

**GREATER MEKONG SUBREGION
26th MEETING OF THE REGIONAL POWER TRADE COORDINATION COMMITTEE
(RPTCC-26)
HA NOI, VIET NAM, 26-27 NOVEMBER 2019**

SUMMARY OF PROCEEDINGS

I. Introduction

1. The 26th Meeting of the Regional Power Trade Coordination Committee (RPTCC-26) was held back-to-back with the meetings of the Working Group for Planning and Operation (WGPO)¹ and the Working Group on Regulatory Issues (WGRI), on 25-27 November 2019 in Ha Noi, Viet Nam. The meetings discussed (i) the work done by the WGPO and WGRI, (ii) updated country power sector development information, and (iii) future activities to support cross-border power interconnections and trade in the Greater Mekong Subregion (GMS). Refer to agenda in **Attachment 1**.

2. Viet Nam's Electricity Regulatory Authority in cooperation with the Asian Development Bank (ADB) organized the RPTCC-26 meeting. Members of RPTCC, WGPO, and WGRI from the GMS countries, and representatives of ADB, Agence Française de Développement (AFD), Japan International Cooperation Agency - observer (JICA), and the World Bank (WB) attended the meeting. **Attachment 2** provides the list of participants.

II. Opening Session

3. Ms. Zhang Qian, National Energy Administration, People's Republic of China (PRC), chaired RPTCC-26. Mr. Pham Quang Huy, Deputy Director General, Electricity Regulatory Authority, Viet Nam and Mr. Andrew Jeffries, Director for Energy Division, Southeast Asia Department, ADB both acted as Co-Chair of RPTCC-26. Ms. Zhang and Mr. Jeffries opened the meeting and expressed appreciation to Viet Nam for the excellent meeting arrangements. Mr. Pham Quang Huy warmly welcomed the participants and reiterated RPTCC's objective of fostering strong coordination among GMS countries and establishing a competitive and efficient regional power market. He also reiterated Viet Nam's continued support foster cross border trade in the region. Mr. Jeffries acknowledged the participation and continued support of all GMS delegations and development partners and briefed the participants on the meeting agenda.

4. Ms. Zhang acknowledged the remarkable socio-economic achievements in the GMS, continued growth of energy demand improvements of power supply, as well as challenges in regional power cooperation, i.e., providing adequate and sustainable power supply. Ms. Zhang noted the need for extensive and practical cooperation in electricity trade and grid connection and shared that investments are important not only in infrastructure but also in knowledge and training. China offered to share technology and is confident that efforts in power cooperation will result in gains to all GMS countries.

III. Plenary Meeting

A. GMS Grid Code

5. Ms. Aruna Wanniachchi, Senior Energy Specialist, ADB and Mr. Michel Caubet, ADB Consultant updated the RPTCC on the GMS Grid Code. The presentation included (i) compliance assessment of the GMS Grid Code, (ii) strategy in enforcement of GMS grid code, (iii) work plan for GMS grid codes and operationalization of GMS synchronous areas; (iv) Lao PDR-Myanmar Interconnection; and (v) progress of regional master plan. Ms. Wanniachchi also discussed the comprehensive work plan of the Working Group for Planning and Operation (WGPO).

¹ Formerly called the Working Group on Performance Standards and Grid Codes (WGPG).

1. Gaps Assessment and Implementation Roadmap

6. Ms. Wanniachchi provided the results of the compliance assessment of the draft grid code. The assessment identified (i) institutional-legal gaps, (ii) regulatory gaps, (iii) technical gaps, (iv) pre-requisites for Third-Party Access, and (v) roadmap for bridging the gaps. See **Attachment 3**.

2. Enforcement GMS Grid Code

7. Mr. Michel Caubet, ADB Consultant presented the strategy in enforcement of GMS Grid Code. He emphasized the need (i) for an Inter-Governmental MOU, (ii) to establish a Grid Code Management Body under the Regional Power Coordinating Center (RPCC), (iii) for Grid Code Secretariat and Grid Code Review Panel, and (iv) for regional electricity regulatory authority. Note that only four GMS countries have independent Regulatory Authorities: Cambodia (EAC), China (NEA), Thailand (ERC) and Vietnam (ERAV). The presentation is in **Attachment 4**.

3. Working Group for Planning and Operation: Work Plan for GMS Grid Codes and Operationalization of GMS Synchronous Areas

8. WGPO Tasks 5 to 8 are related to regional synchronous operation and GMS grid code activities. These tasks are as follows: Task 5: establish an implementation roadmap of the regional GMS Grid Codes, Task 6: establish an organization for the operationalization of the GMS synchronous areas, Task 7: establish the design of the regional electrical ITC system (Electronic Highway), and Task 8: establish an ad-hoc Metering Organization and architecture. Related to strategic planning activities are Task 9: provide guidance to establish GMS regional master plan and Task 10: assess new interconnection projects and manage the portfolio.

Discussion on Grid Code

- Countries appreciated the work on GMS grid code. Thailand shared that the work on the national grid code is progressing but taking some time to complete
- Viet Nam reiterated that they already advised ADB to move this forward, emphasized (i) the need to identify overlaps/issues compared with national grid code; (ii) the importance of enforcement and in view of very critical content prior to implementation; (iii) the review of the structure of the power sector, including the review of legal framework and existing grid code of countries to ensure consistency.
- Lao PDR also recognize that implementation will take a long time, requiring technical knowledge to meet the requirements.
- Considering individual country situations, PRC suggested conducting further research on which gaps to be filled prior to interconnection.
- Viet Nam also agreed to establish a regional authority to enforce the grid code but requires further discussion. PRC likewise raised concern on RPCC enforcement function which is not included in the inter-government MOU which is suggested to be revised.
- On Thailand's clarification on the membership of task force, ADB shared that this, along with activities to bridge to bridge that gap, will be further discussed.

B. Pre-Feasibility Studies of Regional Projects: Myanmar – Lao PDR Interconnection

9. Mr. Philippe Lienhart, ADB Consultant, introduced the work of EDF and briefed RPTCC on the Lao PDR – Myanmar Interconnection, specifically, (i) project scope and organization, (ii) interim report on cross border line feasibility study, (iii) system studies, and (iv) recommendations for synchronizing Lao PDR and Myanmar systems. Refer to **Attachment 5** for the presentation.

Discussion

- The study team appreciated the assistance of countries and Manitoba in providing data and pointed out that more information will be provided in 2020.
- On the need to assess systems study, the team will further discuss with the government. Myanmar suggested to work closely with counterparts from both countries.
- ADB concurred that there is a need to agree on minimum requirement and complementarity before synchronizing.
- The study which began in September 2019 is expected to be completed in March 2020.

C. GMS Regional Master Plan Study: Interim Results

10. Manitoba Consultants gave an update on the GMS regional master plan project which aims to perform studies to develop a regional generation and transmission master plan for the GMS region. Mr. Dharshana Muthumuni discussed the study methodology as well as the model and regional generation planning scenarios identified for the period 2022 to 2035. Selected results and key study outcomes were presented including the aggressive cross-border power trade scenario, with \$27 billion total cost benefit vs. reduced variable renewable energy (VRE) cost scenario, with only \$20 billion total cost benefit; and optimized generation developments, indicating various interconnections. The study will be finalized considering feedback of countries and final detailed analysis. See **Attachment 6** for the presentation.

Discussion

- Viet Nam recognized the importance of the masterplan for long term planning. In this regard, Viet Nam was requested to provide more data, including calculations of solar energy which is a good potential for development.
- Other issues raised include feasibility of the system and enhancing stability with respect to cost.
- On PRC's clarification to hold further consultation before finalizing the document, ADB indicated that both the grid code and master plan are living documents and will consider country comments prior to finalization.

D. Updates on Various Initiatives

1. RETA 9003: Update on Integrated Resource Planning with SEA and Extended Scope for Clean Energy Development in the GMS

11. Ms. Hyunjung Lee, Senior Energy Economist, ADB presented the progress of the activities under TA 9003 since RPTCC-25 held in March 2019 such as (i) knowledge product on Transforming Power Development Planning through Integrating Strategic Environment Assessment (SEA) into Power Development Planning in the GMS region; (ii) a twinning workshop on SEAs in Power Sector Planning in Phnom Penh, with Viet Nam in October 2019; (iii) GMS Energy Efficiency Workshop in Bangkok, Thailand in November 2019. ADB also presented the new scope of TA 9003 for renewable energy and energy efficiency development in the GMS. Possible business models/financing mechanisms were presented, specifically, models on (i) public direct financing through municipalities, (ii) public and private partnership, (iii) public direct financing through a national utility, (iv) public indirect financing with financial intermediary, and (v) energy conservation fund financing. **Attachment 7** provides the details of the presentation.

Discussion

- Lao PDR requested ADB recommend a study or tool to provide total life cycle assessment of energy source, including quantity of CO2 emission that can be reduced at the end of solar project; other chemical waste to be reduced; and if solar power will actually reduce CO2 emission and help environment.
- On emission reduction impact, ADB shared that grid emission factor calculation will be a good source to determine emission, environment and social impact. Furthermore, ADB shared there

are various factors to consider CO2 emission calculation, e.g., level of technology, data on total life cycle, etc. which at the moment is not being done.

- Thailand further raised concern on building of power plants which also has an impact on natural resources, environment, and community.
- ADB reiterated the importance of conducting SEA before a project is decided and awarded to developer.

2. ADB Support to GMS Energy Sector Cooperation: Lessons Learned and Considerations for Future Priorities

12. Mr. Bui, ADB discussed ADB support to GMS power cooperation. Since 2014, ADB supported GMS power cooperation through two regional technical assistance projects: (i) TA8830-REG: Harmonizing the GMS Power Systems to Facilitate Regional Power Trade and (ii) TA9003-REG: Integrated Resource Planning with Strategic Environmental Assessment for Sustainable Power Sector Development in the GMS. Based on a high-level limited survey, the six countries are generally in good agreement on cooperation effectiveness. While achievements of objectives have been mixed, feedback from participants demonstrates a strong commitment and goodwill for the ongoing cooperation from all countries and highlighted opportunities that exist to improve the impact of the cooperation and respond to changing energy sector dynamics in the subregion. **Attachment 8** provides the details of the presentation.

3. Lao PDR Master Plan & Highlights of Myanmar Master Plan

13. JICA briefed the RPTCC on the study on Power Network System Master Plan in Lao PDR. The study which commenced in September 2017 comprised work on (i) stage 1: power trade expansion scenario, (ii) stage 2: power network system development plan, and (iii) stage 3: GMS interregional power trade, including issues and countermeasures regarding grid code, revision of optimal power generation plan of GMS, and proposal of cooperation projects. Future interconnections proposed are (i) expansion from “Generation to System” to “System to System” to improve economic efficiency and power supply reliability, and (ii) “System to System” make it possible to realize GMS power trade with fully utilizing the power generation of Laos in future. The presentation is in **Attachment 9**.

Discussion

- PRC inquired on Lao PDR’s status of surplus power, hydropower mix, and optimization solutions for exporting hydro energy. It was pointed out that Lao PDR export power during dry season given the growing demand for power supply. In terms of hydropower, if supply in the future will exceed power demands and considering domestic use, Lao will both export power and import power from neighboring countries.
- Lao PDR emphasized that the study not final and still requires approval and should be harmonized with the power development plan which is still currently being prepared.

4. Regional Investment Framework (RIF) 2022 Monitoring and Progress

14. Mr. Anthony Robert Gill, ADB, briefed the meeting on the draft GMS Long Term Strategic Framework 2030 (GMS 2030). He described the rationale, key elements of GMS-2030: its vision for a “more integrated, prosperous, sustainable, and equitable subregion”; its mission statement that buildings on the 3Cs of connectivity, competitiveness, and community while embracing environmental sustainability and resilience, internal and external integration, and inclusivity; innovative cross-cutting approaches; strategic pillars, institutional arrangements, and planning and monitoring process. He also briefed the meeting on the Second Progress Report and Update of RIF 2022, highlighting energy sector investment and technical assistance projects. The presentation is in **Attachment 10**. During the discussion PRC inquired on the details of 3 projects without financing.

E. Update of GMS Countries Power System Development, Cooperation, and Trade

15. GMS countries provided updates of their power system development, on-going efforts in power grid interconnection, power trade with neighboring countries, and future development of power sector. The presentation indicated continued growth of electricity demand across the region; increasing generation capacity, reduction in power losses, priority on developing renewable energy resources; and enhanced power cooperation with neighboring countries through memorandums of understanding (MOUs) signed among the countries. To advance renewable energy efforts, Thailand suggested to look into inter-regional renewable energy forecast for GMS for renewable energy purposes, especially for wind and solar farms, while Viet Nam emphasized promotion of investment and grid interactivity of smaller-scale renewable installations. Country presentations are in **Attachment 11**.

16. Key points discussed in the country presentations are summarized below:

Cambodia

- Cambodia confirmed the signing of power purchase agreement (PPA) 500MW between Electricite Du Cambodge (EDC) & Electricite Du Laos (EDL) in September 2019. The timeline for implementation is early 2020; initially, there will be one cross border interconnection and another one will be added eventually.
- The timeline for implementation of PPA 600MW between EDC and TSBP Sekong Power and Mineral Company Limited is early 2024 while the PPA 1,800 MW between EDC and Xekong Thermal Power Plant Company Limited will be in 2020 for the first unit.

PRC

- China Sothern Grid (CSG) clarified that the four key projects identified are proposed projects and are in the planning stage; with a long-term goal of both export and import. CSG also informed the meeting that these proposed projects were discussed with countries involved.

Myanmar

- ADB appreciated Myanmar's effort to utilize the work of the RPTCC and served as input in preparing the national grid code.
- Myanmar further explained the power purchase agreement status of new initiatives for renewable energy indicating the completion of phase 1 (Nabuai and Wantwin) and on-going for succeeding phases; but cannot share the power purchase pricing.
- On the query on subsidy to solar energy, Myanmar shared that the government subsidizes solar energy, but they have to assess the situation to determine the extent of future support.

Thailand

- Thailand shared that they are starting a forecast center to forecast the electricity generated from renewable energy (RE) for generation planning and power system control. The generating company needs to forecast first and learn by themselves. Initially, there is no need to set forecast; subsequently, forecast is needed in view of data requirements for the grid code.
- The details of renewable energy regulations are still being discussed as the power structure will change.
- Thailand also discussed the battery storage initiative including criteria in selecting pilot projects through bidding as well as an initiative on residential rooftop solar power.
- The target for solar energy under PDP 2018 is 12 GW. However, discussion on modification of target under the Community Power Plant is still on-going.

Lao PDR

- On the power demand forecast, Lao further explained the links of different systems and agreed to isolate/dedicate the load area to connect with CSG. Further, Lao has separate systems to meet PPA/domestic requirements.
- Lao has separate systems to meet power purchase agreements and or domestic requirements.
- On connecting the four regions of Lao PDR with higher voltage level, some sectors connect to 230 kv but has to delay plans to have 500 kv as the backbone given the huge budget requirements.
- Given the low demand in the domestic market, focus is on export market.
- Lao PDR confirmed that Lao system is already synchronized with Thailand and Lao PDR exports 600 MW to Thailand.

F. Summary of WGPO and WGRI and Brainstorming on RPTCC workplan

1. Summary of WGRI

17. Mr. Duy-Thanh Bui, ADB took stock of the completed regulatory work. He noted that many building blocks are now in place to enable trading to develop in the GMS but needs to identify the missing blocks if trading is going to expand. Mr. Bui discussed the key themes of country knowledge sharing and the possible next steps to conclude WGRI work. Members of WGRI recommended to undertake a pilot study of grid to grid trading involving three countries. In the process, there is a need to apply the principles and methodology already developed, identify methodology gaps and work closely with WGPO to implement third party access and related regulations to facilitate grid-to-grid trade. The presentation is in **Attachment 12.1**.

Discussion

- PRC further shared that bilateral negotiation are on-going, continue to pursue exchange of information, and requested ADB to make recommendations in choosing the countries.
- Mr. Bui explained that the masterplan is close to finalization which will provide more information to start the three-country interconnection.
- Ms. Wanniachchi (WGPO) noted that various scenarios and business cases have been developed over the years and suggested to WGRI to move forward, identify specific tasks to be done, pick real case scenario, and proceed with the work.

2. Summary of WGPO

18. Ms. Aruna Wanniachchi, ADB summed up the work of WGPO comprising (i) compliance assessment of the GMS Grid Code, (ii) the strategy for grid code enforcement, (iii) the GMS regional master plan, (iv) pre-feasibility studies of Lao-Myanmar interconnection, and (v) the WGPO work plan to continue the activities until a regional coordination body is established. Refer to **Attachment 12.2**

Discussion

- Countries acknowledged Mr. Caubet's advise and contribution to WGPO's work but raised concern on the possible replacement and requested for assistance during the transition period.
- In relation to data requirements, Viet Nam offered to provide data but requested countries to send official letter of request.
- ADB acknowledged valid concerns on the expertise and allotted time.

3. Brainstorming on RPTCC Workplan

19. Mr. Bui facilitated the session with the objective of improving energy supply security through cross-power trade while optimizing use of sub regional energy resources. To achieve this, he suggested new ideas and approaches and enjoined RPTCC to undertake self-assessment of the approaches and plan ahead in preparing further studies and activities.

20. Summary of discussion and recommendations are as follows:

- (i) The WGPO has a clear work plan with milestones set for 2020 – 2021 so this work plan to be implemented;
- (ii) Through the working groups, it is recommended that for future implementation, there is a need to agree first on the objectives and the approach and methodology to accomplish this follows;
- (iii) Start with 3-country pilot study; applying code principles which may result to a real project; mobilize support to bridge the gap; and set criteria for the interconnection;
- (iv) Countries expressed strongly, the need to drive coordination work by revitalizing the establishment of RPCC to coordinate regional power trade with synchronous area. It was suggested to update MOU in view of the concern for individual ministers who will sign the MOU. ADB alerted that GMS Ministers are not energy ministers and they may not have the authority to decide on energy related issues, thus countries need to explore on how GMS ministers can facilitate and move this forward;
- (v) Undertake capacity building and knowledge sharing;
- (vi) WGPO and WGRI should start working together on cross cutting issues of both groups.

21. ADB is encouraged and appreciated countries' willingness to conduct 3 country pilot. The next step is to prepare work plan and explore resources/prepare regional technical assistance to support the activities.

IV. Final Session

1. Other Business matters

22. To continue the tradition of hosting and chairing RPTCC meeting, it was tentatively agreed that the next RPTCC meeting will be convened in six months to be hosted by Cambodia. Between December and mid-2020, the two working groups (WGPO and WGRI) will meet to carry on work the work program. PRC will continue to chair the two meetings.

2. Closing Session

23. ADB expressed appreciation to the countries, development partners: ADF, DFAT, JICA as observer for their participation and appreciated the comments/suggestion in moving the agenda forward. The Chair closed the meeting which covered important issues and informative presentation and appreciated the active participation of countries and Viet Nam as host.

Attachments

1. Agenda
2. List of Participants
3. GMS Grid Codes: Gaps Assessment and Implementation Roadmap
4. GMS Grid Code: Enforcement GMS Grid Code
GMS Grid Code: WGPO-Work plan for GMS Grid Codes and Operationalization of GMS Synchronous Areas
5. Pre-Feasibility Studies of Regional Projects: Myanmar-Lao PDR Interconnection
6. GMS Regional Master Plan Study: Interim Results
7. RETA 9003: Update on Integrated Resource Planning with SEA and Extended Scope for Clean Energy Development in the GMS
8. ADB Support to GMS Energy Sector Cooperation: Lessons Learned and Considerations for Future Priorities
9. Lao PDR Master Plan & Highlights of Myanmar Master Plan
10. Regional Investment Framework (RIF) 2022 Monitoring and Progress
11. Country Presentation
 - 11.1 Cambodia
 - 11.2 Lao PDR
 - 11.3 Myanmar
 - 11.4 People's Republic of China
 - 11.5 Thailand
 - 11.6 Viet Nam
12. Summary of WGPO and WGRI and Brainstorming on RPTCC workplan
 - 12.1 Summary of WGRI Meeting
 - 12.2 Summary of WGPO Meeting