

Report

on

Study Visit of SEC Professionals to India

(13-18 April 2015)



Study Visit Participants

Mr. Mohammad Naeem Malik, Director

Mr. Suresh Shrestha, RF (ETE)

Study Visit of SEC Professionals to India

1. Introduction

This Report has been prepared upon the completion of the "Study Visit of SEC Professionals to India", which is the SEC's approved programme activity for the FY 2015. The main purpose of the activity is to visit the energy related institutes in India to learn from the Indian experiences in the energy sector so that the resources and expertise in India could be utilized to enhance the capacity of the professionals in the region and to explore and identify ways and means to collaborate with them for the development of Energy Sector in the region.

As approved, the study visit of the two-member SEC Professionals including Mr. Mohammad Naeem Malik, Director SEC and Mr. Suresh Shrestha, RF (ETE) took place from 13 to 18 April 2015. The following three institutes were planned to be visited upon prior coordination.

1. The Energy and Resources Institute (TERI), New Delhi
2. National Power Training Institute (NPTI), Faridabad, Haryana
3. Keshava Deva Malviya Institute of Petroleum Exploration (KDMIPE), Dehradun

The team would visit research laboratories, training facilities to benefit from the Indian Expertise by interacting with the relevant Experts of the organizations and also to discuss the way forward in the field of Energy Cooperation in the SAARC Member States.

Besides, SEC also proposed meeting with **Mr. Salman Zaheer**, Director, **Regional Integration of South Asia, The World Bank, New Delhi** with an objective of apprising the Bank of SEC activities and to explore and identify collaborative approaches for energy integration in the region.

Similarly, **Mr. Nagesh Kumar**, Head, UN-ESCAP South and South-West Asia Office invited the team to visit **UNESCAP South and South West Asia Office** for a meeting, exploring collaboration between SEC and UNESCAP being the objective.

The visit to KDMIPE could not take place due to inability to furnish necessary security clearance for the team as informed by the Institute. Not receiving response from Mr. Zaheer, the meeting could not take place. However, a meeting was arranged with **Mr. D.N. Raina**, the Energy Expert to get opinions for planning SEC activities for the coming fiscal year.

2. Visit to The Energy and Resource Institute (TERI), New Delhi

The Energy and Resource Institute (TERI) located in New Delhi is working towards sustainability. Apart from the regional centres across the country, TERI also has affiliate institutes abroad. TERI's researches focus on Biotechnology and Bioresources, Environmental and Industrial Biotechnology, Industrial Energy Efficiency, Sustainable Habitat, Energy–Environment Technology Development, Sustainable Development Outreach, Technology Dissemination and Enterprise Development, Social Transformation, Water Resources, Earth Science, Climate Change etc.

The study team visited TERI RETREAT. The RETREAT (Resource Efficient TERI Retreat for Environmental Awareness and Training), which is TERI's Training and Conference Centre located at Gual Pahari, Gurgaon. At the RETREAT, the study team was welcomed with TERI film, which exhibited the history of TERI, its activities and achievements. The film was then followed by a presentation on Industrial Energy Efficiency by Mr. Pawan Kumar Tiwari, Associate Fellow. The study team then visited different Research Centers and facilities in the RETREAT.

The RETREAT facility focuses on utilization of energy conscious features so as to practice energy autonomy and minimal resource depletion. The RETREAT is an example of sustainable habitat which integrates various forms of renewable energy sources and serves as an ideal example for the promotion of renewable energy technologies. The RETREAT makes full use of the sun and taps its energy through photovoltaic solar panels, biomass gasifiers, underground earth air tunnels for air conditioning.

The Team was briefed by the experts about different biomass technologies and products, which included Turbo Stove for rural households, Biomass Gasifier for Thermal Applications and Electricity Generation, Biomass to liquid fuels and bioenergy from wastes.

Gasifier for thermal applications

With high cost of fuel on one hand and readily available firewood at relatively low prices, biomass gasification is a technology which TERI has developed and promoted with Micro, Small and Medium Enterprises (MSME) in India as the main target group. It was learnt in the visit that more than 600 gasifiers have been installed across the country contributing to cumulative field installation capacity of about 55 MWth, which in turn contributed towards CO₂ reduction of around 175000 tonnes per year. TERI's biomass gasifiers have also found their markets in countries like Sri Lanka, Burma, Thailand and Bhutan.

Gasifier for Electricity Generation

As the demand for electricity is increasing, resulting in a huge deficiency of grid based power and billions of people being deprived of electricity, TERI has developed technology package in the range of 10-150 kW and successfully demonstrated them in India as well as in the neighboring countries.

Bioenergy from Waste

The researchers in this area have developed a state of the art technology named as TEAM (TERI's Enhanced Acidification and Methanation Process) that converts waste to energy (Methane). TEAM Process consists of two phases. The first phase extracts the organic content from the waste and the second stage generates biogas from liquefied waste. The digested residue from the first phase is enriched manure.

Biomass to Liquid Fuel

TERI has developed a gas fired Pyrolyzer Reactor System, which has been tested with non-edible oil seed residues like Jatropha, Karnja etc. The thermal decomposition of organic matter in vacuum or in inert where Pyrolytic vapors are condensed to produce a dark brown mobile liquid called bio crude or bio oil. Dr. Piyali Das, the Biofuel Expert informed the team that the oil generated in the test has been used by blending with crude oil in refineries. The oil is also suitable as a blending substitute to furnace oil. The prototype reactor has been tested to process agro-crop residues like rice stalk, maize stalk, sugarcane bagasse, cashew nut shells etc.

Persons contacted

1. Sangeeta Badawar, Manager (Coordination), Support Services and Protocol
2. Mr. N K Ram, Associate Fellow, Biomass Energy Technology Applications
3. Mr. Pawan Kumar Tiwari, Associate Fellow, Energy and Environment Technology Division
4. Dr. Piyali Das, Fellow: Biofuel expert
5. Mr. Dinesh Chander Pant, Fellow and Area convener
6. Mr. Sunil Dhingra, Biogas expert
7. Mr. Abhishek Aggrawal, Research associate



Visit to TERI

3. Visit to National Power Training Institute (NPTI)

NPTI is an autonomous organization of the Ministry of Power, Govt. of India, which provides training to develop Human Resources in Power Sector. The Corporate Office is located in Faridabad. The Institute provides training in Power Sector to foreign as well as national customers. NPTI through its nine institutes operates on all India basis in the different regions of the country. It provides both professional training and academic programs.



Visit to NPTI

The visit started with a meeting with the Director General Mr. Subodh Garg. The team discussed with Mr. Garg about extending collaboration in terms of enhancing the capacity of the professionals in the region and supporting SEC with its resources in the development of power sector within the region.

The meeting was then followed by a film on NPTI, its services and achievements. The team then had a tour of the facility of NPTI. The institute is well equipped with Hi-Tech infrastructural facilities for conducting different courses on technical as well as management subjects covering the needs of Hydro, Transmission & Distribution Systems and Energy related fields. The team also observed a 500 MW Thermal Power Plant Training Simulator and acquired information on the Simulator and how it is used in training professionals. NPTI conducts industry related academic programmes like MBA in Power Management, BE/B. Tech Degree in Power Engineering, Post Graduate Diploma Course in Thermal Power Plant Engineering, Transmission and Distribution Systems and Hydro Power Plant Engineering. Besides, several long-term, medium-term and short-term training programs in the areas of Thermal, Hydro, Transmission and Distribution, Management and Regulatory Affairs etc are conducted in various institutes of NPTI. Customized training programmes are conducted at the institute.

Apart from the training to National and international professionals, NPTI also provides consultancy services in the power sector. Another service that the institute provides is System Operator Certification.

The institute has a well equipped library with NPTI's publications and training manuals on different aspects of the power sector. MBA in Power Management course is one of the very innovating degree programs that the institute has introduced with a view to catering to the techno-managerial needs of the Power Sector Professionals.

Persons contacted

1. Mr. Subodh Garg, Director General, NPTI
2. Mr. J.S.S Rao, Principal Director (CP&M)
3. Mr. R.K Mishra, Director (Training/Projects)
4. Mr. S.K Choudhary, Principal, MS

4. Visit to UNESCAP, South and South-West Asia Office, New Delhi

On invitation from Mr. Nagesh Kumar, the study team visited The South and South-West Asia Office of the Economic and Social Commission for Asia and the Pacific. The Office was established in the year 2011 in New Delhi to serve 10 ESCAP Member States-comprising of 8 SAARC Member states, Turkey and the Islamic Republic of Iran. Strengthening connectivity, transit and trade for regional economic integration being one of the major agenda of the Office, Mr. Kumar expressed a keen interest to join forces with SEC in supporting the energy connectivity.



Visit to UNESCAP South and South-West Asia Office

5. Meeting with Mr. Raina

Mr. D.N. Raina, the founder president of Entecsol, India has an extensive experience in energy issues across south and Central Asia and has also been associated with SEC from its commencement. It was worthwhile meeting with Mr. Raina to discuss the on-going activities of SEC and also to get ideas and opinions for planning activities for the coming fiscal year. The team had a rigorous exchange of ideas with the expert and the meeting was highly fruitful.

6. Conclusion and Way Forward

The visit was successful in terms of acquiring knowledge about the experiences and expertise of Indian Institutes in energy sector. The team learnt about the innovations and contributions of the institutes in the development of the energy sector. The institutes have expressed their keenness to collaborate with SEC in the future for the human resource development in the sector as well as overall energy sector development in the region.

TERI has a well equipped training facilities and huge pool of experts. The RETREAT provides the use of its facilities including accommodation for holding training programmes, workshops and conferences. TERI has continuous Capacity Building and Outreach Programmes within which it conducts training courses regularly for capacity enhancement and building awareness among all the stakeholders about sustainable use of energy. Workshops, seminars and training programmes are organized for different target groups. SEC can, therefore, collaborate with TERI to utilize the resources for SEC activities relating to capacity development of the stakeholders of the member states. SEC may invite the experts from TERI in SEC's workshops and seminars as well.

Similarly, NPTI in itself is a great facility which SEC can collaborate with for the development of electricity connectivity in the region. The institute showed its eagerness to SEC's proposal of collaborations by contributing to workshops/ seminars organized by SEC. SEC can use the Experts of the institute as resource persons in its workshops and training programmes. SEC may also collaborate with NPTI to use the campus and its accommodation facilities for training the professionals of the region in the future under SEC's activities. SEC may also collaborate in the development and improvement of the curricula of the SEC's Distance Learning Course for Power System Planners and Analysts and the courses to be introduced in the future.