

The logo for the Asian Development Bank (ADB), consisting of the letters 'ADB' in a white serif font inside a black square.

ADB

Concept Paper

Project Number: 44444
October 2011

Bhutan: Green Power Development Project II

Asian Development Bank

I. THE PROJECT

A. Rationale

1. In 2008, ADB approved financing the Green Power Development Project for Bhutan to mainly promote the Dagachhu hydropower development (114 MW) for power export to India, through a public private partnership (PPP).¹ While the cross-border power trading has physically been limited only between Bhutan and India in South Asia, ADB also decided to finance the transmission interconnection between Bangladesh and India in August 2010.² These projects have created potential to expand power trading from the cross-border to regional dimension. The Green Power Development Project-II (the Project) is proposed to export Bhutan's hydropower to both Bangladesh and India through Indian power trader(s). The Project is a medium size run-of-the-river type (210 MW) which will have small environmental and social impacts unlike reservoir types. It is located on the Nikachhu River in Trongsa of the central Bhutan. The Government of Bhutan officially requested ADB for the project on 6 September 2010.³

2. Bhutan is the only South Asian country with a surplus of power for export. While there is seasonal demand and supply gaps particularly in dry winters, the country's annual generation capacity (around 1,500 MW) is significantly greater than its domestic demand; Bhutan is a net power exporter. Of total power generated, around 80% is exported to India as of 2010. Power exports account for more than 40% of national revenue and 25% of gross domestic product (GDP) in Bhutan. Hydropower infrastructure development also contributes another 25% of GDP through the construction sector. The revenue from power exports are the primary source for the government's socioeconomic development for health, education, agriculture and rural development. The hydropower development thus forms the backbone of Bhutan's economy and social lives.

3. Bhutan's potential hydropower is 23,760 MW, 6% of which has been exploited to meet domestic consumption and the remainder is for export. On the other hand, neighboring countries including India and Bangladesh are experiencing a large power supply deficit and their power sources are dominated by fossil fuel-based thermal generation plants with greenhouse gas emission. Clean energy development for power export from Bhutan will increase energy supply stability, improve energy efficiency, and foster climate change mitigation on the sub-regional level. The development of a transmission interconnection between Bangladesh and India is expected to expand the subregional network potential. Given the fact that Bhutan has recently faced with shortage of power during the winter periods due to fast growing domestic demand and reduction of river water flows in the dry seasons,⁴ Bhutan also has economic incentives to import power from the neighboring countries during the lean seasons through the cross-border network. To establish the complementary relationship of power supply among the three countries and to diversify potential buyers and sellers are expected to step forward to a regional power trading market in a competitive environment and strengthen energy security with each

¹ ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Loans, Asian Development Fund Grant, Technical Assistance Grant, and Administration of Grant to the Kingdom of Bhutan for the Green Power Development Project*. Manila.

² ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Bangladesh for the Bangladesh-India Electrical Grid Interconnection Project*. Manila.

³ Project Preparatory Technical Assistance (PPTA, Appendix 5). A PPTA is financed on a grant basis by the Japan Fund for Poverty Reduction (JFPR), and administered by ADB.

⁴ Bhutan is a net power exporter on an "annual basis". There is a shortage of power in the dry winter season when the river flows for generation are drastically reduced.

other.⁵ Trilateral energy trade in the sub-region will eventually contribute to economic growth through deeper regional integration.

4. ADB has already been at the forefront among development partners in developing regional power exchanges in South Asia, through RETA for preparation of the SAARC Regional Energy Trade Study. The Dagachhu hydropower development was the first cross-border power generation project financed by international agencies like ADB in South Asia and the first PPP for an infrastructure project in Bhutan. It was jointly established by Bhutan's state owned Druk Green Power Corporation (DGPC), and India's private energy developer, Tata Power Company. ADB provided the project with \$80 million loans of which \$51 million from OCR was financed for debt while the balance of \$29 million was used for DGPC's equity sourced from the hard-term ADF loan. Another notable feature of the Dagachhu hydropower development was the world's first cross-border Clean Development Mechanism (CDM) project registered by the United Nations Framework Convention on Climate Change (UNFCCC). The Dagachhu's implementation is progressed well.⁶

5. The proposed Project has been identified as the post Dagachhu development to promote the second PPP type project for power export with a scale-up approach.⁷ To lower investment barriers for foreign private sector participation and overcome lack of Bhutan's domestic capital and credit, ADB's catalytic role is still required. While DGPC is financially robust, Bhutan's capital market has still been too small to promote large investment in subsequent hydropower projects. To attract foreign investment and financing for those projects, Bhutan issued the Sustainable Hydropower Policy, 2008 that allows private participation in the hydropower development. The seed money finance from ADB will be crucial for Bhutan to initiate the Nikachhu hydropower development through PPP and explore financial leverage effects through initial public offering and guarantee and syndication processes with commercial banks and financial institutions. To avoid distressing the government's debt sustainability position, it is important for donor(s) to explore (i) concessional sovereign loan to the Government and DGPC for their project's equity injection, (ii) leverage of counterpart investment from any experienced private development partner(s) through PPP structuring, and (iii) development of various debt instruments through commercial finance with credit enhancements (e.g., guarantees, syndications, and project bonds).

B. Impact, Outcome, and Outputs⁸

6. **Impact and Outcome.** The Project's impact is to increase power trading among Bhutan, Bangladesh and India. As an outcome, the sub-regional power trading platform will be created in a commercial manner. The Nikachhu hydropower development will also generate a long-term revenue stream for Bhutan to finance its development needs for social infrastructure such as health and education, as well as economic infrastructure facilities like roads and rural electricity supplies, which will form the very basis of poverty reduction in the country.

7. **Outputs.** The project outputs include (i) operation of a 210 MW run-of-the-river Nikachhu hydropower plant and its associated transmission lines, and (ii) enhanced institutional capacity of DGPC in financial, social, and environmental terms. The project will generate power

⁵ To diversify potential power purchasers is expected for Bhutan to help enhance its competitive advantage of hydropower sales and mitigate the off-take market risk from the single country's buyer.

⁶ For two and half years after the loan approval over the five-year project period, 70% of the total ADB loan amount has successfully been disbursed for the Dagachhu hydropower development.

⁷ The Dagachhu's project cost was around \$200 million. The debt structure was relatively simple with co-financing from a Bhutanese financial institution and an Austrian export credit agency in commercial terms in addition to ADB's OCR loan.

⁸ Appendix 2 (Problem Analysis) and Appendix 3 (Design and Monitoring Framework).

of 903,490 MWh on the average annually. Power generated is expected to be exported by Indian power trader(s) to neighboring countries including India and Bangladesh through the existing grid connected to India and planned one to Bangladesh.⁹ Given that clean and renewable power export will be counted as carbon saving, the resulting reduction of greenhouse gases equivalent to CO₂ emissions is estimated as around 1,000,000 tons every year assuming on the Indian grid system benchmark.

C. Tentative Investment and Financing Plans

8. The total indicative project cost is estimated at \$340 million including contingencies and financing costs. The debt to equity ratio will be based on 70 to 30. It is proposed that ADB will finance a concessional loan of \$40 million (i.e., hard-term ADF loan) as seed finance to the government's and DGPC's equity. The ADB finance is expected to leverage their revenue, contributing to the country's debt sustainability. DGPC has committed its own resources for part of equity (i.e., \$12 million). PSOD may also consider equity participation, subject to the Government's request, sufficient justification for equity investment, and its own due diligence. The debt is expected to be supported by OCR loan (\$80 million) and cofinancing, which may be supported by credit enhancement products, to maximize the financial leverage and attract private and foreign capital.¹⁰ The total ADB loans are expected to be \$120 million. The tentative financing plan is summarized in Table 1.

**Table 1: Tentative Financing Plan
(\$ million)**

Item	Amount
Project Cost (= A + B)¹	340
Debt:Equity	70:30
(A) Equity (30% of Project Cost) (= a+b+c)	102
(a) DGPC/Government	12
(b) DGPC/Government financed by ADB (hard-term ADF loan)	40
(c) Private development partner(s) ² (49% of equity)	50
(B) Debt (70% of Project Cost) (= d+e)	238
(d) ADB (OCR loan)	80
(e) Commercial banks/financial institutions/export credit agency ³	158

^{1/} Includes indicative contingencies (20% of the base cost) and financial charges (10% of the base cost).

^{2/} Includes strategic development partner(s).

^{3/} Includes options of commercial debt (which may be covered by credit enhancement products), export credit, etc. with or without a sovereign guarantee to be studied under the PPTA.

Source: DGPC and ADB estimates.

D. Indicative Implementation Arrangements

9. The Department of Energy (DOE), Ministry of Economic Affairs will be the executing agency. The implementing agencies will be DGPC and a special project company (SPC) to be established by DGPC and private development partner(s). The major implementation arrangements will include (i) shareholders agreement, (ii) power purchase agreements (PPA),

⁹ In case of power trading between Bhutan and Bangladesh, Indian power trader(s) is expected to make the power purchase agreements with each party of Bhutan and Bangladesh on a back-to-back basis.

¹⁰ While Bhutan is a Group A country for ADF only, OCR lending and guarantees can be considered on an exceptional basis for revenue-earning projects that earn foreign exchange revenue and fully service their foreign debt from their net foreign exchange earnings, in accordance with OM A1/BP. The IMF Article IV Consultation (2007 and 2009) ensured that the power sector and hydropower development for export would contribute to improving the debt sustainability and economic growth of Bhutan, citing the Dagachhu hydropower project.

(iii) financing agreements, (iv) CDM arrangement, and (v) engineering, procurement, and construction contract(s). The Project's construction will be implemented over 5 years. The Government and the executing and implementing agencies requested ADB for advance contracting and retroactive financing for project preparation for access roads and any related facilities, goods and services. Procurement, consulting services, and safeguards for the expected ADB financing components of the Project will follow each of relevant ADB guidelines.

II. DUE DILIGENCE REQUIRED

10. DGPC has undertaken a comprehensive feasibility study including the geotechnical surveys. For the project structuring, further due diligence studies during implementation of the PPTA are as follows:¹¹

- (i) **Technical.** The Project site has good accessibility which will reduce the project costs of associated facilities such as access roads¹² and transmission lines.¹³ However the basic design and cost estimates will thoroughly be reviewed and compiled hydrological and geological data will further be examined in a due diligence process.
- (ii) **Economic and Financial.** Compared to the ongoing Dagachhu hydropower development, the proposed Project is expected to make economy's scale merits.¹⁴ Based on the transaction, tariff pricing and cost reviews, the PPTA will carefully assess financial viability and risk mitigation measures (e.g., off-take risks and securities). The PPTA will support the Project's financial structuring to make suitable risk allocations. The carbon finance and its benefits will also be considered in the Project's viability assessments if applicable.¹⁵
- (iii) **Governance.** Legal and commercial agreements will be examined with relevant policies and legal and regulatory frameworks. The PPTA will promote project governance structuring with involvement of the private development partner(s) and the Government.
- (iv) **Poverty and Social.** The access road construction and its employment opportunities will contribute to local development in the project site and residents around the area. The Project's revenue will go to the Government in the form of taxes, dividends, and royalties. These benefits will be used for the Government's socioeconomic development for health, education, and rural development throughout the country. Since the Sustainable Hydropower Development Policy, 2008 requires the project developers for provision of skill training to Bhutanese labors, its costs and programs will be ensured under the PPTA.¹⁶
- (v) **Safeguards.** No indigenous peoples are likely to be affected. No displacements of houses have been foreseen due to construction of project facilities.¹⁷ While the Project's involuntary resettlement impact is expected to be minimized because of the run-of-the-river type plant, further assessments will be undertaken to prepare a resettlement plan in accordance with the Safeguard Policy Statement (2009). While such a plant type is also

¹¹ Appendix 5 (Project Preparatory Technical Assistance).

¹² The development site is close to the existing highway (e.g., around 200 m for a possible intake site).

¹³ There will be close grid connections matching power evacuation. The Nikachhu River is a tributary of the Mangdechhu River. Since the Mangdechhu hydropower project is expected to start construction, the transmission line will come close to the Nikachhu project site. The transmission line to evacuate power generated is expected to be connected to the grid extended to India by the Bhutan Power Corporation.

¹⁴ The DGPC's feasibility study report indicates that the project is financially and commercially viable.

¹⁵ The post 2012 framework for climate change and CDM is unknown yet.

¹⁶ Appendix 4 (Initial Poverty and Social Analysis). Gender equal employment opportunities plans to be designed.

¹⁷ With the weir located in an uninhabited area and other components being in the underground, no resettlement is expected from the project major facilities. However, the overall project impact will be reassessed along with associated facilities of access roads and transmission lines whose routes are being investigated to minimize impacts.

expected have smaller environmental impacts unlike reservoir types,¹⁸ they will carefully be assessed and the environmental management plan will be strengthened if any adverse impacts are foreseen.

III. PROCESSING PLAN

A. Risk Categorization

11. The Project is considered as low risk in accordance with the criteria indicated in the Operational Manual.¹⁹ An ADB direct financing amount is presently expected to be less than \$200 million for the Project. There is a sound record of ADB's previous experience from the ongoing Green Power Development Project in terms of preparation, implementation, and disbursement progress. DGPC has already implemented and operated four hydropower plants with various agencies successfully with no failed projects, and DGPC's institutional capacity is being strengthened by ADB's CDTA comprehensively.²⁰ To tie up with experienced private partner(s) through PPP is expected to further improve the Project's construction and operational risk management. The safeguard impacts are considered less significant at the concept stage based on the site visit and project reports.

B. Resource Requirements

12. The internal staff resources required for the project team is estimated at 20 person-months for ADB staff in addition to 40 person-months for the PPTA consultant.

C. Processing Schedule

13. The indicative processing schedule for the Project is proposed in Table 2:

Table 2: Proposed Processing Schedule

Milestones	Expected Completion Date
Reconnaissance mission	Dec 2010
Cross-departmental and peer reviews	Feb 2011
Approval of PPTA based on the TA fund commitment	Oct 2011
PPTA Implementation	Dec 2011–Feb 2013
Loan fact finding mission	Jul 2012
MRM	Oct 2012
Loan negotiations	Nov 2012
Board consideration	Dec 2012
Loan effectiveness	Mar 2013

IV. KEY ISSUES

14. The Government has requested ADB's comprehensive support for the Project's financial structuring, contractual arrangements (e.g., for PPP, PPA, CDM), and safeguard strengthening. In financial structuring, it is expected to discuss the possibilities of (i) cofinancing and credit enhancement opportunities suitable for Bhutanese systems with OCO, and (ii) private investment and ADB's equity participation with PSOD, along with the PPTA implementation.

¹⁸ While the project site is out of the environmentally protected areas, the environmental impacts will further be examined.

¹⁹ Appendix 1 (Basic Project Information). The categorization was assessed in accordance with the criteria indicated in the Operational Manual.

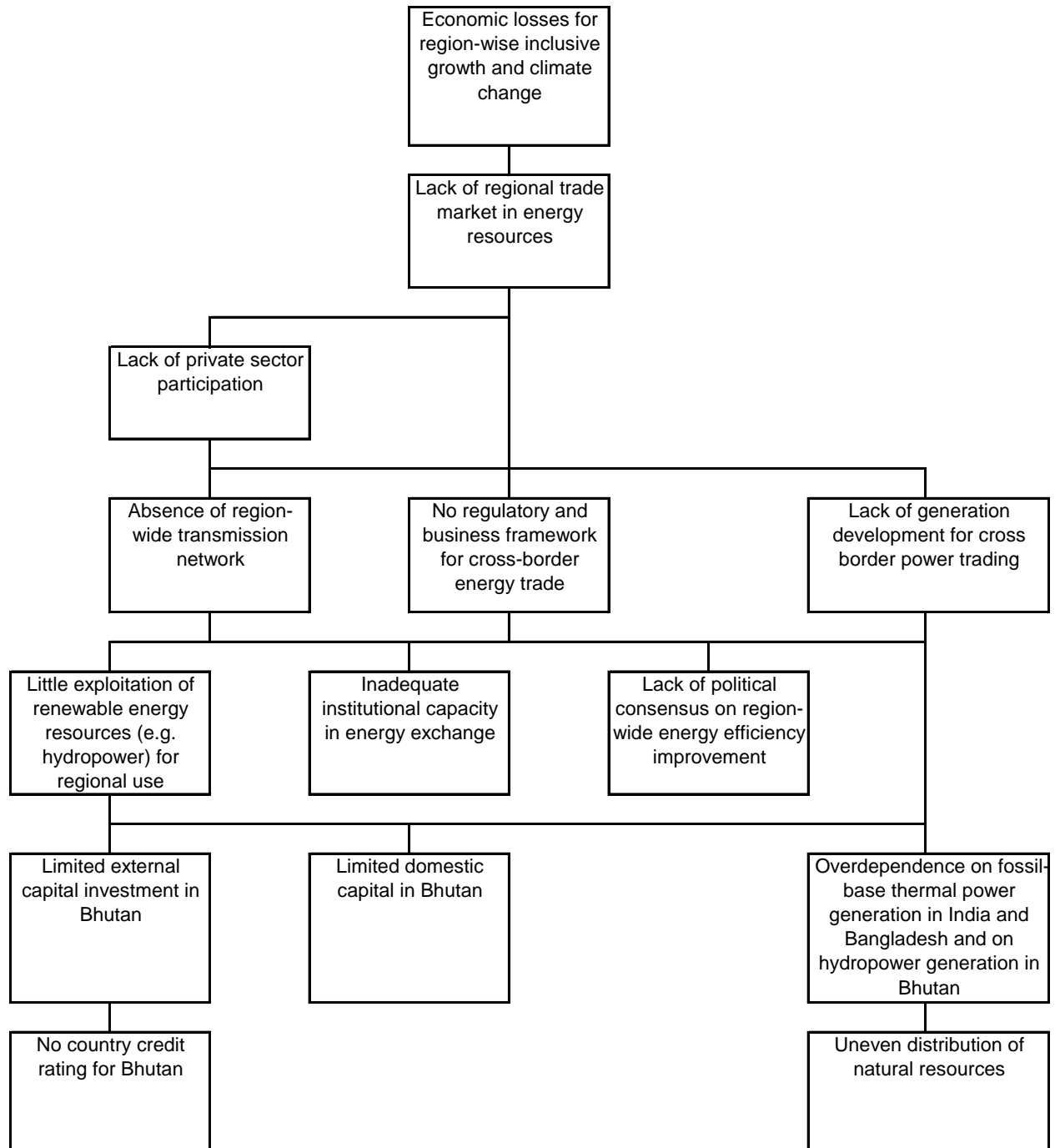
²⁰ ADB. 2008. *Technical Assistance to the Kingdom of Bhutan for Promotion of Clean Power Export Development*. Manila.

BASIC PROJECT INFORMATION

Aspects	Arrangements																				
Modality Expected Financing	Project loan Hard term ADF loan (\$ 40 million) OCR loan (\$80 million) Cofinancing (commercial banks/financial institutions/export credit agencies) (\$158 million) Private investment partner(s) (\$50 million) The government/DGPC (\$12 million)																				
COBP/RCOBP	In an official letter dated on 6 September 2010, the Government of Bhutan requested ADB's support for the project preparatory TA of the Nikachhu hydropower project. Accordingly, the TA is to be included for 2011 in the COBP.																				
Classification	<p>Sector (subsectors): Energy (large hydropower, trade and services)</p> <p>Themes (subthemes): Economic Growth (promoting economic efficiency and enabling business environment), Regional Cooperation (cross-border infrastructure), Private Sector Development (public private partnerships), Environment Sustainability (global and regional transboundary environmental concerns)</p> <p style="padding-left: 40px;">Climate Change: mitigation and adaptation</p> <p>Targeting classification: General Intervention Gender mainstreaming category: some gender benefits Location impact:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Relative weight of spatial impact of the project</th> <th style="text-align: center;">High</th> <th style="text-align: center;">Medium</th> <th style="text-align: center;">Low</th> </tr> </thead> <tbody> <tr> <td>Rural</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Urban</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>National</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Regional</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </tbody> </table> <p>Safeguards: Involuntary resettlement B, Indigenous peoples C, Environment B</p>	Relative weight of spatial impact of the project	High	Medium	Low	Rural	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Urban	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	National	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Regional	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relative weight of spatial impact of the project	High	Medium	Low																		
Rural	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																		
Urban	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>																		
National	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Regional	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																		
Risk categorization	Low risk																				
Partnership(s)	Consultation with export credit agencies and commercial banks for cofinancing																				
Use of a PBA	N/A																				
Parallel PIU	N/A																				
Department and division	South Asia Regional Department (SARD), Energy Division (SAEN)																				
Mission leader and members	K. Ogino, Senior Energy Specialist (team leader); L. George, Energy Specialist, SAEN; H. Kobayashi, Principal Portfolio Management Specialist, SAEN; P. van Houten-Castillo, Social Development Specialist, S. Sasaki, Environment Specialist, SAEN; L. Zhang, Energy Specialist, SAEN																				

ADB = Asian Development Bank, ADF = Asian Development Fund, CPCM = country program confirmation mission, COBP = country operations business plan, PBA = programmatic based approach, PIU = project implementation unit, RCOBP = regional cooperation operations business plan, TA = technical assistance.

PROBLEM TREE



PRELIMINARY DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
<p>Impact</p> <p>Increased power trading among Bhutan, Bangladesh and India</p>	<p>Increase in power trading of at least 5,000 MW from Bhutan to India by 2020 (baseline: 1,000 MW in 2010)</p> <p>Increase in power trading of at least 500 MW from India to Bangladesh by 2020 (baseline: zero n 2010)</p> <p>Increase in investment size of PPP in hydropower development projects in Bhutan with minimum 500 MW by 2020</p> <p>Increase in the energy sector share of Bhutan's GDP from 25% (2009) to [40% (2020)]</p>	<p>DOE's Power Data Book</p> <p>Economic reports of IMF</p> <p>DOE's Power Data Book</p> <p>The Government's five year plans and economic reports</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • Indian power trading market continues. • Bilateral assistance and joint venture investment from India continues for hydropower developments in Bhutan. • Government continues to promote hydropower development through PPP. <p>Risk</p> <ul style="list-style-type: none"> • Exogenous economic and political shocks occur.
<p>Outcome</p> <p>Sub-regional commercial power trading platform created</p>	<p>Executed power trading in regional coverage of the three countries by 2018</p> <p>Increase in investment size of PPP in export oriented hydropower development in Bhutan with minimum 300 MW by 2018 (baseline: 114 MW (2013))</p> <p>Annual reduction of emission gas equivalent CO₂ by additional 1,000,000 tons and its certified credits from CDM in a cross-country basis by 2018 on onward</p>	<p>DOE's Power Data Book</p> <p>DGPC audited financial accounts and annual reports</p> <p>CDM project design document and monitoring reports</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • The existing investment and regulatory framework continues. • Strong electricity demand continues in the neighboring countries' power market. • A transmission link between Bangladesh and India is complete. <p>Risks</p> <ul style="list-style-type: none"> • Power off-taker(s) faces serious default. • Significant hydrological shortage occurs because of natural disaster and climate change. • Post 2012 CDM framework is unknown.

Design Summary	Performance Targets/Indicators	Data Sources/ Reporting Mechanisms	Assumptions and Risks
<p>Outputs</p> <p>Nikachhu hydropower generation plant is operational</p> <p>DGPC's institutional capacity is enhanced financially, socially, and environmentally.</p>	<p>Construction of a 210 MW run-of-river hydropower plant by 2017</p> <p>Construction of a [20] km transmission line to evacuate power generated from the plant to the main grid system by 2017</p> <p>Clean and renewable energy exported additional 903 GWh on an annual average after the plant's commissioned in 2017</p> <p>Continued financial and commercial viability of DGPC including its special project company for Nikachhu, in conformity with the loan covenants</p> <p>Safeguards implemented by in compliance with ADB Safeguard Policy Statement (2009)</p>	<p>DGPC quarterly project progress reports</p> <p>DGPC quarterly project progress reports</p> <p>DGPC quarterly project progress reports and project completion report</p> <p>DGPC audited financial accounts and annual reports</p> <p>Safeguard monitoring reports</p>	<p>Assumptions</p> <ul style="list-style-type: none"> • Cofinancing is timely confirmed and mobilized. • Firm commercial agreements are executed (i.e., power purchase agreement, emission reduction purchase contract). <p>Risks</p> <ul style="list-style-type: none"> • Unexpected cost increases in commodities and raw materials beyond contingencies. • Construction delays due to natural disaster.
<p>Activities with Milestones</p> <ol style="list-style-type: none"> 1. Project preparation <ol style="list-style-type: none"> 1.1 Environmental and social clearance by 2012 1.2 Setup of a special project company by 2012 1.3 Signing of a power purchase agreement by 2012 1.4 Signing of shareholders agreements by 2012 1.5 Financial closure of all agreements by 2013 1.6 Commencement of advance bidding process by 2012 2. Project implementation <ol style="list-style-type: none"> 2.1 Start of land acquisition by 2013 2.2 Engineering, procurement, and construction contract(s) award by 2013 2.3 Start of physical construction by 2013 2.4 In-depth mid-term review of project progress by 2015 2.5 Physical completion by 2017 			<p>Inputs (\$ million)</p> <ul style="list-style-type: none"> • ADB 120 • DGPC 12 • Private sector 50 • Cofinancing 158 <p>(e.g., commercial banks, financial institutions, export credit agencies)</p>

ADB = Asian Development Bank, CDM = clean development mechanism, DGPC = the Druk Green Power Corporation Limited, DOE = Department of Energy, GDP = gross domestic product, GWh = gigawatt-hour, IMF = International Monetary Fund, MW = megawatt, NEC = National Environment Commission, PPP = public private partnership, TA = technical assistance.

INITIAL POVERTY AND SOCIAL ANALYSIS

Country/Project Title: BHU: Green Power Development Project-IILending/Financing
Modality:Project LoanDepartment/
Division:SARD / SAEN

I. POVERTY ISSUES

A. Linkages to the National Poverty Reduction Strategy and Country Partnership Strategy

The Nikachhu hydropower development will have direct and indirect positive impacts on poverty. The local economy is expected to be improved once civil works are started. For example, the development of access roads to the project site will improve accessibility of local communities to main roads. This is expected to stimulate the local economy, while improving quality of life eventually. The hydropower development will also indirectly support Bhutan's rural domestic customers, in particular under a lifeline tariff. The tariff policy allows the Government to subsidize electricity for lifeline consumers, using the royalty power yielded from the power generation plants. Because alternative sources of energy, in particular kerosene, have become progressively more expensive, use of cheaper electricity will increase savings for the poor. Power exports will increase the Government's revenue base and enable the Government to make more resources available for socioeconomic development including health, education, and agriculture. In fact, the Government's revenues from power exports exceeded all the expenditures for agriculture and social sectors (e.g., health and education). During the government's five year plan, the Government envisages that revenues from hydropower development will be the major source for directly improving quality of life and reducing poverty. Incremental income from power exports will also be used for improving and expanding road and bridge infrastructure to promote rural development for poverty reduction.

B. Targeting Classification

1. Select the targeting classification of the project:

 General Intervention Individual or Household (TI-H); Geographic (TI-G); Non-Income MDGs (TI-M1, M2, etc.)

2. Explain the basis for the targeting classification:

The Project will not directly target the households/individuals, but will contribute towards poverty reduction through economic growth and employment generation in the local areas. It will thus contribute in reducing poverty and supporting community development for the rural population.

C. Poverty Analysis

1. If the project is classified as TI-H, or if it is policy-based, what type of poverty impact analysis is needed?
Not applicable.

2. What resources are allocated in the PPTA/due diligence?

The social development specialists will be recruited to conduct the social and poverty analysis.

3. If GI, is there any opportunity for pro-poor design (e.g., social inclusion subcomponents, cross subsidy, pro-poor governance, and pro-poor growth)?

Opportunities for pro-poor design will be explored and any need for supplementary poverty reduction component(s) will be developed.

II. SOCIAL DEVELOPMENT ISSUES

A. Initial Social Analysis

Based on existing information:

1. Who are the potential primary beneficiaries of the project? How do the poor and the socially excluded benefit from the project?

The revenue from power export will be redistributed mainly to social service improvement and basic infrastructure development for inclusive growth. In this regard, the urban and rural population in Bhutan will extensively benefit from the project. For local communities in the project area, the construction and operations of the power plants will generate demand for labor and income generation opportunities. They are expected to directly benefit from the project, particularly during the construction phase when there is a high demand for construction labor in the project areas. An in-depth social analysis will be carried out to focus socio-economic profile of population in the project areas as primary project

beneficiaries.

2. What are the potential needs of beneficiaries in relation to the proposed project?

The main need of rural population is access to markets, social services, and employment opportunities. To do so, the local communities need support in improving local infrastructure and enhance their productivity. In this regard, the initial social analysis has assessed the basic needs of the beneficiaries, through (i) identification of poor households residing in the project area; (ii) consultation with potential beneficiaries; and (iii) assessment of the opportunities of the poor households for their income generation. The preliminary survey in the project areas indicates high demand to participate in construction work of the Project. Based on the Sustainable Hydropower Policy of Bhutan 2008, skill training programs plan to be formulated for local communities to ensure the direct benefits to the project area and beneficiaries.

3. What are the potential constraints in accessing the proposed benefits and services, and how will the project address them?

The local communities in the project area have limited accessibility to markets, social services, and employment. The proposed project is expected to develop access roads and build social service facilities associated with the power plant. Employment opportunities will also be created for construction and maintenance works. The Project will further identify suitable activities and programs to improve their accessibility based on the in-depth social analysis.

B. Consultation and Participation

1. Indicate the potential initial stakeholders.

Affected people/communities, executing/implementing agency staff, local government authorities, civil society groups, and private sector organizations. All relevant stakeholders will be identified and consulted throughout the Project preparation.

2. What type of consultation and participation (C&P) is required during the PPTA or project processing (e.g., workshops, community mobilization, involvement of nongovernment organizations and community-based organizations, etc.)?

Affected persons and communities will be fully consulted during the project design and implementation through stakeholder consultations and workshops, focus group discussions, interviews and surveys if any. The focus group discussions were already conducted by DGPC in October 2010.

3. What level of participation is envisaged for project design?

Information sharing Consultation Collaborative decision making Empowerment

4. Will a C&P plan be prepared? Yes No Please explain.

DGPC and its subsidiary project company will conduct the public consultations in different places and timing. The field consultations will involve all relevant local stakeholders including representatives of any affected people to disseminate the information as well as to get their feedback about the project design and its potential impacts. Other key stakeholders such as relevant line agencies, local government representatives and/or civil society will also be consulted. Consultations will also be undertaken with the affected households and communities during the course of census survey and socio-economic survey along with preparation of social safeguard plans.

C. Gender and Development

1. What are the key gender issues in the sector/subsector⁸ that are likely to be relevant to this project/program?

Women play significant roles in rural economy. The Project will further assess the relevant gender issues in the project areas.

2. Does the proposed project/program have the potential to promote gender equality and/or women's empowerment by improving women's access to and use of opportunities, services, resources, assets, and participation in decision making?

Yes No Please explain.

The Project is expected to increase women's employment during the project construction and will enhance their access to markets and services. It will further explore modalities through which the project may contribute to promoting gender equality and women's empowerment.

3. Could the proposed project have an adverse impact on women and/or girls or to widen gender inequality?

Yes No Please explain.

While women are also expected to benefit from the Project in terms of increased employment opportunities, the Project will identify potential positive and adverse impacts on women and recommend actions such as gender-responsive information campaign on sexually transmitted infections and human trafficking, safety and security needed measures such as information campaign on HIV/AIDS risks, provision of safety and security during construction and special assistance to vulnerable women under the resettlement plan or other social development plans.

III. SOCIAL SAFEGUARD ISSUES AND OTHER SOCIAL RISKS

Issue	Nature of Social Issue	Significant/Limited/ No Impact/Not Known	Plan or Other Action Required
Involuntary Resettlement	None of physical displacements have been foreseen due to the construction of project facilities. Partial land acquisition may be required due to construction of access roads, whose routes are being investigated to minimize impacts. Further studies will identify any impacts to prepare a necessary resettlement plan.	Not known.	<input type="checkbox"/> Resettlement Plan <input type="checkbox"/> Resettlement Framework <input type="checkbox"/> No Action <input checked="" type="checkbox"/> Uncertain
Indigenous Peoples	A preliminary analysis has not identified any indigenous people in the project area, but this will be investigated during the PPTA implementation.	Not known.	<input type="checkbox"/> Indigenous Peoples Plan <input type="checkbox"/> Indigenous Peoples Planning Framework <input type="checkbox"/> No Action <input checked="" type="checkbox"/> Uncertain
Labor <input checked="" type="checkbox"/> Employment Opportunities <input type="checkbox"/> Labor Retrenchment <input checked="" type="checkbox"/> Core Labor Standards	Possible job opportunities during construction. In any cases, core labor standards will be added to the assurances.	Limited impacts.	<input type="checkbox"/> Plan <input checked="" type="checkbox"/> Other Action <input type="checkbox"/> No Action <input type="checkbox"/> Uncertain
Affordability	No issues of affordability.	No impacts.	<input type="checkbox"/> Action <input checked="" type="checkbox"/> No Action <input type="checkbox"/> Uncertain
Other Risks and/or Vulnerabilities <input checked="" type="checkbox"/> HIV/AIDS <input type="checkbox"/> Human Trafficking <input type="checkbox"/> Others (conflict, political instability, etc.), please specify	The issues of HIV/AIDS will be explored.		<input type="checkbox"/> Plan <input type="checkbox"/> Other Action <input type="checkbox"/> No Action <input checked="" type="checkbox"/> Uncertain

IV. PPTA/DUE DILIGENCE RESOURCE REQUIREMENT

1. Do the TOR for the PPTA (or other due diligence) include poverty, social and gender analysis and the relevant specialist/s?
 Yes No If no, please explain why.

2. Are resources (consultants, survey budget, and workshop) allocated for conducting poverty, social and/or gender analysis, and C&P during the PPTA/due diligence? Yes No If no, please explain why.

**PROJECT PREPARATORY TECHNICAL ASSISTANCE
Bhutan: Green Power Development-II**

A. Justification

1. The PPTA aims to (i) conduct due diligence of the feasibility study assessments done by Druk Green Power Corporation (DGPC), and (ii) upgrade their critical aspects required for commercial arrangements, financial structuring, safeguards, and procurement. For the financial closure of the Project, it is necessary to support DGPC and the Government in establishing a special project company and reaching legal agreements of commercial frameworks including the shareholders agreement, and the power purchase agreement(s). To ensure smooth implementation, the safeguard plan and actions will need to be strengthened and the bid documents will be prepared for engineering, procurement, and construction (EPC) contract(s).

B. Major Outputs and Activities

2. The major outputs and activities are summarized in Table A5.1.

Table A5.1: Summary of Major Outputs and Activities

Major Activities	Expected Completion Date	Major Outputs	Expected Completion Date
Technical due diligence	Apr 2012	Inception report	Jan 2012
Least cost estimates	Apr 2012	First interim report	Apr 2012
Institutional framework (i.e. SPC)	May 2012	Second interim report	Jul 2012
Environmental assessment clearance	May 2012	Draft final report	Nov 2012
Resettlement plan	May 2012	Final report	Feb 2013
Power purchase agreement	May 2012		
Shareholders agreement	May 2012		
Project design document for CDM	Jun 2012		
Financial analysis and structuring	Jul 2012		
Economic assessment	Jul 2012		
Bid document preparation	Jul 2012		

CDM = clean development mechanism, SPC = special project company.

Source: Asian Development bank.

C. Cost Estimate and Proposed Financing Arrangement

3. The PPTA is estimated at \$1,250,000 equivalent, of which \$1,000,000 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 a financing plan are in Table A5.2.

**Table A5.2: Cost Estimates and Financing Plan
(\$'000)**

Item	Total Cost
A. Japan Fund for Poverty Reduction^a	
1. Consultants	
a. Remuneration and per diem	
i. International consultants (28 person months)	619.4
ii. Domestic consultants (12 person-months)	48.0
b. International/local travel	168.0

Item	Total Cost
c. Reports and communications	3.0
2. Equipment ^b	13.4
3. Workshops, local training, resource persons, and seminars & conferences ^c	15.0
4. Vehicle rental ^d	9.0
5. Surveys	30.0
6. Miscellaneous administration and support	2.4
7. Contingencies	91.8
Subtotal (A)	1,000.0
B. Government Financing^e	
1. Office accommodation	12.0
2. Remuneration and per diem	160.0
3. Others	78.0
Subtotal (B)	250.0
Total	1,250.0

^a Administered by the Asian Development Bank.

^b Equipment (upon completion of the project, the equipment will be turned over to the IA.)

<u>Type</u>	<u>Quantity</u>	<u>Cost</u>
Printer	1	\$1,800
Digital camera	1	600
Fax machine	1	500
Scanner	1	500
Computer	2	5,000
Copy machine	1	5,000

^c Workshops, local training, seminars, and conferences

<u>Purpose</u>	<u>Venue</u>
Tripartite meetings, stakeholders meeting	Thimphu, Bhutan
Public consultation	Project site

^d Vehicle rental

<u>Justify the use of and the need to purchase or lease a vehicle</u>	<u>Expected length of use</u>
Vehicle rentals are required because of the need for project site reviews, surveys, data gathering, consultations, and commuting to various local offices.	3 months

^e Includes DGPC's contribution.

Source(s): Asian Development Bank.

D. Consulting Services

4. The TA will require 40 person-months of consulting services (28 international and 12 national) for 16 positions (Table A5.3). The TA will be implemented over 15 months. ADB will engage a consulting firm or consortium of firms using quality- and cost-based selection (QCBS) procedures in accordance with *ADB's Guidelines on the Use of Consultants* (2010, amended from time to time).²¹ The TA-financed equipment will be procured under *ADB's Procurement Guidelines* (2010). The disbursements will be made under *ADB's Technical Assistance*

²¹ QCBS's weight is distributed to 90:10 for technical and financial proposals from consulting firms or their consortium considering the major impacts of the consultant's assignment on the project delivery. Simplified technical proposals will be requested. Only international and national environmental specialists may be individually engaged quickly to expedite a lengthy process for environmental clearance, through environmental survey and assessment, stakeholder consultation and participatory workshops.

Disbursement Handbook (2010, amended from time to time). 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.

Table A5.3: Summary of Consulting Services Requirement

International		National	
Name of Positions	Person-months	Name of Positions	Person-months
Power Sector Management Specialist	5	Environment Specialist	4
Financial Specialist	4	Social Development Specialist	4
Economist	1	Electrical Engineer	4
Environment Specialist	4		
Social Development Specialist	2		
Legal Specialist	2		
Public resource Management Specialist	1		
Hydropower Engineer	3		
Hydrologist	1		
Geologist	1		
Electrical Engineer	1		
Mechanical Engineer	1		
CDM Specialist	2		

CDM = clean development mechanism.

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, 5 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 analyze the possibility of regional power trade market 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 control the project risks and their mitigation measures. The expert will also review and assess the precedent Dagachhu hydropower project's results including lessons learned, with other all experts.

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, initial public offering, and/or ADB's direct equity participation while exploring debt financing of loans, export credits, and/or bonds through credit enhancements.

8. **Economist** (international, 1 person-month) and **Public Resource Management Specialist** (international, 1 person-month). The experts will analyze project impacts on the micro and macro economic 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 IMF/IDA to assess the project impacts on the government's fiscal impacts.

9. **Environment Specialist** (international, 4 person-months; national, 4 person-months) and **Social Development Specialist** (international, 2 person-months; national, 4 person-months). The experts will prepare safeguard plans in accordance with the ADB's Safeguard Policy Statement (2009). The Environment Specialists will upgrade the environment impact assessments (or initial environment examination if any), including environment management plans. The Social Development Specialists will upgrade or prepare (i) a resettlement plan including skill training programs for affected local persons who are expected to be in construction works, and (ii) indigenous people development plan if required, based on surveys and social, poverty and gender equality analyses. 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, 3 person-months), **Hydrologist** (international, 1 person-months), **Geologist** (international, 1 person-months), **Electrical Engineer** (international, 1 person-months; national, 4 person-months), **Mechanical Engineer** (international, 1 person-months). The experts will undertake technical due diligence on the feasibility study report. The experts will finalize the least cost options and estimates and prepare the basic design parameters used for the bid documents for EPC contract(s), if applicable.

12. **CDM Specialist** (international, 2 person-months). The expert will prepare a project design document to apply for the clean development mechanism or its subsequent framework if any. With the Environment Specialist and other engineers, the expert will also assess climate change adaptation design for the Project if any.

E. Implementation Arrangements

13. The Department of Energy, Ministry of Economic Affairs will be the executing agency. DGPC and its special project company to be established will be implementing agencies (IAs). The IAs 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 5.4.

Table 5.4: Proposed Technical Assistance Processing and Implementation Schedule

Major Milestones	Expected Completion Date
Categorization meeting for the concept paper	Nov 2010 (Done)
Reconnaissance mission	Dec 2010 (Done)
Cross-departmental and peer reviews	Feb 2011 (Done)
TA Fund commitment	Sep 2011 (Done)
Approval of concept paper	Oct 2011
Recruitment of PPTA consultant	Nov 2011
TA implementation	Dec 2011–Feb 2013

Source: Asian Development Bank.