

**CAREC MEMBERS ELECTRICITY REGULATORS FORUM (CMERF)
STUDIES TO BE FUNDED BY THE ASIAN DEVELOPMENT BANK
OUTLINE TERMS OF REFERENCE**

1. Outline terms of reference for three studies to be funded under this regional technical assistance are presented here. All three studies will be implemented by a single consulting firm. Each study will have a team leader. Firms will be selected predominantly on the basis of the suitability of the team leader for each of the three studies. Team leaders for studies A and B are required to submit evidence of previous publications closely relating to the subject matter, including at least one writing sample in English:

A. **Designing and Approving Efficient and Adequate Tariff Structures Appropriate to Different Consumer Categories, and Involving Lifelines, Reliability Premiums, Discounts for Prepayment, and/or Wattage Limitations**
participating country: Tajikistan

2. **Background.** Three essential features of electricity markets can be usefully considered together when designing regulations. First, consumers have different capacities to pay for electricity. Second, the electricity and heat systems are unable to meet demand during peak demand periods. Third, consumers also differ with respect to their power system requirements, and tendency to pay their power bills. The first point means that regulators are required to design tariff structures that keep electricity affordable to the poor, while still allowing the system to recover its costs. The second means capacity constraints must be allocated in an orderly fashion for the system to function efficiently.

3. The third feature permits flexible tariff structures to be applied cheaply, while improving efficiency. Specifically, different types of consumers can be offered different contracts, some of which will involve limitations on the wattage or energy they can draw, include clauses allowing them to be cut off more frequently, or may require prepayment for electricity. In return for accepting such restrictions on the quality of supply, consumers could receive discounts or lifeline tariffs. Tajikistan is constrained with respect to the total electrical energy available during winter, resulting in frequent load-shedding. This load-shedding is generally visited upon the same communities, without warning or compensation. Regularizing load-shedding, and permitting residential neighborhoods to opt for cheaper interruptible power schemes could therefore improve circumstances considerably. Similarly, significant problems in rectifying the billing and collection system suggest that prepaid metering, which would largely eliminate the need for billing and collections, might be an attractive option. Leaving aside the engineering details, this study will look at what tariff structures will need to be designed with these schemes. The recommendations will involve the use of multipart tariff structures according to the principles detailed in ADB's *Economic and Research Department Technical Note No. 10: Beyond Cost Recovery: Setting User Charges for Financial, Economic and Social Goals (2004)*.

4. For any scheme to work, that requires consumers to voluntarily sort themselves into consumer groups, the scheme must be simple, and there must be a robust way of ensuring that those who receive cheap electricity actually bear the quality restrictions. The best way to ensure this is to design incentive-compatible contracts, wherein wealthier consumers would not wish to receive the quality of power service on offer through the cheaper contract. The objective of this study is to design incentive-compatible power contracts that will meet social goals, while permitting recovery of some defined level of financial cost and offering consumers incentives to conserve power and electrical energy.

5. **Outcome and Impact.** The outcome of the study will be a learning experience that will teach member regulators how to segment markets to efficiently and affordably allocate scarce electrical capacity and energy. The impact will be improved capacity to design and review such pricing and market segmentation schemes.

6. **Consulting Inputs.** This study has the following consulting requirements (person-months are in parentheses): international energy economist (3), domestic Tajikistan power sector specialist/team leader for the domestic consultants (5), domestic survey design expert (2), and 4 domestic enumerators for 1 month each (4).

7. The international consultant will have a firm grasp of power system planning, experience in developing countries, especially with working with primary data from developing countries. Evidence of these skills must be discernable from the writing sample(s) and publications list included with the Curriculum Vitae.

8. The domestic power sector specialist will have a clear understanding of relations between Tajikistan's electricity supply companies and consumers, the constraints faced by consumers in utilizing and paying for power, and consumer behavior given these constraints. Previous experience working on projects involving the Tajikistan power sector will be very important, as will previous experience in the area of social protection.

9. The domestic survey design expert will have experience in collecting survey information regarding public utilities, and consumers' willingness to pay for services. An advanced degree in statistics, survey research, applied economics, or a related field is required. The enumerators will be fully capable of carrying out completed survey designs, and resolving problems directly with the survey design expert. The firm will be responsible for hiring, supervising and covering the costs of the enumerators.

10. **Scope.** The study will examine the possibility of such schemes in Tajikistan. It will proceed in six stages:

- (i) The international consultant, with the assistance of the regulators and domestic consultants, will identify from existing reports the constraints on the power system that need rationing (load, energy, credit). Attention to temporal and broad spatial variation¹ will be crucial. The Asian Development Bank (ADB) is currently undertaking a staff study to assess the long-run marginal cost of power supply in Tajikistan. Its findings will serve as the basis of discussions for designing Tajik tariffs in this study. Specifically, the results of the ADB staff study under a scenario deemed to be most relevant by the regulator, will determine the marginal tariffs suggested under this study.
- (ii) The regulators will provide inputs regarding their priorities in terms of social protection, assist the consultants in evaluating alternative schemes and indicate the costs that must be recovered.
- (iii) The domestic survey design expert, in consultation with the international consultant, will design a survey instrument to assess different types of consumers' service needs, and economic willingness to accept service restrictions. The consultants will also identify candidate enumerators. The team of domestic consultants will then design a survey.
- (iv) The domestic consultants will implement the survey.

¹ For example, the study could focus on alleviating load and credit constraints in the Northern and Southern grids.

- (v) The international consultant will produce a report giving practical suggestions for providing tariff support to the poor, while allocating constraints equitably. The report will identify consumer classes that can be made to self-select, and will identify mechanisms for ensuring differential service standards, self-selection, and tariff structures across groups. It will estimate the number of households in each group, and the likely consumption profiles of each. Using these, it will indicate the revenues that this scheme could raise, the expenditures of each household.
- (vi) The international expert will present the findings and recommendations at the 2006 Central Asia Regional Economic Cooperation (CAREC) Members Electricity Regulators Forum (CMERF) conference, followed by a dissemination workshop in Tajikistan.

11. **Timing:** An inception report will be produced and shared with the regulator and ADB within 3 months of study commencement. This will lay out: (i) the scenario for long-term power demand and sector development deemed relevant by the regulator; (ii) the system constraints that the pricing system will attempt to overcome; (iii) the marginal tariff rate (from the ADB study); (iv) preliminary suggestions for delineating consumer classes and their likely differential service needs; and (v) a definition, agreed with the regulator, of what affordability constraints the pricing system should meet.

12. A draft final report will be shared with the regulator and ADB within 5.5 months. This will update the information provided in the inception report, but will also indicate: (i) survey design and implementation methodology; (ii) proposed multipart tariffs by consumer group; (iii) service quality differentials between consumer groups; (iv) analysis of how tariffs were derived from consumer survey information, emphasizing affordability constraints and the rough number of consumers expected to select into each consumer class (and why); and (v) The expected revenue collection levels from this structure.

13. On receipt of comments from ADB and the regulator, the final report will be prepared and submitted no more than 7 months from the commencement of the study. All changes made between the draft and final reports must be tracked for translation purposes.

B. Possibilities and Pitfalls in Privatizing Distribution Company Management,
participating countries: Azerbaijan, Kyrgyz Republic, and Mongolia, with assistance from Kazakhstan

14. **Background.** State-owned distribution companies (DISCOs) in most CAREC countries are performing poorly. Auctioning of contracts for the private management of DISCOs has been identified as a potential solution to the problem. Azerbaijan has awarded concessions on all four of its DISCOs to two private companies. Kazakhstan has privatized most of its DISCOs. Mongolia has privatized one DISCO, and is considering further privatizations. The Kyrgyz Republic is also considering privatizing some DISCOs.

15. Any contracting arrangement will have to balance the needs to (i) ensure proper payment of generators and the transmission company; (ii) reduce the risk to investors of regulatory inconsistencies; (iii) obtain a good price for the management contract; (iv) prevent commercial risks being passed on to consumers and the government; (v) leverage improvements in reliability and service quality; (vi) ensure adequate transparency in the auction and contracting procedure; and (vii) predictably manage any necessary tariff adjustments.

16. **Outcome and Impact.** The study will build the capacity to help design and supervise the privatization of DISCOs in the Kyrgyz Republic and Mongolia, drawing on the experience of Azerbaijan and Kazakhstan. Analysis of international experience will also facilitate capacity building in Azerbaijan as it continues to work with its concessionaires to improve service quality and financial responsiveness.

17. **Consulting Inputs.** This study has the following consulting requirements (person-months are in parentheses): team leader–international economist/regulatory specialist (4), international legal expert (1), domestic Kyrgyz Republic power sector specialist (5), domestic Mongolia power sector specialist (5), domestic Azerbaijan power sector specialist (2); domestic Kazakhstan power sector specialist (2).

18. The international economist will be assessed primarily on the basis of their experience with and knowledge of privatizations of energy distribution/retail functions. Experience with these issues in transition economies will be a plus. The submitted writing sample(s) should demonstrate up to date knowledge of economic research and best practice in designing such privatizations. This expert will have an advanced degree in economics/public policy.

19. The legal expert will also have relevant experience in facilitating such privatizations, and must be qualified to offer advice to the international economist, particularly on the enforceability of contract provisions. Knowledge of legal conditions in study countries will be important.

20. The domestic consultants will have extensive knowledge of institutional, business, legal and policy arrangements for power sector management in their respective countries. Ability to communicate clearly in the local language, Russian and English will be important.

21. **Scope.** This study will involve one DISCO in the Kyrgyz Republic and one publicly owned DISCO in Mongolia. It will proceed in five stages.

- (i) An assessment of the commercial performance, management practices, and corporate governance of the selected Kyrgyz and Mongolian DISCOs will be prepared by the regulator and the two respective domestic consultants, with inputs from the DISCO management and the international economist. With the assistance of the domestic consultants, the international legal expert will appraise the legal basis for privatization. Case studies will be prepared covering four or five privatizations of comparable DISCOs, focusing on the regulatory and contractual frameworks utilized. Country studies will include those of Azerbaijan and Kazakhstan, and the respective domestic consultants will obtain necessary information in conjunction with the Azerbaijan Ministry of Energy and Industry, and the Kazakh regulators². The four domestic consultants will also plan study tours for the Kyrgyz and Mongolian regulators.
- (ii) Two regulators each from the Kyrgyz Republic and Mongolia (four persons in total) will undertake a back-to-back study tour to Azerbaijan and Kazakhstan, accompanied by the economist. A session will be held in Azerbaijan at which the economist will highlight lessons learned from international case studies that have implications for Azerbaijan's current problems with its DISCOs. Following the tour, the economist will visit the Kyrgyz Republic and Mongolia, and will hold discussions with regulators and other officials to clarify the scope of their privatization plans.

² Kazakhstan regulators are the Agency for Regulation of Natural Monopolies, and the Committee for the Protection of Competition (CPC) under the Ministry of Industry and Trade.

- (iii) In consultation with the Kyrgyz and Mongolian regulators, the economist will draft a sample road map for privatizing the participating DISCOs. The economist will draft white papers laying out the principles that each privatization will have to follow to balance the considerations listed in para. 10. The white paper should be suitable for turning over to lawyers who could utilize them to craft actual requests for tenders. The legal expert will advise on the preparation of the white papers to ensure that they are suitable for that purpose. The economist will also write a final report. This report will include the sample road maps, white papers, case studies, and chapters outlining the background, rationale, scope, regulatory arrangements, legal requirements, and economic analysis of privatization plans for the selected DISCOs in the Kyrgyz Republic and Mongolia.
- (iv) The domestic consultants in the Kyrgyz Republic and Mongolia will each organize dissemination workshops in the city where the targeted DISCO is located.
- (v) The economist will hold back-to-back visits to each country to hold these workshops. The economist will attend the CMERF conference in summer 2006 to present and discuss study findings.

22. **Timing:** Within 3 months of commencement of the study, the team will submit an interim report to ADB and the regulators from the four countries. This will cover the case studies and lessons learned, as well as describing in detail the institutional, economic, and regulatory environment in Mongolia and Kyrgyz Republic. Comparisons with the case studies will be crucial. Within 6 months of commencement of the study, a draft final report will be presented to ADB and the regulators. Comments from ADB and the regulators will be incorporated, and the final report will be made publicly available within 8 months of study commencement. All changes made between the draft and final reports must be tracked for translation purposes.

C. Costs and Input Requirements of Power Utilities across Member Countries

23. **Background.** Regulators that approve tariffs on reported costs must reach decisions on which costs submitted by the utility are reasonable. It is widely recognized that information asymmetry exists, and utilities do not always report costs accurately. It is also well accepted that publicly managed utilities do not always seek to minimize their costs. It is therefore vital for regulators to have a clear perception of just how much it costs to run a utility, and what kind of fuel consumption, other technical parameters, and electricity losses are reasonable. While consumers should not pay for the inefficiency of utilities, any unreasonable expectation would delay decisions related to tariff increases. Regional comparisons of operating norms at utilities are therefore extremely useful.

24. Introducing the notion of disclosure in most CAREC country power sectors is itself of value.

25. **Outcome and Impact.** This study will provide regulators with vital information that they could use to ensure that utilities are given incentives to reduce costs to reasonable levels. The output will be a searchable database in English and Russian posted on the CMERF website with information relevant to making comparisons of allowable costs. In addition to the numbers, the database will provide detailed information on the specific source of the data; the definitions and methods for calculating each piece of information; and information not disclosed, together with reasons for nondisclosure where possible (e.g.: commercially privileged, national security interest, data unmeasured).

26. **Consulting Inputs.** One international consultant working for 4 person-months will be required. This individual consultant will be a power engineer with experience in power generation, transmission and distribution, and supervising data collection and standardization. Attention to detail will be critical, as clear, accurate and consistent definition of variables is the objective. Experience in Central Asia will be required. Proposals will be judged on the verifiable evidence of these qualities.

27. Domestic consultants in each participating country each working for 3 person-months (18 person-months total) will be required to collect data. Each will have prior knowledge of the power sectors, a strong engineering background, local language fluency and English proficiency. One Russian- and English-speaking domestic consultant, with sufficient capabilities in information technology (IT), will be required for an additional 2 months to prepare the database and launch it on the internet as a stand-alone web application in both languages.

28. **Scope.** This activity will involve all six countries participating in the technical assistance. It will include the assimilation of data on the national transmission grid, three DISCOs, and the 10 most important generators in each country. In the People's Republic of China, information can be limited to one regional market only. The study will proceed in four phases:

- (i) From existing documents and studies, the international consultant will familiarize himself/herself with member countries' power sectors. In consultation with the regulators, the consultant will produce a list of measures required to assess reasonable power generation, transmission, and distribution costs. The list will include specific definitions, as well as detailed instructions for domestic consultants, on how to calculate measures and record data.
- (ii) The international consultant will visit the region to hold organizational meetings with the domestic consultants, and assess the scope of the Project. The domestic consultants will then begin collecting data, referring all discrepancies and problems back to the international consultant, who will vet the data and ensure that it is consistent and well-documented.
- (iii) The international consultant will supervise the local IT expert who will prepare the database. The consultant will also prepare a report presenting the findings regarding the availability and reliability of data, the extent and nature of exceptions to disclosure, and highlighting any comparisons across countries that they, the regulators, or ADB project staff consider noteworthy. The final report will include appendices explaining the definitions and sources of all data.
- (iv) The international consultant will attend the 2006 CMERF meeting to present the study findings.

29. **Timing:** Within 2 months of study commencement, the international consultant will present an inception report detailing the list of variables to be collected, and detailed definitions for those providing, gathering, and ultimately interpreting the data. It will also document the results of the organizational meetings with domestic consultants. Regulators will be given a two week window within which to suggest changes to the proposed list of variables. Within 6 months of study commencement, a draft final report will be produced. A demonstration version of the database in English and Russian will be ready for the CMERF meeting, no more than 7 months after study commencement. On incorporation of comments regarding presentation and usability, the database will be ready for launching on the internet no more than 8 months after study commencement. The final report will also be provided within 8 months of commencement. All changes made between the draft and final reports must be tracked for translation purposes.