating could be done by the GMS members themselves.
- c. Mr. Yasuhiro Yokosawa briefed on the demand forecast used in the JBIC study.

### **Generation Expansion Scenarios**

15. Mr. Gerard Doorman first gave an overview over the changes from the previous version of the Draft Final Report. The main change was the inclusion of several Extended Cooperation Scenarios instead of only one. There were four scenarios, one limited cooperation and three extended cooperation scenarios. He showed projected peak load reduction derived from interconnection. Mr. Doorman also showed how additional benefits like reduced reserve costs and increased reliability were estimated. He noted changes in generation project development plans (PDPs) such as the reserve margin and gas share in Thailand. Modification of PDPs covered among others, adjustments in export related projects and commissioning dates according to scenarios. He proceeded to highlight the main results of each scenario in terms of installed capacity by source and annual generation. For Scenario 2A, which resembled earlier results presented, the differences included gas share and reserve margin in Thailand. Social/

environmental impacts of some projects were considered through comparisons of their reservoir area and resettlement requirements.

16. For Scenario 2B it was explained how the export projects included in the scenario were selected. The selection included dividing projects into three cost-based groups, the clearly competitive, the possibly competitive, and the clearly uncompetitive. The possibly competitive group was further evaluated. Scenario 2C was done to analyze the effect of Tasang Hpp, which was identified as a low cost large project but was highly uncertain due to lack of data and possible socio-environmental controversies. After summarizing each scenario, a comparison of the scenarios was made with respect to accumulated generation by source, carbon dioxide emissions and gas demand. It was also pointed out how the effect of increased fuel costs and of a less than ideal power exchange cooperation, were analyzed. Finally he gave some conclusions on expected effects of generation expansion scenarios. These included substitution of thermal plants in Thailand and Viet Nam with large/ medium scale hydro from Laos, Yunnan, Myanmar and Cambodia, resulting in substantial savings from thermal generation and carbon dioxide emissions.

17. The comments on the preceding presentation were as follows:

- a. Ms. Minogue asked whether the social analysis included impacts from transmission line development; Mr. Doorman replied this was not likely.
- b. With reference to Mr. Rahman's query, Mr. Doorman confirmed that the study reflected the WB's hydropower study for Lao PDR (done by Lahmeyer International).
- c. Mr. Chavalit asked why Tasang hpp was not included in scenario 2C; Mr. Doorman said that scenario 2A and 2B included Tasang but 2C did not; this was because of lack of data and controversies (i.e. resettlement issues) it faced.
- d. Mr. Hien asked why Viet Nam was net exporter for a period (up to 2013) in the scenarios; Mr. Doorman replied that this was because of low load factor and lower marginal costs of power in Viet Nam at the start of interconnection.
- e. Mr. Chan Sodavath (Cam) asked about consultant's views on the environmental impacts of hydro projects in Cambodia; Mr. Doorman acknowledged this was a controversial issue, which needed more updated and detailed data. He asked about the possibility of interconnection from Lower Sre Pok hydropower station to Pleiku in Viet Nam and to Ban Sok substation in Laos. He also asked about the interconnection from Chau Doc (Vie) to Thailand via Phnom Penh- Battambang in Cambodia. Mr. Doorman and Mr. Hien viewed that the interconnection to Ban Sok substation from Lower Sre Pok was not possible, rather than interconnection to Tan Dinh substation (Vie) via Sambo hydropower in Cambodia. The consultant also said that interconnection between Viet Nam and Thailand from Chau Doc (Vie) via Phnom Penh and Battambang (Cam) would not be feasible due to weak internal system in Cambodia.
- f. Mr. Tun Lean (Cam) asked about exclusion of some Cambodia hydro projects to export to Viet Nam, like Lower Sre Pok 2, and to Thailand, the Stung Metoeuk 2. These were mentioned in an earlier ADB TA as feasible for development. Mr. Doorman said this was because of limited data or analysis revealed the projects were not viable relative to alternatives in Viet Nam.
- g. Mr. Prutichai noted that the scenarios did not take into account, possible peak load reduction related to export from Thailand to Cambodia.

- h. Mr. Yvon Hotte (AP) asked whether selection of generation to be postponed or commissioned earlier when modifying the power development plans (PDPs), was considering the cost of power plant projects; Mr. Doorman said that this was considered in Lao projects.
- i. Mr. Nguyen Duc Lien (AP) noted that more careful examination of social and environmental impacts of Sambor project was necessary, and MRC was planning to carry out a two-phase study on this.
- j. Mr. Pola Singh (ASEAN) asked how renewable energy would fit in the Master Plan picture. Mr. Doorman replied that potential green projects (geothermal, wind) could be explored but not yet considered in the study.
- k. Mr. Kim asked Thailand for its views on the priority sources of power imports. Mr. Chavalit mentioned the various priority power sources from Lao PDR, Yunnan and Myanmar.

### **Transmission Development Scenarios**

18. Mr. Hans Woldstad presented the results of the transmission system planning for the scenarios with and without future interconnections. This was done in relation to the results of the dynamics/ stability studies done by Mr. Fosser. The focus of presentation was on differences in transmission system development plans between scenarios. He outlined the changes in the scenarios from the Hanoi meeting, such as inclusion of more information, locational comparisons of interconnection alternatives, and determination of transmission system costs based on three extended power cooperation scenarios. For such scenarios, transmission lines across borders (interconnections) were required to utilize generation resources in a neighbouring country. The justifications for establishing a sub-regional 500 kV grid were as follows:

- a. reduced generation costs
- b. reduced overall generation requirements due to non-coincident peak loads
- c. economy transfers of energy

19. Transmission line requirements for scenario 1 were presented for each GMS country, and these included planning assumptions. For extended power cooperation, various interconnection possibilities were presented for three scenarios, 2A, 2B, and 2C. Even if some generation projects apparently were somewhat more expensive than thermal candidates these may be developed because they reduce the cost dependency of fuels such as natural gas, coal and oil. Such robustness in power supply required interconnections. Generation scenarios where the most expensive generation projects were abandoned had also been evaluated with respect to transmission cost reductions. This was similarly done for a generation scenario without Tasang hpp. Required voltage control installations were also presented for various scenarios. Substantial differences in transmission system losses between the scenarios were also pointed out, with observed increases in such loss differences upon generation expansion, but with reduction after 2015.

20. Among observations/ comments on the preceding presentation were the following:

- a. Mr. Hien provided updates on the transmission line projects in Viet Nam, particularly Pleiku and Da Nang- Ha Tinh- Hanoi would be completed before 2010. He asked whether there was need to upgrade or change some of the specifications of the lines

- and the power stations. Mr. Fosser assured that the power dynamics/ stability studies supported the recommended design.
- b. Mr. Prutichai expressed concern on the strength of the Thai and Viet economies to warrant transmission development given the timetable presented.
  - c. Mr. Sodavath inquired about the treatment for interconnection projects for Cambodia. Mr. Woldstad said that the problem was that Cambodia itself was not interconnected internally.
  - d. Mr. Prutichai expressed concern about technical problems that could arise from series compensation and whether planning for transmission lines should consider its effects. Mr. Hotte held the view that series compensation need not be a concern at this point, although technical studies should look at its implications later.

### **Economic Comparison of Scenarios**

21. Mr. Doorman first introduced the general methodology of the economic analysis, which included the study period (2005-2020), measurement of costs in terms of present value, discounting to 2001, and use of 12% discount rate. He showed the results of the cost calculations for the four main generation scenarios, explicitly showing the main components (generation investment, fixed O&M, fuel and variable O&M, etc.). It appeared that Scenario 2B had the lowest total generation system costs, US\$ 2,097 million lower than the Limited Power Cooperation Scenario. Mr. Hans Woldstad then presented the transmission cost categories and transmission system cost base. He highlighted the differences in transmission developments and costs and compared transmission costs of extended cooperation scenarios (2A, 2B, and 2C) against scenario 1.

22. Mr. Doorman presented conclusions on the overall economy of Extended Power Cooperation versus Limited Power Cooperation. An economic comparison of the scenarios, including both transmission and generation costs, was given. It appeared that Scenario 2B had the best economic result with savings of more than US\$ 900 million in net present value referred 2001. Also the other cooperation scenarios resulted in considerable savings. In addition came considerable savings in greenhouse gas (GHG) emissions. The reduced grid option in Lao PDR was somewhat cheaper for scenario 2A, but insignificantly more expensive for scenarios 2B and 2C. It appeared that savings were positive also with 10% and 14 % discount rates and with a less ideal operational cooperation between the countries. The results appeared to be robust against increases in interest rates, hydro and transmission investment costs and the coal price in Yunnan. Mr. Doorman finally listed guidelines for selection of power development scenario.

23. Among specific comments were the following:

- a. Mr. Lien asked about the basis for the return to scenario 2A instead of selecting the least cost scenario 2B. Mr. Woldstad said this was determined by actual situation (commercial agreements, generation plants needing transmission) and data limitations. Mr. Rahman said however that decisions should be based on logical framework rather than on the noted limitations.
- b. Mr. Daovong Phonekeo (Lao) observed minimal differences in the scenarios. Mr. Kim inquired about the confidence level in the results of the model, noting that the 1% to 2% differences in the discounted figures had led to inconclusive results. Mr. Doorman said that while there was confidence in the model, there were some questions on the quality of the data.

- c. In response to Mr. Hien's query, Mr. Prutchai explained that series compensation was used to increase transmission capacity and avoid technical problems in long distance power transmission.

## Day 2

### Indicative Master Plan on Power Interconnection

24. Mr. Prutchai gave a preview of the agenda for the second day of the meeting. Mr. Woldstad followed with a summary of the Indicative Master Plan on Power Interconnections comprising ten interconnection projects. He described briefly the time frame, main justification, study level and risks associated with each project belonging to this plan.

25. The meeting generally noted concerns about how realistic the listed projects were. Among observations in this regard were as follows:

- a. Mr. Chanto Milattanapheng (Lao) and Mr. Prutchai briefed the meeting on the progress achieved in the line from Nam Theun 2 to Savannakhet. Mr. Hotte raised the issue on whether decisions should be based on interconnected system requirements, instead of isolated single line connections.
- b. Mr. Hien noted that Viet Nam planned for 230 kV line from Soc Son to midway up to Malutang in 2005; Mr. Woldstad said this would even reduce the cost of the planned line from Malutang to Soc Son. Mr. Yang Xingwang (PRC) clarified Yunnan's plan for interconnection of Malutang with Viet Nam, and Mr. Woldstad asked to be updated on the status of this line. Mr. Hien proposed interconnection between Yunnan and Viet Nam by 500 kV line.
- c. Mr. Lien noted that conduct of the FS on the Malutang- Soc Son line could be done later, since there were still many unknowns. Mr. Woldstad said however, that the Malutang hpp was found to be viable, and it would help to undertake a study comparing viability of 230 kV versus 500 kV line.
- d. Mr. Fosser said the study recommended the least cost solutions, and the meeting should decide on the approach for any suggestion that differed from these. Mr. Hotte said it was too late to modify the study at this stage, but noted that the information that came up should have been inputted in the master plan study much earlier.
- e. Mr. Prutchai provided the status of the plan for interconnection of Nam Theun 2. Mr. Rahman noted however, that a cut-off was needed for the study, considering the dynamism of the sector. The study could then serve as a base line for future projects.
- f. Mr. Daovong noted that scenario 2A-rg may not be realistic given the time frame for development of the generation plants.
- g. Mr. Rahman noted that while the benefits of interconnection could be shared subregion-wide, the benefits at the project level could be initially skewed. The challenge was to flesh out these benefits to determine who pays for the investment.
- h. Mr. Daovong raised concern that the scenario 2A's recommendation for single circuit line (Nam Theun 2- Savannakhet) differed from what was actually planned. Mr. Fosser clarified however that this should not pose a problem since scenario 2B was the most realistic least cost scenario and it provided for the double circuit line that was actually planned.

26. Project Profiles. Mr. Lars Fosser then presented the project profiles for the proposed interconnections, namely:

- a. FS for 500 kV Power Transmission Interconnection between Lao PDR, Thailand and Vietnam; this was the subject of earlier discussions by EGP participants.
- b. FS of Power Transmission Interconnection from Malutang Hydro Power Plant in Yunnan Province of PRC to Vietnam.
- c. FS of Power Transmission Interconnection from possible future Tasang Hydro Power Plant in Myanmar to Thailand.

27. Among comments/ observations on the aforementioned were:

- a. Mr. Hotte asked to be clarified on what the recommended scenario was, since this would affect the make-up of the project profiles.
- b. Mr. Rahman suggested meeting with the Norconsult team during coffee break to decide on the recommended scenario.
- c. Participants from GMS countries agreed that it was appropriate that Scenario 2B be recommended by the consultants in the final report.

#### **Follow Up Actions for Master Plan (Ownership, Release of Information, Feasibility Study)**

28. Mr. Jong-Inn Kim noted the three areas that required follow up actions for the Master Plan. One was on ownership of and commitment to the Master Plan by the GMS countries. He asked for GMS members' views on the relationship of the Master Plan with the national planning process and its updating by the countries. On the second area, he sought EGP members' views on the disclosure of information in the final report. If agreed, he suggested that EGP members undertake translation of the Executive Summary in their respective languages. He asked EGP members their preferred format for the translated document, whether in book form or CD ROM. Lastly, he cited the need to take stock of feasibility studies to prepare projects recommended for implementation. It was noted that some studies have been completed while others were ongoing. He called on EGP members, multilateral and bilateral donors, commercial banks and the private sector, to be more open and coordinated in their studies, and to report such studies to the EGP/ EPF. He noted that the PPTA for the GMS Power Interconnection Project Phase I (Thailand-Lao PDR-Viet Nam) was included in the ADB 2002 pipeline at a cost of \$0.8 million.

29. EGP participants expressed the following concerns:

On Ownership/ Commitment

- a. Mr. Prutichai noted that the GMS countries are helping update the ASEAN Master Plan and would have the capability to update the GMS master plan study. He cited the need however, for software that could handle multi-area optimization.
- b. Mr. Sodavath said the GMS master plan study could affect the composition of projects in the national plan. He was concerned about the non-inclusion of some Cambodia projects due to lack of data.
- c. Mr. Chavalit asked about the role envisioned for the EGP/ RPTCC for master plan updating. Mr. Prutichai said that the role of the RPTCC would be discussed in a later session with Ms. Minogue.
- d. Mr. Daovong said commitment to the master plan could be reinforced with the signing of the IGA.

- e. Mr. Hotte said that the master plan would be useful only if it was used to guide in national planning. Mr. Rahman stressed that the master plan could provide the regional perspective in national power development planning.

On Disclosure of Information

- f. Mr. Khang said inter-ministerial clearance within each GMS country was needed before disclosure of the study.
- g. Mr. Prutchai said the Final Report of the master plan study would be submitted to the GMS Ministerial Meeting.
- h. Mr. Rahman expressed that the public had the right of access to the study, which was done using public funds. He noted however that some sensitive information would require careful review before disclosure.
- i. Mr. Prutchai said that while updating was desired, it should not deter finalization of the study. He cautioned against release of technical information in the master plan, however.
- j. Mr. Tun Lean asked if this indicative Master Plan study overlapped with the GMS cooperation matrix proposed by each GMS member country. Mr. Kim briefed on the GMS Strategic Framework adopted in the last GMS Ministers' Meeting. This Framework included regional power interconnection and trade arrangements as one of the flagship projects.

On Feasibility Studies

- k. Mr. Prutchai noted JBIC's earlier interest in some of the proposed FS.

### **JBIC Study for Regional Cooperation Strategy in Interconnected Power Networks in Indo-China**

30. Mr. Masaya Kawaguchi (JBIC) introduced the captioned study undertaken under JBIC's Special Assistance for Development Policy and Project (SADEP). Mr. Yasuhiro Yokosawa (TEPCO) gave an overview of the presentation, which consisted of five parts. For the first part, he showed the power demand forecast used for the study for Cambodia, Laos, Thailand and Viet Nam. For Part 2, methodology, he explained the functions, input data, usage and results of tools for planning called RETIC and PDPAT II. For Part 3 he presented characteristics of cases, particularly 10 cases examined in 2015 and four of these in 2020. He gave details of results for cases 2 and 5, such as reduction in reserve margin, reduction in annual costs and changes in energy generated. Part 4, financial analysis, investigated benefits of an independent transmission firm, and showed financial returns at various unit fees and life times. In Part 5 recommendation, Mr. Kawaguchi showed results of various optimal economic plans and explained implications of diversity of demand, interconnection with Yunnan, and proposed operating mode and organization. He then discussed the mechanics of wide area coordinated network system in Japan, including power exchanges, calculation of power charges, cost payment and expense sharing.

31. Mr. Prutchai asked for JBIC support for the FS the transmission line Savannakhet- Ban Sok- Pleku. He also asked JBIC to support feasibility studies on hydropower projects in Myanmar and Cambodia.

### **III. Guidelines for Establishment of Regional Power Trade Coordination Committee**

#### **Progress of Signing for Inter-Governmental Agreement on Regional Power Trade in the GMS**

32. Mr. Kim noted that GMS members' response was requested for the signing of the IGA at the next GMS Ministerial Conference. He said the letters to the GMS Ministers were sent on 8 March 2002. Cambodia and Lao PDR had already agreed but the rest of the GMS members had not yet replied. He requested the members to provide the progress in their countries, and to provide the name of signatory, if possible.
33. Comments from the participants were as follows:
- a. Mr. Wu Demin (PRC) said that while several copies of the IGA would be signed, the instrument of ratification or acceptance should be a single copy only.
  - b. Mr. Honorio Vitasa (ASEAN) explained the practice in ASEAN. He said the Instrument of Ratification or Acceptance is deposited with the Secretary-General of ASEAN, who then provides certified true copies to member countries. In line with this, he suggested that the ADB be the depository, with the signatory countries provided certified true copies. Or the signatory countries would be notified that other countries have ratified the IGA.
  - c. Mr. Rahman said this issue would be discussed with the lawyers/ treaty experts at ADB and ADB will inform GMS members of the proper scheme.
  - d. Thailand and Viet Nam indicated it would respond by end of July. Mr. Kim read a statement from Myanmar Ministry of Electric Power regarding status of IGA clearance within Myanmar Government.
  - e. It was agreed that GMS members will inform ADB of their response on the IGA and their signatory by July 2002.

#### **Institutional and Legal Arrangement/ Framework of the Nordic Power Market**

34. Mr. Per-Olof Johansson (Swedpower) gave a brief on Swedpower and introduced Mr. Peter Byding (Vattenfall) to present on the experiences from the Nordic Power Market. Mr. Byding began with the history and background on Nordel. The organization chart of Nordel was presented and its various elements were explained, namely, the main body, the Executive Body, and the two committees, the Planning and Operating Committees. Nordel's methods on chairmanships, decisions, interactions with others, and publications were explained. Mr. Byding listed the benefits derived under Nordel, such as improved use of existing capacity, common technical specifications, improved communications between power companies, etc. He cited the characteristics of Nordel before deregulation, transition experiences, and drivers behind deregulation. Nordic countries chose the TSO model (for transmission owner and system operator in one integrated company) and the role of the TSO was explained. The rationale for deregulation was discussed. The determination of price was explained, and related slides on the spot market, capacity and demand, and price forecasting were shown. Cited among major risks were price risk, currency risk, capacity risk, counterpart risk, etc. He then noted the changes for Vattenfall in terms of financial hedging, new contracts and invoicing systems in response to price fluctuations, and other actions. He concluded by stating Vattenfall's vision to be a global energy partner.

35. Among comments/ observations on the aforementioned were:
- a. Mr. Rahman inquired about TSOs and how it managed reserve capacities. Mr. Johansson clarified that the TSO did not own generating plants, and bought and sold power in the market pool, and the failing party paid the penalty in case of imbalances. There was some discussion whether TSO should make acquisition of one or two gas turbine plants, which the generating company will now phase out.
  - b. Mr. Daovong asked how power tariffs for consumers changed after deregulation. Mr. Byding said tariffs fell, but Mr. Doorman qualified that prices actually varied depending on water supply, but a good feature of the Nordic market was that retail prices followed wholesale prices.
  - c. Mr. Singh noted that GMS countries were concerned whether the households benefited in terms of prices and non-price factors. Mr. Byding said the price trend was downward; another advantage included more efficient use of energy resources. Mr. Doorman noted however that magnitude of price reduction could not be stated.
  - d. Ms. Minogue asked about how transmission pricing was done between countries. Mr. Byding said these were subject of agreements.
  - e. Mr. Rahman asked about method for setting transmission price, and whether this covered return on assets. Mr. Johansson replied that this involved complex method of computing explained in the distributed pamphlet “ The Swedish Electricity Market...” figure 3 page 4.
  - f. Mr. Kim asked how the costs of Nordel operations were shared among the power companies. Mr. Johansson said companies got their share based on how much they generated and transmitted through the TSO for the power undertaking. Mr. Doorman said that congestion pricing in the Nordic market involved complex procedures.
  - g. Mr. Chavalit asked whether there were long term PPAs between investor and user under deregulation. Mr. Byding said these contracts were negotiated away. Regarding the transmission services by the TSO, Mr. Johansson said that the PPA between the Generating Company and the consumers still were in force and that most of the energy was sold through the bilateral PPAs between trading companies and the consumers.

### **Discussion/ Review of Guideline for Establishment of Regional Power Trade Coordination Committee (RPTCC)**

36. Ms. Diane Minogue recalled the overview she gave earlier on the guidelines for establishment of the RPTCC. She asked the EGP members to review the contents of the draft guidelines, and showed a slide on the discussion points for the RPTCC, such as representation to the RPTCC, national coordinator, PTOA project manager, working groups, financing/ other support and other issues raised by GMS members. Discussions/ agreements by EGP participants on each point, to be endorsed to the EPF, were as follows:

- a. On representation, it was agreed that the RPTCC would have three representatives per country (two from EPF); one of the three would be national coordinator who should be from the power utility since decision on power market structure and PTOA would require utility participation.
- b. It was explained the PTOA Project Manager would be needed to drive the process and undertake internal coordination within his/ her country. It was agreed that Project Manager would be selected from among the national coordinators. Selection of

- manager would come after naming of RPTCC members. Administrative support to the Manager would be provided by the utility.
- c. Mr. Vu Van Thai (Vie) suggested that RPTCC set-up Working Groups to study issues and provide inputs possible subjects as needed to achieve its objectives.
  - d. On financing and other support, there were discussions on sharing costs during PTOA drafting process. There was no consensus on this issue and various options were suggested.
  - e. It was suggested to circulate the Draft Guidelines (Appendix 3) for comment with the objective of approval at the next EGP meeting.

### **Discussion for Study on Regional Power Trade Operating Agreement in the GMS**

37. Mr. Jong-Inn Kim presented the objective of the study, which was to assist GMS members in the preparation of the PTOA, taking into account the IGA and desirable forms of power trade. He enumerated the scope of the study, which included among others, reviewing existing agreements/ studies, assessing desirable forms of power trade, recommending institutional framework, and transmission pricing schemes. He then explained the Terms of Reference, which followed from the scope the study. He then mentioned the implementation arrangements for the study's Steering Committee, Project Manager, EGP/ Working Groups, National Coordinator, Advisory Panel, budget (\$0.6 M) and consulting arrangements.

38. Among comments/ observations on the aforementioned were:

- a. Mr. Prutchai noted that it was too soon to discuss the PTOA process since the power market structure was still unknown.
- b. Mr. Thai said however that EGP members should take this opportunity to obtain comments of the Advisory Panel and consultants.
- c. Mr. Chavalit asked about the barriers to the PTOA process. Mr. Kim clarified that a number of issues would need to be addressed before drafting of the PTOA even begins, such as what to do with long-term contracts.
- d. In response to Mr. Syed Zeya Hoda's (AP) query, Ms. Minogue noted that the plan of ADB and WB was to include institutional and regulatory issues in the market options study.
- e. Mr. Daovong asked how the PTOA would affect various power institutions and their operations. Mr. Rahman clarified that this was very much dependent on the market structure that would be defined first. Mr. Hotte added that the meeting should move on the RPTCC first before tackling the PTOA.
- f. Mr. Prutchai clarified that the RPTCC would be created right after the IGA is signed; appointment of the project manager and coordinators could come later. Mr. Thai and Mr. Wu noted that the IGA would take effect only after three or more countries have ratified it, and ratification would take some time, perhaps six months to one year.

### **Next EGP/ EPF Meeting**

39. As agreed in the previous meeting, ADB will contact Myanmar authorities to obtain their formal endorsement on their hosting of the next EGP/ EPF meeting.

#### **IV. Closing Session**

##### **Adoption of EGP-7 Minutes**

40. The EGP members reviewed the draft minutes and after incorporation of suggested changes, the body therefore approved the minutes of the EGP-7 meeting.

##### **Closing Remarks**

41. Mr. Prutichai thanked all parties for their contribution to the meeting. He asked everyone to stay longer and enjoy the sights of Chiang Mai. He wished everyone a pleasant stay in Chiang Mai and a safe return journey.

42. Mr. Rahman noted that the EGP-7 covered a lot of ground in the last two days. He noted these accomplishments, particularly the progress in preparing the IGA for signing and the first steps taken towards establishment of the RPTCC. He thanked the Royal Thai Government and the EGP Chairman, Mr. Prutichai for the success of the EGP-7 meeting.

43. On behalf of NEPO, Mr. Chavalit thanked the participants for their valuable contributions and inputs. He thanked ADB for its continuing support. He hoped the comments made during the meeting would bring the Master Plan to its final version in due course. He said the EGP-7 accomplishments would provide directions to move forward. He hoped the discussions on needed actions and steps would lead to the signing of the IGA at the 11<sup>th</sup> GMS Ministerial Meeting in Cambodia in September 2002.