Partnership to Strengthen Local Capacity for Economic, Financial, and Social Analysis of Energy Sector Initiatives

MONTHLY REPORT – AUGUST, 2004

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The following are the activities that the partnership conducted in the month of August.

- Dr. Gülen of the UH IELE and Prof. Tamim attended ALO Conference in Washington DC. During the conference they were able to establish contacts with other institutions that have partnerships in Bangladesh and compare experiences with others. The last day session with USAID representatives was most useful in identifying problems common to most partnerships and exploring ways of coping with them. More importantly, Dr. Gülen and Prof. Tamim were able to assess the progress of the UH IELE-PMRE partnership and work on some of the research and training ideas to reflect some recent developments in Bangladesh and observations at the conference.

- Prof. Tamim and UH IELE continued work on research papers.

- Prof. Tamim finalized preparation of materials for and will start teaching the first offering of Energy Value Chain Economics, Policy and Regulation in September.

- The partnership completed Tasks 3 and 4 and wrote reports on evaluation of teaching materials and research capacity at PMRE. These reports are attached to this report. Nevertheless, the process of evaluation will continue throughout the duration of the partnership to accommodate changing needs and developments in the field as PMRE moves forward with the incorporation of energy economics, regulation and policy into its body of work.

- UH IELE worked on revision of the budget to determine what additional funds are available at the partnership due to a shorter stay of Prof. Tamim and Prof. Hossain in Houston than originally planned. There may be sufficient funds to be used for an additional visit of UH IELE to Bangladesh and/or BUET/PMRE staff visit to Houston to attend New Era.

- UH IELE and BUET/PMRE have initiated dialogue to work out arrangements and tentative travel plan/dates for a visit of Prof. Ijaz Hossain to Houston in 2005.

Next steps

Actions expected in the months of September and October include:

- Continue to work on research papers.
- Work on developing a customized training program for energy journalists in Bangladesh.
- Start teaching Energy Value Chain Economics, Policy and Regulation at BUET.
- Finalize revised budget.
Task 3  
Teaching at BUET/PMRE:  
Evaluation and Recommendations for Strengthening Teaching Capacity

Assessment of Teaching Capacity

Facilities

BUET campus is well established, providing mostly adequate teaching and laboratory facilities for engineering education. Although PMRE is one the most recent departments established at BUET, it has ample space in the form of faculty and administrative offices, laboratories, libraries, and office space for teaching fellows and graduate assistants.

Through a donation from Shell, PMRE developed a multipurpose information center with library, LDC projection and computing capabilities. This facility is mostly used by the students at cost basis.

Computing resources are adequate for faculty and researchers with reliable, albeit sometimes slow, internet access. This connectivity allows PMRE faculty and students to remain current on global developments in the field of petroleum engineering. Classrooms are conducive to learning; professors have access to overhead projectors and screens as well as an LCD projector.

Materials

- Access to textbooks for students is somewhat limited. PMRE use basically same textbooks as their western counterparts in their engineering courses; however most of these books (even the significantly cheaper editions published by Indian presses affiliated with Western publication companies) are usually too expensive for most students. Free access is provided to the students from the department library. To avail the central library facility, students have to pay a certain fee. Although, most of the textbooks required in petroleum engineering are available in the department library, sometime the number of copies is found to be inadequate. It is also difficult to stay updated on current books.

- PMRE used to subscribe to all SPE journals. Currently, it receives only JPT and since 2002, subscription to other SPE journals had to be cancelled due to lack of funding. The department also receives Oil & Gas Journal. Lack of journals is a major hindrance for research. The journals published by SPE are absolutely essential for all petroleum engineering research. It would be a great help if the PMRE can be provided funds for subscribing to the following journals.
  1. SPE Reservoir Evaluation and Engineering
  2. SPE Production and Facilities
  3. SPE drilling and Completion
  4. SPE Journal

Couple of new journals on energy and energy economics would also be helpful for the new focus on energy economics research. Through his membership to the International Association for Energy Economics (IAEE), Prof. Tamim will gain access to The Energy Journal. The following journals would be desirable as well:
  1. Energy Policy
  2. Resource and Energy Economics
  3. Energy Economics
  4. Resources, Energy and Development (TERI)
5. International Journal of Regulation and Governance (TERI)

- BUET central library allows some limited number of books to be bought for PMRE but all those books remain in the central facility, which is not widely used by the departmental students (mostly from industry doing part time degrees). So far, almost all of the department library books have been purchased through BUET-University of Alberta linkage project. Some alumni and well wishers donate books to the library once in a while and recently, UNOCAL has offered to buy some books for the library.

- For research and presentation, a laptop computer for the department is also quite essential

The partnership’s focus is not petroleum engineering, but like any department or growing program with research ambitions, PMRE can surely benefit from additional access to journals, web-based publications and other sources in the field of PE. Financial resources of BUET and PMRE are limited; as such it is more likely to pursue donations either from private companies or foundations or through linkages to universities in the U.S., Australia, and the UK among others. To fulfill the goals of the UH IELE – BUET/PMRE partnership in the fields of energy economics, regulation and policy, the partnership is pursuing certain avenues (see recommendations for improvements below).

**Education**

Some professors use PowerPoint slides in their lectures, others prefer traditional methods, but in general, lectures appear to be well-organized and supported by handouts or reading assignments from the textbooks. Petroleum engineering curriculum is well developed and established. Classes meet for three hours per week (either one three-hour session or two 1.5-hour sessions) for 14 weeks each semester. There are usually two mid-term exams and a final, which may be replaced by term projects.

Students have access to industry either through internships with companies or through the events organized by the local chapter of the Society of Petroleum Engineers (SPE). Prof. Tamim was the first chairperson of the Section and strongly encourages student participation in SPE events. In addition, professors such as Prof. Tamim and Prof. Hossain are involved in the Bangladesh energy industry, either as advisors or board members, which allows them to reflect their “real life” experiences to students.

Overall, students are receiving quality education in petroleum engineering as evidenced by the employment record of PMRE graduates both within Bangladesh and abroad.

**Recommendations on Improvements**

**Facilities**

Teaching facilities are mostly adequate. Of course, it is always possible to renovate facilities, upgrade projectors, etc. but these do not appear to be a wise use of scarce resources at this time.

**Materials**

For both research and course content, faculty and graduate students need access to current publications in their fields. Since financial resources are limited at PMRE (or BUET), new textbooks, journals, and other publications or resources can be pursued through:

- Linkages to other universities (e.g., UH IELE can convey a list of desired publications by PMRE to different departments at UH or at other universities through its academic network, or, alternatively can solicit donations from these same sources)
Subscriptions to periodicals (e.g., UH IELE may cover some electronic subscriptions)

Establishing links with companies working in Bangladesh and requesting regular donations of books and periodicals.

Requesting companies to share operations manuals – companies can share whatever is not confidential, maybe of some use for technology.

The partnership is pursuing several memberships for PMRE faculty in associations with a focus on commercial practices in the energy industry. Prof. Tamim will become a member of the Association of International Petroleum Negotiators (www.aipn.org) and the International Association for Energy Economics (www.iaee.org), both of which provide significant resources via their web sites.

During his stay in Houston, Prof. Tamim identified certain publications of interest and UH IELE supplied PMRE with a set of books including:

- Fiscal Policy Formulation and Implementation in Oil-Producing Countries by the IMF (Editors: J.M. Davis, R. Ossowski and A. Fedelino)
- International Energy Transactions by Professor Jacqueline Weaver
- Energy, economics and the Environment by Fred Bosselman, Jim Rossi and Jacqueline Weaver
- Petroleum Accounting Principles by Dennis Jennings, Joe Feiten and Horace Brock
- Guide to Electric Power in Texas by UH IELE
- American Petroleum Law Case Studies by John Mixon
- Color of Oil by Michael Economides and Ronald Oligney
- Principles of Economics by Robert Schiller
- Managerial Economics

In addition, UH IELE supplied materials from the New Era program and the courses taught by UH IELE staff (both in electronic and hard copies). These include:

- *Economics of the Energy Industries*, a textbook under continuous development by UH IELE used both in New Era and energy economics courses taught by Dr. Gülen; the 200+ page book contains an overview of oil, natural gas and electric power value chains as well as the global energy industry and markets, and provides economic project evaluation models for a variety of projects from upstream PSC to merchant power plant construction.

- A book with roughly 30 case studies on a variety of energy value chain problems.

- PowerPoint presentations, including those used by UH IELE and guests in New Era and those used by Dr. Gülen (Economics of Energy) and Dr. Foss (Energy Inc.)

Prof. Tamim also collected handouts and presentations from the other courses he attended at UH (Oil & Gas Accounting, International Energy Transactions, and Economics of Regulation). In particular, Dr. Sherman (Economics of Regulation) supplied Prof. Tamim with the draft chapters from his forthcoming book on regulation; the partnership already incorporated material from this draft into the first course developed for PMRE (Energy Value Chain Economics, Policy and Regulation).

UH IELE may send more books and periodicals to PMRE from its own library as it transforms most of its subscription to electronic format from hard copy.

**Education**

The incorporation of the new material will likely be challenging at first as it is relatively new for engineering professors to teach and engineering students to receive energy
economics, regulation and policy topics. However, Prof. Tamim has been exposed to teaching approaches for the content by UH IELE and other faculty (and Prof. Hossain will experience the same next year). In addition, Prof. Tamim had an opportunity to guest lecture in courses taught by Drs Foss and Gülen on the energy value chain issues faced by Bangladesh.

The partnership is working together to tailor the courses according to the needs of PMRE and the Bangladeshi energy sector. PMRE faculty will have to adjust the delivery of the content based on their initial experiences in class and feedback from students.

In general, providing detailed syllabi for all the courses should allow students to plan for the whole semester and prepare for classes ahead of time. They will also learn how their performance will be evaluated. Syllabi need to include resources for students other than the textbook, such as a list of reference books, journals, articles and web sites.
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Task 4

Research at BUET/PMRE
Evaluation and Recommendations for Strengthening Research Capacity

Assessment of Research Capacity

Although it is not within the scope of current UH IELE – PMRE partnership, based on our visit to PMRE department in January 2004 and our interactions with Prof. Tamim during his visit to Houston between March 24 and June 18, 2004, it appears that PMRE is capable of producing quality research in the field of petroleum engineering, interacting with the industry and making use of its laboratories. PMRE lab conducts gas analyses for most of the private and public sector companies in Bangladesh. One laboratory includes the only PVT analysis machine in Bangladesh.

Most teachers are involved in research, although the research-teaching load ratio varies on experience and exposure. Most of the research is directed towards solving industry problems in Bangladesh. At the same time, several projects were carried out dealing with different fundamental petroleum engineering problems. All students are somewhat involved with research.

Mostly, the University itself provides funding for research. The Bangladesh Government and private companies also funded few projects. Interest from the industry in solving practical problems in collaboration with BUET will be the most sustainable way of research funding. Without that interest, any other funding will not produce meaningful results. In other words, most funding and research should be goal/result oriented.

Our partnership focuses on building PMRE’s capacity in the fields of energy economics, regulation and policy. Prof. Tamim, his colleagues such as Prof. Hossain and his students have already produced some research in these areas. Profs Tamim and Hossain analyzed the economic rationale for all methods of gas utilization in the country. Graduate students submitted theses on production sharing contracts used by Bangladesh with international oil companies. In addition, Profs Tamim and Hossain participated in panels analyzing different aspects of national energy policies. Prof. Hossain is on the Board of Directors for Gas Transmission Company Ltd (GTCL). Prof. Tamim is also a member of the National Energy Advisory Committee of Bangladesh Government. These activities allow them to identify topics of relevance for the Bangladeshi energy sector that can be researched and analyzed by PMRE and that can be supported by the industry.

Research Capacity Enhancement

Although PMRE has been active in the fields of energy economics, regulation and policy, these are new topics for Bangladesh; and PMRE faculty are trained engineers not economists or political scientists. The partnership with UH IELE will help PMRE develop a better understanding of energy value chain economics, regulation of utilities, energy policy-making and research methodologies in these areas. Accordingly, the partnership identified several topics of interest for PMRE and of value for the energy sector in Bangladesh. The following preliminary list is from the Draft Work Plan:

1. Economics of CNG in Bangladesh
2. Economics of natural gas exports from Bangladesh (while in Houston, Prof. Tamim revised and updated the existing case study developed by UH IELE for its New Era program)
3. Development of regional gas markets (possibly in collaboration with research institutes in different countries such as TERI in India and AIT in Bangkok)
4. Optimal use of natural gas in Bangladesh (power generation, fertilizer industry, petrochemicals, etc.)

5. Economics of gas grid extension in Bangladesh

6. Natural gas reserves assessment in Bangladesh

7. A comparative look at Bangladesh PSCs

8. Cost of gas exploration, development and production in Bangladesh by IOC/Petrobangla/Combined. The concept of old gas, new gas and average gas price.

Prof. Tamim and colleagues at UH IELE started working on several research papers, focusing on the natural gas value chain in Bangladesh and its bottlenecks. Papers will be mostly based on the value chain model developed by Prof. Tamim during his stay in Houston. The model identifies three major problems for the development of natural gas resources in Bangladesh. As such, the research addresses topics 2, 4-8 from the list above. One short piece named “The Perils of Bangladesh Gas Value Chain” was published in the anniversary edition of Energy & Power, an energy magazine, on July 1 in Bangladesh. Another version is currently under development for publication in one of the major industry publications such as the Oil & Gas Journal or The World Oil. Eventually, a longer version will be targeting academic journals such as The Energy Journal or Energy Policy.

Working on this research project, it became clear that data on the Bangladeshi energy sector was too scattered. Prof. Tamim will assign one or two graduate students at PMRE to the development of an energy database. This will be a valuable resource for PMRE’s research and policy analysis but it can possibly become a revenue generating activity, meeting data needs of industry participants. Prof. Tamim already assigned a student to initial data collection as our current papers require accurate data. The data will also be used to develop a complete picture of where value is generated along the energy value chain, how much is flowing to the government, how much is potentially wasted and related questions based on a spreadsheet model developed by UH IELE for its New Era program.

Research capacity will also be enhanced by providing resources and guidance to PMRE. For this, the Association of International Petroleum Negotiators (AIPN) and the International Association for Energy Economics (IAEE) memberships are pursued for Prof. Tamim. Both associations have web sites that provide access to a wealth of publications, from newsletters to academic journals. The partnership will continue to identify and assess valuable resources.