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FINAL REPORT

**OPTIONS FOR USAID ASSISTANCE TO
THE BANGLADESHI ENERGY SECTOR**

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LIST OF ACRONYMS

ADB	Asian Development Bank
BPDB	Bangladesh Power Development Board
DESA	Dhaka Electric Supply Authority
DESCO	Dhaka Electric Supply Company
FSA	Fuel Supply Agreement
GOB	Government of Bangladesh
GTCL	Gas Transmission Company Limited
GTZ	German International Development Agency
IRR	Implementing Rules & Regulations
IPP	Independent Power Producer
MDBs	Multilateral Development Banks
MW	Megawatt (1 million kilowatt)
PGCB	Power Grid Corporation of Bangladesh
PPA	Power Purchase Agreement
REB	Rural Electricity Board
RTC	Regional Training Center
TAG	Technical Advisory Group (USAID Global Bureau, Office of Environment, EETP Program)
USAID	U. S. Agency for International Development

INTRODUCTION

The energy sector in Bangladesh is like that of many other developing countries. It is vertically integrated, government owned and characterized by inefficiency¹ and waste, subsidization, mismanagement, inadequate investment and maintenance. It is an instrument for employment, pacification of union interests and dispensing political favor. It is unable to keep pace with demand of the existing system, let alone expanding to meet unserved demand. Thus, instead of *being an engine for economic growth and development* that it could be, the sector is putting the brakes on economic growth. Less than 20% of the population have access to electricity and per capita consumption is less than 110 kWh per year. If the Bangladeshi economy is to grow, it must have clean, reliable and efficient energy. Moreover, it must tap the great potential of natural gas as a source of much needed foreign exchange. In electricity alone it is estimated that to meet projected demand will require between \$5 to \$6 billion USD over the next five years. This does not include the investment in transmission and distribution to get the electricity to end-users or the investment in natural gas infrastructure necessary to supply the fuel. The Government of Bangladesh does not have nor can it any longer count on the Development Finance Institutions to provide the resources. The only hope for Bangladesh's energy sector is efficient operation and the infusion of private, mostly foreign, capital. For this to take place there must be sector restructuring, regulation and eventual private provision of energy. There must be export of either natural gas or natural gas in the form of electricity.

The Government's strategy is to slowly commercial, corporatize and then lastly privatize existing energy operations. This is coupled with the recent introduction private power and soon formal, independent regulation. Bangladesh has taken a few steps in developing appropriate policy but implementation has been very slow. The slow pace of policy development and implementation is due to a number of reasons but lack of institutional capacity, enabling frameworks and public support for reform are principal factors that retard progress. Sustainable economic development in Bangladesh is directly dependent upon fundamental reforms and structural changes in the energy sector.

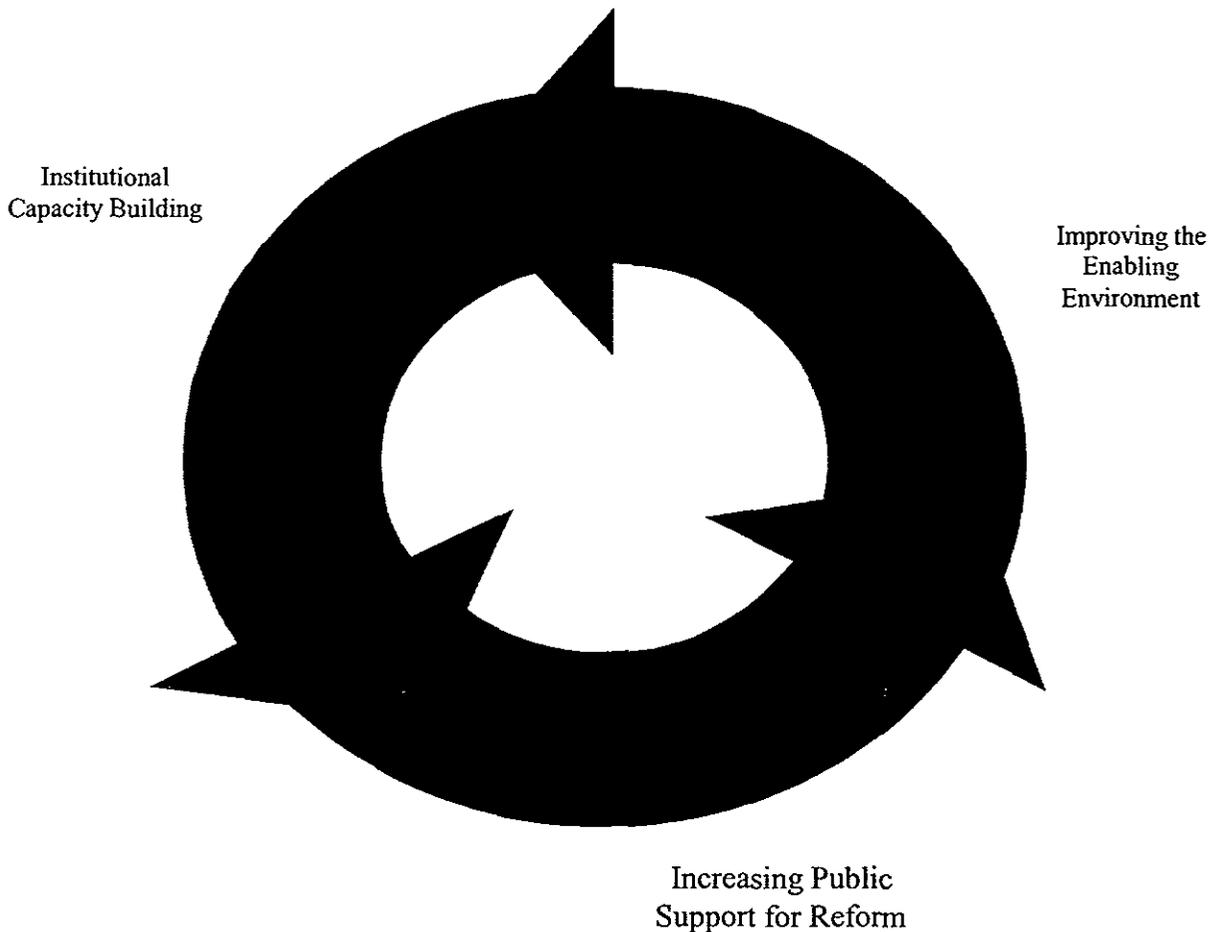
In recognition of the importance of energy sector reform to sustainable economic development, USAID/Dhaka has recently added a new strategic objective for energy. The overall goal of the SO is to improve performance of the energy sector and reduce GHG emissions. Significant reforms in the Bangladesh energy sector need to be undertaken to achieve this goal. Enhancing institutional capacity and encouraging policies that promote production and use of cleaner fuels, such as natural gas, and reducing energy demand through more efficient energy use will lessen GHG emissions.

The new activities that USAID will support under this SO will be in three areas:

- Increased institutional capacity to make decisions in and implement clean energy development
- Improved enabling environment
- Increased public support for energy sector reform

¹ Loss rates approach 40% in the electricity sector.

FIGURE 1



If implemented as part of a highly integrated and focused program, activities under these areas reinforce other areas and have a feedback effect as shown in Figure 1. Activities to increase institutional capacity at those organizations responsible for developing enabling frameworks is one aspect of improving the enabling environment. In turn with better policies and laws and implementing rules and regulations, those entities tasked with implementing restructuring and clean energy development perform better. Better performance translates into more public support for reform. Increased public support builds institutional capacity by raising the stature of the organization. The circle is complete. To amplify the feedback, USAID will work with the restructured entities – the PGCB, DESCO and REB. Building institutional capacity here, provides positive reinforcement to the restructuring process or the enabling framework as it were. This again builds public support. Finally, activities specifically designed to build public support for reform also enter this self-reinforcing mechanism.

In essence USAID’s assistance will help create an environment for efficient operations and private investment by:

- (1) working directly with corporatized energy entities establishing operating procedures and performance measures;

- (2) assisting the GOB to develop a sound restructuring model that leads to eventual private provision;
- (3) aiding the GOB to establish clear rules of the game and rational energy investment policies;
- (4) establishing and implementing regulations designed to promote efficient production and use of energy, and protect the interests of business and consumers alike; and,
- (5) building public support for reform and private provision.

PAST EXPERIENCES AND ON-GOING INITIATIVES

Sector policy development has been relatively slow but steady. However, policy implementation has been even slower and erratic. In electricity several concrete policy steps have been taken, albeit slowly:

1. The Power Cell was created in 1995 under the Ministry of Energy and Mineral Resources to design, facilitate, co-ordinate and monitor power sector reform and to quickly produced two policy documents -
2. A National Energy Policy which was adopted in 1996, and
3. The Private Sector Power Generation Policy that was also adopted in 1996.
4. The Power Cell finalized the Bangladesh Electricity Reform Act in 1999 with assistance from the ADB and is in the process of writing implementing rules and regulations. This act creates an independent regulatory commission.

Restructuring has also followed suit beginning actually as early as 1977 with the creation of the Rural Electrification Board (REB) to expand and improve the distribution network in rural areas through cooperatives. Gradually this has been expanded to include power generation. The success of REB help to create a favorable climate for further restructuring and this was followed by:

1. In 1990 the second step was taken with the creation of the Dhaka Electric Supply Authority (DESA) which was established as a separate distribution authority for Dhaka, recognizing that Dhaka alone accounts for about 50% of electricity demand.
2. The Power Grid Company of Bangladesh (PGCB) was created in 1996 and incorporated under the Companies Act of 1994. Although still a public enterprise, this new structure gives the PGCB much greater control to provide incentives and manage their affairs like a company rather than a government entity. PGCB became a operational entity in 1997 and still has to take complete control of BPDB's transmission assets.
3. Dhaka Electric Supply Company (DESCO) was created in 1996 and incorporated under the Companies Act of 1994 like PGCB. DESCO took control of distribution assets of Mirpur area of Dhaka in 1999.

Although many view PSCs as the first restructuring movement, it was not until 1993 that real structural reform initiatives began in the natural gas sector. A *Petroleum Policy* was adopted in 1993 and the *Gas Transmission Company Limited* (GTCL) was created to assume responsibility for gas transmission within a restructured natural gas sector. GTCL operates as a subsidiary company of Petrobangla. Only a few transmission lines have been turned over to GTCL.

Recently a *Hydrocarbon Unit* was created in the Ministry of Energy and Mineral Resources (MEMR). It is planned that eventually the Hydrocarbon Unit will handle reform activities in the natural gas sector. Donor assistance has been provided to the Unit to develop a new Hydrocarbon Law and the Unit is expecting to vet the act with the next six months. While the founding of the organizations represents important first steps, both are relatively weak and inexperienced to meet the challenges of rational sustainable development of the resource base.

ENERGY SECTOR REFORM OPTIONS

The options for USAID assistance were selected on the basis lessons learned from USAID experience in other countries and on the basis of one overriding principle – that USAID assistance should support only those areas which already are part of a reformed sector or which will clearly contribute to and/or facilitate a reformed energy sector. This means, for example, that if assistance is provided in transmission that it be provided to PGCB not PBD. It also means that general management assistance is

Throughout this report a number of general observations about energy sector restructuring and reform which were drawn from USAID experience in other countries have been discussed. For example, it is common knowledge that one of the major impediments to foreign direct investment, at a reasonable cost, is the lack of enabling frameworks. Thus, this exercise determined the extent of those missing frameworks as a starting point for developing options. There are other lessons learned elsewhere which have been applied in making these recommendations.

Reform will come and the sector will be restructured and privatized. That is a reality that even the most reluctant countries have witnessed. Prior to presenting options some basic questions are put forward and answered.

Working with Utilities

- How does USAID deal with DESCO, given its current uncertain state?

The answer is arrived at by first asking and answering a more general series of questions as these answers lead to the recommend activities.

- Should USAID work with one or more of the restructured utilities?

Supporting and reinforcing reform and restructuring was wisely seen in the USAID strategy as requiring three concurrent avenues - Improved enabling environment, Increased institutional capacity to make decisions in and implement clean energy development, and Increased public support for energy sector reform. Thus, assistance at one or more of these companies is important as it increases the capacity to make decisions, increases public support for reform by demonstrating that restructured organizations are more efficient, more service oriented, and as a result improves the environment in which reform takes place.

- What are the conditions that dictate the best chance of success for USAID assistance **directly** to the restructured entities?

Many energy sector institutions are weak and their progress depends as much, if not more, on their leaders than on the legal underpinnings, rules and regulations and trained staff. It is important that USAID/Dhaka work **directly** with those organizations that have shown some forward movement and that have progressive, reform minded leaders.

It was not possible to meet with DESCO management since the top three slots are now vacant. What is uncertain about DESCO is the top management. Will they be reform minded? Will they maintain the status quo? Unless and until strong, pro-reform management is at the helm of DESCO, **direct** USAID assistance will be neither effective nor sustainable.

Under these conditions, it is recommended that USAID work **directly** with PGCB and GTCL.

- Should USAID then assist DESCO? If so, how is this best accomplished?

DESCO will, for better or worse, be held up as an example of restructuring. USAID can provide **indirect** support to DESCO, support that can prove critical in shaping its course by shaping the parameters that define its operations and providing training to its staff. Under these conditions training is one of the most appropriate and effective means of supporting DESCO. DESCO staff could be invited to training that is scheduled for other organizations. Assistance to the Power Cell and the Regulatory Commission in developing sound implementing rules and regulations and then enforcing them will strengthen DESCO. Finally, developing measures by which to judge the performance of distribution companies can also serve to strengthen DESCO and future distribution companies.

Training at the Utilities

- How does USAID design an effective TA/training program for a problem-ridden, not prone to reform, utility? Is training here the best use of USAID resources?

As discussed above, direct Technical Assistance in this situation is not likely to be effective or sustainable. In the case of Petrobangla, senior management is on temporary assignment as well. Assistance should be limited to training that is already being provided to other organizations and for technical assistance at the Ministry and the Hydrocarbon Cell to develop a sound restructuring policy and plan along with effective implementing rules and regulations. Strengthening the contemplated Regulatory Commission is also another effective way of facilitating change at Petrobangla or PBD.

Regulatory Agencies

- Eventually, there will be fledging regulatory agencies. How can USAID best provide TA and/or partnerships and/or training for these entities?

The best way to influence the Regulatory Commission is to begin now, before it is formed, with a two pronged approach – training and TA in shaping the Commission and its IRRs. The government is supporting one agency to handle both electricity and gas. We are told that it is likely that a functioning Commission is one and a half years. This is unlikely given that the law has not yet passed and the dearth of skilled personnel in this area. Experience with other countries, further along the regulatory process, indicates that unless conditions drastically change that a fully functioning Commission will take more time.

Commission staff are likely to be drawn from the Power Cell, Hydrocarbon Unit, MEMR and the utilities. Realizing that there are few people in the country with experience in energy regulatory matters, USAID can provide **training** now in basic regulatory areas such as tariffs and pricing, licensing, public participation, and regulatory review. This will facilitate the development of a sound restructuring plan and IRRs and it will go along way in providing a slate of qualified candidates for the Commission. This will enable the Commission to begin work with staff that are experienced, or at the least knowledgeable, in energy regulatory matters. It will also prepare the people that will support the utilities in a regulated environment.

Technical assistance. The Power Cell has received TA to help draft the new Act and in developing such procedures as the Grid and Distribution Codes. A few of the simple implementing rules and regulations have also been developed. It would appear, however, that these lack sufficient detail and there are still many important issues which have not yet been addressed. The Commission will still need to develop detailed procedures and it is best to do this now.

Regulatory partnerships are no substitute for TA but they do provide something consultants usually can't provide. They allow commissioners to talk to their counterparts on how to handle everything from political and public pressure to rate increases and restructuring. It allows them to see first hand how an existing Commission conducts its business and to have an experienced Commissioner review their proceedings. In this regard, partnerships do not require a lot of face time.

DOE PASA

- How might the DOE PASA be used more effectively given the current needs of the electricity and natural gas sectors?

DOE and its related agencies, organizations and labs can provide some important assistance to the GOB during this phase of it reform. The following recommendations highlight the immediate needs of the sector:

1. Understanding the role and functions of a Ministry of Energy in a restructured environment.

The MEMR will have to under a significant change during restructuring and its role will change dramatically so that it looks more like DOE. DOE officials can help MEMR by presenting a ½ day seminar to the Ministry (perhaps at one of the Secretary's Sunday seminars) on what the future will look like.

2. Inclusion of Industry representatives in Workshops/Seminars.

The Energy Information Administration is slated to put on a number of workshops. Through the PASA, and as part of the EIA team, EIA should be encouraged to provide industry representatives from energy companies or from their representative organizations such as the American Gas Association. This would prove beneficial.

3. Data Collection and Modeling

EIA has been providing assistance in data collection and Bangladesh can make immediate and significant gains in the energy sector by implementing modern systems of data collection and modeling. In addition to the general support given by EIA, DOE could help to develop energy sector data collection and modeling capabilities necessary to support GOB efforts to restructure and privatize the energy sector and to evaluate the potential impacts of proposed GOB policies and programs. This would be particularly helpful with the FERC and/or the EIA's Financial Reporting Services assisting the Regulatory Commission to develop appropriate data collection procedures and proformas.

4. Power Plant Efficiency

USAID/Delhi through a PASA with DOE's Federal Energy Technology Center (FETC) undertook a project to increase power plant efficiency at the National Thermal Power Corporation. The results were significant. Efficiency increases were significant with only a modest investment. This resulted in both a reduction in fuel costs and in power plant emissions. USAID/Dhaka should consider a similar program designed to make existing power plants more efficient and less polluting.

There are several ways that this could be done. One approach would be for FETC to conduct a demonstration project at one power plant and draw BPDB into replicating this once it is successfully proven. Another approach would be for FETC to hold a workshop cum trade show. This would demonstrate their approach and progress in India and US business would provide the equipment and software.

Supporting Reform

- Assistance regarding power and gas sector contract negotiation, implementation and conflict resolution is needed. What types of TA or training or other assistance should USAID provide? Gas Sector reform support and technical assistance? How best to provide this, TA /training?

There should be a twinning of TA and training in this area. Training needs to take the form of workshops wherein participants are put into contract negotiations through the use of case studies and games.

Technical Assistance

The key to working with the GOB in natural gas in a meaningful way is creating a vision of the future energy sector in Bangladesh that will be vibrant and attract foreign investment (while, of course, protecting the interests of Bangladesh). Having established this vision it is then a matter of looking at the steps which need to be taken to reach this point, what resources are required and where there are gaps. The key areas will be in the restructuring of Petrobangla into a commercial entity, and creating a regulatory environment. In terms of technical assistance the tasks would cover many of the important areas i.e. gas utilization studies, determination of affordability etc. These would be best executed as separate assignments undertaken with a core team with close involvement with Petrobangla and the Ministry of Energy so that there is ownership. This would start with the resident gas advisor.

One activity that is immediately needed in Petrobangla is to synthesize the work which has been done by various agencies World bank, ADB etc. so that any future work can build on what has been done in the past and is not another discrete element. The best approach for this would be to create a task Force within Petrobangla/Ministry that will gather together all work undertaken and review it - determine what needs updating and what new work is required. Co-ordination of technical assistance has been a real problem in the past. Petrobangla and the Ministry will benefit from assistance that builds on that already done rather than reinventing the wheel.

Energy Efficiency

- Energy Efficiency. How should it be defined? Given the agreed upon definition, what kinds of TA or training or other assistance make sense in a program in which the country currently has a skewed and irrational pricing system? Is there room for efficiency in such an environment? This also applies to the gas sector. How do we address an energy sector where the non-technical losses are greater than the technical ones? This is especially important for the power sector.

There are two basic types of efficiency – end use efficiency, or demand side, and supply side efficiencies. For the most part lack of efficiency in both areas is the result of incorrect incentives. On the demand side, prices are the main incentive for efficiency. Unless and until prices are anywhere close to correct, USAID/Dhaka's resources will not be able to effectively address end-use efficiency.

However, supply side efficiency (generation, transmission and distribution) can and should be addressed despite the fact that the preponderance of losses are nontechnical. Nationwide these issues are best addressed at this time through licensing requirements of the Commission, through cost recovery rules, general guidelines and procedures, corporatization and eventually through privatization. At the operating level, DESCO can be provided with assistance to automate billing, institute better meter reading procedures, performance based management systems, general institutional strengthening and create incentive structures that reward better performance, etc.

In light of the above, USAID can best achieve its objectives by simultaneously: (1) working with the Ministry, the Power Cell and Hydrocarbon Unit to develop policy, plans and implementing

rules and regulations for restructuring; (2) working to support restructured corporations whether at the companies themselves or at BPDB or Petrobangla; and (3) working to build public awareness and support on energy reform issues through the media.

DETAILED TECHNICAL ASSISTANCE & TRAINING ACTIVITIES

USAID/Dhaka has four basic types of tools to assist the GOB in energy sector reform – Technical Assistance, Training, Partnerships and the PASA. This report presents options from the toolkit. The cornerstone around which these options are built are two long term resident advisors (expatriate) in gas and electricity reform issues and a local training coordinator. These options do not represent an exhaustive list of possibilities but rather those deemed most important at this time. Given the changing nature of the sector and current shifts in management of key organizations (BPDB and REB), USAID will develop a flexible method of delivering technical assistance and training.

The first set of interventions directly aims to improve the enabling environment for energy reform by building capacity in the Power Cell, Hydrocarbon Cell, the MEMR and, when appropriate, at the regulatory commission. Assistance in this area will, in essence, help in the drafting of policy, laws and implementing rules and regulations (IRRs) and strengthen basic analytical skills. Because energy sector reform is new and private sector provision of energy relatively unknown, the skills and experiences necessary to develop sound policies and laws is not yet resident in the organizations that must bring this about. In addition to the lack of skills and experiences some of these organizations are not adequately staffed. Thus assistance is key from the point of view of quality as well as quantity of personnel.

The options include:

- Resident Advisors in Electricity and Gas Sector Reform
- Enabling Legislation and Legal Technical Assistance
- Regulatory Framework Workshop and Technical Assistance
- Energy Industry Investment Workshop
- Gas and Power Industry Restructuring Workshops
- Gas and Power Industry Regulation Seminars
- Electricity Pricing Seminar and Technical Assistance

The second set of interventions will directly increase the institutional capacity to make decisions in clean energy development to implement key reforms in the energy sector. This will be done by working at operational units. - the BPDB, REB and Petrobangla and gas and power sector companies – PGCB, DESCO and GTCL.

These interventions are:

- Grid Protection and Relay System Needs Assessment (PGCB)
- Emergency Restoration System Plans and Procedures (PGCB)
- Grid accounting and bill collection (PGCB)
- Energy Accounting for Grid Operations

- Short Term Technical Assistance in technical, managerial and financial management in electricity distribution and transmission and gas transmission in a restructured environment
- Management and incentives to reduce distribution losses
- Emergency Restoration System (PGCB)
- Hotline Maintenance
- Grid Code Field based training
- Single Buyer Markets and Grid Company Operations
- Gas contract negotiation and implementation
- Training in International gas and electricity transmission projects - Commercial organization and government support
- Risk management in international pipeline and electricity transmission projects
- Project evaluation and finance
- Competitive Bidding Workshop
- International Procurement Standards and Practices Workshop
- Labor outplacement and transitional support programs
- Transparency in Recruitment

The final set of interventions is aimed at building public support for energy sector reform. In the Bangladesh setting this is more difficult owing the lack of an NGO that is focused on energy. The Mission has rightly concluded that working with the media is the most effective channel to create and foster public support for the reform process. In the absence of an NGO, the Mission is seeking to work with academics and build up a university program that will function to convene seminars on energy topics and to provide policy analysis and advice.

There are number of alternatives to explore in building the capacity of a Bangladeshi University in energy policy and information dissemination while at the same time increasing public support for reform. These include:

- *Teaming the University with a foreign Energy Research Center* such as the East-West Center or the Kennedy School's Electricity Group. A twinning could support visiting lecturers or researchers for a three or six month period. This could be provided through the training IQC. This could be implemented by instructions in the RFP to include a local University as a subcontractor.
- University personnel could be included in the technical assistance component to provide in depth knowledge of policy reform in the Bangladesh context while picking up valuable energy policy skills from expatriate experts. This could be implemented by instructions in the RFP to include a local University as a subcontractor.
- Energy Media Outreach
- Energy Policy Lecture Series

Many of the proposed options are described in detail on the following pages. These interventions have been designed to lay the foundations for the reform effort by strengthening fledgling restructured companies, working to build public support for reform and strengthening institutions charged with developing the enabling environment for reform. Time has not permitted the detailed description of all options.

Intervention:**Resident Gas Sector Reform Advisor****Description and Rationale:**

The Government of Bangladesh is moving slowly to some form restructuring of the gas sector as the means to achieve investment, competition and commercial orientation. Moreover, the country faces some important decisions with respect to the development of world class gas resources – decisions with which it has little experience.

A Petroleum Policy was adopted in 1993 and the *Gas Transmission Company Limited (GTCL)* was created to assume responsibility for gas transmission within a restructured natural gas sector. GTCL operates as a subsidiary company of Petrobangla. Very recently, a *Hydrocarbon Unit* was created in the MEMR. It is planned that eventually the Hydrocarbon Unit will handle reform activities in the natural gas sector. Additionally, policy makers need to consider a wide array of possible structures and yet, the institutions tasked to this advise policy makers and implement enabling frameworks, lack the basic experience and skills. The hydrocarbon reform law has still to be completely formulated and adopted. The hydrocarbon cell has only two professional staff both with little exposure to the relevant issues. Petrobangla, the nation's natural gas company, is now engaged with major international oil & gas companies to exploit the full potential of the country's gas resources. Continued forward movement is critically linked to the successful completion of tasks with which the company has little experience.

A resident gas sector reform advisor will be available to advise senior policy makers on various alternatives and plans for sector reform, work on a day-to-day with line officers tasked with development rules and regulations and implements reforms and directing short term technical assistance and training to meet immediate and anticipated needs in the sector.

Target Audience / Counterpart:

- The resident advisor will be available to work with all government entities involved in the planning, policy, regulation and implementation of natural gas matters.
- It is anticipated that the principal counterpart will be the Additional Secretary, MEMR.

Objective and Results Expected

The objective of the intervention is to provide the GOB's gas related institutions with hands-on expertise on a day-to-day basis. It will lead to increased institutional capacity to design policy and develop implementing rules and regulations & help to strengthen the country's restructured companies and direct short term technical assistance for specialized needs. Anticipated outcomes are the development of sound, rational hydrocarbon reform law, the implementing rules and regulations and restructuring plan.

Level of Effort for Consultants

2 years with the possible one year extension or as allowed under the IQC rules.