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TRAINING NEEDS ASSESSMENT FOR MINISTRY OF ENERGY AND WATER AFGHANISTAN

April 2006

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DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Author's Note

This report was prepared based on inputs received from various internal and external stakeholders associated with the Ministry of Electricity and Water and their activities. In general, there is paucity of prime data including a lack of an authentic and verifiable employee database for different categories of employees. An attempt has been made to address this through interviews with key personnel however it should be noted that the data should be subject to an appropriate review when planning any specific future capacity building activities. Fundamentally, this should not significantly alter the fact that a major capacity building initiative is those programs are to prove sustainable. Nor does it detract from the type/nature of training courses recommended. This report was prepared based on inputs received from various internal and external stakeholders associated with the Ministry of Electricity and Water and their activities. In general, there is paucity of prime data including a lack of an authentic and verifiable employee database for different categories of employees. An attempt has been made to address this through interviews with key personnel however it should be noted that the data should be subject to an appropriate review when planning any specific future capacity building activities. Fundamentally, this should not significantly alter the fact that a major capacity building initiative is needed in parallel with the on-going expansion and restructuring of the sector if those programs are to prove sustainable. Nor does it detract from the type/nature of training courses recommended.

Acknowledgments

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Executive Summary

A Training Needs Assessment (TNA) for the Ministry of Electricity and Water (MEW) was undertaken by consultants from the USAID-sponsored SARI/E program¹, as part of the overall USAID assistance program to Afghanistan². The purpose of the TNA was to identify priority capacity building areas to strengthen the MEW's capability of meeting targets set out in the Power Sector Technical Annex of the "*Securing Afghanistan's Future: Accomplishments and the Strategic Path Forward*" report (January 2004).

The TNA is documented in this report and includes: a) identified training needs; b) recommended capacity building actions, prioritized by time schedule (immediate, short term and long-term)³, and c) strategies and approaches implementing the programs. The report also recommends, where appropriate, creating sustainable linkages between the MEW and South Asia regional training organizations and institutions. A brief overview of the salient features of the TNA is presented below.

Electricity Sector: Current and Future Development (Section 1)

The state of Afghanistan's electrical sector is well documented. It is one of the world's least developed commercial power systems, with official figures estimating access to power at only about **6%** of the population. Only 234,000 customers are connected to the public grid, of which over **30%** (76,000) are in Kabul province. Other provinces have much less access, with the rural population being virtually unserved.

In addition, the existing facilities provide unreliable service for only a few hours each day. The installed generation capacity is about 454 MW but conflict reduced this to around 240 MW. Output is now about 360 MW. There is no national grid for transmission of power-only local networks and these often need rehabilitation. Revenues are limited due to the lack of efficient billing and collection systems. Technical and non-technical losses are high – in the order of **47%** – due to overloaded facilities and lack of customer supervision.

Most experts agree that the provision of an expanded and reliable electric power service is thus critical for future economic growth, social equity, and the political unity of the country, however the current institutional arrangements require restructuring⁴.

¹ USAID's South Asia Initiative for Energy (SARI/Energy) is an eight-country program that promotes regional energy security. Begun in 2000, SARI/Energy focuses on regional approaches to meet South Asia's energy security needs through increased trade, investment and access to clean and renewable energy. SARI/Energy countries include: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

² The TNA was carried out and the report prepared by Anita Bajaj Kochhar, Regional SARI/E - Training Director and Dilip Singh, SARI/E Training Manager with valuable inputs from Dan Vincent, Nexant Country Manager Afghanistan; Richard Smith Chief of Party SARI/E Energy and A K Zakhily, Nexant Training Specialist Afghanistan.

³ For the purposes of this TNA, the three time periods are defined, as follows: immediate = 0 to 3 months; shortterm = 3 – 6 months; and long term = 7 months to 24 months.

⁴ There is a plan to restructure the MEW. Although, final details have yet to be agreed by the Government of Afghanistan, the TNA was undertaken based on the anticipated future organizational structure.

The existing set-up includes the Ministry of Energy and Water (MEW), whose mandate is to manage, control and operate the power sector. Under the Ministry there are five quasi-governmental organizations including Da Afghanistan Breshna Moassesa (DABM). DABM is responsible for the operation and maintenance of the country's power sector infrastructure and is responsible for about **80%** of the country's electricity production.

The on-going conflicts/wars over the last 25 years have left the MEW with a workforce with limited capability to discharge its responsibilities in an effective and efficient manner. Few, if any, of their staff have been able to upgrade their individual and/or collective skills and there is only very small number who possesses the appropriate technical and managerial know-how to run a modern electricity sector⁵. Given the ambitious expansion plans the sector has this acute shortage of professionals at all levels is the major challenge facing the sector in the short to medium term.

Training Needs Assessment: Scope, Methodology and Approach (Section 2)

The scope of the TNA was limited to those entities in the energy portion of the MEW included the following departments: DABM, Kabul Electricity, WAPEKA, Power Construction Unit, the Renewable Energy department; Procurement department, Planning department, Technical Services department, and the Technical Control department. These cover the priorities of the energy sector as envisioned in the MEW Vision and Plan to 2010 (Policy; Generation, Transmission and Distribution, Renewables) and in total, represents about **65%** of the MEW personnel.

The TNA used a two-fold strategy for conducting the gap analyses to identify training needs. The first element included eliciting data directly from the various departments, as identified in the previous paragraph. Data requested included staffing levels, organization charts, and perceived training needs. The second element comprised interviews with relevant persons both from within and outside the MEW. These included donor organizations and technical assistance contractors responsible for administering and/or delivering training to the MEW. The purpose was to understand their experiences to date of providing and /or delivering training as well as their future training programs.

Primary data was collected during face-to-face interviews. Secondary data from the MEW departments was solicited through distribution of a questionnaire (translated into Dari). In addition, other information was gleaned from review of available reports and documents prepared by a variety of entities and organizations involved in capacity building initiatives in the country.

The data gathering was characterized by a paucity of basic data. There is a lack of an authentic and verifiable employee database for different categories of employees throughout the MEW. Also there was no single organization chart. The TNA tried to address these data gaps by requesting directly from the various departments with some success. However, it must be recognized that there has been little opportunity to

⁵ Afghanistan is ranked 173rd of 178 countries in the United Nations Development Program (UNDP)'s human development index.

substantiate the information provided. While this should not have any significant impact on the nature of the capacity building needs identified and associated recommendations, where numbers of persons to be trained are presented these should be treated as indicative at this stage and should be reconfirmed prior to implementation of any major capacity building initiative.

The data provided by the various departments focused on specific capacity building needs of the respective department. The information gathered is included in Appendix F. However, it must be recognized that the sector is restructuring with major expansion planned. To identify capacity building initiatives relevant to and associated with the future development of the sector the anticipated structure of MEW included in the *Proposal for 2nd Stage PRR* was used. It should be recognized, that the plans for restructuring and development of the sector are evolving and the situation can be best described as “dynamic”. To this end, it was decided to categorize capacity building actions around a series of functional activities that should reflect the overall restructuring of the sector as and when it occurs.

Training Undertaken Since 2003 (Section 3)

A review of training activities undertaken by the MEW in the last 3 years was conducted. The purpose was to identify what lessons could be gained from those experiences so as to be able to build on positive achievements. The review indicates:

- About **90%** of the training provided was directly tied to donor-funded technical assistance programs⁶.
- On- the-job training (OJT) and part-time training programs have been the most commonly used approaches⁷.
- it was often difficult to find appropriate personnel for participation in the training programs that have been offered.
- All stakeholder donor training experiences were found to be characterized by the following barriers:
 - Lack of trainees with prerequisite skills to make training effective
 - Lack of motivation to learn

TNA Findings and Recommended Capacity Building Actions (Section 4)

Key findings from the TNA include that:

- there is no apparent overall capacity building strategy within the MEW;
- there is no single focal point within the MEW to manage and coordinate the capacity building activities;
- there is no single data base on the capabilities of sector personnel. This often results in the non-availability of ‘right target audience’ for training;

⁶ There is a myriad of international contractors working in the sector. Most of the training provided in the last three years has been associated with the respective areas where they are working. These include rehabilitation and renovation and institutional development.

⁷ Such training has been carried in an ad-hoc, unsystematic manner with little or no oversight/evaluation

- only a limited number of MEW personnel have a sufficient working knowledge of English or other foreign languages that are sometimes necessary for advanced training;
- there are a limited number of “professional” translators that can support capacity building initiatives, as and when translation could facilitate training;
- there is a shortage of professional, skilled personnel across all of MEW;
- donors have provided a number of experts to fill critical manpower gaps;
- these experts can provide a valuable mentoring function, however there is often no direct counterpart, or where this is, no appropriate counterpart development program or associated expert/counterpart transition plan implemented;
- most training is focused in the Kabul environs;
- there is limited availability of training facilities with necessary equipment to provide appropriate training in technology operation and maintenance.
- the prevailing security situation in certain areas can limit access to training.
- training is sometimes perceived as offering no benefit to potential training participants and participants occasionally demonstrate a lack of motivation to learn resulting in poor attendance / high dropout rates in the courses.
- capacity building needs cover a wide spectrum: from reinforcing basic capabilities for both technical and managerial personnel to the need to develop necessary skills and competencies for effective management and operation of the sector in the future. Such capabilities include regulation and governance; commercial and business operations; information technology; and modern generation, transmission and distribution technology operation and maintenance.

Recommendations

A total of 65 capacity building actions have been recommended for the relevant organization and/or personnel within the existing MEW entities. Specific details of proposed training programs are presented in Appendix E⁸ together with target audiences, proposed duration and prioritization.

The capacity building actions include a range of approaches and mechanisms such as:

- developing an appropriate institutional arrangement to support capacity building
- Mentoring programs
- Apprenticeship (OJT: locally and where appropriate internationally)
- Induction level development programs to create future leadership and management (linked to Manpower Planning Strategy of MEW)
- Executive Diploma in Energy Management (within the local University system)
- Study tours
- Short term training courses (delivered locally and internationally)

⁸ The activities have been prioritized into immediate (0 to 3 months), short-term (4 to 24 months) and long term (25 to 48 months). In prioritizing the course into immediate; short-term and long term, the curve is heavily skewed in the initial 2 years (almost 88 % of the courses recommended are within 2 years). There will be a need to repeat almost 50 % of the recommended short term courses several times. The duration of most of the training activities is about one week but some courses extend between a periods of 3-6 months.

- Distance Learning & open learning courses

While most actions are in the form of training courses, a few (6) institutional development actions are included with a view to improving the efficacy of human resource development within the sector. These include:

- appointment of a Capacity Building Director to oversee the overall capacity building initiatives under the MEW's domain
- development of a transition plan for resident advisors;
- Executive Diploma in Energy Management with a focus on developing future leaders in the sector - to be embedded within University System in Afghanistan
- Induction Level Training Schemes for developing future leadership, management and technical capability in the sector

The actions have been categorized based on the on-going institutional reforms of MEW and DABM, as outlined in the sector expansion plan up to 2010. The nine categories are:

- Generation, Transmission and Distribution expansion
- Sector Restructuring
- Power Imports
- Distribution Sub Sector
- Commercial Aspects
- Renovation and Rehabilitation Programs
- Generation
- Transmission sub sector
- Renewable Energy

Implementing Strategies and Approaches (Section 5)

The following approaches are proposed for implementing the recommendations:

1. Where capacity building needs are large and recurrent use a 4-step approach:

- a. **Train-the Trainers:** Identify/utilize the existing pool of training resources (trainers and education support executives - approx 50 nos.) and other internal persons to form a pool of trainers for implementing the capacity building program.
- b. **Manage the Training Function:** Upgrade skills of this pool to become 'training managers/facilitators' to manage the overall capacity building process from identification of training needs, development of training programs to address the needs including identification of appropriate training providers (both in-house and outside as necessary), to provide overall quality control of the training function and to monitor and evaluate any capacity building initiatives and make recommendations for improvements.
- c. **Partner and Ally:** Develop strategic alliances and partnerships with appropriate training/learning institutions, that can be used to accelerate capacity building in the short to medium term. For example, a strategic alliance/partnership with

PowerGrid Corporation of India would be very beneficial for capacity building associated with transmission systems⁹.

- d. **Institutionalize:** Under such partnerships, the training/learning institution could undertake development and delivery of a series of training courses, sequentially rather than as discrete events¹⁰ with a view to institutionalizing these programs within appropriate institutions in Afghanistan¹¹.

2. When needs are relatively small and specialized (such as Regulation, Energy Policy)

For such specialized needs it is more appropriate to send the trainees to providers of the specialized training internationally.

3. Prioritization or Where to begin?

Although the needs are substantive throughout the sector and both ‘top-down and bottom-up’ approaches for capacity building are required, experience has shown that for any sustainable change or turnaround to occur the best place to focus is to begin from the top.

4. It is not enough to train individuals alone. Appropriate Mechanisms are needed

Capacity building should be an integral part of the day-to-day operations of the sector. As such, it is equally important to develop appropriate institutional mechanisms through which capability is enhanced in response to the needs/priorities of the sector on a continuing basis. Recommended approaches include:

1. Create linkages between capacity building and HR within MEW:

It is vital to link training with HR policy particularly with respect to promotion, career planning, and individual training and development plans should form an integral part of any annual performance appraisal system, when such systems are introduced.

⁹ South Asia has a number of training institutions that provide high quality services to the electricity sector within the region. These resources could be leveraged to provide a significant amount of training to MEW personnel relatively quickly and relatively inexpensively. Other examples include NDPL or Reliance Energy Management Institute (both of India) for Commercial aspects of Electricity Distribution ; for generation expansion/ new capacity - Power Management Institute of India; for Hydro Power with the Training Center of NEA of India or WAPDA Hydel Training Center in Pakistan.

¹⁰ Such partnerships are recommended for continuity and sustainability of the capacity building initiative, as well as providing mentoring opportunities for capacity building resource persons from Afghanistan.

¹¹ As the MEW in-house capacity to manage the training function is currently limited, one alternate option would be to create alliances between the training/learning institutions and Afghan Universities. .

2. **A Training Policy is needed to address capacity building issues:**

An appropriate training and capacity policy is needed. The policy should address: the goals of the policy; the value MEW places in capacity building; and how training should be mutually beneficial to individuals and the organization.

3. **Capacity Building should be an Inherent Part of Career Path:**

Most employees entering the sector are expected to spend the majority of their career serving the needs of the sector either directly as an employee of the MEW or indirectly through a service organization to MEW. Given this, it is imperative to develop career paths that integrate capacity building as an inherent part of the path and training is seen as a prerequisite to advancement to the next level in one's career.

4. **Induction Level Training:**

An important first step toward developing long term capability within the sector would be to introduce Induction Level Training Schemes –wherein fresh graduates are recruited from Colleges in Afghanistan through a competitive selection and put through customized training ranging from 6 months to 9 months.

5. **Incentivize training by Linking to Career Growth:**

There is a large percentage of the MEW personnel who believe there is little tangible benefit from participation in capacity building activities which translates into very little incentive to learn. An approach that linked capacity building activities to career progression could have more sustainable benefit than providing direct incentives such as payment to attend courses.

6. **Use Technology for Training Delivery to overcome lack of infrastructure:**

Considering the limited availability of physical infrastructure for training and constraints on the logistics front (including security risks), the option of using technology for training delivery platform should be explored (Virtual classrooms). It could prove a relative low cost option, and a viable response to meet the rather large training needs especially for classroom-based learning courses, in a relatively short span of time. It is recommended to set up 4-5 such studios (one each in MEW Kabul, Jalalabad and in other provinces).

Considerations

The needs are large and wide ranging but there are several constraints including:

- availability of adequate numbers to whom training can be imparted and
- lack of motivation to learn
- limited availability of local training infrastructure and training resources.

Another important consideration in implementing the training courses is that they would have to be paced in a manner, which provides sufficient time for the participants and entities to absorb and assimilate learning.

Keeping in view the numerous challenges that it faces, it is still imperative for the MEW to take ownership of capacity building programs and their implementation. To do this it must develop suitable mechanisms to periodically review and update the sector's capacity building needs. Of all recommendations, the appointment of an appropriate Capacity Building Director with full responsibility and authority for the MEW's capacity building initiatives is the most important and one of the foremost activities to be undertaken.

Electricity Sector in Afghanistan: An Overview¹²

Afghanistan's power sector is extremely limited. Officially, access to power is only about **6%**, one of the lowest in the world; only 234,000 customers are connected to the public grid, of which over **30%** (76,000) are in Kabul. Other provinces have even less access, with rural areas being virtually un-served. The existing supply network is in urgent need of rehabilitation and thus provision of an expanded and reliable electric power service is critical for future economic growth, social equity, and the political unity of the country.

The existing facilities provide unreliable service for a few hours each day. There is about 454 MW installed generation capacity and after war the output was reduced to 240 MW. The output now is about 360 MW - most of the units require overhaul or replacement. There is limited power import from three neighboring countries totaling about 83 MW.

There is no national grid for transmission of power-only local networks and the existing lines need rehabilitation and expansion. Transmission systems are in disrepair due to insufficient investment, lack of maintenance, and theft of materials over the last 25 years. Substations and low voltage distribution networks are dismantled and overloaded; very few components can be used in the future. In addition, an unknown number of unofficial consumers are connected to individual meter boxes in an extended web of poorly wired secondary circuits. This results in very low supply voltages and high technical losses, which are an economic loss to Afghanistan and, if saved, could be used to supply other customers. Distribution networks in the provincial cities suffer from similar drawbacks.

Electricity tariffs are well below the cost of supply. In Kabul, the average tariff is less than US\$0.02 per kWh. Countrywide, the average tariff is about US\$0.035 per kWh. The overall average cost of supply is estimated at US\$0.07 per kWh, implying cost recovery of just over 50 percent.

The existing countrywide power utility, Da Afghanistan Breshna Moasessa (DABM), does not have the economic resources to improve the service, the financial situation of the DABM being critical. Revenues are limited due to the lack of efficient billing and collection systems. There is little or no control or supervision of meter readings and theft and non-payment are rampant. Technical and non-technical losses are high – in the order of **47%** – due to overloaded facilities and lack of customer supervision. Although an autonomous company, DABM depends on budget resources of the MEW¹³ and is overstaffed. In addition, most staff does not have the needed technical skills to run a modern system.

¹² This section draws heavily from previous reports and documents produced by donors and consultants to the Government including the "Securing Afghanistan's Future: Accomplishments and Strategic Path Forward", January 2004.

¹³ FY 2003 the salaries of the staff were paid by the MWP budget

Institutional Arrangements

Institutional responsibility is spread over several entities owned, and operated through centralized ministries, with some operational functions delegated to public enterprises.

The MEW manages and operates the power sector. Da Afghanistan Breshna Moassesa (DABM) is among the five quasi-government enterprises responsible for the operation and maintenance of Afghanistan's power sector infrastructure. DABM is responsible for about **80%** of the country's electricity production, with the Ministry of Mines & Industry and the Ministry of Light Industry accounting for the remainder.

Recognizing the relative inefficiency in the existing arrangements, the MEW is undergoing institutional reform and DABM is being restructured to operate as a commercially viable organization.

Strategies to meet the Electricity Needs

The Government of Afghanistan has set out its targets to increase access to electricity from the current **6%** population to about **25%** by 2010 and **33%** by 2015 and has also spelt out its strategies to meet the electricity demand in the 'Power Sector Technical Annex (January 2004): *Securing Afghanistan's Future*'.

The key strategies to meet the electricity needs identified by MEW are:

- Priority is to rehabilitate existing power plants, transmission and distribution systems.
- Expand transmission and distribution systems.
- Increase imported power supply.
- Connect 730,000 new customers by 2010.
- Establish a national power grid (ring Kabul with provinces)
- Become a Power Export country by using natural resources (24,000 MW potential)
- Serve as "bridge" for power transit among neighboring countries
- Use renewable energy for "off-grid" rural electrification
- Increase emphasis on institutional reform:
 - Complete the Priority Reform and Restructure of the MEW.
 - Restructure DABM (State Power Company) to operate as commercial entity.
 - Improve and computerize billing and collection systems.
 - Reduce system losses.

Need for capacity building

For the last 25 years, there have been no opportunities for staff upgrades. Almost the entire staff needs technical and managerial up gradation to run a modern and efficient Sector, having been out of touch with commercial activity for the last two decades.

More importantly, one of the greatest challenges faced is an acute shortage of professionals at all levels, to meet the staffing needs of the various departments/ entities in the Sector.

Section 2 TNA: Scope, Methodology and Approach

The original activity envisioned the TNA to be a part of developing a Master Training Program (MTP) for the MEW. The original work scope is included in Appendix A. However, given challenges encountered with respect to the availability and paucity of primary data, it was decided to limit the activity to the conduct of a Training Needs Assessment, (TNA). The TNA undertaken covered all the SOW TNA elements, as described in the scope of work presented in Appendix A, to the extent possible. For example, the lack of verifiable human resource data and the continuing uncertainty surrounding the future organizational structure of the MEW meant it was not possible to appropriately and realistically “benchmark” the MEW against other regional entities.

TNA Scope

The MEW has approximately 500 personnel in Kabul and approximately 11,710 nationwide¹⁴. The TNA was limited to those entities in the energy portion of the Ministry and included the following departments: DABM, Kabul Electricity, WAPEKA, Power Construction Unit, the Renewable Energy department; Procurement department, Planning department, Technical Services department, and the Technical Control department. These cover the priorities of the energy sector as envisioned in the MEW Vision and Plan to 2010 (Policy; Generation, Transmission and Distribution, Renewables) and in total, represents about 65% of the MEW personnel¹⁵.

Table 2.1: Personnel in Key MEW Energy departments

#	Department	Personnel by Category					
		Total Personnel	Engineers	Technicians	Professional	Admin	Non-Professional
1	DABM	5,384	118	500	2788	1978	0
2	KED	1,484	50	300	904	150	80
3	WAPEKA	88	24	40	0	14	10
4	PCU	211	8	15	105	50	33
5	Renewable Energy	70	10	7	21	18	14
6	Procurement	37	4	4	1	22	6
7	Planning	93	15	3	1	12	62
8	Technical Services	140	15	5	37	55	28
9	Technical Control	55	15	0	21	8	11
TOTAL		7,562	259	874	3878	2307	244

¹⁴ An organization chart for the MEW is presented in Figure 1.

¹⁵ Plans for restructuring and development of the sector are evolving and should be considered ‘fluid’. In addition, this is no there is no authentic and verifiable employee database of employees. This does not necessarily render the TNA findings invalid however the numbers and names of department should be treated as indicative at this stage and should be verified once implementation of any training activity.

Methodology

The methodology used in conducting the TNA included interview meetings with MEW stakeholders – both internal and external. External Stakeholders included Donor agencies, their Consultants and Contractors working with MEW, such as AEAI, IRD and Nexant of the USAID; DECON and MVV of the World Bank; Power Grid Corporation of the Government of India; ADB, and GTZ. Internal stakeholders included MEW officials, State Owned Entities officials, and Priority Reforms and Restructuring (PRR) task force members. A listing of stakeholder meetings is given in Appendix B.

The issues explored during the meetings with External Stakeholders were: the nature of training provided; their experience of implementing training; achievements and what could be done better; and the capacity that needs to be developed in the Sector.

The issues discussed with Internal Stakeholder were: key challenges, concerns and changes resulting from restructuring; the capacities and skills/ new competencies required meeting these challenges; and training required.

In addition, the internal stakeholders were requested to complete a questionnaire (translated into Dari to facilitate communication) in which they were to articulate their training needs.

Both parties were also requested to provide relevant documents and reports, as appropriate to facilitate understanding of the sector. An assessment of training needs using gap analysis techniques was carried out based on the collected information, taking into account a review of prior/planned activities, the organizational development plans of the Ministry.

Constraints & Limitations

There were no documents /fact sheets with information on even basic parameters (e.g. generating capacity from various sources, number of employees etc) this had to be compiled and validated from multiple sources.

Several MEW officials could not converse in English (interpreters were used) and attempts to discuss their concerns were only partially successful. Another limitation in carrying out the study was that it was limited to meetings with stakeholders in Kabul, as traveling outside Kabul to meet with Provincial Electricity Departments was not possible for security reasons.

The assessment resulted in the identification of options and approaches to developing appropriate capacity for the MEW as well as recommendations for capacity building actions that can provide quick, high impact results, (0 to 3 months) as well as priority short and long term training requirements.

The findings, recommendations and implementation strategies are presented in Sections 3, 4 and 5 of this document.

Approach

The TNA used a two-fold strategy for conducting the gap analyses to identify training needs. The first element included eliciting data directly from the various departments, as identified earlier in this section. Data requested included staffing levels, organization charts, and perceived training needs. The second element comprised interviews with relevant persons both from within and outside the MEW. These included donor organizations and technical assistance contractors responsible for administering and/or delivering training to the MEW. The purpose was to understand their experiences to date of providing and /or delivering training as well as their future training programs.

Primary data was collected during the face-to-face interviews. Secondary data from the MEW departments was solicited through distribution of a questionnaire (translated into Dari). In addition, other information was gleaned from review of available reports and documents prepared by a variety of entities and organizations involved in capacity building initiatives in the country.

Review of the documents and reports (list given in Appendix C) yielded good information on the status of various aspects of the power sector; proposed programs and future plans and was useful for categorizing the capacity building needs.

The data provided by the various departments focused on specific capacity building needs of the respective department. The information gathered is included in Appendix F. However, it must be recognized that the sector is restructuring with major expansion planned. To identify capacity building initiatives relevant to and associated with the future development of the sector the anticipated structure of MEW included in the *Proposal for 2nd Stage PRR* was used. It should be recognized, that the plans for restructuring and development of the sector are evolving and the situation can be best described as “dynamic”. To this end, it was decided to categorize capacity building actions around a series of functional activities that should reflect the overall restructuring of the sector as and when it occurs.

Overall, the data gathering was characterized by a paucity of basic data. There is a lack of an authentic and verifiable employee database for different categories of employees throughout the MEW. Also there was no single organization chart. The TNA tried to address these data gaps by requesting directly from the various departments with some success. However, it must be recognized that there has been little opportunity to substantiate the information provided. While this should not have any significant impact on the nature of the capacity building needs identified and associated recommendations, where numbers of persons to be trained are presented these should be treated as indicative at this stage and should be reconfirmed prior to implementation of any major capacity building initiative.

Section 3 Training to Date and Lessons Learned

An assessment of the training activities conducted so far (since 2003) was undertaken, with an view to build on the achievements and emphasize lessons learned for training proposed in the future. Details of prior donor training are given in Appendix D. The key findings are summarized below:

- There is no overall capacity building strategy for MEW.
- There is limited management of the training function in MEW.
- About **90%** of the training provided was directly tied to donor-funded technical assistance programs¹⁶.
- On- the-job training (OJT) and part-time training programs have been the most commonly used approaches¹⁷.
- it was often difficult to find appropriate personnel for participation in the training programs that have been offered.
- Lack of motivation to learn

The above are discussed in detail in the following paragraphs.

Analysis of Training since 2003:

1. No overall Capacity Building Strategy

The MEW has no overall strategy for developing the necessary human resources for operating an efficient, cost effective electricity sector in the foreseeable future. What training has occurred or is incurring is focused directly on the particular areas/activities being funded by a donor. Training courses are often single discrete events and not part of any planned overall initiative to build capacity in the sector.

2. Absence of counterpart within MEW who will provide ownership and oversight

There is no single group responsible for directing and managing capacity building initiatives. Training seems to be managed in an ad-hoc manner. Limited oversight/management means that it is not always possible to: ensure the appropriate nominations are made for courses; carry out monitoring and evaluation of training programs; avoid overlaps, and maintain a database of trained personnel and most importantly that the learning from these courses is integrated and institutionalized.

3. Most training so far tied to technical assistance

Currently there are several donor agencies/contractors offering training under the various donor-supported programs. This training is largely (over **90%**) tied to their technical assistance activities – for example: EU & KfW are financing rehabilitation projects for substations and the training provided is on new substation technology

¹⁶ There is a myriad of international contractors working in the sector. Most of the training provided in the last three years has been associated with the respective areas where they are working. These include rehabilitation and renovation and institutional development.

¹⁷ Such training has been carried in an ad-hoc, unsystematic manner with little or no oversight/evaluation

installed by them; GoI is financing part of NETS and Power Grid Corporation of India is providing training on transmissions system being installed.

In some cases, training is provided, when specifically requested by the Ministry e.g. Finance Management Course by DECON/PISU.

The 'Multi Donor-Working Group' in its document on training proposed to the MEW that training should be an integral component of all forthcoming donor-funded contracts.

4. On-the-job Training (OJT)/part-time training- most commonly used approaches:

Most training is undertaken in support of implementation of on-going technical assistance contracts. As such, and because there are not sufficient numbers of appropriate persons to be trained, the most common method of training is OJT and mentoring of employees of TA contractors. Almost **50 %** of the training imparted since 2003 is by OJT.

OJT can be very effective. For example, USAID's training for Billing and Collection Project and O & M training of gas turbines in North West Kabul, both used hands-on-training as it was more easily delivered and practical than classroom sessions. A similar approach was used in training 10 persons working with the Finance Consultant (DECON/PISU).

Another approach being followed is to impart training on a part-time basis for few hours a day. For example, ADB is planning several such courses including Executive training by IIMA for 3 hours a day for a five day period; Energy Policy and Regulatory training by TERI; and Basic Procurement training by IMM.

One of the factors necessitating this approach is the constraint of full time availability for participants for training. While part-time training might be a practical approach under the given circumstances (and could be effective for training in English language/computer skills) it is widely acknowledged that courses, especially those that are conceptual in content, need to be sufficiently intensive and continuous to create basic learning.

There have been some initiatives in this direction, but this is not enough and much more need to be done. Also there are instances, where the participants' dropout half way after they have acquired familiarity with some key phrases in English.

Another language critical to capacity building is familiarity with Computers -here again the experience has been similar to that of English courses.

A viewpoint that was widely expressed - is that the only incentive to attend English classes and Computer courses is to “enhance employability to find attractive jobs with the NGOS and Contractors/ Donors”.

One of the important considerations while conducting a training course is availability of an Interpreter - both during the course delivery and for translation of the course material.

It is recommended that approaches such as distance learning with contact sessions for learning both English language and Computers be explored.

As regards ‘attrition’ that follows training – it may be argued that the resource still remains within the country and after the first flush of attrition; this would get stabilized/neutralized over time.

5. Inappropriate Nominations

‘Inappropriate participation’ was cited as one of the areas of concern by the donors. While the criteria for target audience for each course is clearly stated, the nominations that are proposed often do not meet the stated criteria. One of the Sponsors mentioned that “because nomination/selection of participants for courses is done through the Governors of that province, there could be a bias”.

Nominations for courses, especially outside Afghanistan – go up to the Deputy Minister for approval. One of the priority tasks proposed is to designate a small committee/ functionary within MEW, to take charge of this with sufficient powers delegated to propose and approve nominees.

One tool that could facilitate appropriate selection is a data base on current skill levels/experience details, for the employees. Absent this, it can be difficult to nominate the right persons for any training. While such an exercise will be carried out for DABM by the current Contractors (MVV), MEW will not be covered. This situation is akin to some State Electricity Boards (SEBs) in India in the mid and late 90s!

6. An underlying lack of motivation to learn

This emerged as one of the reasons for poor attendance/high dropout from prior training courses. It was mentioned that because the participants perceive little or no direct benefit in utilizing what is learnt and little prospect for career advancement, there is no incentive to learn. In some cases the donors have paid small amounts as incentives to attend courses. These are in the form of per diems (traveling allowance) to attend training.

7. Ageing workforce

Another factor mentioned by one of the contractors was that the bulk of the people who run and operate diesel fired gas turbines are over 50 years old.

8. Shortage of Skilled Professionals

There is an acute shortage of skilled personnel and one of the foremost challenges is to ensure that organizations are staffed appropriately. In addition, the sector suffers across board as it is not able to recruit adequate numbers of appropriate inductees to whom training can be imparted¹⁸.

9. Locations and Logistics

Logistical arrangements can sometimes be difficult given that there are personnel who require training in locations sometimes considered as security risks by the international community. Hence establishing contacts with local persons is difficult and identifying persons for training is challenging. As such, most of the training has been Kabul-based.

There are also issues of logistics support within Kabul. PISU faced difficulties for its training courses on AUTOCAD 2004 for Survey Engineers and Basic computers course with respect to the venue for conducting these courses. The Civil Service Commission which was to make their facility available, required a special contract for all activities –including one for the use of audio visual equipment -for training. An instance was cited when the nominated person from CSC was not present to open the classroom and the classes had to be suspended for the day!

¹⁸ In the mid 70's, India faced a similar dilemma. In response, utilities like NTPC, Power Grid Corporation of India rolled out induction level training schemes for Engineers, HR and Finance & Accounts Professionals.

Section 4 Recommended Capacity Building Actions

Training and Capacity Building needs of the electricity sector in Afghanistan, have been grouped into 9 categories based on the strategies outlined by MEW to meet the electricity needs and the on-going institutional reforms of MEW and DABM to operate as a commercial entity.

The nine categories segments are:

- A. Restructuring of MEW
- B. Renovation and Rehabilitation Programs
- C. Power Imports from neighboring countries
- D. Generation Sub-sector
- E. Commercial Aspects of Electricity Distribution
- F. Distribution Sub Sector
- G. Transmission sub sector
- H. Expansion and New Capacity in Generation, Transmission, and Distribution
- I. Renewable Energy

A total of 65 training courses and capacity building interventions have been recommended and categorized under the nine thematic segments. Details including their respective target audience, duration and level of priority is given in Appendix E.

Apart from training courses, the Report recommends a few (6) capacity building interventions, such as: appointment of Training Mentor within MEW; development of a transition plan for resident advisors; Executive Diploma in Energy Management with a focus on developing future leaders in the sector - to be integrated within the University System in Afghanistan; Training Schemes at the induction level to build cadres (in Engineering, Finance & accounts and HR) which will in turn help to make the transition to a self reliant and commercially viable sector.

Recommendations include a range of training activities, such as:

- Study tours
- Short term training courses (in Afghanistan and in the South Asia Region)
- Mentoring program (including transition plan for Resident Advisors Ex pats)
- Apprenticeship (OJT: in Afghanistan and in the Region)
- Induction level training schemes within MEW to create professional cadres (linked to Manpower Planning Strategy of MEW)
- Executive Diploma in Energy Management (to be embedded within University system with a focus on developing future leaders)
- Appointing a training Mentor within MEW;
- Institutional building support for sustainability
- Distance Learning & open learning courses

Further, the needs have been prioritized into immediate (0 to 3 months), short-term (4 to 24 months) and long term (25 to 48 months). In prioritizing the course into immediate; short-term and long term, the curve is heavily skewed in the initial 2 years (almost **88 %**).

Keeping in view the imponderables at this stage, only **12%** of the new courses are categorized as long-term priority. Long-term priority courses largely pertain to a) expansion and new capacity addition in generation, distribution, b) new technologies, and c) interventions such as Executive Diploma in Energy Management, which need a long lead-time to be developed. Further, almost **50 %** of the courses recommended will need to be repeated several times over, during third and fourth year.

The training needs and training courses under each of the 9 themes is described below (with details on each of the courses at Appendix E)

A. Restructuring of MEW

MEW is moving from an old administrative framework to a new structure that will respond to the emerging needs of the sector. The Priority Reforms and Restructuring (PRR) Task Force comprising of seven senior executives from within the Ministry has been constituted to develop the proposal for reforms and restructuring of the Ministry.

This endeavor is being supported by experts from bilateral and multilateral agencies like the USAID, World Bank and ADB. Under the lateral entry program of the World Bank, out of the 40 positions identified, 9 have been identified and submitted to the Civil Service Commission (IARCSC) for approval.

Some of the training courses recommended, specifically address the new functions to be carried out under the proposed structure e.g. courses on Regulation, Energy Policy, Human Resource. Few courses are keeping in view the core skills required for rebuilding the sector such as *Refresher courses in Project Management and Contracts Management*.

Change Management skills to make the transition to the new structure is covered in the course on *Corporate Governance and Management*.

- A 1. Course on Management of Training
- A 2. Training course cum study tour for key incumbents of restructuring of MEW
- A 3. Training in Regulation for Engineers
- A 4. Attachment Training with Regulatory Commission/India
- A 5. Course on Energy Policy
- A 6. Training Mentor (within MEW)
- A 7. Developing Transition Plan for the Resident Advisors (Expatriates) in MEW
- A 8. Course on Corporate Governance and Management
- A 9. Basic Management (Organization's principles, framework and processes)
- A 10. Executive Diploma in Energy Management (with focus on developing future leaders)
- A 11. Induction Level Training Schemes (to build professional cadres)
- A 12. Training Center: Institutional Development (Management Development component)
- A 13. Refresher Course in Contracts Management
- A 14. Refresher Course in Project Management
- A 15. Basic Course on Finance & Accounts

- A 16. Refresher Course in Procurement and Stores
- A 17. Basic Course on Human Relation Management
- A 18. Basic course on Office Management
- A 19. Course on Environment Impact Assessment (EIA) for the Projects
- A 20. Environment Awareness Course for Municipalities
- A 21. Advisor for Environmental Policy within MEW

B. Renovation and Rehabilitation Programs:

There are currently several Rehabilitation Programs to improve the existing outdated and dilapidated generation, transmission, and distribution infrastructure to provide reliable power.

Most of the power generating plants in the country are more than 30/40 years old (the earliest one dates back to 1920!) and are either not functional or operating at very low capacities. Some of these units are being refurbished by the OEMs in UK, Germany; USA, etc. and training is part of the contract.

The electricity transmission and distribution network in Afghanistan also needs extensive repairs/up-gradation to be able to provide reliable power. Several donor agencies (USAID, KfW, World Bank, etc.) have either initiated or have plans to undertake renovation and rehabilitation programs. Associated training also forms a part of the various contracts, however, there is an urgent need to provide training to a core group identified within DABM, which can ensure that proper training on new operation & maintenance practices takes place and more importantly is institutionalized.

Training courses are recommended for each of the core groups working on R & R of hydro power stations; transmission and distribution lines.

- B 1. Course on R & R of Hydro Power Stations
- B 2. Course on Upgrades and Modernization of Transmission System
- B 3. Course on Upgrades and Modernization of Distribution System

C. Power Imports from neighboring countries:

Power is currently imported into the country from three countries at present (Iran; Turkmenistan; Uzbekistan), totaling about 83 MW. The current power production in Afghanistan and the import of small amounts of power through existing damaged lines from neighboring countries is insufficient to meet energy requirements. The Government of Afghanistan and supporting multilateral and bilateral donors (USAID, ADB, and the World Bank) have ascertained that Afghanistan's least-cost energy supply option is to increase the relatively small amount of electricity presently imported from the Central Asia Republics (CARs) by up to 300 MW by end of year 2008. The training courses suggested address the emerging needs for the Ministry on economic and technical aspects of power trade, power purchase agreements and gaining practical (hands-on) experience on power trading issues from countries in the Region.

- C 1. Economic aspects of Power Sector: Key Concepts and Tools
- C 2. Course on Power Purchase Agreements
- C 3. Course on Technical aspects of Power Import
- C 4. Attachment Training (Power Procurement)

D. Generation Sub-sector:

Hydropower is one of the major energy sources in Afghanistan. New hydropower projects to the tune of 590 MW (as per the Power Sector Master Plan) are on the anvil and the donor support has been committed for a major part of this generation capacity addition. The capacity building needs in this sector are enormous, as the country's hydropower professionals have been trained almost quarter of a century back, and since then many technological advances (such as reduction in project cycle time) in hydropower projects have been made. Similarly, in addition to about 55 MW of old diesel gensets operating in Afghanistan, several new DG sets are being installed to meet the immediate electricity needs in the country. The new capacity addition (to the tune of about 240 MW in Kabul city and about 51 MW in other parts of the country) is through diesel gensets, which are built with newer technologies and control systems. Few training courses have been conducted on O&M aspects and about 25 operators have been trained in India at the Cummins Training Facility. Considering the generation capacity addition, this is inadequate.

- D 1. Salient Aspects of Civil Engineering for Hydroelectric Projects
- D 2. Construction Material Investigations for Hydropower Projects
- D 3. Refresher Course: Operation & Maintenance of Generators and Turbines
- D 4. O & M of Diesel Generators: Training of Trainers
- D 5. Roll- out of the training course on O&M of DG sets (including for various provinces in Afghanistan)

E. Commercial Aspects of Electricity Distribution:

Electricity tariffs are well below the cost of supply. In Kabul, the average tariff is less than US\$0.02 per kWh. Countrywide, the average tariff is about US\$0.035 per kWh. The overall average cost of supply is estimated at US\$0.07 per kWh, implying cost recovery of just over 50 percent. Further, revenues are limited due to the lack of efficient billing and collection systems. There is little or no control / supervision of readings and theft and non-payment are rampant. Technical and non-technical losses are high – in the order of about **47%**.

USAID has supported a project on computerized billing for Kabul city and Govt. of Iran is supporting similar activity for five other cities.

Senior executives in the Ministry and utility company like DABM (including Provincial Electricity Departments in-charge of distribution function) need to comprehend and practice on modern principles of commercial & energy accounting; metering, billing & revenue management, emerging trends in distribution metering technologies, and electricity retail tariff.

- E 1. Course on Commercial Aspects of Electricity Distribution & Electricity Retail Tariff
- E 2. Course on Metering Billing & Revenue Management
- E 3. Training on Computerized Billing & Customer Care Services
- E 4. Metering Technologies and Systems

F. Distribution Sub Sector:

A large number of networks were severely damaged during the past 25+ years of turmoil and disturbances. Networks expansion and modernization are both planned.

The electricity distribution system in Afghanistan has various voltage levels including 20kV, 15kV, 10kV, 6kV, 400 V, and 220V. It is understood that Government has decided to standardize the sub-transmission voltage at 20kV and the Kabul distribution network is being modified to 20kV/400V system.

Courses proposed are for equipping the staff with expansion schemes and new technologies. Management of various aspects of Distribution Business including loss reduction is proposed. Skill up gradation for frontline workforce such as linemen and meter technicians has also been proposed.

- F 1. Distribution Capacity Expansion and New Technologies
- F 2. Course on O & M of Sub Transmission and Power Distribution System
- F 3. Financial Management for Distribution unit/utility
- F 4. Effective Management of a Power Distribution Utility
- F 5. Distribution Loss reduction
- F 6. Course for Linemen in Distribution Systems
- F 7. Technical skills enhancement for Sub-transmission lines (15 kV) and transformer stations
- F 8. Course on O&M of Junctions and sub-stations
- F 9. Technical course on meters and metering aspects

G. Transmission Sub-Sector

The electricity transmission system in Afghanistan comprise mainly of 110 kV single circuit lines several of which are damaged (including the only 220 kV transmission line for import of power from Uzbekistan to Khulm town) and need repairs or up gradation. The country only has local networks and there is no national grid in Afghanistan. Several donor agencies including USAID, ADB, World Bank, Govt. of India, etc. have initiated the process of rehabilitating the transmission system and construction of new transmission lines supporting the rehabilitation/construction of new power generating systems and import of power from the neighboring countries. The new planned transmission system namely NETS (North East Transmission System) and South East Transmission System (SETS) comprise 220 kV and 110 kV transmission lines connecting important load centers (major cities) around the country. This expansion requires new skill sets for which the following training is recommended:

- G 1. Transmission System Planning and Design
- G 2. Construction, Erection, and Commissioning of Transmission Lines and Substations
- G 3. Power System Operation and Maintenance: for Transmission staff at DABM and at Provinces
- G 4. O&M of transmission lines for Transmission staff, at Provinces
- G 5. Long-term load forecasting studies
- G 6. Grid Management including - scheduling and load dispatching -control and communication systems (at Provinces)
- G 7. Hot-line Maintenance

H. Expansion and New Capacity in Generation, Transmission, and Distribution

Electricity ranks as 2nd priority for the Country (after security). Currently, only **6%** of population has access to electricity and the five-year target of MEW is providing access to **65%** population to in urban areas and **25%** population in rural areas. To meet this target, the (currently) planned new generation is about 689 MW (as part of support from various donors) and extensive network expansions are being undertaken/planned by the donors (USAID, World Bank, ADB, Govt. of India, etc.). All these expansion and new capacity addition requires new skill sets; while the staff at MEW and the Utilities has not had any opportunities to update themselves in new design philosophy and developments in technology. The courses under this theme are focused on aspects of Power Project Development, design and construction aspects; Contracts management and tools and techniques for implementing projects effectively within stipulated time and costs.

- H 1. Refresher Course on: Design of Transmission Lines, Design of Substations and Transmission Network
- H 2. Emerging Trends & Current Developments in Construction of Hydro Power Plants.
- H 3. Training on Survey techniques and Data Entry and Analysis (for transmission line And Stations) using modern software.
- H 4. Course on Power Project Development
- H 5. Contracts Management
- H 6. Distribution Capacity Expansion

I. Renewable Energy

About **6%-10%** of the population has access to grid power & there are many remote areas in Afghanistan which simply will not be grid connected in the foreseeable future. Even by 2010 with all the new capacity addition, it is expected that only about **25%** of the rural population would be connected to grid. Hence decentralized off-grid options – especially renewable energy for power generation assume great significance in a country like Afghanistan. The Department of Renewable Energy was established in the mid eighties with a view to carry out research and promotion of renewable energy technology systems in Afghanistan. At present there is no coherent policy or road map with the Government to utilize and promote renewable energy resources in the country. The department has in the past mainly focused on solar thermal technology for water heating. Currently, with support from GTZ, the department has started a training course on Solar PV lantern assembly for women. Considering the importance of renewable, off-grid technologies for providing power to rural areas (especially micro-hydro) there is a need to familiarize the staff in planning, survey, design, and installation of mini-micro hydro power including institutional approaches (community based operation and maintenance) for long term sustainability.

- I 1. Policy Seminar on Renewable Energy Development (in Afghanistan)
- I 2. Attachment training for developing renewable energy policy and country strategy
- I 3. Course on Survey, Design, and Implementation for Micro-hydro power systems
- I 4. Course on O&M procedures for micro hydro power plants

I 5. Course on community based approaches for micro-hydro implementation

I 6. Course on Resource Assessment for Renewable Energy Technologies

Training Planned by Stakeholders

It was understood in the meetings with the donor agencies & contractors that some training, related to the above needs, is in the pipeline (*details in Appendix D*). Notably among these are –

ADB: Basic Course on Energy Policy & Regulatory Management; Basic Course on Procurement, Senior Executive Education, Basic Course on Financial Management and Transmission System Operations & Load Dispatch

USAID: Support for setting the Vocational Training Center; Operation and Maintenance of Diesel Gensets, Training of Trainers for DG sets

Power Grid Corporation of India (Government of India): Construction and erection of Transmission lines, Operation & Maintenance of Transmission lines

The World Bank: Training to be provided by the consultants (MVV) as a part of the institutional reforms for DABM.

Section 5 Implementation Strategy and Approaches

The capacity building needs of the Afghanistan Electricity Sector are spread across a wide spectrum ranging from basic technical skills to higher level competencies, there are several constraints. This includes a very limited infrastructure to support implementation of capacity building in a substantive manner and in general a lack of motivation for training. There is virtually no training facility outside Kabul, except at Jalalabad. Additionally, there is limited availability of appropriate personnel. As an example, at the Darunta Hydro Power Plant (11.5 MW) – one of the efficient power stations in Afghanistan - there are only 2 electrical engineers out of the 65 employees; all operators are educated to 7th grade only and 10 mechanics are in age range of 63-73 years.

Critical to success, therefore will be to ensure that appropriate strategies are employed in delivery of capacity building. Such strategies are outlined in the remainder of this section. Keeping in view the numerous challenges that it faces, it is still imperative for the MEW to take ownership of capacity building programs and their implementation. To do this it must develop suitable mechanisms to periodically review and update the sector's capacity building needs. Of all recommendations, the appointment of an appropriate Capacity Building Director with full responsibility and authority for the MEW's capacity building initiatives is the most important and one of the foremost activities to be undertaken.

Implementation Strategies

The following approaches are proposed for implementing the recommendations outlined in section 4:

1. **Where capacity building needs are large and recurrent use a 4-step approach:**
 - a. **Train-the Trainers:** Identify/utilize the existing pool of training resources (trainers and education support executives - approx 50 nos.) and other internal persons to form a pool of trainers for implementing the capacity building program.
 - b. **Manage the Training Function:** Upgrade skills of this pool to become 'training managers/facilitators' to manage the overall capacity building process from identification of training needs, development of training programs to address the needs including identification of appropriate training providers (both in-house and outside as necessary), to provide overall quality control of the training function and to monitor and evaluate any capacity building initiatives and make recommendations for improvements.
 - c. **Partner and Ally:** Develop strategic alliances and partnerships with appropriate training/learning institutions, that can be used to accelerate capacity building in the short to medium term. For example, a strategic alliance/partnership with PowerGrid

Corporation of India would be very beneficial for capacity building associated with transmission systems¹⁹.

- d. Institutionalize:** Under such partnerships, the training/learning institution could undertake development and delivery of a series of training courses, sequentially rather than as discrete events²⁰ with a view to institutionalizing these programs within appropriate institutions in Afghanistan²¹.

2. When needs are relatively small and specialized (such as Regulation, Energy Policy)

For such specialized needs it is more appropriate to send the trainees to providers of the specialized training internationally.

3. Prioritization or Where to begin?

Although the needs are substantive throughout the sector and both ‘top-down and bottom-up’ approaches for capacity building are required, experience has shown that for any sustainable change or turnaround to occur the best place to focus is to begin from the top.

In addition, the key is to prioritize and identify training course with a potential for *immediate, high impact results*.

After prioritizing the recommended actions into immediate (0 to 3 months), short-term (4 to 24 months) and long term (25 to 48 months), there is a heavy skew to the initial 2 years (almost **88%**). Long-term priority courses largely relate to new expansion in generation, distribution; new technologies and interventions such as an Executive Diploma in Energy Management, which need a long lead-time to be developed.

It should also be remembered that almost **50 %** of the courses recommended in the short term will need to be repeated several times over during years three and four to meet all the skilled manpower needs of the sector.

¹⁹ South Asia has a number of training institutions that provide high quality services to the electricity sector within the region. These resources could be leveraged to provide a significant amount of training to MEW personnel relatively quickly and relatively inexpensively. Other examples include NDPL or Reliance Energy Management Institute (both of India) for Commercial aspects of Electricity Distribution ; for generation expansion/ new capacity - Power Management Institute of India; for Hydro Power with the Training Center of NEA of India or WAPDA Hydel Training Center in Pakistan.

²⁰ Such partnerships are recommended for continuity and sustainability of the capacity building initiative, as well as providing mentoring opportunities for capacity building resource persons from Afghanistan.

²¹ As the MEW in-house capacity to manage the training function is currently limited, one alternate option would be to create alliances between the training/learning institutions and Afghan Universities. .

4. It is not enough to train individuals alone. Appropriate Mechanisms are needed

Capacity building should be an integral part of the day-to-day operations of the sector. As such, it is equally important to develop appropriate institutional mechanisms through which capability is enhanced in response to the needs/priorities of the sector on a continuing basis. In the short term the role should be on managing the training function, developing strategic partnerships with training/learning institutions and leveraging work such entities already do. A process that facilitated translation of already available training materials should be developed. The process could involve subject experts from Afghanistan in conjunction with institution partners who would work first towards developing Training of Trainers packages. These could be especially useful for covering training participants from the Provinces outside Kabul where there is limited training facilities. Other recommended approaches include:

a. Creating linkages between capacity building and HR within MEW

It is vital to link training with HR policy particularly with respect to promotion, career planning, and individual training and development plans should form an integral part of any annual performance appraisal system, when such systems are introduced.

b. A Training Policy to address capacity building issues

An appropriate training and capacity policy is needed. The policy should address: the goals of the policy; the value MEW places in capacity building; and how training should be mutually beneficial to individuals and the organization.

The electricity sector in India has spelt out specific training policy in terms of training-person days and Budgets (% of salary Budget). The National Training Policy for the Power Sector 2004 of MoP/GoI states:

- Minimum period of 1 week annually for each employee
- Minimum of **1.5%** salary budget initially towards training function

Again some Utilities in India have the following norms:

- For Executives and Officers - 6 person-days per year, for Non-executives - 2 person days per year. Approx **2%** of Salary Budget is allocated for training.
- 6 man days per year for all employees

c. Capacity Building as an Inherent Part of Career Path

Most employees entering the sector are expected to spend the majority of their career serving the needs of the sector either directly as an employee of the MEW or indirectly through a service organization to MEW. Given this, it is imperative to develop career paths that integrate capacity building as an inherent part of the path and training is seen as a prerequisite to advancement to the next level in one's career. It is important for the MEW to develop career path road maps (discipline-wise) and institutionalize these.

d. Induction Level Training

An important first step toward developing long term capability within the sector would be to introduce Induction Level Training Schemes –wherein fresh graduates are recruited from Colleges in Afghanistan through a competitive selection and put through customized training ranging from 6 months to 9 months. Initially, the MEW should focus on the following schemes:

- Engineer Training Scheme
- Human Resources
- Finance and Accounting

One constraint is the existing salary structure of MEW that is not attractive to the relatively small pool of students that currently graduate from local universities. The challenge is to develop a compensation scheme that makes the sector attractive to prospective new graduates and it may be necessary to use a combination of financial and non-financial incentives. At the same time it is important to ensure such a scheme does not have repercussions with existing employees.

e. Incentivizing training by Linking to Career Growth

There is a large percentage of the MEW personnel who believe there is little tangible benefit from participation in capacity building activities. Currently, the average salary in the sector is approximately \$ 50 a month and training offers no prospects for career advancement resulting in very little incentive to learn. It was reported that it is not unusual for potential trainees to expect some direct payment for their participation in planned training activities. A better approach would be to link capacity building activities to career progression and would have more sustainable benefit than providing direct payments to courses attendees.

f. Using Technology for Training Delivery to overcome lack of infrastructure:

Considering the limited availability of physical infrastructure for training and constraints on the logistics front (including security risks), the option of using technology for training delivery platform should be explored (Virtual classrooms). It could prove a relative low cost option, and a viable response to meet the rather large training needs especially for classroom-based learning courses, in a relatively short span of time. It is recommended to set up 4-5 such studios (one each in MEW Kabul, Jalalabad and in other provinces).

The approximate costs for setting a studio with a seating capacity of about 20 persons with audio and video equipment (microphone, camera and large plasma screen and ISDN line) would be in the range of US \$10,000. In addition, the operating costs are approximately US\$ 45 \$/hr per location²².

²²This platform is being increasingly adopted by premier institutions in India such as XLRI, IIM Bangalore, IGNOU.

Section 6

Potential Training Providers/Partner in SARI/E Countries

South Asia has a number of training institutions that provide high quality services to the electricity sector within the region. These resources could be leveraged to provide a significant amount of training to MEW personnel relatively quickly and relatively inexpensively.

One of the most effective strategies recommended from the point of view of sustainability of the capacity building of the sector, is forming long-term partnerships with Institutions in the Region. Under such a partnership, the Regional Institute will-for each of the broad themes under which training needs are identified, undertake to develop and deliver a series of training courses in a more holistic manner, conduct courses in a sequential manner rather than discrete events. Further, such long-term partnerships could also cover other aspects such as follow-up support for the courses and faculty development through mentoring of resource persons from Afghanistan at the Institutes.

A list of 34 recommended training institutions as potential partners from Bangladesh, India, Nepal, Pakistan, and Sri Lanka is being provided below. A brief profile and contacts for each of these institutions is at Appendix F. While the list may not be comprehensive, it can serve as a useful starting point.

Specific recommendations for potential institutional partner for each of the 65 courses are provided at Appendix G.

**Table 6.1 List of Potential Institutional Partners from South Asia
(with codes)**

Country: Bangladesh

S.No	Name of Institution/organization	Code
1	Bangladesh University of Engineering and Technology (BUET): Center for Energy Studies	BD 01
2	Rural Electrification Board (REB) Training Directorate [including training center at Savar]	BD 02

Country: India

S.No	Name of Institution/organization	Code
1	ASCI (Administrative Staff College of India)	IN 01
2	Alternate Hydro Energy Center, IIT Roorkee	IN 02
3	Center for Power Efficiency in Distribution (NDPL)	IN 03
4	Center for Environmental Planning & Technology	IN 04
5	Cummins Training Center, CDSS, India	IN 05

6	National Power Training Institute (NPTI)	IN 06
7	Power Systems Training Institute (NPTI)	IN 07
8	Hot Line Training Center (NPTI)	IN 08
9	HRD Center for Excellence (National Hydroelectric Power Corporation)	IN 09
10	Indian Institute of Management, Ahmedabad	IN 10
11	Indian Institute of Management, Bangalore	IN 11
12	Indian Institute of Management, Lucknow	IN 12
13	Institute of Rural Management, Anand	IN 13
14	Management Development Institute, Gurgaon	IN 14
15	National Environmental Engineering Research Institute	IN 15
16	HRD Division: Power Grid Corporation of India	IN 16
17	Power Management Institute (NTPC)	IN 17
18	Reliance Energy Management Institute (Reliance Energy Ltd)	IN 18
19	The Energy and Resources Institute (TERI)	IN 19
20	Electricity Metering School (Yadav Measurements Private Ltd)	IN 20

Country: Nepal

S.No	Name of Institution/organization	Code
1	Center for Energy Studies, Institute of Engineering, Tribhuvan University	NP 01
2	Nepal Electricity Authority (NEA) Training Center	NP 02
3	Rural Energy Development Program, NEPAL	NP 03
4	School of Environmental Management and Sustainable Development	NP 04

Country: Pakistan

S.No	Name of Institution/organization	Code
1	Lahore University of Management Sciences (LUMS): Rausing Executive Development Center	PK 01
2	Water and Power Development Authority (WAPDA) Staff College, Islamabad	PK 02
3	WAPDA Regional Training Centers	PK 03
4	WAPDA Engineering Academy, Faisalabad (Transmission & Distribution Section)	PK 04
5	WAPDA Hydrel Training Center Mangla	PK 05

Country: Sri Lanka

S.No	Name of Institution/organization	Code
1	Energy Forum	SL 01
2	Institute of Policy Studies	SL 02
3	National Institute of Business Management	SL 03

Appendix A TNA Scope, Coverage, and Approach

When originally envisioned the activity was to include development of a Master Training Program for the power portion of the Ministry of Electricity and Water, a key element of which was the undertaking of a Training Needs Assessment. Given the challenges faced particularly with respect to the availability and paucity of primary data, it was determined to limit the activity to the conduct of a Training Needs Assessment, (TNA).

The scope of work for the overall Master Training Program is presented below in its entirety. The TNA actually undertaken covered all the elements pertaining to the TNA, as detailed in the scope of work below, to the extent possible. The lack of verifiable human resource data and the continuing uncertainty surrounding the future organizational structure of the MEW meant it was not possible to “benchmark” the MEW against other regional entities in an appropriate and realistic manner.

Background

The Ministry of Energy and Water, (MEW) has approximately 500 personnel in Kabul and approximately 6,000 nationwide. Many of the Ministry’s personnel lack critical managerial and/or technical skills to function effectively. MEW, therefore, has significant training needs. Although there are some initiatives underway, the Ministry requires an overall approach to effectively upgrade the capabilities of its personnel, thereby enabling it to operate at a level comparable to that of similar organizations in the region.

An assessment of training needs, using gap analysis, incorporating a review of prior/planned activities, and taking into account the organizational development plans of the Ministry, and bench-marked to regional entities with similar responsibilities, will be carried out and will outline options and approaches to developing appropriate capacity for the MEW. The assessment will seek to identify immediate training opportunities that can provide quick, high impact results, (0 to 3 months) as well as outlining priority short and long term training requirements. The findings, recommendations for approaches to meeting the training needs will be presented in a report that will include information on where appropriate training can be provided within the South Asia region together with recommendations on how to establish sustaining linkages with the appropriate South Asia training institutions²³.

Results Expected

The master training program will provide a framework for MEW to develop its personnel capabilities towards effectively improving its overall performance to a standard comparable to those of similar regional entities. It will also spell-out priority areas that can be immediately targeted to give quick, high impacts in addition to highlighting where precedent should be given in the short to long term.

²³ South Asia has a number of training institutions that provide services to electric utilities within the region to a good quality standard. These resources could be leveraged to provide a significant amount of training to MEW personnel relatively quickly and relatively inexpensively.

Scope of Work

The work will comprise two main elements, one, an assessment of training necessary to develop the capability of MEW's personnel to enable it to function at a level comparable to similar entities in the region; and two, a strategy, consisting of approaches to providing the training with emphasis on those training activities that can have high impact and bring results quickly, as well as prioritized on short to long term needs. The two elements are described as follows:

1. **Training Needs Assessment:** This will involve a focused needs assessment including gap analysis that will address the following:
 - i. Existing training organization, including its current agenda and adequacy of existing infrastructure and resources to meet its needs
 - ii. Review of training courses including those imparted over last 2 years to understand lessons learned as well as those planned in the near future.
 - iii. Review of regional training benchmarks, norms, practices and systems
 - iv. Specific training needs will be categorized, as follows:
 - a. **Policy and Governance** (i.e. pricing, regulation; subsidies; policies for renewable energies, energy supply options; national and international legal issues and leadership issues.)
 - b. **Business and Administration** (i.e. operational and commercial management requirements.)
 - c. **Functional/Technical** (i.e. technical skills, supervisory skills and technology requirements.)
2. **Master Training Program:** This will outline approaches to solving the training needs in the immediate, (0-3 months), short (4-24 months) and long term (25- 48 months).
3. Recommend approaches for creating sustainable linkages between the MEW and appropriate regional training organizations and institutions, thereby leveraging available regional resources.

Deliverables

The following deliverables will be provided:

- Master Training Program that includes assessment of training needs for the MEW, based on their responsibilities and benchmarked to regional standards. The assessment will:
 - Incorporate findings from reviewing prior/planned training activities
 - Take into account lessons learned and regional benchmarking standards to identify immediate training needs with quick, high impact results
 - Outline approaches to providing solutions to short and long term needs

- Recommend ways for MEW to create direct, sustainable linkages with appropriate regional training institutions and organizations, thereby seeking to leverage regional resources.

Schedule

The estimated timing for these activities is February – July 2006.

- Training needs assessment - Due March 2006.
- Master Training Program - Due July 2006.

Appendix B

List of Stakeholder Meetings

11 th Feb	Afternoon	Engg Aqel Khan Zakhily	Training Specialist, Nexant Kabul (Former head, VTC)
12 th Feb	Forenoon	Mr. Dan Vincent	Program Manager, SARI/Energy Kabul
12 th Feb	Forenoon	Mr. Frank Farlik	AEAI, Senior Energy Advisor to MEW
12 th Feb	Forenoon	Mr. Prem Babu	AEAI, Senior Energy Advisor to MEW
12 th Feb	Afternoon	Ms Mary Ann Callahan	Donor Coordinator Cap Bldg, IRD
12 th Feb	Afternoon	Mr. Ahmed Wali Shairzay	Technical Manager, IRD
12 th Feb	Afternoon	Ms. Malalai Wassil	Project Manager, Legal Counsel Energy Trade, IRD
13 th Feb	Forenoon	Engineer Zia Gul Saljuki	Head, WAPECA, Member PRR Task Force, MEW
13 th Feb	Forenoon	Er. Shojaudin Ziaie	Technical Advisor, Water (MEW)
13 th Feb	Forenoon	Er. Mohamad Yunus Nawandish	Advisor to AEAI's Afghan Energy Project
14 th Feb	Forenoon	Mr. Hector Khalona	Tr/Dist Specialist PISU (MEW)
14 th Feb	Forenoon	Mr. Nathan Hansford	Financial Advisor, PISU (MEW)
14 th Feb	Forenoon	Mr. Robert Finley	Procurement Sp, PISU (MEW)
14 th Feb	Forenoon	Prof. Zamlai Zaheb	Univ. of Kabul
14 th Feb	Afternoon	Engg Aqel Khan Zakhily	Training Specialist, Nexant Kabul (Former head, VTC)
15 th Feb	Forenoon	Engg Sultan Ahmad Azizi	General President of DABM
15 th Feb	Afternoon	Meeting at MEW	Donor Coordination Group
16 th Feb	Forenoon	Ms. Barbara Clasen	GTZ, Principal Advisor to MEW
16 th Feb	Forenoon	Mr. Jahid Farahi	Head of Training/Monitoring Officer
19 th Feb	Forenoon	Mr. Zakhily and Mr. Dan Vincent	Training Specialist, Nexant Kabul (Former head, VTC)
19 th Feb	Afternoon	Mr. Jahid Farahi	Head of Training/Monitoring Officer
20 th Feb	Afternoon	Mr. R Rejikumar	MVV Consultants
22 nd Feb	Afternoon	Donors group for Capacity Building	Meeting at MEW
25 th Feb	Afternoon	Engr. Moh Amin Munsif	Dy Minister of Energy
4 th March	Afternoon	Engr. Moh Amin Munsif	Dy Minister of Energy
5 th March	Forenoon	Dr. Moh Din Shah Zadran	Director, Power Construction Unit (PCU)
5 th March	Afternoon	Ms Mary Ann Callahan	Donor Coordinator Cap Bldg, IRD
5 th March	Afternoon	Mr. Gul Agha Ahmadi	Energy Journalist, IRD

6th March	Forenoon	Engg Ghulam Haider	President, Renewable Energy Department
6th March	Forenoon	Engg Shahnaz Hakim	Vice President, Renewable Energy Department
7th March	Forenoon	Engg Aqel Khan Zakhily	Training Specialist, Nexant Kabul (Former head, VTC)
8th March	Afternoon	Mr. Frank Farlik	Meeting at MEW with the donors group for Capacity Building
9th March	Forenoon	Engg Shahnaz Hakim	Vice President, Renewable Energy Department
9th March	Afternoon	Ms Barbara Clasen	Principal Advisor to MEW (Renewable Energy)
9th March	Afternoon	Er Mohamad Yunus Nawandish	Advisor to AEAI's Afghan Energy Project
11th March	Forenoon	Mr. Wali Shairzay	Technical Manager, IRD
11th March	Forenoon	Mr. Trevor Bull	Institutional & Policy Specialist, ADB
11th March	Afternoon	Mr. Nathan Hansford	Financial Advisor, PISU (MEW)
11th March	Afternoon	Mr. Bharat Bhushan	Project Director - Kabul, Power Grid Crop of India Ltd
12th March	Forenoon	Mr. James Willis	Senior Rural Energy Specialist, AEAI
12th March	Forenoon	Ms Janet Kaufmann	Senior Advisor, AEAI (DABM- billings and collection project)
12th March	Forenoon	Mr. Atiqullah Besmil	AEAI, Data Administrator,
12th March	Afternoon	Engg Aqel Khan Zakhily	Training Specialist, Nexant Kabul (Former head, VTC)
13th March	Forenoon	Mr. B A Nagraj	Transmission & Distribution Engineer, AEAI
13th March	Afternoon	Ms Mary Ann Callahan	Donor Coordinator Cap Bldg, IRD
14th March	Forenoon	Mr. Jack Whippen	VP & Chief of Party, AEAI
14th March	Forenoon	Mr. Dennis McCandless	Senior Hydroelectric Engineer, AEAI
14th March	Afternoon	Mr. A Wali Shairzay	Technical Manager, IRD
14th March	Afternoon	Mr Charlie Post	Mechanical Superintendent, AEAI (NW Kabul)
15th March	Forenoon	Mr Gil M Soria	Project Impl. Specialist, ADB
15th March	Afternoon	Mr. Bernd Kadel	Dy Managing Director, DECON (PISU Trng Advisor)

List of documents:

- ADB-Technical Assistance for Capacity Building – mission report: June 2005
- ADB-Technical Assistance for Capacity Building – mission report: December 2005
- Capacity building for power generation, transmission, Distribution: Training program courses – Note prepared by Mr. A Wali Shairzay (IRD)
- Da Afghanistan Breshna Moasessa (DABM): An Introduction. Draft Report, February 2006 – a report by MVV Consultants
- DABM magazine – Status of programs and projects with various donors & Electricity generation stations in Afghanistan; 2004
- Energy System in Afghanistan: Status of Generation, Transmission, and Distribution in Afghanistan by Region, 2004.
- Job descriptions of Energy Policy – Generation, transmission and distribution, Legal and regulatory departments – Note prepared by Mr. Frank Fralik (AEAI)
- List of generation plants, distribution sub stations, transmission lines (planned and existing in Afghanistan) – Project Implementation Support Unit (PISU)
- Map of Afghanistan showing existing and planned Hydro power plants
- Master Plan for power sector in Afghanistan: NORCONSULT Report
- Micro hydro project sustainability: Interim report; December 2005. Paul Collins
- Overview of high growth sub-sectors and vocational prospects in Afghanistan – World Vision Report; January 2006
- Proposal for the 2nd stage of PRR; Ministry of Energy and Water, 2006
- Securing Afghanistan’s Future: Accomplishments and the Strategic Path Forward Power Sector - Technical Annex
- USAID’s projects and programs: Energy Sector – Project Information Sheets
- Website: www.aewp.net

Appendix D

Training to Date

Date	Program	Provider	Duration	Persons Trained	Location	Comments
	Language and Computer literacy	GTZ		92 (Kabul); 54 (Herat)	Kabul and Herat	
	Substation operation and Maintenance	World Bank			Rizakot	Training at Rizakot
	Transmission/distribution peer exchange	Powergird, India		7	India	
October 2005	Diesel/Gen Set operation and Maintenance	USAID/SARI/E	7 days	12	Pune, India	
February 2006	Diesel/Gen Set operation and Maintenance	USAID/SARI/E	10 days	13	Pune, India	
	Gas Turbine Operation and Maintenance	USAID/Fluor				
	Metering and Billing	USAID/AEAI				
December 2005-March 2006	Language Training for VTC instructors	USAID/SARI/E	4 months	40	Kabul	
February 2006	Governance and Management for Rural Energy Associations	USAID/SARI/E	5 days	20	Kabul	
February 2006	Finance and Accounting for Rural Energy Associations	USAID/SARI/E	5 days	20	Kabul	
	Micro-mini hydropower	GTZ	2 days	6	Kabul	Staff of Renewable Energy Dept
	Micro-mini hydropower	USAID/SARI/E	2 days	6	Kabul	Participants from NGO community
	Micro-mini hydropower	UN/NSP	3 weeks	40	Kabul	Participants from NGO community
	Energy Journalists Program	USAID/SARI/E	3 courses	Total 15; 5 persons per course		

Appendix E

Training Recommendations: Table of Training Themes and Courses

A. Restructuring of MEW			
MEW is moving from an old administrative framework to a new structure that will respond to the emerging needs of the sector. Out of the 40 positions identified, 9 have been identified & submitted to the Civil Service Commission (IARCSC). The training needs arising out of the restructuring are:			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
A 1. Course on Management of Training: For effectively implementing any training course in MEW, it is important to upgrade the skills of the executives currently working in the Training Center of MEW. Course will cover-TNA and course planning; course objectives, use of pedagogical tools; training evaluation and impact assessment, training systems & training MIS.	5 days	A batch of 25 to be trained from amongst existing 50 Training and education support executives in MEW	Immediate
A2. Training course cum study tour for key incumbents of restructured MEW: Focus on understanding the Role, Functions, Activities of their counterpart Ministries /departments in the Region (India and perhaps also Pakistan). It will cover case studies on challenges and experiences of restructuring and reforms of the sector in the Region. This training will facilitate MEW in setting it a broad Agenda and a road map.	7 days	For 7 members of MEW: 3 Director Generals; Advisor Energy; Dy. Minister of Energy & 2 Other Sr. Directors of MEW	Immediate

<p>A 3. Training in Regulation: The course would cover 2 modules: a) basics of regulatory economics and tariff setting and b) regulatory accounting. For training, case studies from the SA Region should be used to highlight the challenges that were/being faced and how these were overcome. Transition path to retail tariffs to be covered.</p>	One Week	From amongst the existing Engineers and Lawyers in MEW, currently at lower positions, a pool of 14 or so can be trained and 10 can be selected who can be groomed to be inducted into the Regulatory Function (Legal & Regulatory Department under the General Directorate of Planning).	Immediate
<p>A 4. Attachment Training with Regulatory Commission/India: Once the positions in the Legal & Regulatory Department have been filled, key staff to be sent to India to understand first hand working of a regulatory commission-its organization, regulatory role and functioning of various departments</p>	Two Weeks	3 executives from the Legal & Regulatory Department – Director, GM Legal and GM Regulatory	Short term
<p>A 5. Course on Energy Policy: Course to cover-Supply (availability) and demand and Alternative supply options; Financing energy sector in developing countries; Policies for renewable energy and non-conventional energy sources; Energy-Environment linkages; Energy management and socio-economic analysis</p>	One Week	The Energy Policy Department of MEW will be placing 22 professionals in its various departments. Senior professionals from the Department (Energy Generation – 2; Transmission – 2; Distribution – 2; Renewable Energy – 3); Project Planning Department – 3; Project Services Department – 2 and Energy Advisor. Total – 15	Short term
<p>A 6. Training Mentor (within MEW): Work with a designated counterpart- Training Head within MEW and assist in setting up training function-with appropriate training systems; develop training norms and practices; provide oversight to training function and guidance on road maps for various themes and also linkages with appropriate institutes within the Region. He will also assist in providing sustainability and institutionalizing training that is being provided under technical support in Afghanistan. And to ensure that the training funded by the donor agencies for the electricity sector of Afghanistan, is coordinated and forms an integral part of a Program that addresses capacity building/training needs and long term strategies.</p>	18 months/ 2 years		Immediate

<p>A 7. Developing Transition Plan for the Resident Advisors (Expatriates) in MEW Currently there are several resident advisors within MEW. It is important that the 'Working Group on Capacity Building' representing various donors evolve guidelines for developing & implementing a mentoring program and transition plan</p>			Short Term
<p>An 8. Course on Corporate Governance and Management: The coverage would include: Strategic leadership; change management, planning and effective delegation; corporate functions and accountability; performance management and interface with other entities and stakeholders etc.</p>	5 days	<p>For power utilities / entities that are being created. Various entities are currently functioning as "departments as opposed to commercial entities'. A basic course to make this transition is recommended. The participants in this program will be DABM senior officials and departmental heads; heads of 10 larger Regional Provinces; Total – 28 (DABM – 13, KED – 5, Other Provinces – 10)</p>	Immediate
<p>A9.Basic Management Course To cover basic management functions: Planning, Organizing, Delegating & Controlling Organization's framework and processes</p>	5 days		Immediate
<p>A 10Executive Diploma in Energy Management Focus on developing future leaders To be embedded within University System in Afghanistan-say Kabul Univ.</p>	One Year	Post Graduates	Long term

<p>A 11. Induction Level Training Schemes: To build cadres in engineering; Finance & accounts and HR. Trained in aspects of Afghanistan Electricity requirements and new orientations to help make transition to a self reliant and commercially viable sector.</p>	3 to 6 months	<p>Fresh graduates are recruited from Colleges in Afghanistan through a competitive selection and put through customized training ranging from 3 months to 9 months -who will assume important positions.</p> <ul style="list-style-type: none"> a. Engineer Training Scheme b. Human Relations (from Faculty of Economics) c. Finance and Accounts (from Faculty of Economics) 	Immediate/ Short term
<p>A 12. Training Center: Institutional Support: Training Center is envisaged under DG Planning in the proposed organization chart.</p> <p>While the component on VTC (Vocational Training Center) is being supported by the USAID; the component on Management Development-covering the executives needs to be supported [Management Development segment will cover the entire gamut of disciplines covering management of the electricity business. It will include Policy & Macro Economics Issues, Organization Management – both strategic and operational and Interface issues with various stakeholders such as the Regulators, customers etc. The user categories it will serve are Executives</p> <p>Vocational Training Segment: will include up- gradation of technical skills and multi-skilling, hands- on training on different equipment, raining at OEM and simulator training and on technical practices. The segment here will be primarily operators and supervisors. It is recommended that Management Development component be also supported (by the USAID)].</p>			Immediate

Refresher Courses covering Basic Functional Management areas within MEW are recommended, as follows;			
A 13. Refresher Courses in Contracts Management To upgrade the knowledge about critical issues in the evaluation of tenders, award of contracts and arbitration. The course will include Performance of contract and consequences of non-performance of contract; Claims and Disputes; Post award function in Contracts; Arbitration	4 days	Professionals from MEW (Department of Projects Planning under the General Directorate of Planning – 3, Foreign Relations Department – 2, Procurement Department – 2, and DABM Planning Department – 3). Total – 10	Short term
A 14. Refresher Course in Project Management: To understand tools and techniques of project management and to implement project effectively within time and costs. Project planning, monitoring and control; implications of time overruns.	4 days	Professionals from General Directorate of Planning MEW (Department of Project Services – 9; Project Planning Department – 4; and Planning Department at DABM – 2). Total 15.	Short term
A 15. Basic Course on Finance & Accounts Currently single entry accounting system is being followed in MEW and there is no commercial accounting. Afghanistan Financial Management and Accounting System (AFMAS) are being developed by Ministry of Finance, which will be rolled out by 2007. Without waiting for 2007, it is suggested that the Finance staff in the MEW is trained on basic accounting concepts and conventions: accounting statements; cash flow and fund flow; Depreciation accounting, working capital management, budgets and budgetary control. Note: The size of group in Finance in MEW is about 63 persons. ADB has a budget of \$ 75 million for training and some training programs have been suggested	4 days	Finance and Accounting staff from MEW and other SoEs. One single batch size to be about 25 in number.	Immediate (Course to be repeated)
A 16. Refresher Course in Procurement and Stores: Course to cover: Principles of Materials Management; Inventory management; functions of stores-material requisition; supply orders; material receipts role of QC and inspection etc/.	3 days	Professionals from the Procurement Department at MEW – 10; Technical Department at DABM – 4; Administration Department at KED – 3 (Total – 17)	Short term

<p>A 17. Basic Course on Human Relation Management: Under the existing Administrative Department of MEW-there are separate directorates of recruitment & Employment but no integrated HR Department. A basic course on HR is recommended covering: Aligning HR with Organizational Plans; HR functions such as Manpower Planning; Recruitment and Selection; Compensation Planning and Reward Systems; Performance Management; Discipline; HR, MIS.</p>	4 days	Professionals from the Human Resources Department under the General Directorate of Admin & Finance at MEW – 6; Senior Executives from the Administration Department (Staff and Recruitment Units) at DABM – 12. Total – 24	Short term
<p>A 18. Basic course on Office Management: The focus of this course is to familiarize the office assistants and support staff in the Ministry with the concepts of filing and record keeping and maintaining and retrieval of information</p>	3 days	Office Assistants and support staff from all Departments. A batch of 30 staff to be trained in one batch.	Short term (To be Repeated)
<p>A.19-21 Training Courses on Environment Issues: There is a total lack of sensitivity towards Environmental issues.</p> <p>1. Two courses are suggested</p> <p style="padding-left: 20px;">a. Course on Environment Impact Assessment (EIA) for the Projects</p> <p style="padding-left: 20px;">b. Environment Awareness Course for Municipalities – dealing with issues of emissions from electricity generation and disposal of waste oil that is polluting the water table.</p> <p>2. Advisor for Environmental Policy within MEW</p>	<p>a. 4 days</p> <p>b. 3 days</p> <p>2 years</p>	<p>a. Executives from Planning department of MEW (to be identified – no separate function as yet), and</p> <p>b. From Municipalities (to be identified from the Provinces)</p>	<p>Short term</p> <p>Short term</p> <p>Short term</p>

B. Renovation and Rehabilitation Programs:			
There are currently several Power Rehabilitation programs to improve the existing outdated and dilapidated generation, transmission and distribution infrastructure to provide reliable power and developing the capacity of the MEW and DABM to initiate improved commercial operations.			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
B 1. Course on R & R of Hydro Power Stations: Some of the hydropower units (30-40 years old) are being refurbished and have advanced relatively far. Although training is part of the OEM contracts, unless there is a core group within DABM with basic training on salient aspects of renovation programs, there is concern/risk that new maintenance and operation practices are not integrated and absorbed/institutionalized.	7-10 days	For identified engineers/Sr. technical DABM staff in provinces and DABM associated with the contractors working on R & R of Hydro Projects. Energy Generation Directorate (MEW) – 2; Power Production Zone (DABM) – 12; Other hydro power plants – 8. Total – 22	Immediate
B 2. Course on Upgrades and Modernization of Transmission System: Distribution and Transmission Network expansion and modernization is also underway. While network design, supply and erection is being undertaken by the Contractors and the associated training will form a part of the various contracts, there is however, a need to provide training to a core group identified within the DABM to ensure they understand the design, operation and maintenance aspects of the new technologies	5 days	For identified engineers/Sr. technical DABM staff in provinces and DABM associated with the contractors working on Distribution R& R and Transmission respectively. Transmission system: Power Production Zone (DABM) – 4; Construction Division (DABM) – 2; Kabul Electricity Department – 3; Energy Transmission Directorate (MEW) – 3. Total – 12	Immediate
B3. Course on Upgrades and Modernization of Distribution System Concept of modernization, Network design and the new technologies used in the network, substation equipment and metering; recent technology advances in the Region; quality of electrical power harmonics and reactive power etc.	5 days	Power Production Zone (DABM) – 4; Construction Division (DABM) – 2; Dispatch Center (DABM) – 2; Kabul Electricity Department (Network Development Directorate) – 2; Energy Distribution Directorate (MEW) – 2. Total – 12	Short term

C. Power Imports from neighboring countries			
Power is currently imported into the country from three countries at present (Iran; Turkmenistan; Uzbekistan), totaling about 83 MW. Import is also emerging as one of the key option for power development for Afghanistan. Training in international power trade is therefore very important. Following courses aimed at building block for cross border trade, in the short term are suggested:			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
C 1. Economic aspects of Power Sector: Key Concepts and Tools (Basic level courses): Concepts like capital costs of projects (pay back period, B-C ratio; variable costs and levellized tariffs); Comparing costs of plants; impact of plant usage & generation economics; cost of supply & its composition etc.	6 days	For Department of Project Planning (MEW) – 12; Planning Department (DABM) – 3; Total – 15	Short term
C 2. Course on Power Purchase Agreements: For power import including mechanism for price adjustments. To cover: a). Technical, Commercial aspects; b). Legal/Regulatory Aspects. c). Inviting Bids, Evaluating Bids and Contract Negotiations.	6 days	For Energy Generation Directorate (MEW) – 2; Energy Transmission Directorate (MEW) – 4; Legal & regulatory Department (MEW) – 6; Procurement Department (MEW) – 3; Power Production Zone (DABM) – 5. Total – 20	Short term
C 3. Course on Technical aspects of Power Import: To ensure quality and reliability of Power: -Power Systems: operational aspects of transmission system, grid synchronization -Upgrades and Dispatch protocols	6 days	For Energy Generation Directorate (MEW) – 2; Energy Transmission Directorate (MEW) – 4; Planning Department (MEW) – 4; Power Production Zone (DABM) – 4. Total – 14	Short term
C 4. Attachment Training: Power Procurement With a power trading organization (PTC/India) to learn on all salient aspects of procurement.	Three weeks	Energy Transmission Directorate (MEW) – 2; Planning Department (MEW) – 1; Legal & Regulatory Department (MEW) – 1; Planning Department (DABM) – 1. Total – 5	Short term

D. Generation Sub-sector:			
A). Hydropower: Hydropower is one of the major energy sources in Afghanistan. Currently, of the 260 MW installed capacity, only about 195 MW is functional. Rehabilitation of several of these old hydro power plants is currently being carried out and the needs are covered under the Rehabilitation. New hydropower projects to the tune of 590 MW (as per the Power Sector Master Plan) are on the anvil. The capacity building needs in this sector are enormous, as the country's hydropower professionals have been trained almost quarter of a century back and since then many technological advances in hydropower projects have been made. The following courses are suggested for this sector:			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
D 1. Salient Aspects of Civil Engineering for Hydroelectric Projects: Training for Engineers at various levels who will be engaged in construction activities relating to new hydroelectric projects. Course to cover aspects of concrete mix design, hydrology, rock mechanics, rock bolting, cable anchoring, steel fiber reinforced, earthquake engineering etc.	One week	Energy Generation Directorate (MEW) – 2; Directorate of Project Services (MEW) – 8; Spingar Construction Unit – 6; Power Production Zone (DABM) – 4. Total – 20	Long Term
D 2. Construction Material Investigations for Hydropower Projects: Familiarize the participants with construction material survey/investigation for concrete and rock fill dam. Advanced investigation planning & their significance in Laboratory/field test. Identification, estimation, & collection of samples from quarry sites and cursory evaluation of the site in regard to the mine ability.	One week	Energy Generation Directorate (MEW) – 1; Directorate of Project Services (MEW) – 9; Spingar Construction Unit – 8; Power Production Zone (DABM) – 4. Total – 22	Long Term
D 3. Refresher Course: Operation & Maintenance of Generators and Turbines Update knowledge & skills of the participants about Generators, Turbines as well as cover the maintenance aspects. Course to cover: selection / design aspects, hydro turbine & generator; governing system mechanical, electronics & O&M of hydro turbines; leveling alignment & balancing of hydro generators; O&M of hydro generators; control & protection of hydro power sector.	5 Days	On-site training for Engineers, Electrical Foreman and Turbine Mechanics of the existing Hydro power plants – 20 in a batch.	Immediate (To be repeated at each hydro power plant facility)

<p>B). Diesel power generation: In addition to about 55 MW of old diesel gensets operating in Afghanistan, several new DG sets are being installed to meet the immediate electricity needs in the country. There has been a capacity addition to the tune of about 240 MW in Kabul city alone, while there are about 51 MW capacity additions in other parts of the country. Few training courses have been conducted on O&M aspects and about 25 operators have been trained in India at the Cummins Training Facility. Considering the capacity addition, this is inadequate. The following training courses are recommended:</p>			
<p>D 4. O & M of Diesel Generators: Training of Trainers This course is targeted at the capacity enhancement of VTC instructors and develop additional technical resource persons within DABM technicians and operators who will act as resource/trainers in the following training. The course would cover operation procedures and routine inspection, maintenance procedures, proper use of tools and tackles and overhauling of equipments.</p>	3 months	14 nos. – VTC teachers 4 and 10 technicians/ operators (from DABM-DG Sets Repair Department and KED-General Substations Directorate)	Immediate
<p>D 5. Roll out of the training course on O&M of DG sets (including for provinces): The operators of DG sets in the provinces would be trained by the VTC teachers (trained in the above course) and other resource persons as identified, on operation and maintenance procedures. This course would be for about 10 technicians at one time and would be repeated.</p>	15 days	Each batch – 12 trainees. To train the following: Other technicians at DABM (DG Sets Repair Department) – 12 KED (General Substations Directorate) – 30 DG set operators at other provinces – 92 Other private DG set operators – ?	Short term (To be repeated)

E. Commercial Aspects of Electricity Distribution			
Electricity tariffs are well below the cost of supply. In Kabul, the average tariff is less than US\$0.02 per kWh. Countrywide, the average tariff is about US\$0.035 per kWh. The overall average cost of supply is estimated at US\$0.07 per kWh, implying cost recovery of just over 50 percent. Further, revenues are limited due to the lack of efficient billing and collection systems. There is little or no control or supervision of readings and theft and non-payment are rampant. Technical and non-technical losses are high – in the order of about 47 percent. Training recommended in this area are as follows:			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
E1. Course on Commercial Aspects of Electricity Distribution & Electricity Retail Tariff The course to cover: Commercial & Energy Accounting; Metering Billing & Revenue Management - Electricity Retail tariff (understand tariff principles; supply cost mgmt; evaluating cost of supply; tariff modeling, average cross subsidy & average cost of supply recovery.	4 days	Distribution Heads from the various Provinces under DABM responsible for financial performance of Distribution; 4-5 Senior Executives from Distribution at DABM and MEW (Higher level course). Energy Distribution Directorate (MEW) – 2; Power Production Zone (DABM) – 2; Planning Department (DABM) – 2; KED – 2; Other Provinces – 4. Total – 12	Short term
E 2. Course on Metering Billing & Revenue Management: Process Appraisal of the Metering Billing and Collection <i>Cycle for Revenue Realization</i> ; Metering Management System; Bill generation & dispatch; Revenue realization and reconciliation; treatment of customer complaints in metering billing and collection & best industry practices from the region.	3-4 days	Technical and Finance Executives from Distribution Systems from DABM and Professional Staff from Distribution from the MEW. Financial Division (DABM) – 4; KED – 2 (Management), 2 (Cash Accounting), 2 (Acquirement of Bills), Other larger Regional Provinces – 10. Total – 20	Short term (To be repeated)

<p>E 3. Training on Computerized Billing & Customer Care Services: There is need for training the entire Staff in Distribution-Province-wise where computerized billing systems are being considered for introduction.</p>	5 days	<p>Relevant Staff who will implement the system in the province. Billing Department (KED) – 20, computer operators (KED) – 10; Provinces – 20 (2 from about 10 larger Provinces). Total – 50</p>	Short term to long term (To be repeated)
<p>E 4. Metering Technologies and Systems: Metering techniques; metering technology to understand energy metering principles, and systems; latest emerging trends in distribution metering including IT enabled metering Systems, Remote Metering; Energy Monitoring and Audit Application meters.</p>	2 days	<p>Distribution Heads from the various Provinces under DABM responsible for financial performance of Distribution; 4-5 Senior Executives from Distribution at DABM and MEW (Higher level course). Energy Distribution Directorate (MEW) – 1; Planning Department (DABM) – 2; Meter Evaluation Department (KED) – 2; Other Provinces – 10. Total – 15.</p>	Short term

F. Distribution Sub Sector:			
During the war, a large number of networks were severely damaged. Networks expansion and modernization are both planned. For instance, the Kabul distribution network is being modified to 20-kV/400V systems.			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
F 1. Distribution Capacity Expansion and New Technologies: Course for system planning and expansion scheme preparation, evaluation for providing new connections / electrification and services; Capex program. HVDS, new technologies in distribution automation and sub station equipment; reactive power management etc.	4 days	Energy Distribution Directorate (MEW) – 2; Planning Department (DABM) – 6; KED (Survey & Design of Networks) – 2; KED (Management) – 2. Total – 12	Short term
F 2. Course on O & M of Sub Transmission and Power Distribution System: Course to cover O & M of Distribution Lines; O& M of Distribution sub-station and distribution equipment; distribution equipment protection; maintenance planning and scheduling; maintenance mgmt; emergency mgmt. and predictive maintenance techniques; planning for spares and consumers, safety in network operations.	4 days	Substation & Automatic Relays (DABM) – 10; Energy Distribution Department (MEW) – 2; Junctions Directorate (KED) – 4; Other Provinces – 10. Total – 26.	Short term
F 3. Financial Management for Distribution units: To provide an understanding of financial management of distribution business more specifically cost and revenue tracking and reporting. Also an understanding on preparing feeder-wise business plan.	4 days	Sr. Executives in-charge of Finance & Accounts of Distribution from Provinces and DABM. Financial Departments at KED – 6; Other provinces – 10. Total – 16.	Short term
F 4. Effective Management Of A Power Distribution Utility: Distribution planning; modernization of distribution system; detection and elimination of theft; techniques for reducing distribution losses. Consumers' services; managerial aspects of loss reduction; need to improve maintenance	4 days	Energy Distribution Directorate (MEW) – 1; Planning Department (DABM) – 2; KED – 3; Other Provinces – 10. Total – 16.	Short term

<p>F 5. Distribution Loss reduction: Technical and non-technical losses are high – in the range of 47 percent – due to overloaded facilities and lack of customer supervision. there is need to manage the aggregate technical and commercial losses within the acceptable limits for better financial health of the organization. The course to provide an understanding into sources of technical losses and commercial methods of controlling the losses; distribution automation and new technology application in distribution. and role of consumer organizations and franchisee in reducing commercial losses.</p>	4 days	KED (Director Electro Technique, Director of Junctions, Network Development Directorate) – 6; Other Provinces – 10. Total – 16.	Short term
<p>F 6. Course for Linemen in Distribution Systems: Focus on roles and responsibilities of Linemen as key frontline workforce of the distribution systems: Construction, Operation & Maintenance, safety practices, metering, billing and collection, etc. The specific course topics would include themes such as network installation guidelines, distribution equipment overview, protection systems and safety checklists, metering aspects, maintenance schedules, and practical sessions on cable splicing, conductor jointing, etc.</p>	5 days	For the line crew of existing distribution systems (DABM/other provincial utilities) and at least 4 trainers from the VTC to be trained as Trainers - to train the crew for upcoming distribution networks. Network Development Directorate (KED) – 10; Other Provinces – 10; VTC teachers – 4. Total – 24.	Short term (To be repeated)
<p>F 7. Technical skills enhancement for Sub-transmission lines (15 kV) and transformer stations: This course would focus on technicians engaged in operation and maintenance of sub-transmission systems and the transformer sub-stations and will cover topics like grounding, isolators & bus bars, automation (relays), live line maintenance techniques, protection systems, etc.</p>	5 days	Technicians at DABM (Technical Department) – 2 Technicians at KED (Transmission Directorate, High Voltage and Automatic Security Relay Directorates and 15 kV cable office) – 10 Other provinces – 10. Total – 22.	Short-term (To be repeated)

<p>F 8. Course on O&M of Junctions and sub-stations This course would cover principles of operation and basic construction features of Junctions and distribution sub-stations, tools and tackles (their usage and handling), handling/laying along with termination and jointing of power cables and testing procedures, protection systems & safety procedures, maintenance of substation equipments including instrument panels and instrumentation.</p>	5 days	Technicians at DABM (Technical Department) – 2; KED (Junctions Directorate and General Sub-stations Directorate) – 10 Other provinces – 10. Total – 22.	Short-term (To be repeated)
<p>F 9. Technical course on meters and metering aspects: Focus on enhancing the technical skills for installation, testing and commissioning of modern meters (depending upon the types of meters that would be installed), Repair and Maintenance, detection of theft/tampering of meters and calibration of meters.</p>	3 days	Technicians at KED (Meter Evaluation, Meter Installation, Meter Commanding and Laboratory Commanding offices) – 12 Other Provinces – 10. Total – 22.	Short-term (To be repeated)

G. Transmission sub-sector:			
The electricity transmission system in Afghanistan comprise mainly of 110 kV single circuit lines several of which are damaged (including the only 220 kV transmission line for import of power from Uzbekistan to Khulm town) and need repair or up gradation. The country only has local networks and there is no national grid in Afghanistan. Several donor agencies including USAID, ADB, World Bank, etc. have initiated the process of rehabilitating the transmission system and construction of new transmission lines supporting the rehabilitation/construction of new power generating systems and import of power from the neighboring countries. The new planned transmission system comprises of 220 kV lines connecting important load centers (major cities) around the country. This expansion requires new skill sets for which the following training is recommended:			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
G 1. Transmission system planning and design (including power system modeling studies viz. load flow studies, stability studies and system planning; power system design, issues relating to selection of voltage levels, types of conductors, tower transformers, circuit breakers and other substation equipment etc. and environmental impact studies	One week	Project Services Directorate (MEW) – 11; Power Construction Unit – 8; Monitoring & evaluation (MEW) – 1; Construction Department (DABM) – 2. Total – 22.	Long term
G 2. Construction, erection and commissioning of transmission lines and substations	5 days	Power Construction Unit – 3 Engineers, 7 Technicians, & 20 Workers; Power Production Zone (DABM) – 3 Transmission Engineers; Construction Division (DABM) – 2 Engineers. Total – 35.	Immediate
G 3. Power System Operation and Maintenance: for transmission staff at DABM and at Provinces:	Two weeks	Power Production Zone (DABM) – 10; KED – 10. Total – 20	Short term
G 4. O&M of transmission lines for Transmission staff at Provinces	5 days	KED – 10; Other Provinces – 20. Total – 30	Long term
G 5. Long term load forecasting studies	3 days	Planning Department (DABM) – 5; Dispatch Center (DABM) – 15. Total – 20.	Long term

G 6. Grid Management including - scheduling and load dispatching -control and communication systems (at Provinces) for provinces	3 days	Provincial Electricity Departments – Engineers and Supervisors – 20.	Long term
G 7. Hot line maintenance	3 months	Power Production Zone (DABM) – 20; KED and Other Provinces – 20. Total – 40	Short term

H. Expansion and New Capacity in Generation, Transmission and Distribution			
Electricity ranks as 2nd priority for the Country (after security). Currently, only 6% of population has access to electricity and the five-year target of MEW is: -65% population to be covered in urban areas and 25% population to be covered in rural areas. The installed generating capacity in the country was about 454 MW, which was reduced to 240 MW during the war, and currently the generation output is about 360 MW. The new generation being planned is 689 MW (Source: Breshna Magazine; PISU (MEW), Presentation of Dy Minister of Energy presentation at New Delhi on 21st March 2006 and USAID Project Info Sheet) This expansion requires new skill sets:			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
<p>H 1,2 & 3. Survey and Design for New Projects: WAPECA currently functions as a department of MEW and is responsible for feasibility studies and design of new generation, transmission, and distribution projects (90 employees). The staff has not had any opportunities to update themselves in new design philosophy and developments in technology. Training is recommended in following areas:</p> <p>1. Refresher course on: Design of transmission lines, Design of substations and transmission network</p> <p>2. Current developments in Construction of hydro Power Plants</p> <p>The Sr. Executives still talk in terms of 10 years to complete hydro plants while there is experience in China to complete hydro plants in just 3 /4 years.</p> <p>3. Training on Survey techniques and Data Entry and Analysis (for transmission lines and Stations) using modern software.</p> <p>Training to be provided to the entire unit so that it could be integrated within the group. It was mentioned that while some training was provided to them in this area-it covered only a few engineers and since the staffs that were to download data to computers was not trained; the training was not very useful.</p>	<p>5 days</p> <p>5 days</p> <p>5 days</p>	<p>Project Services Directorate (MEW) – 11; Power Construction Unit – 8; Monitoring & evaluation (MEW) – 1; Construction Department (DABM) – 2. Total – 22.</p> <p>Project Services Directorate (MEW) – 16; SpinGar Construction Unit – 4; Construction Department (DABM) – 2; Monitoring & evaluation (MEW) – 2. Total – 24.</p> <p>Project Services Directorate (MEW) – 14; Power production Zone (DABM) – 4; Construction Department (DABM) – 4. Total – 22.</p>	<p>Short term</p> <p>Short Term</p> <p>Short Term</p>

<p>H 4. Course on Power Project Development: Stages of a power project cycle: Basic of project management; special issues in power projects; techniques of project planning; economic aspects of power projects; technical feasibility of power projects; case studies in power project development.</p>	4 days	Project Services Directorate (MEW) – 5; Project Planning Department (MEW) – 6; Planning Department (DABM) – 4; Power Construction Department – 2. Total – 17.	Short term
<p>H 5. Contracts Management To upgrade the knowledge about critical issues in the evaluation of tenders, award of contracts and arbitration. The course will include Performance of contract and consequences of non-performance of contract; Claims and Disputes; Post award function in Contracts; Arbitration</p>	3 days	Procurement Department (MEW) – 7; DABM (Technical Relations Department, Construction Department & Technical Department) – 7. Total – 14.	Short term
<p>H 6. Distribution Capacity Expansion: Course for expansion scheme preparation, evaluation for providing new connections/electrification and services; Capex program. (Same Course as F1)</p>	4 days	Energy Distribution Directorate (MEW) – 2; Planning Department (DABM) – 6; KED (Survey & Design of Networks) – 2; KED (Management) – 2. Total – 12.	Short term

<p>I. About 6%-10% of the population has access to grid power & there are many remote areas in Afghanistan which simply will not be grid connected in the foreseeable future. Even by 2010 with all the new capacity addition, it is expected that only about 25% of the rural population would be connected to grid. Hence decentralized off-grid options – especially renewable energy for power generation assume great significance on a country like Afghanistan. At present there is no coherent policy or road map with the Government to utilize and promote renewable energy resources in the country. Following courses aimed at building the capacity of the Renewable Energy Department (RED) in policies, strategies and promotion of renewable energy technology in the country are suggested:</p>			
Recommended Capacity Building/Training activities	A	B	C
	Duration	Target audience/beneficiary stakeholders (approx. nos. and levels)	Priority
<p>I 1. Policy Seminar on Renewable Energy Development (in Afghanistan): Seminar on 'Enabling Policy Framework for Promoting & Developing Renewable Energy for key personnel in the Ministry and the Department. This seminar would be aimed at sharing regional experiences on policies and strategies (issues like Institutional & Financial Mechanisms, Policy Incentives, etc.) for promotion of renewable energy.</p>	4 days	MEW: Director General of Energy Policy – 1, Energy Advisor – 1; Dy Minister of Energy – 1; RE Department of MEW – 17 (All Engineers and Technicians as per current staff strength). Total – 20.	Immediate
<p>I 2. Attachment training for developing renewable energy policy and country strategy As a follow-on activity towards developing policies and roadmap, key officials would be attached with one of regional Institutions/ organizations. These Institutions would also facilitate interaction with local Renewable Energy Ministry/Department to facilitate development and refining the draft policy document developed after Course I 1.</p>	6 days	Renewable Energy Directorate of MEW – 2 [Head (1) and Deputy head (1)]	Short term

<p>Courses on Mini-micro hydro power: Micro hydropower is one of most suitable and cost effective technologies to provide energy to remote rural areas. The RE Department has a mandate of to carry out survey, design, and installation of up to 10 MW capacity mini/small hydropower in Afghanistan. In the recent years, about 337 micro hydro power plants were installed in the country. An assessment of these projects indicated that there is a serious lack of design, construction standards, and quality control mechanisms. Moreover, there was a lack of comprehensive training for the operators on proper O&M procedure and the implementing mechanisms with community involvement. The following courses are suggested:</p>			
<p>I 3. Course on Survey, Design and Implementation for Micro-hydro power systems The focus of this course would be to train Engineers and technicians on survey, planning and implementation of mini-micro hydro technology. They would also be provided exposure to new technologies and techniques in micro hydro design/implementation</p>	Two weeks	Renewable Energy Directorate of MEW – 4 (3 Engineers + 2 Technicians) Project Services Department (MEW) – 3; Project Planning Department (MEW) – 1. Total – 8.	Short term
<p>I 4. Course on O&M procedures for micro hydro power plants Proper operation and maintenance of such remote installations is the key to their sustainability. This training would focus on O&M procedures and is aimed as a training of trainers.</p>	5 days	Renewable Energy Directorate of MEW – 2 VTC instructors – 2 Professionals from NGOs – 3	Short term
<p>I 5. Course on community based approaches for micro-hydro implementation Experience from the region on remote rural electrification programs indicate that community based models are most sustainable. This training would focus on start-up and setting up of community based micro hydro systems and the modalities to ensure that these models are sustainable with proper capacity building of communities and their linkages with other stakeholders</p>	5 days	Renewable Energy Directorate of MEW – 2 NGO Professionals – 18. Total – 20.	Short term

<p>I 6. Course on Resource Assessment for Renewable Energy Technologies Afghanistan has more than 300 sunshine days in a year and in remote areas where micro-hydro is not technically feasible, solar and/or wind energy technologies could be viable options. This course would focus on assessment of resources (e.g. Wind mapping), use of tools like GIS, technology design issues, and linkages with manufacturers/suppliers.</p>	One week	Renewable Energy Directorate of MEW – 11 (Solar Energy); 8 (Wind Energy); VTC instructors – 2. Total – 21.	Short term
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1. Country: Bangladesh

**BD 01. Bangladesh University of Engineering & Technology (BUET):
Department of Electrical and Electronic Engineering
Centre for Energy Studies**

Website: <http://www.buet.ac.bd/>

Bangladesh University of Engineering and Technology
Dhaka 1000, Bangladesh
Tel: + 880-2-9665650/ext. 7304
Fax: + 880-2-8613046
Email: daers@buet.ac.bd

Contacts:

Head, Deptt. of EEE; e-mail: headeee@eee.buet.ac.bd;

Director, CES; e-mail: dirces@buet.ac.bd

The Bangladesh University of Engineering and Technology (BUET) was established in 1984. BUET's Department of Electrical and Electronics Engineering through its Bureau of Research, Testing and Consultation (BRTC), provides consultancy, advisory, research & testing services in areas of power systems & communications, financial models for energy efficiency projects, and computers. The Department offers training courses for power and electrical engineers on the above.

In addition to BRTC, the Center for Energy Studies (CES) at BUET, conducts education and research, organizes seminars, symposia, training workshops, short courses and outreach programs on areas including non-conventional (e.g. biomass, biogas) and renewable (e.g. solar, wind, hydro) resources of energy and their supply, utilization and conservation of energy. CES conducts short training courses on renewable energy technologies and their application in rural areas.

BD 02. Rural Electrification Board (REB) Training Directorate

Website: <http://www.reb.gov.bd/>

REB Training Center in Dhaka and at Savar
Director Training, REB
Joar Sahara,
Khilkhet,
Dhaka 1230.
Ph: + 880-2-8916421, e-mail: rebtrg@citechco.net

Contact: Mr. Abdur Rahim, Director (Training)

The Rural Electrification Board (REB) was established in 1977 with a responsibility to implement the rural electrification Program, mainly distribution (with some Generation & Sub-transmission). The REB has been electrifying rural areas through rural electric societies (called *Palli Bidyut Samity* /PBS– cooperative model.) The program has been supported by USAID with technical assistance from National Rural Electric Cooperative Association (NRECA), USA. NRECA have been the consultants to REB Bangladesh for the past 27-years, and in conjunction with REB, they have designed and developed a comprehensive training curriculum on community based electricity delivery systems.

REB places high emphasis on capacity building and has an extensive and rigorous approach towards training of all its stakeholders. All their staff training is generally tied to career advancement in REB, which ensures that training is actively integrated into REB's operations.

There are two training institutes are under the REB. The one in *Dhaka* offers training programs for engineers, officers, PBS board members, and REB contractors on various technical subjects (mainly distribution systems) required for REB and PBS.

The Savar Training Center specializes in Linemen Training, which is one of their most comprehensive training programs.

2. Country: India

IN 01. Administrative Staff College of India, Hyderabad

Website: <http://www.asci.org.in/>

Bella Vista,
Raj Bhavan Road,
Khairatabad, Hyderabad - 500 082, India .
Phone: 0091-40-23324365 / 23310952; Fax: 0091-40-23312954

Contact: Dr. S. Padam, Dean of Training & Conferences; e-mail: padam@asci.org.in;
Dr. Usha Ramachandra, e-mail: uhsar@asci.org.in

The Administrative Staff College of India (ASCI) is a premier institution of in-service training for practicing managers, was established in 1956 at the initiative of government and the Indian Industry. For over five decades, ASCI have been providing management development (training), consultancy, and research for professionalization of management in India and the developing world.

ASCI has been actively associated with the USAID supported SARI/Energy Program as one of the Regional Training Institution Partners (TIPS). Under the SARI/Energy Program ASCI has also developed a *Regional Resource Centre on Energy Restructuring and Regulation* that contains web-based information, training kits, curricula, best

practices documents, guides to international resources as well as select regional database relating to energy restructuring and regulation.

ASCI conducts management development programs and other training in the areas of *Infrastructure management and regulation, Power sector reforms, Restructuring of power utilities, Strategic Management, Procurement, Operations, Materials and project Management, Restructuring and privatization, Managing change in government public enterprises, infrastructure and utilities, etc.*

IN 02. Alternate Hydro Energy Centre, IIT Roorkee

Website: <http://www.ahec.org.in/>

Alternate Hydro Energy Centre

Indian Institute of Technology, Roorkee

Roorkee-247667, Uttaranchal, INDIA.

Telephone: +91 1332 274254, 285213; FAX: +91 1332 273517, 273560

E-mail: ahec@iitr.ernet.in, ahec@iitr.ernet.in, ahec@vsnl.com

Contact: Mr. Arun Kumar, Head, AHEC

Alternate Hydro Energy Centre (AHEC) was established at the University of Roorkee with initial support from the Ministry of Non-Conventional Energy Sources in 1982, with the mandate to promote power generation through the development of Small Hydropower projects (SHP) in hilly as well as plain areas & development of decentralized integrated energy systems in conjunction with other renewable energy sources e.g. biomass, solar, wind, etc.

AHEC offers training to the field engineers and technologists through short term training courses. AHEC also runs a three semesters M.E. Course in ‘Alternate Hydro Energy Systems’ for field engineers.

In addition to the regular training courses, the Centre also conducts customized short term training courses on almost *all aspects of small hydro projects including preparation of detailed project reports, engineering designs, techno-economic analysis, providing technical guidelines for field execution, and refurbishment of power houses. The Centre also provides training courses on development of biomass and solar energy systems in the field of renewable energy.*

IN 03. Centre for Power Efficiency in Distribution (NDPL)

<http://www.ndplonline.com/cenpeid/index.htm>

Center for Power Efficiency in Distribution (CENPEID)

NDPL, Sector 11, Rohini,

Delhi 110085, India.

Phone: +91-11+45397453; Fax: +91-11-27570725

Contact: Mr. V C Mathur, Chief Mentor; e-mail: vcm@ndplonline.com
Mr. S K Das, Head of Group-Training; e-mail: sk.das@ndplonline.com

North Delhi Power Limited (NDPL) is a joint venture private company with limited govt. stake responsible for distribution of electricity in the Northern areas of Delhi. NDPL has been the frontrunner in implementing power distribution reforms in the Capital City.

NDPL places high emphasis on employee training (as stipulated by the Government of India) and has established Centre for Power Efficiency in Distribution (CENPEID) with a vision to provide training, sharing knowledge, conducting research and providing a forum for policy advisory in Power Distribution.

CENPEID conducts regular training courses under Distribution Reforms, Upgrade and Management (DRUM) project of USAID and MoP, GoI.

Training courses offered include entire gamut of courses in distribution sub-sector (techno-managerial, commercial and technical). The target groups for various training at CENPEID are Linemen, Technician, Supervisors, Engineers, and Managers. It also offers specialized training for technicians and linemen. CENPEID offers long duration training for fresh entrants to build cadres in Engineering.

IN 04. Center for Environmental Planning & Technology

<http://www.cept.ac.in/>

Center for Environmental Planning and Technology
Kasturbhai Lalbhai Campus, University Road,
Navranpura, Ahmedabad 380009
Gujarat, India
Telephone: 091-79-26302452, 26302470; Fax: 091-79-26302075
Email: registrar@cept.ac.in

Center for Environmental Planning and Technology (CEPT) is a leading institution (has now become a State University) offering undergraduate and postgraduate programs in the areas of natural and built environment and related disciplines.

CEPT has qualified faculty known for its contributions in academics and research. CEPT has exchange programs with several international institutions. The courses/programs offered at CEPT are approved by the State Government and AICTE (All India Council for Technical Education).

CEPT undertakes customized training programs for Environmental Impact Assessments and Environmental awareness courses for Municipalities.

IN 05. Cummins Training Centre, CDSS, India

Website: http://www.cumminsindia.com/cdss/service/info_06.htm

Cummins Training Centre, CDSS
35 A/ 1/2, Erandwana,
Pune – 411038, India
Tel: +91-20-25431234, 254300661; Fax: +91-20-25439490
Contact: Mr. Satish K Kale, Capacity Building Executive,
E-mail: satish.k.kale@cummins.com

The Cummins Training Center at the Cummins Diesel Sales & Service (CDSS), Pune was established in 1976 to ensure end users to be trained on Cummins products. The training imparted is on systematic planning and professionally carrying out operations, maintenance, and rebuild of Cummins Products.

The training courses being offered at the Centre cover diesel engine awareness, operation, maintenance, & repair and complete re-building. In addition special training courses can be designed to suit client's needs and these can also be arranged at client's site.

Two batches of 12 and 13 diesel operators respectively, from Afghanistan have already been trained at the Cummins Training Centre with USAID support as part of the SARI/Energy Program.

IN 06. National Power Training Institute (NPTI)

Website: <http://npti.nic.in/>

National Power Training Institute
Corporate Office, NPTI Complex, NPTI Corporate Office
Sector– 33, Faridabad – 121 003, India
Phone: +91-0129-2275308, 2275475; Fax: +91-0129-2277412
E-mail: co@npti-india.com
Contact: Mr. R K Sharma, Director; e-mail: rksharma_npti@yahoo.co.in

National Power Training Institute (NPTI), an ISO 9001:2000 organization under Ministry of Power, Government of India, is the national apex body for training and human resources development in power sector. NPTI has nine units in different power zones of the country through which training is offered.

NPTI offers techno-managerial and managerial courses in areas of Hydro, Thermal, Power Systems, Total Quality Management, etc., covering technology-management interface, power-environment interface, power financing, privatisation and regulatory issues.

Training courses provided include *1 year Executive Training program of Graduate Engineers, Distribution Planning for Efficiency & Reliability Energy Accounting & Auditing, Transformer & Switchgear Maintenance, Relay Maintenance, Cable Jointing, Transmission & Distribution Engineering, Training on Load Dispatcher Simulator, Sub Transmission & Distribution System, Distribution Metering & Efficient Energy*

Management, O & M of Transformers & Circuit Breakers, O & M of Transmission Lines & Substations, Advanced Power System Protection, Power System Operation & Control, High Voltage Testing of Power System Equipment, Power Line Carrier Communication (PLCC) and Digital Communication.

NPTI offers long duration training for fresh entrants to build cadres in Engineering.

IN 07. Power Systems Training Institute (of NPTI)

Website: www.kar.nic.in/psti

Power Systems Training Institute

P.B. No. 8201, Subramanyapura Road

Banasankari II Stage

Bangalore - 560 070

Phone: +91-80-26713758, 26714549; Fax: +91-80-26713758

E-mail: pstinpti@yahoo.com

Power Systems Training Institute (PSTI) was established in the 1972 primarily to cater to the need for properly trained personnel to man the various state and regional load dispatch centers in India. Its portfolio of training courses was increased to cover other facets power systems. Since 2002, PSTI merged with National Power Training Institute, which is an ISO, 9001:2000 organization under Ministry of Power, Government of India.

PSTI offers training courses on various facets of power systems including Power systems operations, control & protection, dispatcher simulator training, O&M of transformers & circuit breakers, O&M of transmission lines and substations, sub transmission and distribution systems, etc.

IN 08. Hot Line Training Centre, Bangalore (of NPTI)

Website: <http://www.kar.nic.in/psti/HLTC/>

Hot Line Training Centre

26thKm, Kanakapura Road,

Somanahalli, Udayapura Post,

BANAGLORE-560 082

Tel: +91-80-28432212 & 28432053, Fax: +91-80-28432596

E-mail: hltc_cea@vsnl.net

hltc_npti@vsnl.net

Hot Line Training Centre (HLTC) at Bangalore was set up in 1974 under Central Electricity Authority for providing specialized training on maintenance of live lines. HLTC has merged with and is now a part of National Power Training Institute (NPTI).

HLTC conducts various courses on Live Line Maintenance Techniques up to 220KV using Hot Stick Method, Live Line Maintenance for 440 KV using Bare Hand Technique,

Capsule Course for Executives, Seminars/on site training on insulator washing, and switchyard maintenance techniques using cold hand method.

IN 09. HRD Centre for Excellence (National Hydroelectric Power Corporation)

Website: <http://www.nhpcindia.com/>

NHPC Office Complex

Sector - 33, Faridabad - 121 003

Haryana, India.

Phone: 91-129-2275312; Fax: 91-129-2277941

Contact: Executive Director; e-mail: kpsingh@nhpc.nic.in

National Hydroelectric Power Corporation (NHPC) is one of the largest organizations for hydropower development in India. NHPC is an ISO 9001 and ISO 14001 certified, multi-disciplinary organization and has large expertise and state of art technology for planning and executing both large and small size Hydro Power Projects. NHPC's capabilities include the complete spectrum of hydropower development from concept to commissioning.

NHPC's in-house HRD Centre for Excellence, established to provide training and capacity building of its cadres, offers to conduct training need assessment, planning for training interventions, and provide training in the following areas: *Refresher courses / Workshops on Hydropower development (Micro/Mini/Small/ Large projects), Special training courses for Design & Engineering, Underground works like Tunneling and use of related equipment, Environment Management, Geology & Geo-technical aspects, On job training for O&M of Hydro Power Stations, Management Training Programs with focus on Project Management, Development Programs for Workmen, Supervisors & Young Managers.*

IN 10. Indian Institute of Management Ahmedabad, India

Website: <http://www.iimahd.ernet.in/>

Indian Institute of Management

Vastrapur, Ahmedabad 380 015, INDIA

Tel: +91 79 2632-4862, 2630 724; Fax: +91 79 2630 6896

Contact: Dr Sebastian Morris; e-mail: morris@iimahd.ernet.in

Indian Institute of Management Ahmedabad (IIMA) is one of India's premier management institutes and a notable international school of management, established in 1961 as an autonomous body with the active collaboration of the Government of India, Government of Gujarat, and industry. The Institute had initial collaboration with Harvard Business School, which influenced the Institute's approach to education.

Executive Education (Management Development Programs)

IIMA has been very active in designing and offering several MDPs on contemporary topics to bring the latest in management discipline to practicing managers. IIMA offers several MDPs focused on functional and sectoral areas such as *general management courses for middle and senior executives, human resource management, organizational behavior, operations management, strategy and infrastructure.*

The case method of study is the major tool. It is supplemented by group exercises, role-plays, computer games, lecture-cum-discussions, and presentations by participants. So far more than 36,500 managers from public and private sector organizations and government departments have participated in more than 1000 MDPs.

IN 11. Indian Institute of Management (IIM) Bangalore

Website: <http://www.iimb.ernet.in/iimb/>

Indian Institute Of Management Bangalore
Bannerghatta Road, Bangalore - 560 076, India
Tel Ph. No: 91-80-26582450; Fax Number: 91-80-26584050
Contact: Neha R Pai, Consultant-Executive Education; email: edp@iimb.ernet.in

The Indian Institute of Management Bangalore was established in 1973. The flagship Postgraduate Programme in Management (PGP) and Fellow (Doctoral) Programme in Management (FPM) are very highly rated and IIMB alumni occupy senior managerial and academic positions across the globe. In addition to the long-duration programmes (PGP, PGSM, PGPPM and FPM), IIMB offers a wide range of executive education programs to meet the continuing education needs of business executives.

Executive Programs

IIMB's Executive Education is aimed at broadening the outlook and strengthening the skills of practicing managers. The Institute's Executive Education Programs comprise Open Programmes, International Programmes and Customized Programmes. The faculty specialise in the following fields: *Regulation and Privatisation, Environment, Energy and Infrastructure (Electricity, telecommunications), etc.*

IN 12. Indian Institute of Management, Lucknow

Website: <http://www.iiml.ac.in/>

Indian Institute of Management, Lucknow (IIML)
Prabandh Nagar, Off Sitapur Road,
Lucknow – 226013, INDIA
Phone: (91-0522) 2734101 to 2734120 Ext. 6282 / 6284 / 6285
Fax: (91-0522) 2734026, 2734025
Email: mdp@iiml.ac.in or mdpoffice@iiml.ac.in
Contact: Prof. Neerja Pande, Chairperson- MDP; Phone: (91-0522) 2736657

Indian Institute of Management, Lucknow (IIML), was established in 1984, by the Government of India, as a national level school of excellence in management science. In addition to the long-duration programmes (PGP, PGSM, PGPPM and FPM), IIML offers a wide range of Management Development Programs (MDPs) to meet the continuing education needs of business executives. IIM Lucknow devises and designs customized tailor-made programs for power utilities; courses offered include general management as well as functional areas. The programs can also be conducted at the location designated by the client organization.

IN 13. Institute of Rural Management Anand (IRMA)

Website: <http://www.irma.ac.in>

Institute of Rural Management Anand,
Post Box No. 60, Anand - 388 001,
Gujarat, India.

Phone: +91- 2692 - 260391 / 263260 / 261502, Fax: +91 - 2692 - 260188

Contact: Prof Haribandhu Panda; e-mail: hari@irma.ac.in

Institute of Rural Management, Anand (IRMA) is an autonomous institution with the mandate of contributing to the professional management of rural organizations. It was founded in 1979 at the initiative of the National Dairy Development Board and with the support of Government of India, Government of Gujarat, and Swiss Development Co-operation. Ever since its inception IRMA has been working closely with Co-operatives, NGOs, Governments, National and International agencies with the mission to promote sustainable, eco-friendly, and equitable socio-economic development of rural people through professional management of their institutions and organizations.

IRMA is an active partner in the Rural Energy Training Network (RETN) established with support from USAID's SARI/Energy Program.

IRMA offers short-term training programs - Management Development Programs (MDPs) for in-service managers/officers and executives of rural organizations. Several of these MDPs are custom made, tailored to meet the needs of particular organization/sector.

IRMA's strength is in providing technical/management support for developing cooperative/community based institutional systems for providing services like electricity in rural areas. IRMA's training portfolio includes *energy policy development and implementation, regulation, tariff fixation, etc. for senior executives/management in the cooperatives for rural electrification (general courses on different functional areas covering finance, accounts, organization behavior, human resource management, cooperatives, operation and maintenance management and strategic management, etc.), and training on specific functional modules for middle and junior executives.*

IN 14. Management Development Institute, Gurgaon

Website: <http://www.mdi.ac.in/>

Management Development Institute
Mehrauli Road, Sukhrali, Gurgaon - 122 001
Ph.: +91-124-2346162-63, 2349831-36, 2340173, and 2340153
Fax: +91-124-2341189; 2340147
Contact: Dr. Atmanand, Professor, and Chairman
Centre for Energy Management, MDI
E-mail: atmanand@mdi.ac.in

The Management Development Institute (MDI) was established in 1973 with the support of the Industrial Finance Corporation of India (IFCI).

The Centre for Energy Management is set up by the Management Development Institute, Gurgaon in collaboration with other organizations with a mission to develop, propagate and disseminate the knowledge of energy and power related issues. As part of its activities the center collaborates with organizations/ departments of national and international repute for conducting study, research, consultancy and organizing seminars and conferences in areas of energy and power sector.

Management Development Courses

MDI conducts more than 100 Management Development Programs every year. Programs of varying duration and structure focus on the current areas of interest to executives at the senior, middle, or junior management levels.

PG Diploma in Business Management: Energy Management with specialization in Power Distribution

In order to create pool of talent, the Ministry of Power, in collaboration with USAID, under DRUM project, has developed the Executive Post Graduate Diploma in Business Management (EPGDBM): Energy Management with specialization in Power Distribution. The program will have 12 months of classroom training in MDI complex at Gurgaon and another 3 months for project works, which each individual will develop at his / her own workplace.

IN 16. HRD Division: Power Grid Corporation of India Limited

Website: <http://www.powergridindia.com/pgnew/>

Saudamini, Plot No.2, Sector 29, Near IFFCO Chowk,
Gurgaon (Haryana) - 122001, INDIA
Phone: 91-124-2571700 through 2571719; Fax: 91-124-2571760, 2571761

Contact: Mr. Chetan Verma, Dy General Manager (Corporate Communication)
Phone: +91-124-2571913, Fax No.: +91-124-2571912
E-mail: chetan@powergridindia.com

POWERGRID, one of the largest Transmission Utility in the world, was incorporated in October 1989 for establishment and operation of regional and national electrical power grids in India. POWERGRID is the Central Transmission Utility (CTU) of the country and the first ISO 9001:2000 company in Indian power sector.

POWERGRID has in-house expertise in all specialized areas of electrical power transmission with systems up to 765 KV UHV AC, ± 500 KV HVDC, Gas Insulated Sub-stations, Static Var Compensators, Series Capacitors, Flexible AC Transmission System (FACTS), Controlled Shunt Reactors, etc. POWERGRID has also been certified for operating an Integrated Management System involving OHSAS: 18001 (Occupational Health & Safety Management System), ISO: 9001 (Quality) & ISO: 4001 (Environment).

The HRD Division at POWERGRID, manages and provides capacity building of its employees through several training courses aimed at various employee levels/functions. These training courses in *transmission system operation and maintenance (including grid at various voltage levels and transformer sub-stations), load dispatch, etc.* are also available to other agencies/utilities. *Apart from technical training, courses are also offered on general management, finance and HR functions related to utility management and operations. Further, specific areas/topics like commercial & tariff management and distribution sector reforms are also covered.*

IN 17. Power Management Institute (NTPC)

Website: <http://www.pmintpc.com/>

Plot No.5-14, Sector-16A, Noida - 201 301

Distt: Gautambudh Nagar (UP), India

Telephones: +91-120-2515201/2, 2515218/219/220; Fax: +91-120-2515210 and 2515234

E-mail: psg@pmintpc.com

E-mail: chief@pmintpc.com

Contact: Shri. R. K. Mathur, Sr. Manager (Program Services)

The Power Management Institute (PMI) was set up by National Thermal Power Corporation (NTPC) in recognition of the vital role that management development has to play, in the context of the challenges associated with the growth of the Indian Power Sector. The Institute is involved in the training and development of middle and senior level personnel from the power sector.

PMI offers a wide range of courses to *Junior, middle and Senior level management, related to enhancing general management competence and skills and leadership development, upgrading functional management skills (HR, Finance, Materials & contracts); Enhancing technical expertise & competencies (various aspects of generation-hydro & thermal, Transmission and Distribution Sectors); Long duration*

induction level training schemes; other areas like Power Training, Regulation and Environment.

PMI offers long duration training for fresh entrants to build cadres in Engineering, Finance and HR.

IN 18. Reliance Energy Management Institute (Reliance Energy Ltd.)

Website: <http://www.rel.co.in/career/mgtinstitute.asp>

Reliance Energy Management Institute

19, Aarey Colony, J-V Link Road, Goregaon,

Mumbai – 400 065

Tel: + 91-22-268599543, ext. 5110; Fax: + 91-22-26858055

Contact: Dr. B.S.K. Naidu; DG (Trg. & Dev.)

Email: bsk.naidu@rel.co.in

Reliance Energy Management Institute (REMI) is the Training and Organizational Development Initiative arm of Reliance Energy Limited (REL), a major multi-national firm with an operating private sector distribution utility. REMI has been doing pioneering work in the field of the power sector, especially distribution management and employee development for the last few years. REMI has been instrumental in providing training to the various state electricity boards in India as well as in conducting courses for executives from other developing countries.

The Institute covers a variety of training areas right from *technical to behavioral, management related to utility operations – mainly on distribution sub-sector, both technical and commercial.*

IN 19. The Energy and Resources Institute (TERI)

Website: <http://www.teriin.org/>

Darbari Seth Block, IHC Complex, Lodhi Road, New Delhi - 110 003, INDIA

Tel. (+91 11) 2468 2100 and 2468 2111; Fax (+91 11) 2468 2144 and 2468 2145

e-mail: mailbox@teri.res.in

Contact: Dr Leena Srivastava, Executive Director

The Energy and Resources Institute (TERI) was formally established in 1974 and has grown substantially over the years, particularly, since it launched its own research activities and established a base in New Delhi, its registered headquarters.

The specific areas in which TERI conducts research activities and provides training/capacity building courses are *policy analysis on energy and environment issues, regulatory studies and governance in infrastructure sectors, and renewable energy resources.*

TERI has staff strength of over 700 employees, drawn from a range of disciplines and experience, supported by excellent infrastructure and facilities.

IN 20. Electricity Metering School (Yadav Measurements Private Limited)

Website: <http://www.ymlabs.com/>

Yadav Measurements Pvt. Ltd.
Post Box 169, Plot No. 19-20, Haridas Ji Ki Margi Trident Road
Udaipur, Rajasthan, India
Tel/Fax: +91 294 2434050 / 2430413 (O); Fax: +91 294 2434067
Contact(s): Mr. N.K. Bhati, Managing Director
Email: nandkishore.bhati@ymllabs.com

Yadav Measurements Pvt. Ltd. (YMPL), Udaipur is an independent laboratory and training center for engineers and technicians in the electricity distribution utilities. YMPL is accredited by India's National Accreditation Board for testing and calibration Laboratories (NABL) and the United Kingdom Accreditation Services (UKAS), UK for complete calibration and type testing of electricity meters and other instruments.

YMPL, through its 'Electricity Metering School' regularly conducts training courses on '*Electricity Metering Technologies, Systems and Applications*', and workshops on '*Electricity Revenue Protection*' for Utilities.

3. Country: Nepal

NP 01. Center for Energy Studies, Institute of Engineering, Tribhuvan University

Website: <http://ces.ioe.edu.np/>

Institute of Engineering, Tribhuvan University
Ananda Niketan, Pulchowk,
Lalitpur, Nepal
G P O Box 1175, Kathmandu
Tel: +977-1-532235; Fax: +977-1-532234
Email: ces@ioe.edu.np, cesioe@healthnet.org.np

Center for Energy Studies (CES) is an autonomous body established under Institute of Engineering (IOE), Tribhuvan University (TU) and has been working in the area of renewable energy since its establishment.

CES conducts short training courses (awareness generation and technical aspects) and workshops on renewable energy technology systems for stakeholders at various levels.

For last 5 years, in association with Department of Mechanical Engineering, IOE/TU, it has been conducting a two year Master level degree course on Renewable Energy Technology – Master of Science in Renewable Energy Engineering (MSREE).

NP 02. Nepal Electricity Authority (NEA) Training Centre

Website: <http://www.nea.org.np/>

Nepal Electricity Authority,
Training Center Department
Kharipati, Bhaktapur, Nepal
Phone: +977-1-6614736, 6610033; Fax: +977-1-6614626

Contact: Mr. Thakur Raj Pandey, Director
E-mail: trpandey_prd@yahoo.com

Nepal Electricity Authority (NEA) Training Centre has been established to provide need based training for the NEA staff. In addition to providing continuing training on topics of utility business, the Centre also provides tailor made courses to meet the specific requirements of the clients in the utility sector.

The Centre has electrical and mechanical workshops, simulator for generation and transmission functions. The distribution laboratory at the Centre is used to provide vocational training on testing and installation of meters, meter reading, industrial wiring, etc.

The specific courses offered by NEA Training Centre are:

Generation: O& M of hydropower stations and diesel power plants for middle and junior level staff, workshop practices and some vocational training courses for mechanics and electricians involved in repair and maintenance activities.

Transmission: design and construction of transmission lines, high voltage transmission line and sub-station maintenance of advanced level, grid management for engineers working in transmission sector, etc.

Distribution: low voltage lines – construction and maintenance, distribution transformer maintenance, cable jointing, meter testing & installation courses for middle and junior level technicians, advanced level courses in distribution system planning and loss reduction for engineers and executives.

Hydropower: hydropower projects, economic and financial aspects of hydropower projects, investigation, and studies.

Management: basic accounting, inventory management, management training (decision making, project management, self development, etc.), is training on office procedures for office assistants, financial management, environmental studies, etc.

In addition to the Training Center, the **Soil, Rock & Concrete Laboratory (SRCL)** at NEA which was established in 1986 also provides consulting and advisory services in field exploration, construction material investigation, hydrological, hydraulic studies, and design of water resources projects, especially projects related to the development of hydropower in Nepal. It has sections specialized in the field exploration as well as engineering design of hydropower projects. At present, it is one of the leading water resources institutions of Nepal.

Contact: Mr. Vishnu Bahadur Singh, Chief, SRCL (Manager, NEA)
Tel: 370432, 372520, 371056; E-mail: vbs@ntc.net.np
Post Box No. 11137,
Bhagwan Pau, Swayambhu
Kathmandu, Nepal

NP 03. Rural Energy Development Program, NEPAL

Website: <http://www.redp.org.np/>

P. O. Box # 107, Kathmandu, Nepal
Tel: +977-1-520048; Fax: +977-1-521547
E-mail: redpkm@mos.com.np

Contact: Mr. Kiran Man Singh

Rural Energy Development Program (REDP) is a UNDP supported endeavor implemented to enhance rural livelihoods and preserve the natural environment by supporting micro-hydro, solar and biogas as entry points for rural energy systems' development. REDP's focus is on creating comprehensive institutional arrangement for rural energy development.

REDP's research and development activities focus on community mobilization, decentralized energy planning, micro hydro demonstration schemes and human resource development. REDP has established Human Resource Development Center for the capacity building at all three levels – center, district, and grassroots. REDP also collaborates with the University of Flesnburg, Germany for academic, technical, and intercultural exchange in the areas of mutual interest.

REDP provides training on *community mobilization and decentralized energy planning especially for micro hydro design and installation, operation and maintenance, institutional arrangements (management), biogas plants and solar PV systems installation.*

NP 04. School of Environmental Management and Sustainable Development

Website: http://www.schems.edu.np/training/eia_introduction.php

School of Environmental Management and Sustainable Development (SchEMS)
Shanti Nagar, 62/38 Siddhicharan Marg,
P.O. Box: 2453, Kathmandu, Nepal
Tel: +977-1-4107509, 4107803; Fax: +977-1-4107517
E-mail: schems@wlink.com.np, schems@mos.com.np

School of Environmental Management and Sustainable Development (SchEMS) was established in January 1999 as an affiliate of Pokhara University, Nepal. The main

objective of SchEMS is ‘to prepare skilled human resources base on integrated environmental management and sustainable development in line with the contemporary need of the country in particular and that of the region in general’. SchEMS is affiliated to international universities in countries such as Bangladesh, Canada, The Netherlands, UK, USA, and Australia.

SchEMS has also been a Training Institute Partner (TIP) for the USAID sponsored SARI/E program and has been identified as environmental "Hub" center for South Asian countries by USAID South Asian Regional Program.

In addition to conducting training on Environment Management, SchEMS also offers training courses on Strategic Environmental Impact Assessment.

4. Country: Pakistan

PK 01. Lahore University of Management Sciences (LUMS): Rausing Executive Development Centre

Website: <http://www.lums.edu.pk/>

Lahore University of Management Sciences,
Opposite Sector U, DHA,
Lahore Cantt. - 54792, Pakistan
Tel: +92-42-5722670-9; Fax: +92-42-5722591
Contact: Nuzhat Kamran, Head, and M&ER;
Tel: +92-42-5722670 (ext: 2208), Email: nuzhatk@lums.edu.pk

The Lahore University of Management Sciences (LUMS) is a national university, established by sponsors belonging to Pakistan’s leading private and public sector corporations. LUMS has two schools: the Suleman Dawood School of Business and the School of Arts and Sciences. LUMS provides executive development education through its Rausing Executive Administration Centre (REDC).

LUMS Executive MBA (EMBA), is spread over 25 months and involves a total of 16 weeks of full-time academic activity supplemented by distance learning.

Rausing Executive Development Centre (REDC)

Website: <http://www.lums.edu.pk/edc/index.html>

Manager REDC
Tel: +92-42-5722670 - 79 Ext: 3222; Direct: +92-42 – 5722142
Email: rec@lums.edu.pk
Contact: Ms. Mehreen Rashid, Manager, REDC; e-mail: mehreen@lums.edu.pk

REDC designs and conducts client-specific programs for top senior and middle-level management. The portfolio of programs offered includes *executive general management*,

operations/project management, financial management courses, organizational behavior/human resource management, etc.

Water and Power Development Authority (WAPDA)

WAPDA offers training on various core power sector topics through its specific training centers given below:

PK 02. WAPDA Staff College, Islamabad

Website: <http://202.38.50.35/htmls/training-index.html>

WAPDA Staff College, Sector H-8/1 Islamabad.

Phone: +92-51- 9257151; Fax: +92-51- 9257140

WAPDA Staff College offers courses on general management for middle and junior level managers and engineers of utilities. Courses include *Utility Operation, Management Training, Commercial Training, Financial Training and Audit and Accounts Training for Staff and officers.*

PK 03. WAPDA Regional Training Centers

Website: <http://202.38.50.35/htmls/training-index.html>

WAPDA Staff College also controls the eight Regional Training Centers (RTCs) that are presently located with various distribution companies for providing training on distribution sub-sector. The RTC at Lahore Electric Supply Company is a partner training institution in the Rural Energy Training Network (RETN) formed under USAID supported the SARI/Energy program.

The RTCs provide training for *technicians working on the distribution and offer courses for linemen & assistant linemen, commercial clerks, meter readers, bill distributors, etc.*

PK 04. WAPDA Engineering Academy, Faisalabad

Website: <http://202.38.50.35/htmls/training-index.html>

Principal: Mr. Muhammad Anwar Ch.

The Engineering Academy at Faisalabad has several sections relating to power sector. The **Transmission and Distribution section** specializes in *training on transmission and distribution systems – induction courses, grid operation and maintenance, transformer protection and maintenance, distribution system operation & maintenance, load dispatching course, etc. for junior and mid-level engineers and technicians.* The Academy has well established labs, simulators, and workshops including high voltage lab.

In addition to the above, the Academy also provides *Vocational Training Courses in transmission and distribution sectors – like cable jointing, motor winding, advanced fitting practices, electronic control circuitry, etc.*

PK 05. WAPDA Hydel Training Centre, Mangla

Website: <http://202.38.50.35/htmls/training-index.html>

Established in 1977 the Hydel Training Centre at Mangla provides *theoretical as well as on-the-job training on operation and maintenance of hydro power stations to the newly recruited Junior Engineers and technical staff of Hydel Power Stations.*

5. Country: Sri Lanka

SL 01. Energy Forum

Website: <http://www.energyforum.slt.lk/>

Energy Forum

239 Highlevel Road,

Kirulapone,

Colombo 05, Sri Lanka.

Telephone: +94-11- 5524613; **Fax:** +94-11- 2852167

Email: eforum@sltnet.lk

Contact: Mr. Abey Gunawardana, Program Manager

Mr. Bandula Chandrasekara, Field Coordinator

The Energy Forum was established in 1991 is an independent non - profit organization. It is a network of individuals and organizations promoting renewable and decentralized energy technologies and. The purpose of forming EF was to address the policy - level issues common to the decentralized energy sector.

Energy Forum has been an active partner in the Rural Energy Training Network (RETN) established with support from USAID's SARI/Energy Program.

Energy Forum conducts research studies, training courses and workshops/seminars for *off-grid application of energy technologies and promotion of renewable energy technologies.*

SL 02. Institute of Policy Studies

Website: <http://www.ips.lk/>

The Institute of Policy Studies of Sri Lanka

99, St. Michael's Road,

Colombo 03, Sri Lanka.

Telephone: +94 - 11 - 2431368, 2431378, 2431408; Fax: +94 - 11 – 2431395

E-mail: ips@ips.lk

IPS is the apex economic policy research institute in Sri Lanka, established as an autonomous research institute, by an Act of Parliament in December 1988, and was formally gazetted in April 1990. Since its inception, the Institute of Policy Studies has been supported through a collaborative project between the Royal Netherlands Government and the Government of Sri Lanka.

An emerging role of the Institute has been that of an independent source of long-term policy advice. Today, the IPS has evolved to be a respected independent economic policy research center in Sri Lanka operating outside the formal government sector.

IPS conducts research and organizes workshops/seminars on Regulatory Policy, Restructuring of the state owned enterprises.

SL 03. National Institute of Business Management

Website: <http://www.nibm.lk/>

NIBM Colombo Center
120/5, Wijerama Mawatha,
Colombo 7.
Tel.: +94-11-2692165, +94-11-2693404
E-mail: info@nibm.lk

The National Institute of Business Management (NIBM) was established in 1976 and has been offering training and development opportunities in management and IT education in Sri Lanka.

In the field of management and productivity the NIBM offers the mid-level employees and managers the opportunity to obtain well-recognized qualifications in diverse fields through the numerous Certificate and short-term courses. The Management Development Division at the Institute also designs and conducts tailor-made customized training programs on specific topics/issues as required by the client organization.

The range of courses being offered at NIBM are *office organization & management, customer relationship management, training of accounts & audit staff and human resource planning & implementation.*

Appendix G

Potential Institutional Partners for the Recommended Training Courses

Recommended Capacity Building/Training activities	Potential Training Institutions in South Asia Region
A. Restructuring of MEW	
A 1. Course on Management of Training	PMI (IN 17), MDI (IN 14), IIM-A (IN 10),
A 2. Training course cum study tour for key incumbents of restructured MEW	ASCI (IN 01), MDI (IN 14), IIM-A (IN 10)
A 3. Training in Regulation	ASCI (IN 01), TERI (IN 19)
A 4. Attachment Training with Regulatory Commission/ India	APERC
A 5. Course on Energy Policy	MDI (IN 14), IIM-A (IN 10), IIM-B (IN 11), IPS (SL 02), TERI (IN 19)
A 6. Training Mentor (within MEW)	-
A 7. Developing Transition Plan for the Resident Advisors (Expatriates) in MEW	-
A 8. Course on Corporate Governance and Management	PMI (IN 17), ASCI (IN 01), MDI (IN 14), IIM-A (IN 10), IIM-B (IN 11), IIM-L (IN 12), LUMS (PK 01), WAPDA Staff College (PK 02)
A 9. Basic Management Course	PMI (IN 17), NIBM (SL 03), CENPIED (IN 03), REMI (IN 18)
A 10. Executive Diploma in Energy Management	MDI (IN 14)
A 11. Induction Level Training Schemes	PMI (IN 17), CENPIED (IN 03), NPTI (IN 06), NHPC (IN 09), Power Grid (IN 16)
A 12. Training Center: Institutional Support (Management Development)	-
A 13. Refresher Courses in Contracts Management	PMI (IN 17), CENPIED (IN 03), Power Grid (IN 16)

A 14. Refresher Course in Project Management	PMI (IN 17), CENPIED (IN 03), Power Grid (IN 16), LUMS (PK 01)
A 15. Basic Course on Finance & Accounts	PMI (IN 17), CENPIED (IN 03), Power Grid (IN 16), NEA Training Center (NP 02), LUMS (PK 01)
A 16. Refresher Course in Procurement and Stores	PMI (IN 17), CENPIED (IN 03), Power Grid (IN 16), LUMS (PK 01)
A 17. Basic Course on Human Relation Management	PMI (IN 17), CENPIED (IN 03), Power Grid (IN 16), LUMS (PK 01)
A 18. Basic course on Office Management	NEA Training Center (NP 02), NIBM (SL 03)
A.19-21 Training Courses on Environment Issues:	
1 a. Course on Environment Impact Assessment (EIA) for the Projects	SchEMS (NP 04), CEPT (IN 04)
1 b. Environment Awareness Course for Municipalities	CEPT (IN 04), NEERI (IN 15)
2. Advisor for Environmental Policy within MEW	-

B. Renovation and Rehabilitation Programs

B 1. Course on R & R of Hydro Power Stations	NHPC (IN 09)
B 2. Course on Upgrades and Modernization of Transmission System	Power Grid (IN 16)
B 3. Course on Upgrades and Modernization of Distribution System	CENPIED (IN 03), REMI (IN 18)

C. Power Imports from neighboring countries

C 1. Economic aspects of Power Sector: Key Concepts and Tools (Basic level courses)	MDI (IN 14), PMI (IN 17), ASCI (IN 01), IIM-A (IN 10), IIM-B (IN 11), IIM-L (IN 12), TERI (IN 19)
C 2. Course on Power Purchase Agreements	PMI (IN 17), ASCI (IN 01)
C 3. Course on Technical aspects of Power Import	BUET (BD 01), Power Grid (IN 16)
C 4. Attachment Training: Power Procurement	Power Trading Corporation of India

D. Generation Sub-sector	
D 1. Salient Aspects of Civil Engineering for Hydroelectric Projects	NHPC (IN 09), NEA Training Center (NP 02)
D 2. Construction Material Investigations for Hydropower Projects	NEA Training Center (NP 02), NHPC (IN 09)
D 3. Refresher Course: Operation & Maintenance of Generators and Turbines	NEA Training Center (NP 02), NHPC (IN 09), WAPDA Hydrel Training Center, Mangla (PK 05)
D 4. O & M of Diesel Generators: Training of Trainers	Cummins Training Center (IN 05)
D 5. Roll out of the training course on O&M of DG sets (including for provinces)	Cummins Training Center (IN 05)

E. Commercial Aspects of Electricity Distribution	
E 1. Course on Commercial Aspects of Electricity Distribution & Electricity Retail Tariff	CENPIED (IN 03), REMI (IN 18)
E 2. Course on Metering Billing & Revenue Management	CENPIED (IN 03), WAPDA-RTC (PK 03), REMI (IN 18)
E 3. Training on Computerized Billing & Customer Care Services	CENPIED (IN 03), REMI (IN 18)
E 4. Metering Technologies and Systems	Electricity Metering School (IN 20), CENPIED (IN 03)

F. Distribution Sub Sector	
F 1. Distribution Capacity Expansion and New Technologies	CENPIED (IN 03)
F 2. Course on O & M of Sub Transmission and Power Distribution System	CENPIED (IN 03), REMI (IN 18)
F 3. Financial Management for Distribution units	CENPIED (IN 03), REMI (IN 18)
F 4. Effective Management Of A Power Distribution Utility	CENPIED (IN 03), REMI (IN 18)
F 5. Distribution Loss reduction	CENPIED (IN 03), NPTI (IN 06)
F 6. Course for Linemen in Distribution Systems	WAPDA-RTCs (PK 03), WAPDA Engg Academy (PK 04), REB-Savar (BD 02), CENPIED (IN 03), NEA (NP 02)

F 7. Technical skills enhancement for Sub-transmission lines (15 kV) and transformer stations	WAPDA- Engg Academy (PK 04), CENPIED (IN 03)
F 8. Course on O&M of Junctions and sub-stations	WAPDA- Engg Academy (PK 04), CENPIED (IN 03)
F 9. Technical course on meters and metering aspects	WAPDA- Engg Academy (PK 04), CENPIED (IN 03), Electricity Metering School (IN 20)

G. Transmission sub-sector

G 1. Transmission system planning and design	Power Grid (IN 16), PSTI (IN 07)
G 2. Construction, erection and commissioning of transmission lines and substations	Power Grid (IN 16)
G 3. Power System Operation and Maintenance: for transmission staff at DABM and at Provinces	Power Grid (IN 16), PSTI (IN 07)
G 4. O&M of transmission lines for Transmission staff at Provinces	Power Grid (IN 16), NEA Training Centre (NP 02), PSTI (IN 07)
G 5. Long term load forecasting studies	Power Grid (IN 16), PSTI (IN 07)
G 6. Grid Management including - scheduling and load dispatching -control and communication systems (at Provinces)	Power Grid (IN 16)
G 7. Hot line maintenance	HLTC (IN 08)

H. Expansion and New Capacity in Generation, Transmission and Distribution

H 1, 2 & 3. Survey and Design for New Projects:	
1.Refresher course on: Design of transmission lines, Design of substations and transmission network	Power Grid (IN 16)
2.Current developments in Construction of hydro Power Plants	NHPC (IN 09)
3. Training on Survey techniques and Data Entry and Analysis (for transmission lines and Stations) using modern software	Power Grid (IN 16)
H 4. Course on Power Project Development	PMI (IN 17)

H 5. Contracts Management	PMI (IN 17), CENPIED (IN 03), Power Grid (IN 16)
H 6. Distribution Capacity Expansion	CENPIED (IN 03)

I. Renewable Energy	
I 1. Policy Seminar on Renewable Energy Development (in Afghanistan)	TERI (IN 19)
I 2. Attachment training for developing renewable energy policy and country strategy	TERI (IN 19), CES Tribhuvan University (NP 01)
I 3. Course on Survey, Design and Implementation for Micro-hydro power systems	AHEC (IN 02), NEA Training Centre (NP 02)
I 4. Course on O&M procedures for micro hydro power plants	AHEC (IN 02), NEA Training Centre (NP 02)
I 5. Course on community based approaches for micro-hydro implementation	REDP (NP 03), Energy Forum (SL 01), IRMA (IN 13)
I 6. Course on Resource Assessment for Renewable Energy Technologies	TERI (IN 19), BUET (BD 01), Energy Forum (SL 01)

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