# Technical Assistance Concept Paper

Project Number: 55124-001
Knowledge and Support Technical Assistance (KSTA)
April 2021

# Accelerating the Clean Energy Transition in Southeast Asia

Asian Development Bank

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# KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE AT A GLANCE

**1. Basic Data** — **Project Number:** 55124-001

| | | | |
|---|---|---|---|
| **Project Name** | Accelerating the Clean Energy Transition in Southeast Asia | **Department/Division** | SERD/SEEN |
| **Nature of Activity** | Capacity Development, Policy Advice | **Executing Agency** | Asian Development Bank |
| **Modality** | Regular | | |
| **Country** | REG (CAM, INO, PHI, THA, VIE) | | |

| **2. Sector** | **Subsector(s)** | **ADB Financing ($ million)** |
|---|---|---|
| ✓ Energy | Energy sector development and institutional reform | 2.25 |
| | **Total** | **2.25** |

**3. Operational Priorities**

- ✓ Addressing remaining poverty and reducing inequalities
- ✓ Accelerating progress in gender equality
- ✓ Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability
- ✓ Strengthening governance and institutional capacity
- ✓ Fostering regional cooperation and integration

**Climate Change Information**

| | |
|---|---|
| GHG Reductions (tons per annum) | 0.000 |
| Climate Change impact on the Project | Medium |
| **ADB Financing** | |
| Adaptation ($ million) | 0.00 |
| Mitigation ($ million) | 2.25 |
| **Cofinancing** | |
| Adaptation ($ million) | 0.00 |
| Mitigation ($ million) | 1.80 |

**Sustainable Development Goals**

SDG 1.5, 1.b
SDG 5.b
SDG 7.a
SDG 13.a
SDG 16.8

**Gender Equity and Mainstreaming**

Some gender elements (SGE) ✓

**Poverty Targeting**

General Intervention on Poverty ✓

**4. Risk Categorization** Complex

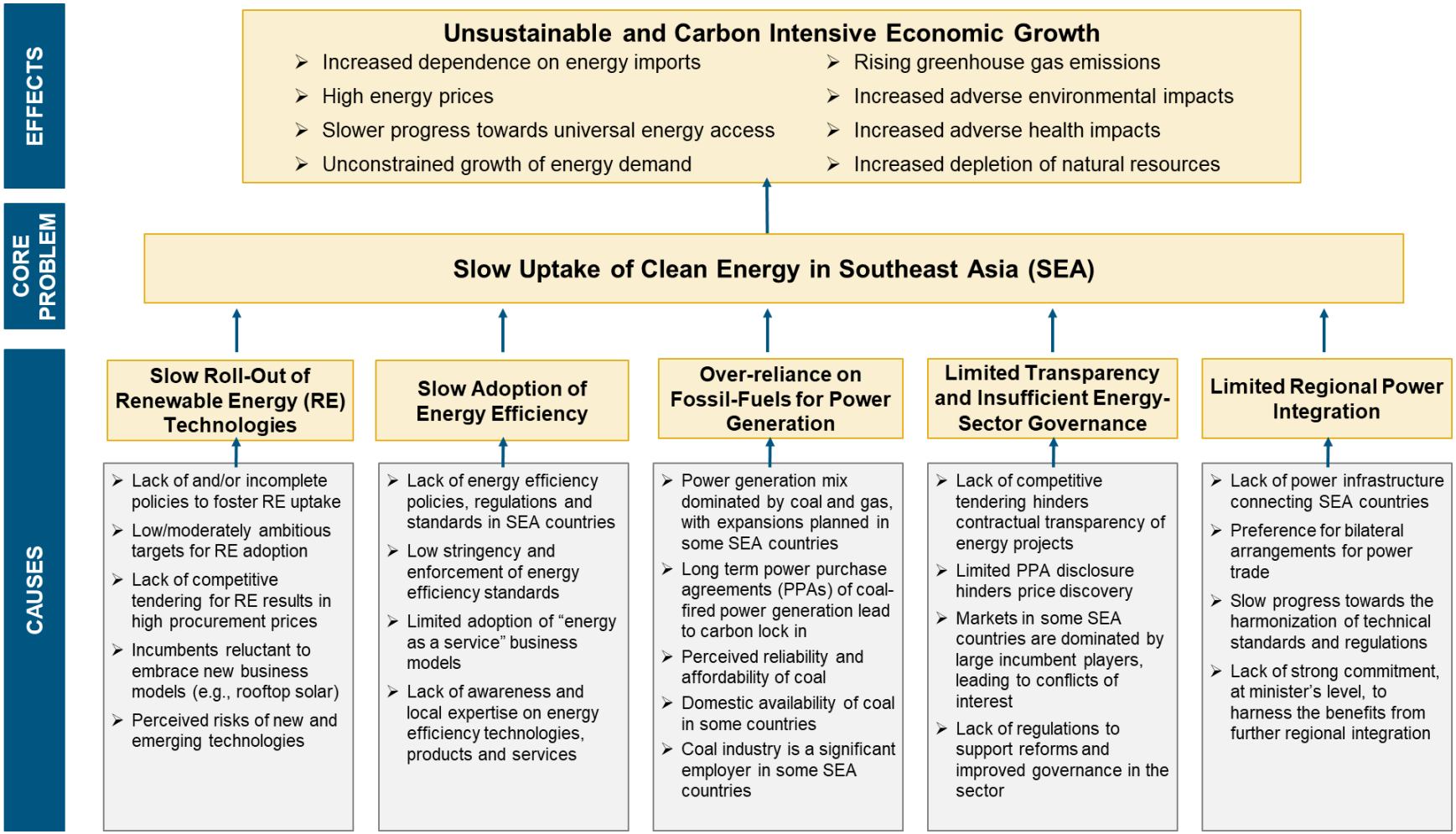
**5. Safeguard Categorization** Safeguard Policy Statement does not apply

**6. Financing**

| Modality and Sources | Amount ($ million) |
|---|---|
| **ADB** | **2.25** |
| Knowledge and Support technical assistance: Technical Assistance Special Fund | 2.25 |
| **Cofinancing** | **1.80** |
| Clean Energy Fund under the Clean Energy Financing Partnership Facility (Full ADB Administration) | 1.00 |
| Spanish Cooperation Fund for Technical Assistance (Full ADB Administration) | 0.30 |
| Strategic Climate Fund (Full ADB Administration) | 0.50 |
| **Counterpart** | **0.00** |
| None | 0.00 |
| **Total** | **4.05** |

**Currency of ADB Financing:** US Dollar

## PROBLEM ANALYSIS DIAGRAM



# I. KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE

1. The knowledge and support technical assistance (TA) will support the countries of Southeast Asia (SEA) to transition to a cleaner energy future. While this transition is already underway in some countries, the pace of the transformation needs to be accelerated across the region to avert a development path inconsistent with the goals of the Paris Agreement. This transition needs to be just and inclusive,[1] ensuring affordable, reliable, and equitable access to energy services. The proposed TA will assist SEA countries with a comprehensive package of solutions that will include: (i) the preparation of sectoral and country-specific assessments; (ii) the development of new business models, feasibility reports, and other technical studies; (iii) the conduct of workshops and policy dialogues; and (iv) the development of project investment pipelines to be financed by the Asian Development Bank (ADB) and other development partners.

2. The proposed TA is well aligned with ADB's Strategy 2030 and will support several of its operational priorities.[2] By assisting SEA countries to develop clean energy solutions in an affordable manner, the TA will contribute to a wider access to energy services, thereby reducing inequalities, including gender-based ones. A transition to cleaner forms of energy will also support SEA countries to tackle climate change by reducing their greenhouse gas (GHG) emissions. In addition, activities implemented under the TA will enhance energy sector governance and transparency, foster opportunities for power system integration within the Association of Southeast Asian Nations (ASEAN), and support South-South knowledge transfer. Overall, the TA will strongly support sustainable development goal (SDG)1 (poverty alleviation), SDG5 (gender equality and women empowerment), SDG7 (affordable and cleaner energy), SDG13 (climate action), and SDG16 (stronger institutions). The TA is included in the 2021 workplan for the Southeast Asia Department.

## A. Rationale

3. **Clean energy progress in Southeast Asia.** Energy demand in SEA has been growing at a rapid pace, driven by robust economic growth, demographic expansion, and increased urbanization. While the ongoing coronavirus disease (COVID-19) pandemic has lowered energy demand, a rebound is expected in 2023–2025.[3] Traditionally, SEA has been reliant on fossil fuels, with coal consumption more than doubling in the last decade.[4] The rapidly increasing energy demand is also a challenge to the long-term ambition of keeping regional GHG emissions on a trajectory consistent with the goals of the Paris Agreement. To address these challenges, there is the need to accelerate the transition to cleaner forms of energy, which is a move towards lower carbon, less polluting, and less environmentally impactful models for energy generation, distribution, and utilization. This transition will be well aligned with the green recovery programs implemented by governments in an effort to rebound from the COVID-19 crisis, as the development of clean energy infrastructure has been shown to result in a larger proportion of local jobs and higher local economic benefits. Women would also be among the main beneficiaries of a just and equitable transition to a clean energy future.[5]

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[1] ADB has also made a commitment to Just Transition in a High Level MDB Statement.
[2] ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila.
[3] International Energy Agency (IEA). 2020. *World Energy Outlook 2020*. Paris.
[4] IEA. 2020. *Coal 2020: Analysis and forecasts to 2025*. Paris.
[5] A study by the International Renewable Energy Agency (IRENA) found that women represent 32% of the renewable energy workforce, which compares with a 22% share in the oil and gas industry. IRENA. 2019. *Renewable Energy: A Gender Perspective*. Abu Dhabi.

4. Clean energy has begun to make inroads in SEA. In 2019, for the first time, more renewable energy projects than coal projects reached final investment decision in the region.[6] More recently, deployment of new renewable capacity has accelerated in some countries at an unprecedented scale. In Viet Nam, utility-scale grid-connected solar photovoltaic capacity increased from only 260 megawatts (MW) in April 2019 to 5,053 MW in July 2020.[7] Similarly, Cambodia launched its first open reverse auction for new solar photovoltaic capacity in 2019. The region is also quickly embracing new technologies, including offshore wind power (Viet Nam), floating solar (Indonesia), and utility-scale battery storage (Thailand).

5. Some countries in the region have also indicated tentative measures to either scale back their coal generation expansion plans, cancel projects, or retire old plants. Viet Nam is revising its power development plan to accommodate more renewable capacity in lieu of coal. In October 2020, the Philippines announced a moratorium on new coal power plants.[8] The deployment of new technologies, with attendant disruptions, has also manifested itself in new business models, new entrants, and efforts by already-established players to re-invent themselves. When it comes to serving remote areas and small islands across the region, decentralized renewable energy systems in combination with storage may offer cost-effective solutions in the near-term.

6. **Challenges to the cleaner energy transition**. Notwithstanding these encouraging signs, more needs to be done to accelerate the transition towards cleaner energy in SEA. Several persistent challenges need to be addressed and at scale, including policy, regulatory, and institutional capacity constraints. In some countries, development is hampered by low tariffs, while in others they are stalled due to the perceived threat of new technologies to the traditional business models of power utilities and the high risks and uncertainties associated with certain emerging technologies. Another challenge is that power systems in the region have been developed based on a traditional centralized model, with limited regional interconnection of power grids, leaving them unable to accommodate variable renewable energy (VRE) at a large-scale.

7. Energy efficiency remains largely untapped in the region (footnote 6). Progress has been hampered by a lack of energy efficiency policies and regulations and energy performance standards seldom following global best practices. Further progress is hindered by a lack of awareness and local expertise on energy efficiency, which is reflected in the slow adoption of "energy as a service" business models and the reluctance of national banks to finance energy efficiency projects. Countries in the region could also benefit from further cooperation at the regional level, for instance in the harmonization of minimum energy performance standards.

8. The power generation mix of most SEA countries is dominated by fossil fuels, namely coal and natural gas. Despite the scaling back of project development pipelines, coal-fired power generation still features prominently in the power development plans of some SEA countries. On its latest power development plan, Viet Nam is planning 17 gigawatts (GW) of new coal capacity by 2030, whereas in 2019 Cambodia signed agreements for importing up to 2.4 GW of power generated from coal in Lao People's Democratic Republic.[9] Existing and planned coal-fired power projects have an adverse impact on the environment and health of populations and are major contributors to GHG emissions.[10] On the other hand, coal-fired generation is generally perceived as a well-proven, reliable, and affordable technology. In addition, coal is widely available, and the

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[6] IEA. 2019. *Southeast Asia Energy Outlook 2019*. Paris.
[7] Lantau Group. 2020. *ADB Assessment, Strategy and Roadmap for Viet Nam (18 October 2020)*. Unpublished.
[8] IHS Markit. 2020. *Philippines announces moratorium on new coal-fired power*.
[9] Phnom Penh Post. 2019. *Cambodian-Lao coal power deal an environmental worry*.
[10] In 2018, an estimated 450,000 deaths in Southeast Asia are attributed to air pollution. National Bureau of Asian Research. 2020. *Powering Southeast Asia: Meeting the Region's Electricity Needs*.

industry is a significant contributor to the economy in some SEA countries.[11] Therefore, the phasing out of coal needs to consider broader socioeconomic impacts within the context of a just transition in impacted countries.

9. For more than two decades, SEA countries have been exploring opportunities for enhancing regional power interconnections and power trading through various platforms, including the ASEAN Power Grid initiative and the Greater Mekong Subregion Regional Power Trade Coordination Committee (GMS-RPTCC). Notwithstanding these efforts, regional power trade still accounts for a marginal proportion of the total power consumed in the region and the multiple benefits of regional power trade and cooperation could be further leveraged.[12]

10. Cross-cutting the issues above, the development of cost-effective energy infrastructure in several SEA countries has been hindered by inadequate sector governance and transparency. This is reflected in the limited public disclosure of the terms and conditions of power purchase agreements (PPAs), owing to the region's preference for negotiated bilateral agreements rather than reverse auctions. This has led to information asymmetry, conflicts of interest, high transaction costs, noncompetitive pricing, and often poor quality of service.

11. The long-term aim of reaching net-zero emissions requires a profound transformation in terms of how energy is produced and used. The power sector has been at the forefront of this transformation,[13] benefiting from the significant drop in renewable energy costs, particularly wind and solar. Transport and heavy industry sectors where fossil fuels are more difficult to replace as cost effectively will take longer to decarbonize. In these sectors, the clean energy transition will hinge, firstly, on the increased electrification of transport[14] and, in the mid- to long-term, on the use of alternative fuels such as hydrogen produced from renewable electricity (green hydrogen) in industrial processes.[15] A cleaner power sector will thus be a key enabler of this transition.

12. **Role of Asian Development Bank and value addition**. ADB has been a key development partner supporting SEA countries in the transition to a cleaner energy future through a combination of TA, policy dialogue, transaction advisory services, and financing of first-mover projects and investments. For example, ADB has been financing the private sector across SEA to invest in the first set of renewables and renewables plus storage projects, electric vehicles, and battery charging infrastructure. In the public sector, ADB provided transaction advisory support for the first utility-scale reverse auction in Cambodia – which led to the lowest power purchase tariff for a solar project in SEA – and has spurred similar efforts across the region. ADB has also been a key proponent of regional power trade and interconnections, through its support of technical studies and policy dialogue, and financing for certain keystone projects under the auspices of the GMS-RPTCC. While ADB has supported improved governance in the sector as well as energy efficiency investments, these are two areas where more needs to be done.[16]

13. ADB is well-positioned to continue driving the clean energy transition in the SEA, and this dovetails effectively with its ongoing effort to support its developing member countries (DMCs) to design and deliver green recovery programs in response to the COVID-19 pandemic. The TA will

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[11] See, for example: Reuters. 2020. *Miners welcome Indonesia's new jobs bill that could spur coal growth*.
[12] IEA. 2019. *Establishing Multilateral Power Trade in ASEAN*. Paris.
[13] IEA. 2020. *Power Systems in Transition – Challenges and Opportunities Ahead for Electricity Security*. Paris.
[14] World Economic Forum. 2018. *The electrification of transport could transform our future – if we are prepared for it*.
[15] Noussan, M. et al. *The Role of Green and Blue Hydrogen in the Energy Transition – A Technological and Geopolitical Perspective*. Sustainability 2021 (13).
[16] ADB. 2020. *Sector-wide Evaluation (August 2020): ADB Energy Policy and Program, 2009–2019*. Manila.

build on the outcomes of TA 9003-REG[17] and other country-specific activities that have been piloting clean energy technologies and business models. Furthermore, it will complement efforts organized under ADB's ASSURE program.[18] Opportunities for synergies under a one ADB umbrella will be keenly explored, especially with the ASEAN Catalytic Green Finance Facility, the Office of Public-Private Partnership, and a regional knowledge and support TA proposed by the Private Sector Operations Department.[19] In addition, given the importance of improving access to knowledge and information to increase capacities of DMCs on clean energy, a plan will be prepared to disseminate to a wider audience all knowledge products completed under the proposed TA.

## B. Proposed Solutions

14. The TA will be aligned with the following impact: accelerated transition to cleaner forms of energy in Southeast Asia (footnote 2).[20] The outcome of the TA will be enabling conditions for the clean energy transition created and enhanced.[21] The TA will have five outputs, as follows:

15. **Output 1**: **Opportunities for public and private sector investments in new renewable energy capacity increased.** The TA will support SEA countries to overcome barriers to the uptake of renewable energies, including: (i) VRE (solar and wind), (ii) waste-to-energy, (iii) flexible generation/dispatch technologies (e.g. battery storage, hydropower), (iv) emerging technologies and services (e.g. offshore wind power, floating solar, electrical mobility), and (v) markets for innovative ancillary services.[22] The TA will assess opportunities for integrating these technologies and services across multiple sectors, especially in urban settings, and for raising capital through green financing options. To this end, the TA will support the preparation of technical and sectoral studies,[23] design and conduct of large-scale reverse auctions, and de-risk and mobilize private sector capital for these investments, including through the use of green and climate finance.

16. **Output 2: Opportunities for energy efficiency improvements through public and private investments developed.** The TA resources will improve energy efficiency in buildings, appliances, and the industrial sector. It will draw on experiences from Cambodia and Indonesia. In Cambodia ADB is currently supporting the development of key enabling policies and the scoping of a public investment program. In Indonesia ADB is assessing the market for energy service companies. The TA will support the drafting and enactment of policies, regulations and standards on energy efficiency; the design of public procurement programs for more efficient appliances; and the development of new projects and business opportunities centered on "energy as a service" for the digital economy.

17. **Output 3: Mechanism for accelerating the phase out of coal and other fossil fuel-based generation assets established.** The TA will support: (i) the design of a funding mechanism to support the early retirement of coal and other fossil-fuel based generation assets, and (ii) develop a fund or facility to develop clean energy infrastructure. This work will build on the

[17] ADB. 2015. *Technical Assistance for Integrated Resource Planning with Strategic Environmental Assessment for Sustainable Power Sector Development in the Greater Mekong Subregion.* Manila.
[18] The ASSURE (ASEAN Scaling UP Renewables + Storage) initiative is an ADB program that aims to deploy renewables and storage on a large-scale through the catalyzation of green finance from public and private sources.
[19] The proposed knowledge and support TA is titled "Developing Private Sector Next-Generation Renewable Energy Opportunities in Southeast Asia (REG)" and was circulated for interdepartmental review and comments on 10 March 2021.
[20] United Nations. 2015. *The Paris Agreement*. New York.
[21] The preliminary design and monitoring framework is in Appendix 1.
[22] These include grid stability services such as voltage control, frequency reserve, inertial response, etc.
[23] Topics of studies will include a gender perspective and may focus on women's participation in renewables.

results and recommendations of an ADB-funded pre-feasibility study, currently underway, on the viability of setting-up a carbon reduction facility. Activities will include the development of country-specific plans for coal asset retirement with comprehensive analysis on the associated economic and social benefits, establishment of the funding mechanism, and setup of the implementation rules and procedures of the fund/facility.[24]

18. **Output 4: Energy sector governance and transparency in Southeast Asia enhanced.** Increasing shares of VRE, decentralized power generation, and technological innovation present new challenges to energy sector public institutions in SEA. Enhancing energy sector governance and transparency will allow them to manage these challenges more efficiently. A priority area is the need to increase disclosure of electricity contracts, especially of fossil fuel-based power generation assets. The TA will build on the outcomes of an ongoing ADB-funded study that is assessing the benefits of PPA disclosure by working with selected SEA countries in the adoption of best practices. The TA will also support additional sector reforms in coordination with other ongoing TA activities in SEA.

19. **Output 5: Regional power grid integration in Southeast Asia enhanced.** The TA will support two major activities under this output. First, it will enable ADB to continue serving as the Secretariat of the GMS-RPTCC and build a stronger link with similar activities undertaken at the ASEAN level under the ASEAN Power Grid initiative. In this role, ADB will continue supporting discussions on power trade, facilitate the establishment of multilateral agreements, and support the preparation of technical studies and pilot projects.[25] Second, the TA will leverage these regional cooperation platforms to fully realize opportunities for regional cooperation related to outputs 1–4.

## C. Indicative Technical Assistance Budget and Financing Sources

20. The proposed TA budget is $4.05 million, of which (i) $2.25 million will be financed on a grant basis by ADB's Technical Assistance Special Fund ($0.25 million TASF 7 and $2.00 million TASF-others), (ii) $1.0 million will be financed on a grant basis by the Clean Energy Financing Partnership Facility and administered by ADB,[26] (iii) $0.5 million will be financed on a grant basis by the Strategic Climate Fund and administered by ADB,[27] and (iv) $0.3 million will be financed on a grant basis by the Spanish Cooperation Fund for Technical Assistance and administered by ADB.[28] The entire financing volume of the TA will qualify as climate mitigation finance.

## D. Implementation Arrangements

21. The TA will be implemented over a period of 36 months, from June 2021 to June 2024. ADB will be the executing agency. The Southeast Asia Energy Division (SEEN) will be the implementing agency in collaboration with GMS-RPTCC and energy ministries of SEA countries. During implementation, ADB will work closely with DMCs of the region to identify specific needs and priority issues that are aligned with the scope of the TA. It is estimated that a total of 330

[24] SEA countries with high shares of electricity generated from coal are the most likely candidates for activities. The output will also explore opportunities for the retirement of carbon intensive fuels from the power generation mix, namely diesel and heavy fuel oil.

[25] Technical studies and pilots to be conducted from a gender perspective.

[26] This is a potential funding source, subject to endorsement of the Clean Energy Working Group and approval of the Climate Change Steering Committee.

[27] Total cofinancing amount is $500,000, which includes a grant component of $476,190 and ADB administration fees of $23,810.

[28] The grants from the Strategic Climate Fund and the Spanish Cooperation Fund for Technical will be allocated for work in Thailand on energy efficiency.

person-months (130 international and 200 national) of individual consultants' inputs is required. A consulting firm may also be recruited using quality- and cost-based selection (90:10). Resource persons will be engaged, as needed, to support TA activities and outputs. ADB will engage the consultants and carry out procurement following the ADB Procurement Policy (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions. The indicative implementation arrangements are summarized in Table 1.

**Table 1: Indicative Implementation Arrangements**

| Aspects | Arrangements | | |
|---|---|---|---|
| Indicative implementation period | June 2021–June 2024 | | |
| Executing agency | ADB | | |
| Implementing agencies | SEEN in collaboration with RPTCC and energy ministries of SEA countries | | |
| Consultants | Package title | Selection method | Engaged by |
| | Firms | Quality- and cost-based selection | ADB |
| | International Consultants | ICS | ADB |
| | National Consultants | ICS | ADB |
| | Resource Persons | ICS | ADB |
| Disbursement | The TA resources will be disbursed following ADB's *Technical Assistance Disbursement Handbook* (2020, as amended from time to time). | | |

ADB = Asian Development Bank, ICS = individual consulting services, RPTCC = Regional Power Trade Coordination Committee, SEA = Southeast Asia, SEEN = Southeast Asia Energy Division, TA = technical assistance.
Source: Asian Development Bank.

## II. DELIBERATIVE AND DECISION-MAKING ITEMS

### A. Risk Categorization

22. Following para. 11 of the staff instructions on business processes for knowledge and support TA, the TA is categorized *complex* as ADB financing exceeds $1.5 million.

### B. Scope of Due Diligence

23. The need for and scope of the TA was discussed at the GMS-RPTCC meetings, the Energy Transition Council meetings being held in advance of the upcoming Conference of Parties 26, and as part of SEEN's bilateral consultations with governments of SEA countries. The following items will be prepared and appended to the ensuing TA paper: (i) detailed implementation arrangements and budget; and (ii) detailed terms of reference of consultants.

### C. Processing Schedule

24. The processing schedule by milestone is in Table 2.

**Table 2: Processing Schedule by Milestone**

| Milestones | Expected Completion Date |
|---|---|
| 1. Technical assistance (TA) concept paper approved | April/May 2021 |
| 2. Fact-finding completed | May 2021 |
| 3. TA approved | June 2021 |
| 4. TA agreement signed | August 2021 |

Source: Asian Development Bank.

**PRELIMINARY DESIGN AND MONITORING FRAMEWORK**

| **Impact the TA is Aligned with**<br>Transition to cleaner forms of energy in Southeast Asia achieved[a] | | | |
|---|---|---|---|
| **Results Chain** | **Performance Indicators** | **Data Sources and Reporting Mechanisms** | **Risks and Critical Assumptions** |
| **Outcome**<br>Enabling conditions for clean energy transition are created and enhanced | **By June 2024**:<br>a. ADB-enabled public and private investments in clean energy increased to at least $600 million per year (2021 baseline: $300 million)<br>(OP 1.2, OP 1.3, OP 3.1, OP 6.1, OP 7.1)<br><br>b. Total clean energy investments in SEA increased by at least 100% (2019 baseline: $15 billion[b])<br>(OP 1.2, OP 1.3, OP 3.1, OP 6.1, OP 7.1)<br><br>c. At least two new gender-sensitive and socially inclusive energy sector policies and strategies supported (2021 baseline: 0)<br>(OP 2.1) | a. Progress reports; COBPs<br><br>b. IEA report, IRENA report, Bloomberg New Energy Finance, or other similar energy sector publication<br><br>c. Progress reports | R: Political and macroeconomic instability, including debt and protracted recovery from the COVID-19 pandemic<br><br>R: Shift of SEA countries' priorities away from clean energy |
| **Outputs**<br>1. Opportunities for public and private sector investments in new renewable energy capacity increased | **By June 2024**:<br>1a. At least two resource assessments on wind and solar conducted (2021 baseline: 0)<br><br>1b. At least three pre-feasibility studies on wind or solar conducted, with gender assessments included in all studies (2021 baseline: 0)<br><br>1c. At least one utility-scale reverse auction conducted (2021 baseline: 0)<br>(OP 3.1)<br><br>1d. At least three gender-responsive and inclusive studies on regional best practices, guidelines, and lessons learned prepared (2021 baseline: 0)<br>(OP 2.1)<br><br>1e. At least 30% of the participants in the training program on renewable energy technologies, systems integration | 1a.–1e. Progress reports | R: SEA countries' commitment to clean energy transition weakened<br><br>R: Overcapacity in power generation mix<br><br>R: Inability to introduce major changes to power development plans already developed |

| Results Chain | Performance Indicators | Data Sources and Reporting Mechanisms | Risks and Critical Assumptions |
|---|---|---|---|
| | and/or innovative business models conducted in a SEA country (with at least 30% of invitees consisting of women) report improved understanding/ knowledge of the topics (2021 baseline: 0).<br>(OP 2.1, OP 3.1) | | |
| 2. Opportunities for energy efficiency improvements through public and private investments developed | 2a. Development of at least three policy documents, regulations, and standards on energy efficiency in SEA countries (2021 baseline: 0)<br>(OP 3.1)<br><br>2b. At least one public procurement process for energy efficient equipment organized in one SEA country (2021 baseline: 0)<br>(OP 3.1)<br><br>2c. Development of at least one investment pipeline for energy efficiency projects and business models centered on energy as a service in SEA (2021 baseline: 0)<br>(OP 3.1) | 2a.–2c. Progress reports | R: Long lead times in issuing policies, regulations, and standards due to extensive consultation processes and/or lack of capacities of related ministries in the evaluation of technical documents<br><br>R: Resistance to change of incumbent players may delay the adoption of new business models |
| 3. Mechanism for accelerating the phase out of coal and other fossil fuel-based generation assets established. | 3a. A gender-responsive and inclusive plan for coal asset retirement prepared for at least one country (2021 baseline: 0)<br><br>3b. Rules and procedures for the fund/facility to support retirement of coal assets and the transition to clean energy infrastructure prepared (2021 baseline: 0)<br><br>3c. At least $500 million in seed funding mobilized to establish the fund/facility (2021 baseline: 0)<br>(OP 3.1) | 3a.–3b. Progress reports | R: Insufficient political support to significantly shift away from coal |
| 4. Energy sector governance and transparency in Southeast Asia enhanced | 4a. Guidelines on PPA terms disclosure prepared based on regional and global best practices and presented in high-level regional forum (2021 baseline: 0)<br>(OP 6.1) | 4a.–4b. Progress reports | R: Reluctance to disclose PPA terms due to legal and confidentiality issues |

| Results Chain | Performance Indicators | Data Sources and Reporting Mechanisms | Risks and Critical Assumptions |
|---|---|---|---|
| | 4b. Best practice guidelines on PPA terms disclosure adopted in at least one SEA country (2021 baseline: 0)<br>(OP 6.1) | | R: Lack of political will to enhance energy sector governance |
| 5. Regional power grid integration in Southeast Asia enhanced | 5a. At least two GMS-RPTCC meetings held per year, with at least 30% of the invitees consisting of women (2021 baseline: 0)<br>(OP 7.1)<br><br>5b. At least two technical studies on matters related to power trade in GMS conducted (2021 baseline:0)<br>(OP 7.2)<br><br>5c. At least one annual high-level meeting on regional power trade issues organized, involving ASEAN governance bodies, with at least 30% of the invitees consisting of women (2021 baseline:0)<br>(OP 7.1)<br><br>5d. At least one technical study on regional harmonization of standards or procedures (e.g., on energy efficiency) conducted (2021 baseline:0)<br>(OP 7.2)<br><br>5e. Regional project pipeline developed (2021 baseline:0)<br><br>5f. At least 30% of the participants in the training program on regional power grid integration conducted (with at least 30% of the invitees consisting of women) report improved understanding/ knowledge of the topics (2021 baseline: 0).<br>(OP 7.1) | 5a.–5f. Progress reports | R: Lack of political will and leadership to enhance regional cooperation on power trade |

**Key Activities with Milestones**

**1. Opportunities for public and private sector investments in new renewable energy capacity increased**

1.1 Finalize first renewable energy resource assessment in a SEA country to be designated (Q3 2022)
1.2 Finalize second renewable energy resource assessment in a SEA country to be designated (Q3 2023)
1.3 Finalize first country-specific pre-feasibility study in renewable energy (wind or solar) (Q4 2022)
1.4 Finalize second country-specific pre-feasibility study in renewable energy (wind or solar) (Q2 2023)
1.5 Finalize third country-specific pre-feasibility study in renewable energy (wind or solar) in a SEA country to be designated (Q2 2024)
1.6 Conduct utility-scale reverse auction for renewable energy capacity in a SEA country to be designated (Q3 2023)
1.7 Finalize first study on regional best practices, guidelines, and/or lessons learned (Q1 2022)
1.8 Finalize second study on regional best practices, guidelines, and/or lessons learned (Q1 2023)
1.9 Finalize third study on regional best practices, guidelines, and/or lessons learned (Q1 2024)
1.10 Conduct training program on renewable energy technologies, systems integration and/or innovative business models (Q4 2023)

**2. Opportunities for energy efficiency improvements through public and private investments developed**

2.1 Organize public procurement process for energy efficient equipment in selected SEA countries (Q3 2023)
2.2 Enact policies, regulations, and standards on energy efficiency in selected SEA countries (Q1 2024)
2.3 Prepare investment pipeline for energy efficiency projects and business models centered on energy as a service in selected SEA countries (Q1 2024)

**3. Mechanism for accelerating the phase out of coal and other fossil fuel-based generation assets established**

3.1 Perform analysis of coal power generation fleet in relation to power sector development plans in several countries to determine potential for a significant share of retirement (Q2 2022)
3.2 Estimate cost and value to retire a share of coal fleet and shift to clean power production (Q2 2022)
3.3 Seek endorsement for country-specific plans for coal asset retirement by several SEA governments (Q2 2023)
3.4 Consult with financial experts and develop rules and procedures of fund/facility to support retirement of coal assets and clean energy infrastructure deployment, including considerations for the just transition of impacted populations (Q3 2022)
3.5 Market to both public and private funders to seek $250 million in seed funding to operationalize the fund/facility (Q3 2023)
3.6 Develop scale-up plans to extend fund/facility beyond SEA countries with potential private and public sector partners (Q1 2024)

**4. Energy sector governance and transparency in Southeast Asia enhanced**

4.1 Develop PPA terms and guidelines for disclosure based on best practice in other regions (Q2 2022)
4.2 Present PPA disclosure guidelines in high-level regional forum (Q3 2022)
4.3 Conduct senior management and expert level discussions and capacity building for adoption of PPA disclosure terms by governments (Q1 2024)

**5. Regional power grid integration in Southeast Asia enhanced**

5.1 Conduct RPTCC meetings biannually (first by Q2 2021, last by Q2 2024)
5.2 Finalize first technical study on power trade in the GMS (Q4 2022)
5.3 Finalize second technical study on matters related to power trade in the GMS (Q2 2024)
5.4 Organize first annual high-level meeting on regional power trade issues involving ASEAN governance bodies (Q4 2022)
5.5 Organize second annual high-level meeting on regional power trade issues, involving ASEAN governance bodies (Q4 2023)

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|---|
| 5.6 Conduct technical study on regional harmonization of standards and procedures (e.g., on energy efficiency) (Q4 2022)<br>5.7 Finalize regional project pipeline (Q1 2024)<br>5.8 Organize one ministerial meeting on regional power grid integration either at the GMS or ASEAN level (Q4 2023)<br>5.9 Conduct training program on regional power grid integration (Q4 2023) |
| **Inputs**<br>ADB: $2,250,000 (TASF 7: $250,000; TASF-others: $2,000,000)<br>Clean Energy Financing Partnership Facility: $1,000,000[c]<br>Strategic Climate Fund: $500,000[d]<br>Spanish Cooperation Fund for Technical Assistance: $300,000 |

ADB = Asian Development Bank, ASEAN = Association of Southeast Asian Nations, COBP = country operations business plan, COVID-19 = coronavirus disease, GMS = Greater Mekong Subregion, IEA = International Energy Agency, IRENA = International Renewable Energy Agency, PPA = power purchase agreement, Q = quarter, R = risk, RPTCC = Regional Power Trade Coordination Committee, SEA = Southeast Asia, TA = technical assistance, TASF = Technical Assistance Special Fund.

[a] ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila; United Nations. 2015. *The Paris Agreement*. New York.

[b] IEA. 2020. *World Energy Investment 2020*. Paris. The baseline pertains to approximate figures for renewable energy investments. 2019 is the earliest year for which data is available.

[c] The Clean Energy Financing Partnership Facility is a potential funding source, subject to endorsement of the Clean Energy Working Group and approval of the Climate Change Steering Committee.

[d] Total cofinancing amount is $500,000, which includes a grant component of $476,190 and ADB administration fees of $23,810.

Source: Asian Development Bank.

# TERMS OF REFERENCE FOR CONSULTANTS

## A. Background

1. **Clean energy progress in Southeast Asia.** Energy demand in Southeast Asia (SEA) has been growing at a rapid pace, driven by robust economic growth, demographic expansion, and increased urbanization. While the ongoing coronavirus disease pandemic has lowered demand in recent months, it is expected that post-pandemic energy demand will regain its prior trajectory between 2023 and 2025.[1] The rapidly increasing energy demand is also a challenge to the long-term ambition of keeping greenhouse gas emissions in a trajectory consistent with the goals of the Paris Agreement.

2. Clean energy has begun to make inroads in SEA. In 2019, for the first time, more renewable energy projects than coal projects reached financial investment decision in the region[2]. More recently, in 2020, deployment of new renewable capacity has accelerated in some jurisdictions at an unprecedented scale. In Viet Nam utility-scale grid-connected solar photovoltaic capacity increased from just 260 megawatts (MW) in April 2019 to 5,053 MW in July 2020.[3] Similarly, Cambodia launched its first open tender for new solar photovoltaic capacity in 2019, achieving a record low procurement price for this technology.[4] The region is also quickly embracing new technologies, including floating solar photovoltaic and offshore wind power. In addition, some countries in the region have indicated tentative measures to either dial back their coal power plant expansion plans, or outright cancel some projects.

3. **Challenges to the cleaner energy transition**. Notwithstanding these encouraging signs, more needs to be done to accelerate the transition towards cleaner energy in SEA. Despite the recent success of large-scale renewable energy programs, the potential of renewable energies, in particular variable renewable energy, remains largely untapped. This is mostly attributed to policy, regulatory and administrative constraints, while in some jurisdictions developments are hampered by low tariffs and the perceived threat of certain technologies to the traditional business models of power utilities. Energy efficiency also remains largely untapped (footnote 2), with progress hampered by a lack of policies and low enforcement of energy performance standards.

4. The power generation mix of most SEA countries is dominated by fossil fuels. Despite its adverse implications to the environment and health of local populations, coal-fired power generation still features prominently in the power development plans of some SEA countries. On the other hand, for more than two decades, SEA countries have been exploring opportunities for enhancing regional power interconnections and power trading through various platforms, including the Association of Southeast Asian Nations (ASEAN) and the Greater Mekong Subregion (GMS) Regional Power Trade Coordination Committee (RPTCC). Notwithstanding these efforts, regional power trade still accounts for a marginal proportion of the total power consumed in the region.[5]

5. Cross-cutting to the issues above, the development of cost-effective energy infrastructure in several SEA countries has been hindered by inadequate sector governance and transparency. This is reflected, for example, in the limited public disclosure of the terms and conditions of power purchase agreements (PPAs), owing to the region's preference for direct bilateral negotiations

[1] International Energy Agency (IEA). 2020. *World Energy Outlook 2020*. Paris.
[2] IEA. 2019. *Southeast Asia Energy Outlook 2019*. Paris.
[3] Lantau Group. 2020. *ADB Assessment, Strategy and Roadmap for Viet Nam (18 October 2020)*. Unpublished.
[4] ADB. 2019. *ADB-Supported Solar Project in Cambodia Achieves Lowest-Ever Tariff in ASEAN*. Manila.
[5] IEA. 2019. *Establishing Multilateral Power Trade in ASEAN*. Paris.

between the private sector and the off-taker rather than reverse auctions. In many cases this has led to information asymmetry, high transaction costs, noncompetitive pricing, overcapacity, unsustainable debt, and poor quality of service.

6. Against this background, the proposed knowledge and support technical assistance (TA) will support SEA countries addressing the challenges above and enable them to accelerate the transition to a cleaner energy future. To this end, the proposed TA will assist SEA countries with a comprehensive package of solutions that will include: (i) the preparation of sectoral and country-specific assessments; (ii) the development of new business models and feasibility reports and other technical studies; (iii) the conduct of workshops and policy dialogues; and (iv) the development of project investment pipelines to be financed by the Asian Development Bank (ADB).

7. The TA has five outputs: (i) public and private sector investments in new renewable energy capacity increased; (ii) opportunities for energy efficiency improvements through public and private investments harnessed; (iii) mechanism for accelerating the phase out of coal and other fossil fuel-based generation assets operationalized; (iv) energy sector governance and transparency in Southeast Asia enhanced; and (v) regional power grid integration in Southeast Asia enhanced. It is strongly aligned with ADB's Strategy 2030, including operational priorities 1 (addressing remaining poverty and reducing inequalities), 2 (accelerating progress in gender equality), 3 (tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability), 6 (strengthening governance and institutional capacity), and 7 (fostering regional cooperation and integration).

8. The TA requires the combination of two types of consulting services: firms and individual consultants. ADB will carry out procurement following the ADB Procurement Policy (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions. The TA will engage consulting firm(s) using quality-and-cost-based selection (90:10), while consultant recruitment will be via individual consulting services given the wide range of skills, expertise and experience needed to achieve the different outputs. The profiles specified in the table below are indicative of the consulting services required for the TA.

**Table: Summary of Consulting Services Requirement**

| **Expertise/Position** | **International** (person-months) | **National** (person-months) |
|---|---|---|
| **Overall Coordination and Assistance** | | |
| Regional Coordinator and Specialist on Clean Energy | 36 | |
| Assistant, Accounting and Operations | 12 | |
| | | |
| **Output 1** | | |
| Senior Power Systems Engineer | 6 | |
| Senior Renewable Energy Specialist | 6 | |
| National Renewable Energy Specialist | | 36 |
| Energy Specialist (for Knowledge Products) | 6 | |
| | | |
| **Output 2** | | |
| Senior Energy Efficiency Specialist | 6 | |
| Energy Efficiency Technology Specialist | 5 | |
| Energy Efficiency Finance Specialist | 5 | |
| Energy Efficiency Policy Specialist | 5 | |
| Procurement Specialist | 2 | |
| National Energy Efficiency Specialist | | 36 |

| Expertise/Position | International (person-months) | National (person-months) |
|---|---|---|
| | | |
| **Output 3** | | |
| **Overall Management** | | |
| Senior Energy and Financial Expert/Team Leader | 6 | |
| Senior Specialist on Coal Technologies | 2 | |
| Just Transition and Safeguards Expert | 3 | |
| **General Fund Structuring and Operation Setup** | | |
| Senior Financial Specialist | 3 | |
| Senior Legal Counsel | 3 | |
| **Country-Specific Work** | | |
| Sustainable Energy Technology, Policy and Markets Expert | 4 | |
| Senior Expert on Energy Policy and Markets | | 36 |
| Local communication/political economy specialist | | 36 |
| | | |
| **Output 4** | | |
| Senior Energy Specialist on Power Sector Policy and Markets | 6 | |
| Energy Specialist on Power Sector Policy and Market | | 20 |
| | | |
| **Output 5** | | |
| Regional Power Trade Coordination Committee Coordinator | 4 | |
| Regional Power Integration Specialist | 4 | |
| Power Grid Specialist | | 24 |
| Senior Specialist on Energy Performance Standards | 6 | |
| Capacity Building Specialist | | 12 |
| **TOTAL** | **130** | **200** |

Source: Asian Development Bank estimates.

## B. Consulting Services

9. **Regional Coordinator and Specialist on Clean Energy (international, full-time, 36 person-months).** The consultant should ideally have at least a master's degree in a relevant field (energy, economics, engineering), and a minimum of 10 years of relevant work experience with clean energy private developers, bilateral or multilateral donors, or with the broader international development assistance community. Experience of working in SEA and ADB is highly desirable. The consultant will work closely with the regional ADB project officer and teams of consultants hired by ADB on project preparation and implementation, as well as policy and program development in SEA countries. The consultant will support ADB identifying new investment opportunities on clean energy, provide technical advice and analytical support in the preparation of technical reports, and provide organizational support for field missions to countries of the region.

10. **Assistant, Accounting and Operations (international, intermittent, 12 person-months).** The consultant should have at least a bachelor's degree or its equivalent in public administration, management, accounting or related field, and at least five years of relevant experience of work in international organizations. The consultant will work closely with the regional ADB project officer and provide overall administrative and operational assistance in implementing the TA. The consultant will monitor project implementation, collect data to develop project progress reports, and coordinate with other ADB divisions on budget execution.

11. **Senior Power Systems Engineer (international, intermittent, 6 person-months).** The consultant(s) should have at least a master's degree in mechanical or electrical engineering, and

at least 15 years of experience in power systems analysis. The consultant(s) will be engaged for the preparation of renewable energy resource assessments and pre-feasibility studies in SEA countries. For the technology under consideration (e.g., wind, solar), the consultant(s) will conduct analyses of power system operations (e.g., on dispatching generation priorities, voltage stability, frequency control) to determine the feasibility of national power systems to accommodate higher shares of renewable energy and the gradual phase-out of fossil fuel-based power generation.

12. **Senior Renewable Energy Specialist (international, intermittent, 6 person-months).** The consultant(s) should have at least a master's degree in mechanical or electrical engineering, and at minimum of 10 years of experience in renewable energy resource assessments and grid integration issues. The consultant(s) will be engaged for the preparation of renewable energy resource assessments and pre-feasibility studies in SEA countries. For the technology under consideration (e.g., wind, solar), the consultant(s) will: (i) review resource data available from public sources; (ii) analyze national policy and regulatory frameworks for renewable energy technologies; (iii) analyze social and environmental constraints for future developments; (iv) conduct preliminary economic and financial assessment of projects; and (v) identify the most promising areas for project development.

13. **National Renewable Energy Specialist (national, intermittent, 36 person-months)**. The consultant(s) should have a bachelor's or master's degree in a relevant field (energy, economics, engineering), and a minimum of 5 years of relevant work experience in the development of clean energy projects. The consultant(s) will work in close coordination with the senior power system engineer(s) and the senior renewable energy specialist(s) in the preparation of renewable energy assessments and pre-feasibility studies in the host country. The consultant(s) will support the specialists in the collection of relevant data for the renewable energy studies, liaise with government officials and national institutions, and provide technical inputs, as necessary, to the studies and deliverables prepared.

14. **Energy Specialist (international, intermittent, 6 person-months)**. The consultant(s) should have a master's degree in a relevant field (energy, economics, engineering), and a minimum of 5 years of work experience in clean energy technologies, policies and regulations. The consultant(s) will carry out the studies under the TA on regional best practices, guidelines, lessons learned and templates.

15. **Senior Energy Efficiency Specialist (international, intermittent, 6 person-months)**. The consultant(s) should have at least a master's degree in a relevant field (energy, economics, engineering), and a minimum of 10 years of relevant work experience on energy efficiency. The consultant(s) should have a proven-track record on: (i) demand-side energy efficiency; (ii) policy and strategy development; (iii) project development and implementation; (iv) deployment of energy efficiency technologies including in industrial and commercial applications; and (v) financing and development of innovative business models. The consultant(s) will support the development of energy efficiency policies, regulations, technical standards, guidelines, and operational manuals in selected SEA countries.

16. **Energy Efficiency Technology Specialist (international, intermittent, 5 person-months).** The consultant(s) should have a master's degree in an engineering subject (mechanical, electrical, civil, etc.), and a minimum of 5 years of work experience on energy efficiency. The consultant(s) will work in coordination with the Senior Energy Efficiency Specialist(s) and provide technical inputs in the identification of energy efficiency technologies suitable to the national context of SEA countries, including on matters related to development, commercial application and implementation.

17. **Energy Efficiency Finance Specialist (international, intermittent, 5 person-months).** The consultant(s) should have at a master's degree in a relevant field (engineering, finance, economics), and a minimum of 5 years of work experience on energy efficiency. The consultant(s) will work in coordination with the Senior Energy Efficiency Specialist(s) in identifying financing options for energy efficiency investment pipelines as well as innovative business models that could enable energy investments in SEA countries.

18. **Energy Efficiency Policy Specialist (international, intermittent, 5 person-months).** The consultant(s) should have a master's degree in a relevant field (engineering, economics, public finance), and a minimum of 5 years of work experience on energy efficiency. The consultant(s) will work in coordination with the Senior Energy Efficiency Specialist(s) in the preparation of policy documents on energy efficiency in selected SEA countries. The consultant(s) will provide technical assistance in drafting those documents taking into account regional and global best practices, and in close consultation with national governments.

19. **Procurement Specialist (international, intermittent, 2 person-months).** The consultant(s) should have a bachelor's or master's degree in public administration, procurement or related field, and have a minimum of 5 years of relevant work experience. The consultant(s) should have proven experience in successfully conducting at least one public procurement process in a developing member country. The consultant(s) will provide technical support and expert advice to a public procurement process for energy efficient equipment to be carried out in one SEA country.

20. **National Energy Efficiency Specialist (national, intermittent, 36 person-months).** The consultant(s) should have a bachelor's or master's degree in a relevant field (energy, economics, engineering), and a minimum of 5 years of work experience in energy efficiency technologies, policies and regulations. The consultant(s) will be engaged to support the international energy efficiency specialist(s) engaged by ADB to implement Output 2 of the TA. The consultant(s) will provide support in the collection of relevant data for the energy efficiency studies and assignments conducted in the selected SEA country, liaise with government officials and national institutions, and provide technical inputs, as necessary, to the studies and deliverables prepared.

21. **Senior Energy and Financial Expert/Team Leader (international, full-time, 6 person-months).** The consultant(s) should have at least a master's degree in a relevant field (energy, economics, engineering), and a minimum of 15 years of work experience in power-generation technologies, financing and policy development. The consultant(s) will be engaged to provide strategic guidance and technical inputs to ADB in the design and establishment of a funding mechanism to support the early retirement of coal-fired power generation assets in SEA countries. The consultant(s) will also have similar functions regarding the development of a fund or facility to develop clean energy infrastructure to replace the coal-related assets to be retired.

22. **Senior Specialist on Coal Technologies (international, intermittent, 2 person-months).** The consultant(s) should have at least a master's degree in engineering (mechanical, electrical), and a minimum of 10 years of work experience in coal-fired power generation technologies. The consultant(s) will work in coordination with the Senior Energy and Financial Expert/Team Leader in the design and establishment of the funding mechanism for the early retirement of coal assets. The consultant(s) will provide technical inputs on aspects related to dispatch, flexible operation and decommissioning costs of the assets to be retired.

23. **Just Transition and Safeguards Expert (international, intermittent, 3 person-months)**. The consultant(s) should have at least a master's degree in social sciences or related field, and a minimum of 10 years of experience in conducting safeguards, gender and social impact assessment studies. The consultant(s) will carry out a gender-responsive and inclusive study on the social impacts of job losses associated with the early retirement of coal assets in SEA countries. The consultant(s) will assess the needs of local populations for a "just transition", including on opportunities for the generation of alternative jobs, including on clean energy.

24. **Senior Financial Specialist (international, intermittent, 3 person-months).** The consultant(s) should have at least a master's degree in a relevant field (engineering, economics, finance) and a minimum of 10 years of experience in the financing of energy projects, of each at least 5 years should be on clean energy finance. The consultant(s) will work in coordination with the Senior Energy and Financial Expert/Team Leader in the development of a fund or facility to develop clean energy infrastructure to replace the coal-related assets to be retired. The consultant(s) will conduct research on global best practices in the establishment of such mechanism, propose different options for its establishment, and prepare a detailed set of rules and regulations to govern its operation.

25. **Sustainable Energy Technology, Policy and Markets Expert (international, intermittent, 4 person-months)**. The consultant(s) should have at least a master's degree in a relevant field (engineering, economics, finance) and a minimum of 10 years of experience in clean energy technologies, policies and markets. The consultant(s) will assess countries in SEA where the activities laid out through the funding mechanism(s) could be first implemented (i.e., retirement of coal assets, development of clean energy infrastructure). The assessment will include a thorough analysis of the needs and resources of the country, including its policy and regulatory framework.

26. **Senior Legal Counsel (international, intermittent, 3 person-months).** The consultant(s) should have a least a master's degree in law or relevant field and a minimum of 10 years of professional experience in structuring and establishing equity and debt funding vehicles with a particular focus on the energy sector. The consultant(s) will work in coordination with the Senior Energy and Financial Expert/Team Leader in the development of a fund or facility to develop clean energy infrastructure in lieu of the coal-related assets to be retired. The consultant(s) will advise the team on the legal and fiduciary aspects related to the establishment of the mechanisms.

27. **Senior Expert on Energy Policy and Markets (national, intermittent, 36 person-months)**. The consultant(s) should have a bachelor's or master's degree in a relevant field (engineering, economics, finance) and a minimum of 5 years of experience in energy policy or energy market research. The consultant(s) will prepare a detailed list of the coal assets to be retired in the respective SEA country, support the international consultants on data collection, as required, and support consultations with national stakeholders. The consultant(s) will also assist ADB in developing a pipeline of investment projects on clean energy infrastructure that could be financed by the fund to be established.

28. **Local Communication/Political Economy Specialist (national, intermittent, 36 person-months).** The consultant(s) should have a bachelor's or master's degree in communications, political science or related field a minimum of 5 years of experience in conducting political and economic analysis. The consultant(s) will conduct a thorough analysis of the national political and socioeconomic context of selected SEA countries and advise ADB on

the challenges and opportunities of mobilizing investments to these countries through the funding mechanisms to be established.

29. **Senior Energy Specialist on Power Sector Policy and Markets (international, intermittent, 6 person-months).** The consultant(s) should have a bachelor's or master's degree in a relevant field (engineering, economics, finance) and a minimum of 5 years of experience in energy policy, governance or research. The consultant(s) should also have previous experience in advising or drafting power purchase agreements (PPAs). Building on the outcomes of an ADB-funded study whose aims is to assess the transactional and governance benefits of PPA disclosure, the consultant(s) will prepare detailed guidelines for the disclosure of PPA terms. The consultant(s) will identify at least one country where these guidelines could be implemented, and present the outcomes of the work at a high-level regional forum.

30. **Energy Specialist on Power Sector Policy and Markets (national, intermittent, 20 person-months).** The consultant(s) should have a bachelor's or master's degree in a relevant field (engineering, economics, finance) and a minimum of 5 years of experience in energy policy, governance and market analysis. The consultant(s) will work with the energy and finance ministries of the respective SEA country to implement the PPA disclosure guidelines prepared by the international consultant. The consultant(s) will ensure the guidelines are adapted to the local context, organize national workshops and consultations, and ensure their application to at least one renewable energy project.

31. **Regional Power Trade Coordination Committee (RPTCC) Coordinator (international, intermittent, 4 person-months)**. The consultant(s) should have at least a master's degree in a relevant field (energy, economics, engineering), and a minimum of 7 years of experience in the formulation of energy policies, research, or project origination and implementation, preferably in countries of the Greater Mekong Subregion (GMS). The consultant(s) will support ADB fulfilling its role as the secretariat of the GMS-RPTCC, and responsibilities will include: (i) the organization of meetings of the RPTCC and its working groups; (ii) coordination and provision of technical inputs to technical studies and pilots; and (iii) identification of projects that could involve multilateral power trade in the GMS.

32. **Regional Power Integration Specialist (international, intermittent, 4 person-months)**. The consultant(s) should have at least a master's degree in mechanical or electrical engineering, and a minimum or 10 years of experience in power systems planning and integration. The consultant(s) will carry out a technical study on matters related to power trade in the GMS aimed at fostering regional power trade, which will cover the following topics: (i) development of regional generation planning scenarios; (ii) implementation of the regional generation and transmission master plan; and (iii) identification of priority projects for improving interconnection among GMS countries.

33. **Power Grid Specialist (national, intermittent, 24 person-months).** The consultant(s) should have at least a bachelor's degree in electrical engineering, and a minimum of 5 years of work experience in power grid planning and power systems integration. The consultant(s) will support the Regional Power Integration Specialist in the preparation of the technical study on power trade by focusing on aspects related to national power grids.

34. **Senior Specialist on Energy Performance Standards (international, intermittent, 6 person-months).** The consultant(s) should have at least a master's degree in an engineering subject (mechanical, electrical), and a minimum of 10 years of work experience on energy efficiency standards and regulations. The consultant(s) will lead the preparation of a study on the

development of harmonized minimum energy performance standards (MEPS) for different appliance/equipment types in SEA countries. To this end, the consultant(s) will: (i) conduct research on regional and global good practices on MEPS for the selected appliances/equipment; (ii) conduct gap analyses on MEPS development among the SEA countries involved; (iii) provide recommendations for the harmonization of MEPS; and (iv) develop a framework for MEPS harmonization in these countries.

35. **Capacity Building Specialist (national, intermittent, 12 person-months).** The consultant(s) should have at least a bachelor's degree in a relevant field (engineering, economics, etc.), and a minimum of 3 years of experience in providing trainings and/or other capacity building activities. The consultant(s) will be responsible for organizing and develop the contents of capacity building trainings involving GMS countries.