Technical Assistance Report

Project Number: 52096-001
Transaction Technical Assistance Facility (F-TRTA)
October 2018

Southeast Asia Energy Sector Development, Investment Planning and Capacity Building Facility

Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
ASEAN	–	Association of Southeast Asian Nations
CCS	–	carbon capture and storage
COBP	–	Country Operations Business Plan
DMC	–	developing member country
TA	–	technical assistance
TASF	–	Technical Assistance Special Fund

NOTE

In this report, "$" refers to United States dollars.

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CONTENTS

TRANSACTION TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data — **Project Number:** 52096-001

Project Name	Southeast Asia Energy Sector Development: Investment Planning and Capacity Building Facility	**Department/Division**	SERD/SEEN
Nature of Activity	Project Preparation	**Executing Agency**	Asian Development Bank
Modality	Facility		
Country	CAM, INO, MYA, PHI, VIE		

2. Sector

	Subsector(s)	ADB Financing ($ million)
✓ Energy	Energy sector development and institutional reform	4.00
	Total	**4.00**

3. Strategic Agenda

Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Climate Change impact on the Project	Low

4. Drivers of Change

Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Client relations, network, and partnership development to partnership driver of change	Some gender elements (SGE)	✓
Knowledge solutions (KNS)	Knowledge sharing activities		
Partnerships (PAR)	Implementation Regional organizations		

5. Poverty and SDG Targeting

		Location Impact	
Geographic Targeting	No	Regional	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG17		

6. Risk Categorization Complex

7. Safeguard Categorization Safeguard Policy Statement does not apply

8. Financing

Modality and Sources	Amount ($ million)
ADB	**4.00**
Transaction technical assistance: Technical Assistance Special Fund	4.00
Cofinancing	**1.40**
Clean Energy Fund under the Clean Energy Financing Partnership Facility (Full ADB Administration)	1.00
Clean Technology Fund (Full ADB Administration)	0.40
Counterpart	**0.00**
None	0.00
Total	**5.40**

I. THE TECHNICAL ASSISTANCE FACILITY

A. Justification

1. The proposed transaction technical assistance (TA) facility will provide project preparatory assistance, technical support, policy advice, knowledge sharing, and capacity building to support the implementation of ongoing projects. The TA will strengthen due diligence and improve project readiness to Southeast Asian developing member countries (DMCs) for a series of lending projects and programs identified in the country operations business plans (COBPs), 2018-2020.[1] The TA facility will initially support project preparation activities related to (i) Support for a Sustainable Power Sector (Cambodia); (ii) National Solar Park Project: Capacity Development for Increased Solar Generation (Cambodia); (iii) Grid Reinforcement Project for Expanded Renewable Energy Generation Project (Cambodia); and (iv) Carbon Capture and Storage (CCS) Activity in the Natural Gas Processing Sector (Indonesia).[2] These energy sector projects require similar preparation, due diligence, design and readiness activities and therefore, this TA facility will reduce transaction costs through minimizing the need for stand-alone transaction TAs.

2. The TA facility will also provide technical knowledge services and capacity building support to ongoing projects, such as (i) Ha Noi and Ho Chi Minh City Power Transmission Development Sector project and Power Transmission Investment Program (Tranche 3) (Viet Nam);[3] (ii) Market Transformation Through Introduction of Energy-Efficient Electric Vehicles Project (Philippines);[4] and (iii) Power Transmission Improvement Project (Myanmar).[5] The transaction TA facility, as funds are added, intends to encompass TA support for ongoing projects and the loans and grants listed in the future Southeast Asia region's COBPs.

3. The Association of Southeast Asian Nations (ASEAN) region includes rapidly growing national economies predicted to experience energy demand growth by almost two-thirds over the next two decades, representing 10% of the rise in total global energy demand, as the regional economy triples in size and experiences urban population growth of over 150 million people.[6] Energy sector infrastructure needs are enormous, with an estimated $2.7 trillion required investment in energy supply and efficiency through 2040.[7] Out of about 640 million people in the region, an estimated 65 million people (10%) remain without electricity[8] and 250 million (40%) rely on biomass for cooking[9] (footnote 6). Access to modern energy varies significantly among the ASEAN countries, ranging from 26% in Myanmar and 65% in Cambodia up to 100% in the region's most advanced economies such as Singapore and Malaysia.[10]

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[1] These include Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Viet Nam.

[2] Future facility support is also anticipated for the GMS Cross-Border Power Trade and Distribution Project (Lao PDR), the Sustainable Rural Power Supply Project (Philippines), and the Power Network Development Project (Myanmar).

[3] To provide technical support in line with the changing requirements in network planning to integrate renewable energy on a large scale including adapting new smart grid technologies such as battery energy storage systems and to achieve energy efficiency and energy savings using energy services companies.

[4] To provide technical advice to the government on business models for electric vehicles and effective deployment of vehicle charging infrastructure for increased electric vehicle use to ensure sustainability of the ongoing project.

[5] To provide support for procurement and financial management and ADB requirements given the weak capacity of executing and implementing agencies in Myanmar.

[6] International Energy Agency. 2017. *Southeast Asia Energy Outlook 2017*. Paris.

[7] The total investment of $2.7 trillion can be broken into fuel supply (30.0%), transmission and distribution (25.9%), energy efficiency (21.9%), renewable energy generation (13.0%), and non-renewable electricity generation (9.2%)

[8] Indonesia, Philippines, Myanmar and Cambodia are the countries where those without electricity are concentrated.

[9] Except Malaysia and Singapore, most of ASEAN countries have populations relying on biomass for cooking such as Lao PDR (96%), Myanmar (94%), Cambodia (83%), Philippines (60%), Indonesia (26%) and Thailand (26%).

[10] ASEAN Centre for Energy. 2017. *The 5th ASEAN Energy Outlook 2015-2040.* Jakarta.

4. The role of the energy sector as a key enabler of inclusive growth has become more important as the DMCs of Southeast Asia face the challenge of expanding their economies and meeting climate change mitigation targets. Improved access to affordable and sustainable forms of energy is critical to enhance competitiveness, to contribute to climate change mitigation, and to promote increased economic activity in remote areas and thereby to improve inclusiveness of development. In addition, continued urbanization, rising incomes leading to increased ownership of appliances and increased demand for cooling, as well as rapidly growing commercial and industrial activity— all collectively contribute to electricity being the largest share of total energy consumption growth in the region (footnote 6). In meeting all development needs, however, sustainable energy transition should be the main thrust of energy strategies for the DMCs in the region.

5. Traditional challenges remain relevant in reaching the unelectrified population and meeting fast growing electricity demand in the region. However, the energy sector landscape is rapidly changing, driven by technological innovation and rapid cost reduction in non-hydro renewable energy and clean technologies. The world-wide penetration of solar and wind energy in recent years has been remarkable: Costs have been reduced by about 50% compared to 10 years ago and annual capacity additions achieve new records. For example, 62% of net power generation capacity additions globally came from renewable energy in 2016.[11] Electric battery and energy storage technologies are becoming more available and affordable as a solution to balance the intermittency of solar and wind power and to improve network reliability and stability. Increasing applications of digital technologies enhance demand response capability and can transform energy systems into more efficient and integrated ones. Solar rooftops, microgrids, and decentralized energy services call for new business models and necessary policy and regulatory changes. In this region, the private sector increasingly plays an important role in bringing innovation and scaling up investment, while the public sector seeks to improve policies and regulatory environments for private sector participation and market-oriented sector development. As such, there are enormous opportunities for developing countries to leapfrog conventional business models and technologies through public-private partnerships and other means to achieve sustainable and cleaner energy development. Experiences in many other countries, notably People's Republic of China and to a lesser extent in India, show that renewable energy is economically competitive with thermal and other generation sources and can expand rapidly and with greater flexibility.

6. The series of loans and knowledge services identified in the COBPs of the individual countries within the Southeast Asia region represent the commitment of their respective governments to make such a transition in developing their energy sectors. This way, they can support economic growth, expand and enforce existing electrical grids, connect businesses and households, and enhance the quality of life in unconnected villages across the region. While the investment and capacity building needs differ among the DMCs in Southeast Asia region, they share common challenges and objectives to expand renewable energy, enhance transmission and distribution networks to better manage intermittent renewable energy, and increase energy efficiency investments. A successful transition requires significant improvements in the capacity of executing and implementing agencies in project preparation and implementation, and knowledge sharing becomes essential so that the governments and utilities can properly and quickly understand the availability and affordability of alternative clean and low carbon technologies and continue to electrify those without access to modern energy services.

[11] REN21. 2017. *Renewables 2017 Global Status Report*. Paris.

7. In this regard, this TA facility is designed to maximize the TA resources in preparing loans in different countries that require similar technical, financial, economic, environment, social, governance and legal due diligence. The TA will also support (i) those cross-border transmission projects that engage multiple countries, (ii) enhance the government's capacity in the areas of project design and implementation, and (iii) facilitate cross-country knowledge sharing and capture best practices to successfully expand the use of renewable energy resources and clean technologies in the region (solar power in Cambodia, the Philippines, and Viet Nam; efficient transmission and distribution networks in Myanmar; and CCS in Indonesia). This will enhance the efficiency of project preparation, address common issues across the projects, and will reduce the transaction costs through minimizing the need for stand-alone transaction TAs.

B. Outputs and Activities

8. **Output 1: Energy sector project feasibility and preparation supported.** The TA facility will provide technical expertise to prioritize, plan, and prepare investment projects for potential ADB financing. This will include all necessary due diligence, assessment of technical suitability, and the economic, financial and social viability of the proposed projects. The TA facility will also address capacity and institutional issues, environmental and social safeguards, and identify measures to strengthen project implementation. Detailed activities will include, as required: (i) technical feasibility studies; (ii) economic analysis; (iii) financial management assessments, financial evaluation and financial analysis; (iv) procurement assessments, plans and preparation of bidding documents; (v) gender analysis, collection of baseline data and gender action plans; (vi) risk assessment and management plans; (vii) safeguards documents on environment, involuntary resettlement and indigenous peoples; (viii) integrity due diligence; (ix) initial poverty and social analysis; (x) climate adaptation measures and climate risk and vulnerability assessment; (xi) sector assessment; (xii) project implementation consultant recruitment; and (xiii) assisting resettlement plan implementation.

9. **Output 2: Technical and advisory, capacity development and implementation support provided.** The TA facility will provide technical support including policy advice and sector analysis, capacity building development and project implementation support. The TA facility will provide technical experts in clean energy such as solar power, rural electrification including mini-grids, transmission and distribution grid enhancement, battery storage systems, energy efficiency and smart grid development. This output also includes policy dialogue, sector diagnostics, regulatory assessment, power system planning, development of electricity markets, and tariff related analysis. The objective of this output is to encourage support in necessary policy and regulatory improvements, private sector participation, and informed investment decisions. These activities will be undertaken with the engagement of government staff and national institutions, through on-the-job training as well as participation in appropriate training opportunities. ADB will review all government requests under this output and provide support linked to ongoing or ensuing energy investments and programs while ensuring strong coordination and harmonized approaches with key development partners' assistance.

10. **Output 3: Knowledge developed and shared.** The TA facility will support workshops, and conferences to enhance knowledge and lesson sharing among related ministries within the Southeast Asian DMCs in a 'south-south' manner to further strengthen outputs 1 and 2 above. The TA facility will also support knowledge sharing among the Asia-Pacific countries on development of clean energy alternatives in close collaboration with ADB's Energy Sector, Group to collect and disseminate appropriate lessons learned and knowledge products within ADB and to policy makers, line ministries, and energy planners in the Southeast Asian DMCs, especially in linkage with Greater Mekong Subregion program and ASEAN energy cooperation programs. This

output will help increase awareness of international experience and expertise to better inform ADB operations in the sector and increase links amongst key energy sector actors.

C. Cost and Financing

11. The TA facility is estimated to cost $5.4 million, of which (i) $4.0 million will be financed on a grant basis by ADB's Technical Assistance Special Fund ($3.0 million from TASF 6 and $1.0 million TASF-others), (ii) $1.0 million will be financed on a grant basis by the Clean Energy Fund[12] under the Clean Energy Financing Partnership Facility and (iii) $0.4 million will be financed on a grant basis by the Clean Technology Fund, both to be administered by ADB. The key expenditure items are listed in Appendix 1. The scope of the TA facility is expected to expand to cover additional activities, consistent with the TA facility's outputs and outcome and be replenished from time to time as funds are required and identified, including those from cofinancing sources and ADB-administered trust funds. The governments will provide counterpart support in the form of counterpart staff, office and communication facilities, and other in-kind contributions. The governments were informed that approval of the TA facility does not commit ADB to finance any ensuing project.

D. Implementation Arrangements

12. ADB will administer the TA facility. The TA facility will provide funding to support projects only after the project concept paper is approved by ADB. ADB's Energy Division, Southeast Asia Department will be responsible for TA facility implementation, working closely with executing and implementing agencies in Southeast Asia DMCs and in close coordination with resident missions and other development partners. The TA facility will be implemented over 40 months from September 2018 to December 2021.

Table 2: Implementation Arrangements

Aspects	**Arrangements**		
Indicative implementation period	September 2018 – December 2021		
Executing agency	ADB		
Consultants	To be selected and engaged by ADB		
	Individual consultants	57.5 person-months	$826,400
	Firm(s) through QCBS (90:10)	215.5 person-months	$3,465,200
Procurement	To be procured by consultants following ADB's *Procurement Policy* (2017, as amended from time to time) and the associated project administration instructions and TA staff instructions.		
Disbursement	The TA resources will be disbursed following ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time). Cost-sharing rule will be applied.		
Asset turnover or disposal arrangement upon TA completion	Upon TA completion, all goods purchased will be turned over to the executing agency.		

ADB = Asian Development Bank; QCBS = quality- and cost-based selection; TA = technical assistance.
Source: ADB estimates.

[12] Financing partners: the governments of Australia, Norway, Spain, Sweden, and the United Kingdom.

13. **Consulting services.** The consultants will be engaged by ADB in accordance with ADB's *Procurement Policy* (2017, as amended from time to time) and the associated project administration instructions and TA staff instructions. Most technical experts will be engaged through consulting firm(s) using quality- and cost-based selection method (quality: cost weighting of 90:10). The maximum use of output-based/lumpsum consulting contracts will be considered to simplify TA administration and improve operational efficiency. Disbursements under the TA will be in accordance with ADB's Technical Assistance Disbursement Handbook (2010, as amended from time to time). For the areas of social and environmental safeguards, program coordination, knowledge and resource speakers, and for specialized technical requirements, consultants will be engaged using the individual selection method and output-based partial lump sum contracts. The consultants will consist of energy sector specialists as primary experts, and financial, economic, legal, gender, social, environmental, climate expertise, and other experts as required. The terms of reference for consultants are in Appendix 3.

II. THE PRESIDENT'S DECISION

14. The President, acting under the authority delegated by the Board, has approved the Asian Development Bank (ADB) (i) administering a portion of technical assistance not exceeding the equivalent of $1.0 million to be financed on a grant basis by the Clean Energy Fund under the Clean Energy Financing Partnership Facility; (ii) administering a portion of technical assistance not exceeding the equivalent of $0.4 million to be financed on a grant basis by the Clean Technology Fund; and (iii) ADB providing the balance not exceeding the equivalent of $4.0 million on a grant basis, all for Southeast Asia Energy Sector Development, Investment Planning and Capacity Building Facility, and hereby reports this action to the Board.

Takehiko Nakao
President

1 October 2018

COST ESTIMATES AND FINANCING PLAN
($'000)

Item	Amount		
	ADB[a]	**Clean Energy Fund under the Clean Energy Financing Partnership Facility**[b]	**Clean Technology Fund**[c]
A. Consultants			
1. Remuneration and per diem			
a. International consultants	2,196.0	530.4	185.6
b. National consultants	534.0	133.3	46.7
2. Out-of-pocket expenditures			
a. International and local travel	519.2	108.4	38.0
b. Reports and communications	50.0	3.7	1.3
c. Surveys	30.0	3.7	1.3
d. Goods (computer, printer, software, etc.)[d]	50.0	74.1	25.9
e. Workshops and conferences	80.0	7.4	2.6
f. Training/Study Tours	50.0	37.0	13.0
g. Miscellaneous Administration and Support Costs[e]	100.0	75.7	26.5
B. Contingencies	390.8	26.3	59.1
Total	**4,000.0**	**1,000.0**	**400.0**

Note: The technical assistance facility is estimated to cost $5.4 million, of which contributions from the Asian Development Bank and the Clean Energy Fund under the Clean Energy Financing Partnership Facility and the Clean Technology Fund are presented in the table above. The government will provide counterpart support in the form of communication facilities and other in-kind contributions.

[a] Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF 6 and TASF-Others).

[b] Financing partners: the governments of Australia, Norway, Spain, Sweden, and the United Kingdom. Administered by the Asian Development Bank.

[c] Administered by the Asian Development Bank. CTF financing refers to Trustee ID XCTFDB753A-ADB-PP-PJ-GR-1.

[d] The equipment will be turned over to the executing agency after project completion.

[e] The miscellaneous administration and support costs include (i) direct hire of consultants (Program coordinator) to support the project; (ii) resource contracts to hire specialized expertise (e.g. chemical engineers, geophysical engineers, etc.) for very short-term work (5-10 days) through resource contracts; (iii) travel by Asian Development Bank project team members to international energy events as resource persons to present analyses and findings obtained from the technical assistance; and (iv) translation and interpretation expenses.

Source: Asian Development Bank estimates.

PROJECTS UNDER TECHNICAL ASSISTANCE FACILITY
Table A2: Indicative Consultants' Inputs Allocation

		Indicative risk category of ensuing projects and person-months allocations							
		Total	Loan[a] low	Loan[b] low	Loan[c] low	Grant[d] low	Loan[e] low/complex	Loan[f] complex	Loan[g] complex
A.	**International Consultants**								
	Solar energy specialist	8.0	4.0	1.0	0.0	0.0	3.0	0.0	0.0
	Electric vehicle specialist	9.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0
	CCS specialist	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
	Transmission line specialist	10.0	3.0	0.0	5.0	0.0	2.0	0.0	0.0
	Substation specialist	6.0	0.0	0.0	4.0	0.0	2.0	0.0	0.0
	Distribution specialist	8.0	2.0	0.0	4.0	0.0	2.0	0.0	0.0
	Energy efficiency specialist	8.0	3.0	0.0	0.0	0.0	5.0	0.0	0.0
	Rural electrification specialist	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
	GIS specialist	3.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0
	Smart grid specialist	8.0	0.0	0.0	2.0	0.0	3.0	2.0	1.0
	Energy policy and regulatory specialist	6.0	0.0	1.0	0.0	0.0	5.0	0.0	0.0
	Power system planner	10.0	8.0	0.0	2.0	0.0	0.0	0.0	0.0
	Energy economist	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
	Financial/PPP Specialist	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
	Financial innovation and engineering specialist	3.0	0.0	1.0	0.0	0.0	2.0	0.0	0.0
	Project financial specialist	8.0	0.0	0.0	3.0	1.0	2.0	2.0	0.0
	Project economist	10.0	4.0	0.0	3.0	1.0	2.0	0.0	0.0
	Procurement specialist	8.0	0.0	0.0	3.0	1.0	2.0	2.0	0.0
	Environmental specialist	6.0	0.0	0.0	3.0	1.0	2.0	0.0	0.0
	Social resettlement specialist	6.0	0.0	0.0	3.0	1.0	2.0	0.0	0.0
	Gender specialist	5.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
	Climate change specialist	2.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0
	Knowledge specialist	2.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5

	Program coordinator	12.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0
	Resource persons	3.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5
	Subtotal A	**154.0**	**47.0**	**6.0**	**34.5**	**10.5**	**36.5**	**8.5**	**11.0**
B.	**National Consultants**								
	Power sector specialist	16.0	3.0	1.0	4.0	2.0	2.0	0.0	4.0
	Renewable energy specialist	9.0	4.0	1.0	0.0	2.0	2.0	0.0	0.0
	Transmission engineer	12.0	3.0	0.0	6.0	0.0	2.0	1.0	0.0
	Distribution engineer	7.0	2.0	0.0	4.0	0.0	1.0	0.0	0.0
	Energy efficiency specialist	6.0	3.0	1.0	0.0	0.0	2.0	0.0	0.0
	Energy policy and regulatory specialist	5.0	0.0	1.0	2.0	2.0	0.0	0.0	0.0
	Power system planner	6.0	4.0	1.0	0.0	0.0	1.0	0.0	0.0
	Energy economist	5.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
	Financial/PPP Specialist	3.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0
	Project financial specialist	7.0	0.0	0.0	3.0	1.0	2.0	1.0	0.0
	Project economist	9.0	4.0	0.0	3.0	1.0	1.0	0.0	0.0
	Procurement specialist	6.0	0.0	0.0	3.0	1.0	2.0	0.0	0.0
	Environmental specialist	6.0	0.0	0.0	3.0	1.0	2.0	0.0	0.0
	Social resettlement specialist	6.0	0.0	0.0	3.0	1.0	2.0	0.0	0.0
	Gender specialist	5.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
	Climate change specialist	5.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
	Resource persons	6.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0
	Subtotal B	**119.0**	**30.0**	**9.0**	**34.0**	**14.0**	**22.0**	**5.0**	**5.0**
	Total (A+B)	**273.0**							

CCS = carbon capture and storage; GIS = geographic information system; PPP = public private partnership.

[a] Support for a Sustainable Power Sector in Cambodia, 2020; [b] National Solar Park Project: Capacity Development for Increased Solar Generation (Cambodia), 2019; [c] Grid Reinforcement Project for Expanded Renewable Energy Generation Project (Cambodia), 2019; [d] Pilot Carbon Capture and Storage Activity in the Gas Processing Sector in Indonesia, 2019/2020; [e] Ha Noi and Ho Chi Minh City Power Transmission Development Sector Project (Viet Nam) and Power Transmission Investment Program Tranche 3 (Viet Nam), ongoing; [f] Power Transmission Improvement Project (Myanmar), ongoing; and [g] Market Transformation through Introduction of Energy-Efficient Electric Vehicles Project (Philippines), ongoing;

Source: Asian Development Bank estimates.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/LinkedDocs/?id=52096-001-TAReport

1. Terms of Reference for Consultants
2. Risk Assessment and Risk Management Plan