

Technical Assistance Report

Project Number: 50294-001 Regional—Capacity Development Technical Assistance (R-CDTA) December 2016

Improving Institutional Capacity on Preparing Energy Efficiency Investments

(Financed by the Clean Energy Fund under the Clean Energy Financing Partnership Facility)

This document is being disclosed to the public in accordance with ADB's Public Communications Policy 2011.

Asian Development Bank

ABBREVIATIONS

ADB	_	Asian Development Bank
DMC	_	developing member country
GHG	_	greenhouse gas
Mtoe	_	million tons of oil equivalent
TA	_	technical assistance

NOTE

In this report, "\$" refers to US dollars.

Vice-President	W. Zhang, Operations 1
Director General	H. Kim, South Asia Department (SARD)
Director	M. Khamudkhanov, Officer-in-Charge, Energy Division, SARD
Team leader Team members	A. Zhou, Senior Energy Specialist, SARD J. Fantilanan, Senior Operations Assistant, SARD A. Yusupov, Energy Specialist, SARD

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

CONTENTS

		Page
CAPA	CITY DEVELOPMENT TECHNICAL ASSISTANCE AT A GLANCE	-
I.	INTRODUCTION	1
II.	ISSUES	1
III.	THE CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE	3
	 A. Impact and Outcome B. Methodology and Key Activities C. Cost and Financing D. Implementation Arrangements 	3 3 4 4
IV.	THE PRESIDENT'S DECISION	5
APPE	NDIXES	
1.	Design and Monitoring Framework	6
2.	Cost Estimates and Financing Plan	8
3.	Outline Terms of Reference for Consultants	9

CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE AT A GLANCE

1.	Basic Data			Project N	umber: 50294-001
	Project Name	Improving Institutional Capacity on Preparing Energy Efficiency Investments	Department /Division	t SARD/SAEN	
	Country	REG, BAN, BHU, MLD, NEP, SRI	Executing Agency	Asian Development Bank	
2.	Sector	Subsector(s)		Finar	ncing (\$ million)
1	Energy	Energy efficiency and conservation		Total	2.00 2.00
3.	Strategic Agenda	Subcomponents	Climate Cha	ange Information	
	Inclusive economic growth (IEG) Regional integration (RCI)	Pillar 1: Economic opportunities, including jobs, created and expanded Pillar 2: Trade and investment	Climate Cha Project	ange impact on the	Low
4.	Drivers of Change	Components	Gender Equ	uity and Mainstreaming	
	Governance and capacity development (GCD) Knowledge solutions (KNS) Partnerships (PAR) Private sector development (PSD)	Institutional development Knowledge sharing activities International finance institutions (IFI) Official cofinancing Conducive policy and institutional environment	No gender	elements (NGE)	1
5	Poverty and SDG Targ	etina	Location Im	nact	
5.	Geographic Targeting Household Targeting SDG Targeting SDG Goals	No No Yes SDG7	Not Applica	ble	
6.	TA Category:	В			
7.	Safeguard Categorizat	tion Not Applicable			
8	Financing				
•-	Modality and Sources			Amount (\$ million)	
	ADB	·			0.00
	None				0.00
	Cofinancing				2.00
	Clean Energy Fund under the Clean Energy Financing Partnership Facility		ership		2.00
	Counterpart				0.00
	None				0.00
	Total				2.00
9.	Effective Development	t Cooperation			
	Use of country procuren	nent systems No			
	Use of country public fir	nanciai management systems No			

I. INTRODUCTION

1. Energy efficiency measures should be treated as "the first fuel" rather than "the hidden fuel," according to the International Energy Agency.¹ Improving energy efficiency is a cost-effective measure for meeting energy demand and ensuring sustainable economic growth. However, energy efficiency initiatives cannot be pursued in isolation and should be part of a comprehensive development strategy in which policies, regulations, standards, technology deployment, and other national and sector issues are interlinked.

2. The Asian Development Bank (ADB) considers energy security and climate change to be the dual challenges facing developing Asia's energy sector, and its Energy Policy aims to direct ADB operations toward actions that will help the region address these challenges.² ADB supports energy efficiency opportunities in the investment portfolio of all ADB sectors. In 2015, investments in clean energy were just under \$2.50 billion, with efficiency investments at \$1.37 billion.³

3. During 1997–2016, South Asia has been one of the fastest-growing regions in the world, with gross domestic product per capita rising by an average of 6% each year. ADB projected that South Asia's energy consumption could grow by 3% per annum from 2010 to 2035.⁴ But the energy sector has not been able to keep pace with the region's impressive macroeconomic growth, and South Asia continues to experience chronic supply shortage and poor quality of service. ADB has significant experience in supporting supply-side energy projects to address supply shortage, but it needs to build on this experience to strengthen synergies between supply-side and demand-side interventions. The proposed technical assistance (TA) aims to assist five developing member countries (DMCs) in South Asia (Bangladesh, Bhutan, the Maldives, Nepal, and Sri Lanka)⁵ in enhancing their capacity for energy efficiency development, and increasing energy efficiency investments in a cost-effective manner to meet the energy demand in each country. The design and monitoring framework is in Appendix 1.⁶

II. ISSUES

4. Bangladesh, Bhutan, India, the Maldives, Nepal, and Sri Lanka are the ADB DMCs in South Asia. About 1.5 billion people live in the region, which is more than one-fifth of the global population, and its population is growing by 1.5% to 1.8% annually. South Asia accounts for 6%–7% of global greenhouse gas (GHG) emissions, but these figures are rising.

5. Three pillars guide the implementation of ADB's Energy Policy: (i) promoting energy efficiency and renewable energy, (ii) maximizing access to energy, and (iii) promoting policy reform to create the frameworks and an enabling environment for clean energy and widespread energy access. Energy demand is increasing rapidly in these five DMCs to support the

¹ International Energy Agency. 2013. Energy Efficiency Market Report 2013: Market Trends and Medium-Term Prospects. Paris. p. 55.

² ADB. 2009. *Energy Policy*. Manila.

³ ADB. 2016. 2015 Clean Energy Investments Project Summaries. Manila.

⁴ ADB. 2013. Energy Outlook for Asia and the Pacific. Manila.

⁵ India has well-established capacity in energy efficiency project development. In 2016, ADB approved a \$200 million demand-side energy efficiency investment project. ADB. 2016. Report and Recommendation of the President to the Board of Directors: Proposed Loan to Energy Efficiency Services Limited for the Demand-Side Energy Efficiency Sector Project (Guaranteed by India). Manila.

⁶ The technical assistance (TA) first appeared in the business opportunities section of ADB's website on 8 November 2016.

economic growth needed to raise the living standards of their populations. According to ADB's Energy Outlook for Asia and the Pacific, Bangladesh's primary energy demand is projected to increase from 31.10 million tons of oil equivalent (Mtoe) in 2010 to 77.60 Mtoe in 2035, growing at an annual rate of 3.7%. Bhutan's primary energy demand is projected to increase from 1.41 Mtoe in 2010 to 1.70 Mtoe in 2035, at an average annual growth rate of 0.8%. The Maldives' primary energy demand is projected to increase from 0.26 Mtoe in 2010 to 0.64 Mtoe in 2035, at an average annual growth rate of 0.64 Mtoe in 2035, at an average annual growth rate of 0.64 Mtoe in 2010 to 16.60 Mtoe in 2035, at an annual growth rate of 2.0%. Sri Lanka is projected to increase from 9.90 Mtoe in 2010 to 20.30 Mtoe in 2035, at an annual growth rate of 2.9%. These compare with the projected world average growth rate of 1.5% per year for the same period (footnote 4).

6. Of the energy supply options, energy efficiency measures stand out as the most inexpensive way to acquire new energy system capacity and satisfy growing demand.⁷ To address local, regional, and global environmental challenges successfully, each of the five DMCs has realized that it needs to take preventive measures to avoid an increase in emissions amid rapid economic growth and increasing energy demand. This has compelled them to accelerate efforts to promote energy efficiency and to develop clean, renewable sources of energy.

7. Each country understands the impact of climate change and has made attempts to combat it. All five countries have submitted their intended nationally determined contributions to the United Nations. They recognize the impact of energy efficiency improvement not only in lowering energy bills or reducing the gap between energy demand and supply, but also in achieving national and global sustainability by reducing GHG emissions. Governments, ADB, and other development partners have undertaken several initiatives to promote energy efficiency. Most have focused heavily on softer outputs such as capacity building, enabling activities, demonstrations, and awareness raising. ⁸ To meet future energy challenges, development partner assistance needs to transition from such programs to investments that deliver energy savings while providing policy dialogue for capacity development to support energy efficiency.

8. The first step in identifying energy efficiency investment opportunities is energy audit, in particular, detailed energy audit. Energy audit is an inspection, survey, and analysis of energy flows for building, industrial system and process. Detailed energy audits or investment grade energy audits provide solid recommendations which focus on a specific piece of equipment or process in a building or a facility, e.g., lighting, a boiler, a drying process etc. Energy audits are powerful tool for conducting technical and economic analysis of potential energy saving projects in a building or an industrial facility and identifying technically and economically feasible energy efficiency improvement opportunity for existing equipment. Detailed energy audits are the basis for future engineering design of energy efficiency investment.

9. In parallel with energy audits, institutional capacity development is also crucial to energy efficiency investment, such as development of national action plan and roadmap, enactment of

⁷ United States Environmental Protection Agency, National Action Plan for Energy Efficiency. 2009. *Energy Efficiency as a Low-Cost Resource for Achieving Carbon Emissions Reductions*. Washington, DC.

⁸ ADB. Regional: Expanding the Implementation of the Energy Efficiency Initiative in Developing Member Countries. <u>https://www.adb.org/projects/41279-012/main;</u> ADB. Regional: SASEC Subregional Energy Efficiency Initiative. <u>https://www.adb.org/projects/45419-001/main;</u> ADB. Regional: Preparation of Energy Efficiency Policies and Guidelines for Bhutan and Nepal. <u>https://www.adb.org/projects/46494-001/main;</u> and ADB. Regional: Asia Energy Efficiency Accelerator. <u>https://www.adb.org/projects/46241-001/main</u>.

energy efficiency law, regulations and standards, and energy efficiency awareness of government officers. Bangladesh and Sri Lanka have developed some policies and have the capability to support energy efficiency but still lack the institutional capacity to scale up energy efficiency in the industrial, commercial, and residential sectors. Bhutan, the Maldives, and Nepal are in an early stage to take the necessary steps to develop policies and strengthen their capacity.

10. Previous TA projects recommended energy efficiency improvement to mitigate GHG emissions and enhance energy security (footnote 8). The proposed TA aims to assist the five selected DMCs in enhancing government capacity to design and develop energy-efficient projects, including by (i) conducting energy audits and identifying energy-saving measures in industrial facilities and buildings; (ii) developing an inventory of bankable energy-saving projects suitable for support by ADB, other financial institutions, or energy service providers; and (iii) supporting national and regional energy efficiency policy dialogue, developing energy-saving action plans and road maps, and providing training to energy professionals, such as energy managers and energy auditors, through the South Asia Subregional Economic Cooperation Energy Working Group and cooperation among developing members. The TA will focus on identifying large-scale energy efficiency projects in the two biggest energy consumer countries, Bangladesh and Sri Lanka; and smaller energy efficiency projects in Bhutan, the Maldives, and Nepal.

III. THE CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE

A. Impact and Outcome

11. The impact will be sustainable investments in energy efficiency enhanced. The outcome will be improved capacity of the five DMCs to develop energy efficiency projects.

B. Methodology and Key Activities

12. The TA aims to realize the objectives of the five DMCs for high energy security and more efficient energy production and consumption. Knowledge products and experiences will be shared through the South Asia Subregional Economic Cooperation, the South Asian Association for Regional Cooperation, and other channels. The TA will also conduct training programs and dialogue workshops on energy efficiency technologies, policies and regulations, and fiscal and financial instruments. It will produce the following outputs:

- (i) Energy audit activities conducted. It includes detailed energy audits of at least five buildings in total from five countries, one per country; and at least five industrial facilities in total from five countries, one per country. Each building shall have a floor area of 2,000 square meters or larger; and each facility shall have an annual energy consumption of 600 tons of oil equivalent or greater.
- (ii) A pipeline of energy efficiency projects developed. The pipeline includes at least five investment grade energy efficiency projects (ideally one per DMC), which are identified from the detailed energy audits.
- (iii) Capacity building activities and policy dialogues conducted. There will be, at least, two training programs completed for the five DMCs; two policy dialogue workshops conducted for the five DMCs; and a total of 100 government officers from five DMCs trained.

13. The TA outputs will contribute to strengthening the capacity of the five DMCs to develop energy efficiency projects, with analytical evidence gathered during the energy audits and

discussions with stakeholders. The TA is built on the premise that the targeted DMCs are willing to formulate and implement energy efficiency projects. The main risks are (i) a change in government priorities and decreased support for energy efficiency initiatives, and (ii) high turnover of trained personnel, which will be mitigated through continuous policy dialogue with the relevant DMC governments.

C. Cost and Financing

14. The TA is estimated to cost \$2.25 million, of which \$2.00 million will be financed on a grant basis by the Clean Energy Fund⁹ under the Clean Energy Financing Partnership Facility and administered by ADB. The governments of the participating DMCs will provide counterpart support in the form of counterpart staff, office space (if needed), transportation and accommodation, assistance in project site visits, workshops and seminars, and other in-kind contributions. The cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

15. ADB, through the Energy Division of the South Asia Department, will serve as the executing agency of the TA, in partnership with the relevant government agencies in each DMC. ADB will obtain a no objection in writing from the relevant government agencies before commencing and/or financing the proposed activities in the five DMCs. The proposed implementing agencies for the TA, which will be finalized in consultation with the governments of each participating DMC, are

- (i) Bangladesh: Sustainable and Renewable Energy Development Authority;
- (ii) Bhutan: Department of Renewable Energy;
- (iii) the Maldives: Ministry of Environment and Energy;
- (iv) Nepal: Ministry of Energy; and
- (v) Sri Lanka: Sustainable Energy Authority.

16. The TA will engage 70 person-months of international consulting services and 116 person-months of national consulting services following ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). A consulting firm (4 international consultants for 48 person-months and 20 national consultants for 70 person-months) will be engaged using quality- and cost-based selection with a standard quality–cost ratio of 80:20. Individual consultants will also be engaged to support the project implementation, and will consist of (i) a senior advisor (international, 22 person-months) who will act as lead technical expert on energy efficiency technology, policy, and finance; (ii) an operations coordinator (Philippine national, 36 person-months); and (iii) a project analyst (national, 10 person-months). The outline terms of reference for the consultants is in Appendix 3.

17. All procurement under the TA will be carried out following ADB's Procurement Guidelines (2015, as amended from time to time). Lump-sum or output-based contracts will be considered for consulting services under the TA, in line with the action plan for ADB's Midterm Review of Strategy 2020 (actions 2.9.2 and 2.10.2).¹⁰ Disbursements under the TA will follow ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time). TA activities will be monitored and reports will be made available through the ADB website. Upon TA completion, all equipment procured under the TA will be turned over or disposed of in

⁹ Financing partners: the governments of Australia, Norway, Spain, Sweden, and the United Kingdom.

¹⁰ ADB. 2014. *Midterm Review of Strategy 2020: Action Plan*. Manila.

accordance with ADB's project administration instructions.¹¹ The TA will be implemented over 36 months from December 2016 to November 2019.

IV. THE PRESIDENT'S DECISION

18. The President, acting under the authority delegated by the Board, has approved ADB administering technical assistance not exceeding the equivalent of \$2,000,000 to be financed on a grant basis by the Clean Energy Fund under the Clean Energy Financing Partnership Facility for Improving Institutional Capacity on Preparing Energy Efficiency Investments, and hereby reports this action to the Board.

¹¹ ADB. 2013. Administering Grant-Financed Technical Assistance Projects. *Project Administration Instructions*. PAI 5.09. Manila.

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with: Sustainable investments in energy efficiency enhanced^a **Performance Indicators Data Sources and** with Targets and Baselines **Results Chain** Reporting **Risks** Outcome By 2019: Capacity of five At least three project Concept papers Change in government DMCs to develop concept papers prepared priorities and decreased energy efficiency or approved support for energy projects improved (2016 baseline: 0) efficiency initiatives Outputs By 2018: 1. Energy audit 1a. At least one energy 1a-c. Energy audit High turnover of trained activities conducted efficiency report published reports personnel (2016 baseline: 0) 1b. Energy audits of at least five buildings in total from five countries (each building with a floor area of 2,000 square meters or larger) conducted (2016 baseline: 0) 1c. Energy audits of at least five industrial facilities in total from five countries (each facility has an annual energy consumption of 600 tons of oil equivalent or greater) conducted (2016 baseline: 0) By 2019: 2. A pipeline of 2. At least five investment 2. Project feasibility energy efficiency grade energy efficiency study reports projects developed projects (ideally one per DMC) identified (2016 baseline: 0) 3. Capacity building 3a-b. Training and 3a. At least two training activities and policy programs completed for workshop reports dialogues conducted the five DMCs (2016 baseline: 0) 3b. At least two policy dialogue workshops conducted for the five DMCs (2016 baseline: 0) 3c. At least a total of 3c. Consultant's report 100 government officers

Bos	ulte Chain	Performance Indicators	Data Sources and Beporting	Bisks
nes		from five DMCs trained (2016 baseline: 0)	neporting	11363
Key	Activities with Mi	lestones		
1. 1.1 1.2 1.3 1.4	 Energy audit activities conducted (by Q2 2018) Identify potential audit recipients (Q2 2017) Formulate the scope of audits in terms of types of equipment and facilities and potential energy efficiency measures (Q2 2017) Develop a schedule for performing audits (Q3 2017) Prepare audit reports with (i) a description of the technical and economic potential for energy savings and (ii) an outline of a recommended energy savings strategy (Q2 2018) 			
2. 2.1 2.2 2.3	 2. A pipeline of energy efficiency projects developed (by Q1 2019) 2.1 Conduct a technical appraisal of the audited projects (Q3 2018) 2.2 Conduct a financial appraisal of the audited projects (Q3 2018) 2.3 Develop inventory (Q1 2019) 			
3. 3.1 3.2	 Capacity building activities and policy dialogue conducted (by Q2 2019) Organize training events on energy audits (Q3 2018) Organize policy dialogues on energy efficiency policy and financing mechanisms (Q2 2019) 			
Inputs				
Clean Energy Fund under the Clean Energy Financing Partnership Facility: \$2,000,000				
Note: The governments of the participating DMCs will provide counterpart support in the form of counterpart staff, office space (if needed), transportation and accommodation, project site visits, workshops and seminars, and other in-kind contributions.				
Assumptions for Partner Financing				
Not	Not applicable			

DMC = developing member country, Q = quarter. ^a Defined by project. Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN

(\$'000)

Item	Amount
Clean Energy Fund ^a under the Clean Energy Financing Partnership	
Facility	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	1,100.0
ii. National consultants	476.0
b. International and local travel	
i. International travel	80.0
ii. Local travel	20.0
c. Reports and communications	50.0
2. Equipment ^b	10.0
3. Publications and information services	10.0
4. Training, seminars, and conferences ^c	80.0
5. Miscellaneous administration and support costs ^d	24.0
6. Resource persons (including Asian Development Bank staff travel) ^e	50.0
7. Contingencies	100.0
Total	2,000.0

Note: The technical assistance (TA) is estimated to cost \$2.25 million, of which contributions from the Clean Energy Fund under the Clean Energy Financing Partnership Facility are presented in the table above. The governments of the participating developing member countries will provide counterpart support in the form of counterpart staff, office space (if needed), transportation and accommodation, assistance to project site visits, workshops and seminars, and other in-kind contributions. The value of government contributions is estimated to account for 11% of the total TA cost. ^a Financing partners: the governments of Australia, Norway, Spain, Sweden, and the United Kingdom. Administered

by the Asian Development Bank (ADB).

^b Equipment includes computers, printers, and selected energy monitoring equipment. Procurement will follow ADB's Procurement Guidelines (2015, as amended from time to time). Upon completion of the TA project, all equipment procured under the project will be turned over or disposed of following ADB. 2013. Administering Grant-Financed Technical Assistance Projects. *Project Administration Instructions*. PAI 5.09. Manila.

^c Includes at least two training programs and two workshops, with a total of about 100 participants from five countries.

^d Includes translation and interpretation costs.

^e Includes honorarium and travel costs for resource persons and facilitators, participants' travel costs, ADB staff travel costs as resource persons and/or speakers, and logistical costs.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Introduction

1. The implementing project officer from the Energy Division of the South Asia Department of the Asian Development Bank (ADB) will serve as the team leader to coordinate all inputs from consultants under the technical assistance (TA). The TA will require 48 person-months of international experts and 70 person-months of national consultants from a consulting firm. The TA will also engage a team of individual consultants, consisting of (i) a senior advisor (international, 22 person-months) who will act as lead technical expert and with advisory knowledge on energy efficiency technology, policy, and finance; (ii) an operations coordinator (Philippine national, 36 person-months); and (iii) a project analyst (national, 10 person-months). ADB will engage consultants following its Guidelines on the Use of Consultants (2013, as amended from time to time). The consulting team and individual consultants will work with the implementing agencies in the selected countries.

2. The consultants will ensure that all work and outputs under this TA are fully compliant with ADB and government policies and guidelines.

B. Consulting Firm

3. A consulting firm will be engaged to undertake investment-grade energy efficiency audits and capacity development in five selected developing member countries (DMCs) to identify energy efficiency projects. The team will be made up of 4 international experts and 20 national experts (Table A3).

International Positions	Person- Months	National Positions	Person- Months
Energy efficiency finance expert (1)	12.0	Energy efficiency finance experts (5)	10.0
Industrial energy efficiency expert (1)	12.0	Energy efficiency auditors (5)	17.5
Building energy efficiency expert (1)	12.0	Energy efficiency technology experts (5)	17.5
Energy efficiency expert and communications manager (1)	12.0	Energy efficiency monitoring and evaluation experts (5)	25.0
Total	48.0	Total	70.0

Table A3: Summary of Positions for the Proposed Consulting Firm Team

1. International Experts

4. **Energy efficiency finance expert** (international, 12 person-months). The expert will be in charge of the energy efficiency financing aspect of the TA, providing an international best practice perspective, and will work with national consultants and operations teams on implementation to ensure consistency with the overall aims of the TA. The expert will preferably have postgraduate qualifications in economics, commerce, banking, or a related field.

5. **Industrial energy efficiency expert** (international, 12 person-months). The expert will be in charge of the energy efficiency initiatives and project design for industrial facilities, and will work with national consultants and operations teams on implementation to ensure consistency

with the overall aims of the TA. The expert will preferably have postgraduate qualifications in an engineering- or energy-related field.

6. **Building energy efficiency expert** (international, 12 person-months). The expert will be in charge of the energy efficiency project design and will collaborate with national consultants and operations teams on implementation. The expert will preferably have postgraduate qualifications in an engineering- or energy-related field.

7. **Energy efficiency expert and communications manager** (international, 12 personmonths). The manager will develop and maintain networks to strengthen knowledge exchange between energy efficiency practitioners, advocates, policy makers, and other stakeholders.

2. National Consultants

8. The terms of reference for the national consultants in the consulting firm are described below:

- (i) **Energy efficiency finance experts** (one national consultant per developing member country, 10 person-months total). The experts will work with the national consultants and operations teams on implementation to ensure that the financing models are effective and consistent with the overall aims of the TA. The experts will preferably have postgraduate qualifications in economics, commerce, banking, or a related field.
- (ii) Energy efficiency auditors (one national consultant and about 3.5 personmonths per developing member country). The auditors will be based in the target DMCs and will assist with ongoing implementation efforts. The auditors will preferably have postgraduate qualifications in engineering, as well as auditing accreditation in the country of operation.
- (iii) **Energy efficiency technology experts** (one national consultant and about 3.5 person-months per developing member country). The experts will be based in the targeted DMCs and will assist with ongoing implementation efforts. They will preferably have strong knowledge of national energy efficiency policies and regulations, initiatives, stakeholders, and business finance; and will have experience in best practice energy efficiency technology solutions and their application in available energy efficiency opportunities in commercial buildings and/or industrial sites. The experts will preferably have postgraduate qualifications in engineering or a field related to energy technology.
- (iv) Energy efficiency monitoring and evaluation experts (one national consultant and about 5 person-months per developing member country). The experts will be based in the target DMCs and will assist with ongoing implementation efforts. They will preferably have strong knowledge of national energy efficiency policies and regulations, initiatives, stakeholders, and business finance; and will have experience with energy efficiency data, energy metering and monitoring, and verification and reporting regimes. The experts will preferably have postgraduate qualifications in engineering, and accreditation from a recognized monitoring and evaluation organization such as the Efficiency Valuation Organization.

C. Individual Experts

9. **Senior advisor** (one international consultant, 22 person-months). The senior advisor will be in charge of planning and implementing all activities, and will lead assistance in mainstreaming energy efficiency solutions and investments into the five DMCs. All work will be done in collaboration with operations team members and national consultants. The senior advisor will preferably have postgraduate qualifications in economics, policy, or an energy-related field.

10. **Operations coordinator** (Philippine national, 36 person-months). The operations coordinator will serve as the liaison between ADB, country implementing agencies, and project experts; and will assist in monitoring TA implementation. The consultant will complete tasks together with and under the overall supervision of the ADB project officer, in close collaboration with the senior advisor and the selected consulting firm. In the event that travel is needed, contract variations will be prepared to cover the travel cost.

11. **Project analyst** (national, 10 person-months). The project analyst will conduct analytical research about energy efficiency investments and provide operational support.

D. Reporting Requirements

12. The following reports will be submitted for each selected developing member country at the key stages of TA implementation:

- (i) inception report;
- (ii) midterm report containing the results of stakeholder assessments, the developed energy efficiency initiatives for each target country, and training results and event plans;
- (iii) implementation progress reports; and
- (iv) final report upon TA completion.