

ASEAN POWER GRID PROGRAM

Regional



Concept Note | 06 Jan 2022

This Project aims to contribute to the enhanced ambition of Association of Southeast Asian Nations (ASEAN) regarding its energy transition objectives, renewable energy integration in the grid, and reduction of coal and fossil fuels in the region's energy systems. The Project will generate important knowledge products and presentation material to enhance the confidence of the political decision-makers and the decision-making institutions in the energy sector decarbonization most importantly via establishing a viable, flexible, and digitized transmission network where renewable energy supply can be channeled to support the regional demand.

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[Annex 1: Background information to the ASEAN Power Grid Program](#)

[Annex 2: ASEAN Power Grid Roadmap Terms of Reference \(TOR\)](#)

I. INTRODUCTION

1. The Southeast Asia Energy Transition Partnership (ETP) brings together governments and philanthropies to work with partner countries in the region - to contribute to the achievement of the UN's Sustainable Development Goals (SDGs) and the Paris Climate Agreement objectives. ETP supports the transition towards modern energy systems that can simultaneously ensure economic growth, energy security, and environmental sustainability. ETP's strategy is built around four inter-related pillars of strategic engagement that are squarely aligned to address the barriers to energy transition. These are (i) policy alignment with climate commitments, (ii) de-risking energy efficiency and renewable energy investments, (iii) extending smart grids, and (iv) expanding knowledge and awareness building. See www.energytransitionpartnership.org for more about ETP.

II. PROJECT DETAILS

A. Rationale and Objectives

2. The rationale for the APG Program (APGP) is derived from the limited coordination and stop-and-go-progress in the past and current progress to implement the integrated power network. Implementation of APG has a significant potential to generate demand for and supply of renewable energy to meet the region's energy demand. APGP aims to enable an integration of the Southeast Asian energy demand and considerably increase renewable energy resources in the Region's energy supply for these rapidly growing economies to enhance confidence in RE and reduce fossil fuel sources in power production to meet the rising demand. Ensuring consistency between renewable energy development and moving towards a clean energy mix, on the one hand and the development of operationalization of the APG is central to the rationale for the APGP. This requires a comprehensive and aligned policy framework between jurisdictions. Additional background information to the APG is in [Annex 1](#).
3. ETP and its Aligned Program, Clean Affordable Secure Energy (CASE), the the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the United States Agency for International Development (USAID) are embarking on a collaboration to reinforce the ASEAN Center (ACE) for Energy to implement the APG to foster progress from its current study stage to implementation. The Project aims to contribute to the enhanced ambition of the ASEAN regarding its energy transition objectives, renewable energy integration in the grid, and reduction of coal and fossil fuels in the region's energy systems. The Project will generate important knowledge products and presentation material to enhance the confidence of the political decision-makers and the decision-making institutions in the

energy sector decarbonization most importantly via establishing a viable, flexible, and digitized transmission network where renewable energy supply can be channeled to support the regional demand.

B. Expected Outputs

4. The expected outputs of the Project are:
 - a. **Output 1. Coordination** of the APG process to reach the implementation stage to ensure timely and progressive decision-making on all issues emerging from the plans and processes. CASE will provide coordination and advisory services to reinforce ACE and HAPUA to ensure systematic, progressive, structured and results-oriented facilitation, including in documenting and facilitating decision-making, troubleshooting, course-correcting support to ensure that the Roadmap for APG is implemented keeping with its time-bound progress. Output 1 will be financially and technically supported by CASE.
 - b. **Output 2. Roadmap.** A concrete roadmap to foster a systematic stepwise progression of the APG from the current study to implementation stage. The roadmap will provide a coherent, central coordinating tool for stakeholders and the coordinating agencies to drive progress to implementation by 2025 along the various plans, ranging from technical and analytical inputs to political agreements for APG implementation. The road map will identify financing needs for the pending studies and pilot projects, investments, and a comprehensive financial framework for dialogue and coordination with public and private sources of funding. Terms of reference for the roadmap can be found in [Annex 2](#). Output 2 will be supported by ETP.
 - c. **Output 3. Analytical work** on economic, financial, technical, environmental, social, institutional, and governance arrangements for implementation of the APG implemented in 3 parts, structured under sub-components and reflecting key requirements for establishing multilateral power trade in ASEAN¹. Output 3 will be supported by ETP and will include:
 - i. Focus 1: Minimum Requirements for Multilateral Market Development that include a review and analysis of (a) ASEAN Interconnectivity Status, (b) Existing AMS Structure of electricity markets and develop Options for Multilateral Market Development, (c) the existing AMS multilateral power trade (including Lao-Thailand-Malaysia-Singapore Power Integration Project

¹ Detailed description of Output 3: Analytical works should refer to the AIMS III Phase 3 TOR, as approved by HAPUA at the Kick-Off Meeting on 18 April 2022.

and Brunei-Indonesia-Malaysia-Philippines Power Integration Project) and other international examples, (d) Institutional Market Model Design, (e) the political requirements.

- ii. Focus 2: Regulatory Framework that will develop (a) a charter for a multilateral AMS regulatory body (AMSRB)² and (b) a general methodology for ASEAN-wide Integrated Resource and Resilience Planning (IRRP) by accounting the management system for the increase in VRE deployment.
- iii. Focus 3: Grid Code and Technical Standards that will set up (a) Grid Code recommendations and (b) strategy to establish ASEAN Multilateral Power Trade.³ The Grid Code recommendations will be coordinated with the related work of other donors, particularly the grid codes developed under the Asian Development Bank - the Greater Mekong Subregion (GMS) initiative.⁴

d. **Output 4. Implementation of the Multilateral Power Trade Pilot Project** to foster concrete steps toward implementation of APG. Activities related to the Output 4 will be carefully coordinated with other donors' relevant work, particularly that under the USAID Smart Power Program. The components, to be confirmed in consultation with HAPUA, are envisaged to include:

- i. Intergovernmental agreement among Member Countries and other AMS, to expand the power trade to other neighboring countries.
- ii. Institutional arrangements under a new version of a Working Group and Technical Task Forces, involving the new joining parties.
- iii. A Technical Task Force Study and recommendation of technical, commercial, legal and tariff aspects, on how the new power interconnection project will be implemented.

² The AMSRB would establish rules for issues such as open access to the transmission system, allocation of costs for transmission enabling multilateral markets, standard contract requirements, setting just and reasonable rates to recover relevant costs, dispute resolution mechanisms, and other issues delegated to it by AMS.

³ Strategy to establish ASEAN Multilateral Power Trade based on interconnection prioritization and the harmonized Technical Standard for system and market operation (RTO/ISO non-discriminatory service mechanism), Ex-post congestion management strategy, Ex-ante congestion management strategy (Physical Transmission Rights (PTRs) and Financial Transmission Rights (FTR), Harmonised wheeling charge methodology, Information Disclosure, Interconnector capacity calculation methodology (based on the resulted interconnection development resulted from four scenarios of the AIMS III Phase 2), and Ancillary Service Market Design.

⁴ GMS Regional Code: Governance Code, Connection Code, Operational Security Code, Operational Planning and Scheduling Code, Load Frequency Control and Reserves Code, Emergency and Restoration Code, Market Code, Metering Code, Operational Training Code. Accessible via:
<https://greatermekong.org/greater-mekong-subregion-regional-grid-code>

- iv. Identification of key areas of a pilot power interconnection project such as draft Energy Purchase and Wheeling Agreement (EPWA), Interconnection Operation Manual, and Pricing.
- v. Securing the approval and agreement of the EPWA and other key areas by each country involved.
- vi. Development of an implementation plan, including a plan for securing funding for new infrastructure (as necessary), construction, commissioning and start of electricity transfer for new power trade.

C. IMPLEMENTATION ARRANGEMENTS AND TIMELINE

A. Consulting Services

- 5. ETP Secretariat will develop terms of reference for each assignment and engage consultant services to implement these assignments using the UNOPS procurement guidelines. These assignments will begin with the component 2, or preparation of the roadmap and the financing framework, and then proceed to the analytical studies and progressively to the Implementation of the Multilateral Power Trade Pilot Project.
- 6. Decision making milestones will be identified in the roadmap as milestone events in the context of the ASEAN political entities' regular meetings. These decision-making events will be supported by the analytical work under program as well as by donor coordination through the APGP and with the support of CASE services that will reinforce the ACE. Under each technical assignment, a Monitoring and Evaluation Framework will be updated and monitored for results-based delivery of the assignment and attainment of the objectives.

7. RESULTS-BASED MONITORING FRAMEWORK AND RISKS

A. Results-Based Monitoring Framework

- The outputs of the two projects will be monitored using the framework in Table 1. All reports will update the achievement of the indicators.

Table 1. Results and Monitoring Matrix of P1 and P2

| ETP Results | Project Output(s) | Indicator | Target | Data Source and Means of Verification |
|--|---|---|--|---|
| Impact: Increased integration of Renewable Energy (RE) in Southeast Asia and reduced fossil fuel sources in power production. | | | | |
| Long-Term Outcome: Implementation and enhancement of the ASEAN target of 25% RE in the Region's Energy Mix. . | | | | |
| Intermediate Outcome 1. Strengthened RE and EE policy enabling environment | | | | |
| Short-Term Outcome 1.1 National RE and EE policies, regulations, standards, and energy plans reflect a clear commitment to Energy Transition agenda and integrated into sectoral plans to contribute to the achievement of Paris Agreement | Signed Multi-country trading agreement (s) | Indicator 1: number of agreements signed | Target 1: Progress made toward the 16 bilateral trading agreements required under ASEAN AIMS III program and the implementation of the ASEAN Power Grid (APG), a Renewables Energy dominated integrated power system | Asean Secretariat |
| Intermediate Outcome 2. De-risking Investments to Renewable Energy | | | | |
| Short-Term Outcome 2.2 De-risked project finance is accessible via financial institutions generating a pipeline of large-scale RE/EE projects | Increased investment and deployment of RE in the Region from the baseline of 13.94% in TPES in the ASEAN region | Indicator 2.1: USD investments under ASEAN AIMS III APG Indicator 2.2: RE of 25% in Total Primary Energy Supply (TPES) in the ASEAN Region | Target 2.1: Tracked Target 2.2: Tracked percentage increase in ASEAN share of RE in TPES from 13.94% | Asean Secretariat ACE records IEA Annual Report |
| Intermediate Outcome 3: De-Risking Investments for Renewable Energy | | | | |

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|--|---|--|--|--|
| <p>Short-Term Outcome 3: Extending Smart Grids National energy strategy and sectoral plans involve evidence-based planning for an improved national-smart-grid system along with related infrastructure and innovative technologies</p> | <p>Roadmap implementation of ASEAN Power Grid from study to implementation stage - AIMS intentional document</p> | <p>Indicator 3.1: 1 Roadmap and financing framework</p> <p>Indicator 3.2: 1 Results matrix of APG implementation progress</p> | <p>Target 3.1: 1</p> <p>Target 3.2: 1</p> | <p>Project Documents Asean Secretariat ACE Reporting Hapua decisions Project Reports</p> |
| | <p>Completion of pending analytical work on ASEAN Power Grid</p> <p>A completed AIMS III Phase 3 study accepted by HAPUA and endorsed by the ASEAN Energy Ministers</p> | <p>Indicator 3.3:</p> <p>(i) minimum requirements for multilateral market development</p> <p>(ii) regulatory framework</p> <p>(iii) harmonized grid code and technical standards</p> | <p>Target 3.3:</p> <p>(i) 1 Report on analytical study on designing and implementing fully operational bilateral and multilateral power trading.</p> <p>(ii) 1 harmonized regulatory framework standard</p> <p>(iii) 1 harmonized grid code and technical standards document</p> | |
| | <p>Implementation of the Multilateral Power Trade Pilot Project</p> | <p>Indicator 3.4:</p> <p>(i) The Multilateral Power Trade Agreement for the expansion of LTMS-PIP among other interconnection of AMS:</p> <p>(ii) Task force study on technical, commercial, legal and tariff</p> <p>(iii) Draft Energy Purchase and Wheeling Agreement (EPWA), Interconnection Operation Manual, and Pricing</p> <p>(iv) Approval for EPWA</p> <p>(v) Investment financing framework and plan</p> | <p>Target 3.4:</p> <p>(i) 1 multilateral agreement</p> <p>(ii) 1 task force report</p> <p>(iii) 1 draft EPWA, 1 interconnection operation manual and 1 pricing reference manual</p> <p>(iv) 1 approval decision</p> <p>(v) 1 plan</p> | |

