

## PROJECT PREPARATORY TECHNICAL ASSISTANCE

(South Asia Subregional Economic Cooperation Green Power Investment Program)

### A. Justification

1. The project preparatory technical assistance (PPTA) aims to (i) conduct due diligence of Druk Green Power Corporation's (DGPC) pre-feasibility studies and detailed project report, and Bhutan Power Corporation's (BPC) transmission plans, and (ii) strengthen their critical aspects required for engineering designs and assessments, commercial arrangements, financial structuring, safeguards, and procurement. For the Nyera Amari hydropower plant, it is necessary to support DGPC in establishing the project's special purpose company and reaching legal agreements of commercial frameworks including the shareholders agreement, and the power purchase agreement(s). To ensure smooth implementation, the safeguard plans and actions will need to be formulated and strengthened, and the bid documents will be prepared in advance. The PPTA will also study the project structuring options and develop the roadmap of DGPC's Dorjilung and Chamkarchhu hydropower projects, which are located in the eastern and central regions of Bhutan.

### B. Major Outputs and Activities

2. The major outputs and activities are summarized in Table A3.1.

**Table A3.1: Summary of Major Outputs and Activities**

<b>Major Activities</b>	<b>Expected Completion Date</b>	<b>Major Outputs</b>	<b>Expected Completion Date</b>
Climate change assessments	December 2016	Inception report	June 2016
Technical due diligence	September 2017	First interim report	December 2016
Least cost estimates	September 2017	Second interim report	June 2017
Environmental assessment clearance	October 2017	Third interim report	December 2017
Resettlement plan	October 2017	Draft final report	February 2018
Institutional framework (i.e. SPC)	November 2017	Final report	April 2018
Power purchase agreement	November 2017		
Shareholders agreement	December 2017		
Financial analysis and structuring	November 2017		
Economic assessment	November 2017		
Bid document preparation	January 2018		

SPC = special purpose company.

Source: Asian Development bank.

### C. Cost Estimate and Proposed Financing Arrangement

3. The PPTA is estimated at \$1,750,000 equivalent, of which \$1,500,000 equivalent will be financed on a grant basis by the Japan Fund for Poverty Reduction (JFPR), and administered by ADB. The Government of Bhutan will finance the remaining \$250,000 equivalent through in-kind contribution. The cost estimates and financing plan are in Table A3.2.

**Table A3.2: Cost Estimates and Financing Plan**  
(\$'000)

Item	Total Cost
<b>A. Japan Fund for Poverty Reduction<sup>a</sup></b>	
1. Consultants	
a. Remuneration and per diem	
i. International consultants (36 person months)	1,032.8
ii. Domestic consultants (13 person-months)	78.0
b. International/local travel	216.0
c. Reports and communications	3.0
2. Equipment <sup>b</sup>	1.0
3. Workshops, training, resource persons, and seminars & conferences <sup>c</sup>	15.0
4. Vehicle rental <sup>d</sup>	9.0
5. Surveys	30.0
6. Miscellaneous administration and support	4.8
7. Contingencies	110.4
<b>Total</b>	<b>1,500.0</b>
<sup>a</sup> Administered by the Asian Development Bank.	
<sup>b</sup> Equipment	
Type	Quantity
Projector	1
	\$1,000
<sup>c</sup> Workshops, training, resource persons, and seminars & conferences	
Purpose	Venue
Tripartite meetings, stakeholders meetings	Thimphu, Bhutan
Public consultations	Project site
<sup>d</sup> Vehicle rental	
Justify the use of and the need to lease a vehicle	Expected length of use
Vehicle rentals are required because of the need for project site reviews, surveys, data gathering, consultations, and commuting to various local offices.	3 months

Source: Asian Development Bank.

## D. Consulting Services

4. The TA will require 49 person-months of consulting services (36 international and 13 national) for 16 positions (Table A3.3). The TA will be implemented over 24 months. ADB will engage a consulting firm using quality- and cost-based selection (QCBS) procedures in accordance with ADB's Guidelines on the Use of Consultants (2013, amended from time to time).<sup>1</sup> The only international and national environmental specialists may be individually engaged quickly to expedite environmental surveys and assessments, stakeholder consultations and participatory workshops. The TA-financed equipment will be procured under ADB's Procurement Guidelines (2013).<sup>2</sup> The disbursements will be made under ADB's Technical Assistance Disbursement Handbook (2010, amended from time to time).<sup>3</sup> The TA, among other tasks, needs to adequately address the following aspects relating to the ensuing loan project: (i) detailed capacity assessment for executing and implementing agencies, and their remedial action plans to minimize procurement and financial management risks if any; (ii) loan related procurement plan; and (iii) implementation schedule with sequencing of any consultant recruitment and procurement bidding and awarding.

<sup>1</sup> QCBS's weight is distributed to 90:10 as a quality to cost ratio for technical and financial proposals from consulting firms considering the major impacts of the consultant's assignment on the project delivery. Full technical proposals will be requested.

<sup>2</sup> All equipment procured will be registered in ADB's OAS Fixed Asset Registry as ADB property during the TA implementation period. Upon the TA completion, the equipment will be turned over to the executing agency.

<sup>3</sup> The TA includes payments linked to satisfactory deliverables on an output and lump sum basis.

**Table A3.3: Summary of Consulting Services Requirement**

<b>Positions</b>	<b>Person-Months Required</b>
<b>International</b>	<b>36</b>
Power Sector Management Specialist	6
Financial Specialist	4
Economist	2
Environment Specialist	5
Social Development Specialist	3
Legal Specialist	2
Public resource Management Specialist	1
Hydropower Engineer	2
Hydrologist	2
Geologist	2
Electrical Engineer	4
Mechanical Engineer	1
Climate Change Specialist	2
<b>National</b>	<b>13</b>
Environment Specialist	5
Social Development Specialist	4
Electrical Engineer	4

Source: Asian Development Bank.

5. The outline terms of references for the PPTA consultants are described in paras. 6 to 12.
6. **Power Sector Management Specialist** (international, 6 person-months). As the project team leader, the expert will conduct overall project management, focusing on key activities including institutional setup, public private partnership structure, power trading arrangements, other commercial frameworks, negotiation strategies, and selection of off-taker(s), investor(s), cofinancier(s) and/or insurer(s). The expert will control the project risks and their mitigation measures. The expert will also review and assess the precedent Dagachhu and Nikachhu hydropower projects' results including lessons learned, with other all experts. The expert will analyze the possibility of power trade options based on the supply and demand scenarios that see price and marginal cost projections and assess concrete action plans and roadmap to facilitate such trading opportunities. The expert will also assess any sector reform requirements.
7. **Financial Specialist** (international, 4 person-months). The expert will support financial structuring with strategic emphasis of risk mitigation and pricing negotiations based on the project financial projection and risk profile. The expert will promote equity financing through private partner's joint venture, and initial public offering while exploring debt financing of loans, export credits, and/or bonds through credit enhancements. The expert will also assess the financial management and design the fund flow and disbursement mechanisms.
8. **Economist** (international, 2 person-months) and **Public Resource Management Specialist** (international, 1 person-month). The experts will analyze project impacts on the micro and macroeconomic values including the country and regional levels. The Economist will examine the project economic viability while the Public Resource Management Specialist will undertake the country's debt sustainability analysis in conformity accordance with the methodology of International Monetary Fund/International Development Association to assess the project impacts on the government's fiscal impacts.
9. **Environment Specialist** (international, 5 person-months; national, 5 person-months) and **Social Development Specialist** (international, 3 person-months; national, 4 person-months). The experts will prepare safeguard frameworks and plans in accordance with the

ADB's Safeguard Policy Statement (2009). The Environment Specialists will prepare environmental assessment review frameworks and environmental impact assessments (or initial environment examination if any), including environment management plans.<sup>4</sup> The Social Development Specialists will upgrade or prepare (i) resettlement frameworks and plans including community development plans, and (ii) indigenous people planning frameworks and indigenous people development plans if required, based on surveys and social, poverty and gender assessments.<sup>5</sup> The experts will help conduct public consultations with affected stakeholders.

10. **Legal Specialist** (international, 2 person-months). The expert will support documentation and negotiations on the legal and commercial agreements including shareholders agreements, power purchase agreements, and articles of incorporation, with reviews of policies and legal and regulatory frameworks relevant to the project.

11. **Hydropower Engineer** (international, 2 person-months), **Hydrologist** (international, 2 person-months), **Geologist** (international, 2 person-months), **Electrical Engineer** (international, 4 person-months; national, 4 person-months), **Mechanical Engineer** (international, 1 person-months). The experts will undertake technical due diligence on the pre-feasibility study report and detailed project report, and provide any guidance to DGPC and BPC for their reports and works. The experts will finalize the least cost options, estimates, and schedules, and prepare the basic design parameters used for the bid documents.

12. **Climate Change Specialist** (international, 2 person-months). The expert will prepare climate change analysis for mitigation and adaptation. With the Environment Specialist and other engineers, the expert will also assess greenhouse gas emission reduction, and climate change adaptation design for the project if any.

## E. Implementation Arrangements

13. The Department of Hydro Power and Systems, Ministry of Economic Affairs will be the executing agency under the PPTA. BPC, DGPC, and the project's special purpose company to be established will be implementing agencies under the PPTA. The implementing agencies will provide the consultant with counterpart project staff including the project manager, office space with furniture, data and documentation required. The proposed PPTA processing and implementation schedule is listed in Table 3.4.

**Table 3.4: Proposed Technical Assistance Processing and Implementation Schedule**

<b>Major Milestones</b>	<b>Expected Completion Date</b>
Reconnaissance mission	July 2015
Project concept paper meeting	October 2015
TA Fund commitment	November 2015
Approval of concept paper	November 2015
Recruitment of PPTA consultant	May 2016
TA implementation	May 2016–April 2018

Source: Asian Development Bank

<sup>4</sup> Includes watershed management, river basin development approach, biodiversity assessment (covering terrestrial and aquatic flora and fauna in seasons), environmental flow assessment, and downstream cumulative impact assessment.

<sup>5</sup> Includes assessments and resultant action plans of poverty and social impact, gender impact, participation dimensions, social safeguards, and other social risks as indicated in Appendix 4.