

PROPOSAL

Regional Economics of Climate Change in South Asia Part I: Cleaner Technologies and Options

I. Basic Data

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| A. | Project Officers | Soo-Nam Oh, TRM ¹ Naoki Sakai, SAEN Tae Yong Jung, EAOD (Advisor) |
| B. | Executing Agency | ADB |
| C. | Implementing Agency(ies) | ADB |
| D. | Prioritized Areas | Regional Cooperation and Integration |
| E. | Types of Outputs | Innovative Intervention |
| F. | Coverage (Country/Regional) | Regional (Bangladesh, Bhutan, Maldives, Nepal, Sri Lanka) |
| G. | Amount Requested | \$500,000 |
| H. | Implementation Period | May 2009–March 2010 |

II. Proposed Project

A. Background and Rationale

1. ADB's Strategy 2020 (2008) focuses on addressing climate change as part of the broader agenda of environmentally sustainable growth in developing member countries (DMCs). One of the envisaged interventions is assistance to access clean and renewable technologies and in suggesting concrete policy options eventually leading to a more climate resilient economy and sustainable development.

2. ADB's Regional Cooperation and Integration Strategy (2006) states that ADB will support regional public goods as one of the four pillars, and that the support will focus on promotion of clean energy and energy efficiency improvement, among others. The South Asia Regional Cooperation Strategy and Program (2006) also supports regional cooperation in environment through knowledge-based cooperation and capacity building activities.

3. South Asia is the most vulnerable to climate change in the five regions in Asia and the Pacific in terms of food, biodiversity, water resources, coastal eco-system, human health, settlement, land degradation including sea level rise (Maldives/Bangladesh/India/Sri Lanka), melting Himalayan glaciers (India/Nepal/Bhutan), and increased cyclones (Bangladesh).

4. Consensus building at the regional- and country-level by decision-makers is needed on the steps to have concrete adaptation options in the face of climate change and address the barriers to the adoption of renewable energy and energy efficient technologies as well as climate friendly options available in their countries and the region to address climate change in South Asia. These steps include policy formation, plans, and other actions to develop comprehensive climate adapted development plans, taking into consideration the expected future climatic conditions, among others.

¹ Former Principal Economist (Regional Cooperation/SAOC).

5. Therefore, the South Asia Climate Change Implementation Plan (2008) supports a South Asia region economic analysis, which will be a comprehensive study focusing on the economics of adaptation to climate change and cleaner technologies/options for the region.

B. Impact and Outcome

6. ADB will carry out Regional Economics of Climate Change in South Asia (RECCSA). The proposed study, the first comprehensive one in South Asia, will capitalize on a similar study for Southeast Asian countries.² The study will also be complementary/supplementary to ongoing climate change projects in the participating member countries.

7. The RECCSA will be conducted to undertake a comprehensive study focusing on economics of adaptation to climate change, and cleaner technologies and options for the region. The study will be undertaken in two parts: Part I of the study will be a study of cleaner technologies and options, based on an analysis of marginal abatement cost (MAC) curves. Part II is to complete the study by analyzing adaptation options and policy scenarios, which contributes to the implementation of low carbon strategies in participating countries and the region. This proposed study is for Part I, and a separate regional technical assistance will be formulated for Part II. The design and monitoring framework of Part I is in Appendix 1.

8. Impact. Part I of the RECCSA will help develop cleaner technologies. It can contribute to the reduction of emissions of greenhouse gas (GHG) and local level pollutants as well as to the improvement of national energy security in the long-run by identifying barriers to technology adoption, capacity building, identifying potential Clean Development Mechanism (CDM) projects which could be developed through various carbon funds including the Carbon Funds under ADB's Carbon Market Initiative (CMI) and by proposing climate policy options for the participating countries and the region.

9. Outcome. Regional and country-level decision-makers of participating countries will have an improved understanding of the economic potential of various cleaner technologies and options and their costs through the analysis of MAC curves in the participating countries and the region through this study under Part 1.

C. Outputs

1. Scope of work

10. Part I of the RECCSA will help regional and country-level decision-makers understand cleaner technologies and options required to make informed decisions. It essentially consists of two stages: preparation stage to consolidate research and data, and analysis of MAC curves. The scope of the study will depend on the availability of data.

11. The proposed study will cover all South Asia Department (SARD) countries except for India, considering substantial work has already been done for India and focusing on low-income countries. However, the study result will be shared with all South Asian countries.

² ADB. 2007. *Technical Assistance for a Regional Review of the Economics of Climate Change in Southeast Asia* (TA 6427-REG). The TA, amounting to \$904,200, was financed by the Government of the United Kingdom.

12. The results of the study is planned to be presented at key international events and workshops, including COP15—the Fifteenth Conference of the Parties under United Nations Framework Convention on Climate Change (i.e., COP15, UNFCCC, Copenhagen, December 2009) subject to the decision of participating countries.

2. Outputs

13. **Output 1: Assessments of cleaner technologies and options.** Under this component, an economic assessment will be conducted on cleaner technologies and options available domestically in the participating countries as well as regionally. It would also enable identification of technology gaps and appropriate technologies in the participating countries. Barriers to the adoption of cleaner technologies and options will also be identified.

14. **Output 2: MAC Curve Analysis.** Country specific MAC curve analysis in South Asia will provide insights into and recommendations for future domestic and regional policies for adopting cleaner technologies and options. It also aims at identifying co-benefits of cleaner technologies and options. The MAC curve analysis will heavily depend on information on industrial structure and GHG-related technologies and the most relevant methodology will be selected among many available options.

15. Regional consultation and workshop will involve various stakeholders including policy makers, experts, and the private sector. They will increase awareness on the current status of GHG emissions and projected future changes in the participating countries as well as the region. The study results and findings will be communicated through participation in international fora.

D. Activities and Milestones

16. The study activities include: (i) carrying out a study of economic assessment of the available cleaner technologies and options domestically and regionally; (ii) projecting GHG emissions from energy and non-energy sectors with the assessment of possible low carbon options for the region; (iii) holding one regional consultation and one national experts workshop in each participating country to initiate the study; (iv) holding second regional workshop to discuss a draft final report; and (v) publication and dissemination of the findings of the study.

17. The study will require 11 person-months of international and 23 person-months of national consulting services. Resource persons will be engaged to review the reports and participate in the regional consultation and workshop. The consultants will be recruited on an individual basis in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time). Disbursements under the study will be made in accordance with ADB's *Technical Assistance Disbursement Handbook* (January 2008, as amended from time to time). The consultants' terms of reference are in Appendix 2. The study is expected to be implemented over 11 months from May 2009 to March 2010.

18. Key activities and milestones are as follow, and the details are in Appendix 3.

Recruitment of consultants: IV May–IV July 2009 (sequential recruitment)
Regional and national experts workshops (Inception): IV June 2009 onward
Draft Final Report: IV December 2009
Publication: IV March 2010

E. Project Evaluation and Information Dissemination

19. There will be a regional consultation and a regional workshop, with representation from relevant stakeholders, to discuss and evaluate draft inception and draft final reports, respectively. A regional workshop under Part II will also include the discussions on the draft final report as part of the whole RECCSA. These workshops will also increase awareness and policy implications of climate change issues in South Asia.

20. The study results will be presented at various international workshop and conferences. The study report will be disclosed by uploading them on the ADB website. The final outputs of the study will be disseminated through publication of policy papers, separately or together with the results of Part II.

F. Scope of Replication/Use in Other DMCs

21. There have been many efforts on regional economics of climate change studies (RECCSs) globally. However, the success studies have so far been limited in terms of quality and country coverage. The proposed RECCSA will build on ADB's successful RECCS in Southeast Asia and complement ADB's parallel RECCS for East Asia. The findings from the assessments and projections will provide an accurate assessment of the existing situation in the participating countries and the region. This would facilitate formulation and adoption of new and innovative policy measures to tackle the current and future climate change challenges. Since the climate change issues in South Asia are very diverse across countries, recommendations on regional cooperation in South Asia will have additional value for other regions' dealing with equally diverse climate change issues.

G. Cost Estimates and Financing Plan

22. The study, which is estimated to cost \$500,000, will be financed on a grant basis under RETA 6337: Development Partnership Program for South Asia, which is financed by the Government of Australia through the Australia-ADB South Asia Development Partnership Facility. The proceeds will cover consulting services, consultations and workshop, and publication. The cost estimates and disbursement schedule is given in Appendices 4 and 5, respectively.

H. Proposed Project Management System

23. ADB will be the executing and implementing agency. Within ADB, the study is expected to be implemented by South Asia Country Coordination and Regional Cooperation Division (SAOC), in close coordination with the Sustainable Infrastructure Division, Regional and Sustainable Development Department (RSID).

24. The management of the study will follow a two-tiered structure. A study team, comprising of project team members, ADB SARD Climate Change Working Group members, and international consultants, will be formed to carry out the study activities. The team will be led by the project officer and will be guided by a steering committee. The steering committee, which will act as the project executive, will set the methodological and strategic directions of the study. Chaired by a review leader, the committee will comprise representatives from senior government officials from all the participating countries and ADB. The review leader will be a prominent expert on climate change issues in the region.

Attachments

1. Design and Monitoring Framework
2. Outline Terms of Reference
3. Details of Implementation Schedule
4. Cost Estimate and Financing Plan
5. Disbursement Schedule

DESIGN AND MONITORING FRAMEWORK

| Design Summary | Performance Targets/Indicators | Data Sources/Reporting Mechanisms | Assumptions and Risks |
|--|---|--|---|
| Impact Development of cleaner technologies and contribution to the global reduction of GHG emissions in the long-run | <ul style="list-style-type: none"> Measurable reduction in GHG emissions in the region due to the uptake of cleaner technologies in South Asia | <ul style="list-style-type: none"> National, regional, and global statistics International, regional, and national forums on climate change | Assumption <ul style="list-style-type: none"> Scientific evidence that climate change will continue to have an impact on the environment. |
| Outcome Better alignment of ADB operations with the need of the participating countries for addressing climate change challenges | <ul style="list-style-type: none"> Visible improvement in the development of climate change-related policies and measures in South Asia Visible improvement in public awareness on the urgency of addressing climate change challenges and potential of cleaner technologies and options | <ul style="list-style-type: none"> National government policy documents International, regional, and national forums on climate change International, regional, and national media | Risks <ul style="list-style-type: none"> Timing in reaching consensus among countries could vary. Government policies and overall cooperation of participating countries could change. The timing of the implementation of the study's recommendations could vary across countries. |
| Outputs 1. Assessments of cleaner technologies and options | <ul style="list-style-type: none"> One regional consultation on the issues of climate change and cleaner technologies and options A national expert workshop on country-specific cleaner technologies and options for each participating country Identification of barriers to cleaner technology adoption | <ul style="list-style-type: none"> Number of government officials who participated in the consultations Feedback from the participating countries Feedback from relevant international and regional organizations International, regional, and national media Database of country-level data for GHG emission sources and other important socioeconomic data and studies on climate change from participating countries | Assumption <ul style="list-style-type: none"> Climate change will continue to have an impact on the environment. Risks <ul style="list-style-type: none"> Data might not be available and of reliable quality. Regional analysis and policy recommendations might cause conflicts with existing development plans of the participating DMCs. |

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|---|---|---|
| 2. MAC Curve Analysis | <ul style="list-style-type: none">• Country specific Marginal Abatement Cost (MAC) curve analysis in South Asia• Identification of co-benefits of cleaner technologies and options• Final study reports completed and released by first quarter of 2010 | <ul style="list-style-type: none">• Feedback in regional and international workshops and conferences |
| Activities with Milestones (By IV July 2009) 1.1 Consultation with participating countries 1.2 Engagement of individual consultants (Consultative Process Facilitator, Program Coordinator, and five national consultants) 1.3 Mapping of existing and expected regional and country-level analysis of GHG mitigation options 1.4 Conduct of a regional consultation meeting 1.5 Conduct of the national expert workshops in each participating country 1.6 Preparation of an inception report 1.7 Engagement of Lead Consultant, a South Asia Energy & Non-Energy Model Specialists (By IV December 2009) 2.1 Country-level research and data gathering 2.2 Preparation and analysis of GHG projection, technologies and options for both country and regional levels 2.3 Identification of barriers to technology adoption 2.4 Consolidation, preparation, and submission of draft final report 2.5 Conduction of a regional workshop 2.6 Presentation of interim findings to the regional workshop and international conferences on climate change (By IV March 2010) 3.1 Formulation of policy recommendations for adoption of cleaner technologies and other options at the regional and national level 3.2 Consolidation and analysis of the national assessments into a regional assessment 3.3 Preparation and submission of the final report 3.4 Dissemination in workshops and conferences 3.5 Publication of the final report. | | Inputs \$500,000 in grant from the Government of Australia 11 person-months of international consulting services 23 person-months of national consulting services |

ADB = Asian Development Bank, DMC = developing member countries, GHG = greenhouse gases.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. International Consultants

1. Lead Consultant (4 person-months, intermittent)

1. The Lead Consultant will have extensive knowledge and experience in climate change issues. The successful candidate will

- (i) under the direction of the project officer, manage and supervise the South Asia energy and non-energy model specialists, national climate experts, and program coordinator—collectively, the study team—and all activities under the technical assistance (TA);
- (ii) undertake the scoping, mapping, assembly, and review of existing regional and country-level climate change studies, including work carried out by governments, international institutions, academic institutions, and nongovernmental organizations;
- (iii) finalize the inception report;
- (iv) prepare a draft final report;
- (v) prepare a final report that includes, among other things, the summary outcome of the consultations, analysis of the model outputs, policy directions and recommendations; and manage the subsequent dissemination of the outputs; and
- (vi) perform other tasks relevant to this TA as may be assigned by the project officer.

2. South Asia Energy/Non-Energy Model Specialists (4 person-months, intermittent)

2. The energy and non-energy model specialists will have extensive experience in energy and non-energy modeling and working knowledge of the energy sector and greenhouse gas (GHG) analysis. The successful candidate will

- (i) provide and make available an energy/non-energy model with full documentation, including the assumptions made, the basis for the assumptions, the data requirements, and data formats;
- (ii) assemble and review pertinent energy/non-energy related information and other basic economic data for the participating countries to be used for the energy model structures;
- (iii) provide and analyze total and sectoral energy demand-/non-energy activity-projections, associated GHG emission projections and the potential role of cleaner technologies/options;
- (iv) identify the sectors with potential for GHG reduction for participating countries;
- (v) prepare and submit a formal report on the analysis of an energy/non-energy model with GHG reduction potential and present the same during the regional consultations, as may be necessary; and
- (vi) perform other tasks relevant to this TA as may be assigned by the project officer and the lead consultant.

3. Consultative Process Facilitator (3 person-month, intermittent)

3. The consultative process facilitator will generally coordinate and facilitate the regional consultations and national expert workshops under the TA. The successful candidate will

- (i) develop a detailed work plan for the regional consultation and the national expert workshops, and prepare suitable lists of participants in collaboration with national focal points and consultants;
- (ii) develop an initial inception report;
- (iii) design and implement internal and external consultation processes, including tasks such as helping prepare workshop-related materials, maintaining a database to record responses received, making arrangements with resident missions, and acknowledging all responses received;
- (iv) schedule, coordinate, and facilitate the regional consultation meetings and national expert workshops, as directed by the project officer and the lead consultant;
- (v) compile, analyze, and report on each regional meeting and on the cumulative results of the two regional consultation and national expert workshops;
- (vi) prepare and submit a formal report on the outcome of the regional consultations and national expert workshops; and
- (vii) perform other tasks relevant to this TA as may be assigned by the project officer and the lead consultant.

B. National Consultants

1. National Climate Experts (3 person-months each, total 15 person-months)

4. At least five national climate experts (one for each participating country) will undertake country-level review, assessment, and data gathering, and provide administrative support. The successful candidates will

- (i) assemble and review existing country-level climate change studies, including work carried out by governments, international institutions, academic institutions, and non-government organizations;
- (ii) prepare a status report on the country-level climate change, including the historic and current trends, policy interventions made, and pending policy legislation and recommendations, identify barriers to technology adoption and technology gaps;
- (iii) attend the respective national consultation and the regional consultation;
- (iv) provide data necessary for input to make energy demand and GHG emission projections, information on existing technologies and practices in different sectors;
- (v) present the report, findings, and outputs during the national expert workshops;
- (vi) provide other related country-level data and assistance to the project officer and lead consultant, as necessary; and
- (vii) perform other tasks relevant to this TA as may be assigned by the project officer and the lead consultant.

2. Program Coordinator (8 person-months)

5. The program coordinator, under the direction and supervision of the project officer, will
- (i) coordinate, and assist the lead consultant in, the activities under the TA;
 - (ii) coordinate with the respective country focal representatives to facilitate the national expert workshops;
 - (iii) participate in the two regional meetings and national expert workshops, as directed by the project officer;

- (iv) maintain all technical databases for participating countries and conduct simple analysis, as directed by the project officer;
- (v) closely coordinate with the study team for East Asia RECCS for synergy effect of two studies; and perform other tasks relevant to this TA as may be assigned by the project officer and the lead consultant.

DETAILS OF IMPLEMENTATION SCHEDULE

1. RECCSA comprises two parts as follows.
 - (i) Part I: *Cleaner Technologies and Options* is to reach a consensus among regional and country-level decision-makers on the steps needed to have concrete cleaner technologies and options and climate policy and measures available in their countries and the region to address climate change in South Asia. The Part I will be financed by *RETA 6337: Development Partnership Program for South Asia* under Australia-ADB South Asia Development Partnership Facility funded by the Government of Australia.
 - (ii) Part II: *Adaptation and Impact assessment* to review and analyze climate impact and adaptation with climate policy scenarios, which contributes to the implementation of low carbon strategies in participating countries and the region, including the policy formation, plans, and/or other actions to develop comprehensive climate adapted development plans, considering expected future climatic conditions, among others. Part II will be undertaken to complete the study, including analysis on adaptation. A separate technical assistance will be formulated, and co-financing is being considered.
2. Major milestones of the proposal (i.e., Part I: *Cleaner Technologies and Options*) is as follows.

| Date | Event |
|---------------------|---|
| IV May-IV July 2009 | Recruitment of consultants (sequential recruitment) |
| IV July 2009 | Regional consultations and national experts workshops (inception) |
| IV December 2009 | Draft Final Report |
| IV January 2010 | Regional Workshop (to be organized by Part II) |
| IV March 2010 | Publication |



COST ESTIMATES AND FINANCING PLAN (\$'000)

| Item | Total Cost |
|---|-----------------------|
| Asian Development Bank Financing^a | |
| 1. Consultants | |
| a. Remuneration and Per Diem | |
| i. International Consultants | 191.80 |
| ii. National Consultants | 87.00 |
| b. International and Local Travel | 100.00 |
| c. Reports and Communications ^b | 20.00 |
| 2. Workshop, and Conferences | 27.00 |
| 3. Audit | 2.00 |
| 4. Contingencies | 72.20 |
| Total | 500.00 |

^a Financed by RETA 6337: Development Partnership Program for South Asia under Australia-ADB South Asia Development Partnership Facility funded by the Government of Australia. Total amount also includes ADB's administration fee, audit cost, bank charges, and provision for foreign exchange fluctuations (if any), to the extent that these items are not covered by the interest and investment income earned on this grant, or any additional grant by the Government of Australia.

^b Includes publications-related costs.

Source: Asian Development Bank estimates.