AEE - INDIA CHAPTER

ENERGY WINDOW

VOL. 11 (ISSUE # 1-3) January September 2013

INDIAN INSTITUTE OF SOCIAL WELFARE AND BUSINESS MANAGEMENT

(DEPARTMENT OF ENERGY MANAGEMENT)

CONTENTS

EDITORIAL COMMENT

We have been experiencing good times and bad times too–they are coming in so close sequence that also makes us to understand that we are passing through more challenging time that the globe has ever faced. More people are recognizing that energy plays an important role –nay, more important role, and is a unique tool to handle both matter and spirit! At AEE India Chapter, IISWBM we had a memorable experience in last six months. Our Master Degree students and AEE Student Members Mr. Senthil A Kumar, Mr. Dipayan Sarkar and Mr. Pratim Raha worked for the people without electricity and some people rejected by society. They used energy-knowledge as their tool and humanity as their guide to design & deploy a standalone SPV system on the community hut roof-top in a remote village and design efficient environmentally benign home for the handicapped with the help of Ramakrishna Mission and Missionaries of Charity. The society recognized the effort with national and state-level first prizes/awards to them (http://www.iiswbm.edu/whats-new_achievement-energy-mng.asp). World's largest energy show WEEC was held in end of September 2013 and this time representatives from India Chapter and NCR Delhi Chapter attended making perhaps a all-time high participation from India. The SPV power bid became the lowest at ₹ 5.51/kWh on 27th August this year in Karnataka which is cheaper than most of electricity tariff in India. May the Almighty give us all the necessary strength for the best in this scenario of both challenges and opportunities, for Merry Christmas and Happy New Year 2014 to all.

The Great with Their Greatest Inventions

William Stanley, Jr.

(November 28, 1858May 14, 1916)

William Stanley Jr., the p**ioneer of the transformer and AC distribution systems was born in Brooklyn, New York** in 1858. During his lifetime he was granted 129 patents covering a wide range of electric devices. The most notable of these is the induction coil, a transformer that creates alternating current electricity. In the 1880s every electricity distribution system used direct current (DC). The problem is that DC transmission over long distances is impractical, requires thick wires, is dangerous and could not be used for lighting. On the other hand, alternating current (AC) systems do not have these drawbacks. AC voltage systems could be varied by use of induction coils, but no practical coil system had been invented. Stanley's patent #349,611 changed all this and became the prototype for all future transformers.

The prevailing power system of the day was the Edison Direct Current (dc) system. Its low voltage (100/220 volts) and large conductors made it impossible to distribute current over distances greater than a mile without high resistance and voltage drops. Stanley recognized the weakness of the Gaulard & Gibbs system as not being self-regulating, because its induction coils were wired in series. Using a parallel circuit allowed the potential (voltage) to be constant and inherently self-regulating. His discovery of this effect appears in a notebook entry of September 18, 1883.

Stanley developed the transformer in the tranquility of his new home in Great Barrington. He designed his own transformer which would revolutionize the industry. His first patented design was induction coils with single cores of soft iron and adjustable gaps in order to regulate the electromagnetic force which affects the secondary coil.

He used a Siemens steam engine in a rubber mill near Cottage Street that produced 500 volts. He stepped-up the voltage to 3000 and sent the power to Main Street. There he had 6 step-down transformers located in basements to bring down the power to 100 volts so it could be used for lights at each location. There were 36 incandescent bulbs total in all the shops that were lit by the system. The power transmission cable was strung up to the large Elm trees on the street. He used transformers in parallel to prevent load changes on one device from affecting all other devices downstream.

In 1890 Stanley founded the Stanley Electric Manufacturing Company in Pittsfield, Massachusetts. In 1903 the General Electric Corporation purchased a controlling interest in the firm. The land on which the company once stood is now the site of the William Stanley Business Park of the Berkshires in Pittsfield

A first prototype transformer built by Stanley in 1885

In October 2004, The Board of Directors of the Institute of Electrical and Electronic Engineers (IEEE) has approved an IEEE milestone plaque to commemorate the historical significance of providing *alternating current electrification to offices and stores on Main Street in Great Barrington, Massachusetts.*
Reference: http://www.ieeeghn.orgaccessed on 5th July 2013.

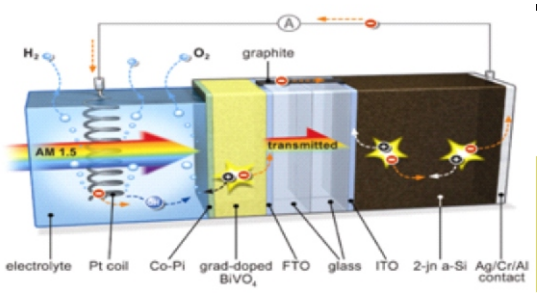
Technology Lookouts

Solar Hydrogen Production through Artificial Photosynthesis

Using a simple solar cell and a photo anode made of a metal oxide, HZB and TU Delft scientists have successfully stored nearly five percent of solar energy chemically in the form of hydrogen. This is a major feat as the design of the solar cell is much simpler than that of the high-efficiency triple-junction cells based on amorphous silicon or expensive III-V semiconductors that are traditionally used for this purpose. The photo anode, which is made from the metal oxide bismuth vanadate ($BiVO_4$) to which a small amount of tungsten atoms was added, was sprayed onto a piece of conducting glass and coated with an inexpensive cobalt phosphate catalyst. W

The experts were able to develop a rather elegant and simple system for using sunlight to split water into hydrogen and oxygen. This process, called artificial photosynthesis, allows solar energy to be stored in the form of hydrogen. The hydrogen can then be used as a fuel either directly or in the form of methane, or it can generate electricity in a fuel cell. One rough estimate shows the potential inherent in this technology: At a solar performance in Germany of roughly 600 Watts per square meter, 100 square meters of this type of system is theoretically capable of storing 3 kilowatt hours of energy in the form of hydrogen in just one single hour of

sunshine. This energy could then be available at night or on cloudy days.



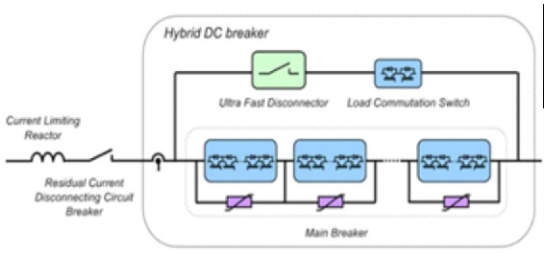
How it works?

When light hits the system, an electrical potential builds up. The metal oxide layer acts as a photo anode and is the site of oxygen formation. It is connected to the solar cell by way of a conducting bridge made of graphite (black). Since only the metal oxide layer is in contact with the electrolyte, the silicon solar cell remains safe from corrosion. A platinum spiral serves as the cathode where hydrogen is formed. (Credit: Image courtesy of Helmholtz Association of German Research Centres).

Source:http://www.sciencedaily.com accessed on 12th August 2013ou

A High-Power Circuit Breaker could finally make DC Power Grids Practical

Existing mechanical High Voltage DC breakers are capable of interrupting HVDC currents within several tens of milliseconds, but this is too slow to fulfill the requirements of a reliable HVDC grid. HVDC breakers based on semiconductors can easily overcome the limitations of operating speed, but generate large transfer losses, typically in the range of 30 percent of the losses of a voltage source converter station. To overcome these obstacles, the Swiss conglomerate ABB has developed a hybrid HVDC breaker. The hybrid design has negligible conduction losses, while preserving ultra-fast current interruption capability.



Hybrid HVDC Breaker

High-voltage DC power lines can efficiently transport electricity over thousands of kilometers and for long distances underwater, outperforming the AC lines that dominate transmission grids now. But for a century, AC prevailed because high-voltage DC could be used only for point-to-point transmission, not to form the integrated grid networks needed for a stable electricity system.

ABB has solved the main technical hurdle to such grids. It has developed a practical high-voltage DC circuit breaker that disconnects parts of the grid that have a problem, allowing the rest to keep working.

DC grids would be more efficient at connecting far-flung sources of renewable energy, allowing utilities to average out local variations in wind and solar power while bringing power to areas without much sunshine or wind. Solar power from the Sahara could power cloudy Germany, and wind power from all over Europe could keep the lights on at night. The result: more reliable renewable energy that can better compete with fossil fuels.

Source: http://www.technologyreview.com accessed on 19th May 2013.

The Whitepaper

Solar Energy - Sustainable Energy Option

Ramachandra T.V and Ganesh Hegde

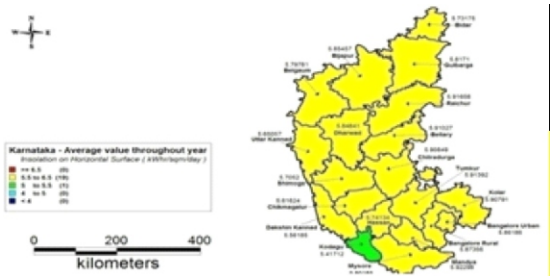
[1] Energy & Wetlands Research Group, Center for Ecological Sciences [CES]

[2] Centre for Sustainable Technologies (astra)

Indian Institute of Science, Bangalore, Karnataka, 560 012, India

Solar technologies such as Solar Photovoltaic (SPV) and Concentrated Solar Power (CSP) systems utilize solar radiation wavelengths between 0.29-5.5im and major part of the spectrum gets attenuated in other wavelengths due to either absorption or scattering in the atmosphere [1]. The industrialization and consequent activities have increased the energy demand. Electricity meets a major portion of this energy demand and the energy from conventional sources accounts to 87.89%. The total installed generating capacity in the country has increased by 255% from 58,012 MW (1989) to 2,06,456 MW (2011) and average Transmission and Distribution (T&D) loss of 27.2% recorded during 2009-2010. Considering the growing environmental problems coupled with the diminishing stock of fossil fuels, the focus has to be on the renewable sources of energy, which as on today accounts to only 15,691.4 MW grid-connected plants and 367.9 MW off-grid plants. Centralized conventional power plants are unable to meet everyone's' demand evident from the absence of electricity in about 74 million households or nearly 32,800un-electrified villages. This necessitates a decentralized, low-carbon, reliable, efficient and renewable options for energy generation. Key features of RE based generation are reduction of T&D losses, easier voltage management with flexible maintenance and reduced pilferages, scope for decentralized development at local levels with job opportunities due to the assured energy supply and availability of natural resources [2].

Solar Energy: Sustainable Energy Option: Energy consumption in Karnataka has increased gradually from 21698.23 GWh (2002-03) to 36975.2 GWh (2010-11). State is currently facing electric energy deficiency as consumption has exceeded the generation. Karnataka receives an average insolation of 5.55 kWh/m^2/day annually. Insolation varies from 4.5 to 7 kWh/m^2/day throughout the year (Figure 1). All districts of the state receive average insolation of 5.5 to 6.5 kWh/m^2/day annually except Kodagu (5-5.5 kWh/m^2/day) [1]. Electric energy can be harvested directly from available solar potential using solar photovoltaic (SPV) cells (modules).



Month	Jan	Feb	Mar	Apr	May	Jun
Avg. Insolation (kWh/m^2/day)	5.36	6.06	6.56	6.38	6.03	4.84
Month	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Insolation (kWh/m^2/day)	4.50	4.47	5.03	4.63	4.50	4.74

Average annual solar insolation (kWh/m^2/day) in Karnataka

About 68.43% of the population lives in rural areas of the state where the domestic electrical energy consumption ranges from 40 to 60 kWh per month per household. In rural area per capita energy consumption is about 10 to 12 kWh/month. This domestic demand can be supplied using solar PV installation on the rooftop where the average rooftop area available is 109.83 m^2. Roof area required is about 4.12% (3.62 m^2) of the total area available (ç=10%, effective area = 80% of available area) to generate 60 kWh per month using rooftop solar PV technology

Recommendations for Sustainable Energy during 21st Century

1. Solar PV technology has the potential to meet the domestic and irrigation demands in the decentralized way. Appropriate policy incentives might help in the large scale deployment of solar devices at household levels. There is a need to focus on energy efficient decentralized electricity generation technologies with micro grid and smart grid architecture, which would go long way in meeting the energy demand. In this regard, suggestions are:
2. Roof top based SPV would help in meeting the household energy demand in rural as well as urban households. Rural household require about 70-100 kWh per month and to meet this requirement 5-6 m^2 rooftop is adequate (at ç=10%, and insolation of 5 kWh/m^2/day) and the average rooftop in rural locations in Karnataka is about 110 m^2 and about 115 m^2 in urban localities.

   [To supply electricity to households in remote areas entails investment on infrastructure apart from transmission and distribution (T&D) loss of electricity. Current assessment reveals that T&D loss in Karnataka is about 19.5% resulting in the loss of 7,210.16 GWh (annual demand is 36,975.2 GWh in 2010-11) or Rs. 5,047.11 crores (@ Rs. 7/kWh).**]**
3. Considering the current level of T & D losses in centralized system, inefficient and unreliable electricity supply, it is necessary to promote decentralized energy generation. Small capacity systems are efficient, economical and more importantly would meet the local electricity demand. The incentive could be

a. Rs. 4.00 per unit for first five years (comparable to **subsidies granted to mini hydel projects, the powe purchase at ` 3.40)** and Rs.3.50 for the next two years for the electricity generated from roof top solar PV.

b. Buyback programmes for the electricity generated at household level and in micro grid -GBI of Rs. 5 to be provided for electricity generation (< 5 kW) feeding to the grid by SPV.

c. Free solar home lighting (with LED lamps) for economically disadvantaged sections of the society.

d. All street lights and water Supply installations in local bodies to be energized through solar power (or hybrid mechanism) in a phased manner

e. Install solar rooftops in all new government/local body buildings and in a phased manner in the existing government/local body buildings, etc.

f. Exemption from payment of electricity tax to the extent of 100% on electricity generated from solar power projects to be allowed for at least10 years.

g. Fixing of standards for quality installation.

4. Commercial lighting in advertisement boards should only be from SPV panels.
5. Capacity building of youth through technical education for installation and servicing of SPV panels.
6. Setting up service centers in block development offices to meet the requirement of service support for RE technologies (Solar, biogas, energy efficient chulas, etc.).

References

Ramachandra T.V., Rishabh Jain and Gautham Krishnadas 2011. Hotspots of solar potential in India, Renewable and Sustainable Energy Reviews, vol. 15, Issue 6, 2011

Ramachandra T V, 2011. Renewable energy transition: Perspective and Challenges, In: Energy India 2020- A Shape of Things to come in Indian Energy Sector, Saket Projects Ltd., Ahmedabad, Pp:175-183.

The Relevance of Energy Management System ISO 50001 in Industries

Payel Chakraborty
Analyst, Verde Renewables Pvt. Ltd.
Alumni of MPSM-Energy Management 2011-13 Batch, IISWBM Kolkata

There is no disagreement on the fact that discipline is indeed a necessity in every sphere of life to achieve long lasting and effective results, be it in academics, business management or even home-management. In a field as important as energy management discipline is essential and that is the foremost purpose of having an Energy Management System.

Today, industries have taken a step forward in the field of energy conservation, be it conducting energy audits or taking stringent measures to monitor their energy systems. But there is a need to induce a systematic approach and only then will they be able to reap the benefits of these efforts. This discipline in energy management is brought about by ISO 50001:2011 Energy Management System (EnMS).

In the course of implementing EnMS in the industries, it was found that in most industries the drive for energy conservation and management is mainly shared by the Energy Manager and few others who form the 'Energy Management Team'. The rest remain quite ignorant and unenthusiastic about 'piggy-banking' the most precious resource that is no more a luxury but a necessity: energy. What if that Energy Manager leaves the company to move to a new one? Should the present company now be deprived of his drive and ideas for energy management? Here comes the importance of the management system. When the Energy Management System will be in place in the industry the drive and innovative ideas for energy management will be shared and evolved by each person in the organization starting from the top management, middle management to the process owners and maintenance people and even the procurement department will play its part in considering energy efficiency as a criteria in the purchase of equipments.

In industries the process owner has the best knowledge of the process he controls; no one but he understands the process best. It is he who can come up with the best measures regarding how well to manage energy in his process. EnMS will ensure each process owner, operator, shop floor staff make their contribution towards energy conservation on a day-to-day basis. Thus, a continuous improvement cycle keeps operating in the organization, reaping its obvious, inherent benefits.

EnMS has increased the confidence in the energy data of the industries and confidence among stakeholders. EnMS ensures benefits on a long-term basis and hence has become an essential need in the industries.

Snapshot

Uttarakhand Flood: A Man Made Disaster

It is now beyond doubt that existing and under construction hydropower projects in Uttarakhand have played a significant role in increasing the proportions of disaster in Uttarakhand this June 2013. Uttarkashi, Kedarnath, Gaurikund, Rambada and Rudraprayag in the state of Uttarakhand are badly affected by land slides, flash floods and heavy rains.

Experts say rapid deforestation and construction work in the hills are some of the reasons behind frequent floods and landslides. Several hydropower projects and mining projects are going on in Uttarakand. The blasts used during tunnel constructions or mining is leading to landslides. According to the sources Asiganga hydropower project played a key role in the Uttarkashi disaster in 2011-12. At the project site of Asiganga blasts are being carried our regularly to make the dam which results in debris falling into the river. The blasts also damage the environment. The debris raises the water level in the river which leads to flash floods when it rains heavily. During monsoon such floods have become very common and cause a lot of destruction. A large number of trees are also cut for these projects, causing soil erosion and leading to massive landslides.

More than 220 power and mining projects are running in 14 river valleys in Uttarakhand. Several rivers are being diverted through tunnels for these projects leading to major disasters in the state.

Source: http://www.downtoearth.org.in accessed on 11th July 2013.

India Bangladesh Electrical Grid Interconnection Project

State-owned NTPC Vidyut Vyapar Nigam (NVVN), a subsidiary of NTPC Ltd, is expected to start supplying power to Bangladesh by end of 2013. NVVN has been nominated as the nodal agency for supply of power to Bangladesh. The development comes close on heels of Bangladesh Joint Secretary (Power), Md. Anwar Hossain handing over the sovereign guarantee to NVVN, CEO N. K. Sharma in Dhaka on August 7. A sovereign guarantee is an instrument of payment security against supply of the 250 MW for 25 years from various power stations of NTPC under the Power Purchase Agreement (PPA) signed between NVVN and Bangladesh Power Development Board (BPDB) in February last year.

The 125 km transmission line will connect Behrampur in India and Bheramara in Bangladesh, which would enable transfer of electricity from the former to the latter. Of the total line length, 40 km would fall in the Bangladesh territory while the rest would be in India. The transmission systems of India and Bangladesh, which are based on 400 kV alternate current (AC) and 230 kV AC respectively, is proposed to be synchronized by installing a back-to-back high voltage direct current (HVDC) link. The line will have an initial transfer capacity of 500 MW, which will later be upgraded to 1,000 MW. On the India side, 400 kV switching station has been set up atBaharampur in West Bengal by loop-in-loop out of the existing 400 kV Farakka-Jeerat S/C line.

Of the USD196.8 million project cost, the Indian component will cost USD38.2 million, which will be funded by POWERGRID. For Bangladesh's segment, estimated to cost USD158.6 million, the Asian Development Bank (ADB) is extending a loan of USD100 million while the Government of Bangladesh will contribute USD58.6 million.
Reference: The Hindu, August 8, 2013

CERC May Further Tightened Frequency Band for National Grid

To avoid a blackout such as the one that affected several states on 31 July and 1 August 2012, the Central Electricity Regulatory Commission (CERC) plans to further narrow the frequency band for the country's national grid. Grid frequency is a critical aspect of power system operations and a function of demand and supply. Global standards require that grid frequency be kept close to 50 hertz (Hz), but power-short India has had a history of the frequency fluctuating from below 48Hz to above 52Hz. A low or high frequency could result in the grid collapsing. In a discussion paper, the country's apex power sector regulator has suggested a grid frequency band of 49.95Hz to 50.05Hz. The current band is between 49.7Hz and 50.2Hz. Consequently, in a petition to CERC the National Load Despatch Centre (NLDC) has also sought for Imposing strict volume limits on Unscheduled Interchage (UI) injection/withdrawal and Introduction of locational bias in UI settlement rate to maintain the grid discipline and grid security.

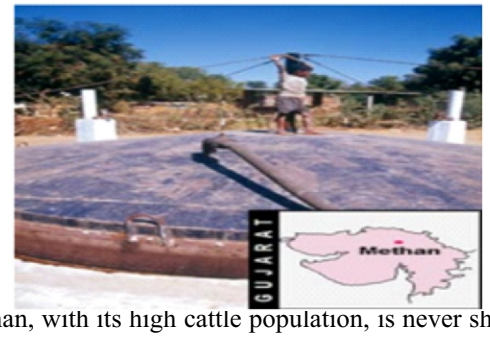
In the Draft 'CERC Regulations, 2013' it is further mentioned that “A record capacity of 54,963.9 MW has been added during the 11th Plan period. The Installed Capacity at the end of the 11th Plan was 1, 99, 877 MW as on 31.3.2012. The 12th Plan envisages a capacity addition of another 88537 MW. The Installed capacity as on 31.3.2013 is 2, 23, 344 MW and a capacity of 23, 467 MW has already been added n the year 2012-13 which includes a capacity of 20, 687 MW from conventional sources of energy against the target of 17, 956 MW. Such rate of capacity additions annually would take care, of concerns of the beneficiaries regarding their inability in meeting the demand or increase in load shedding due to narrowing down of grid frequency range.
Reference: http://www.cercind.gov.in accessed on 10th July 2013.

How do they do it?

Methan village in Sidhpur tehsil, Patan district of Gujarat saves 500 metric tonnes of fuelwood annually. They've been doing it for the last 15 years. This village is home to India's largest biogas plant, run by Silver Jubilee Biogas Producers and Distributors Cooperative Society Limited. "The biogas plant has been running since April 25, 1987, with minor repair works, and supplies gas to the villagers. Our cooperative runs the plant with no external assistance. This is the largest biogas plant in the country," claims Kasimbhai Khan, former supervisor of the cooperative society.

Mehsana-based Dudh Sagar Dairy (dsd) and the state government's Gujarat Energy Development Agency had initially helped set up the plant. dsd officials approached the villagers with their plan for the plant, and educated them in the utilisation of cowdung to produce biogas. This, they said, would reduce both indoor pollution and dependence on firewood. With an aid of Rs 19.91 lakh from the then department of non-conventional energy sources (now, ministry of non-conventional energy sources) of the Union government, the biogas plant was inaugurated.
The biogas plant has eight digesters with a total capacity

of 630 cubic metres (cum). Six digesters have a capacity of 85 cum each, and two have a capacity of 60 cum each. When the plant was used for the first time, 25 tractor trolleys of cowdung were fed into the digesters. Now the plant needs only one trolley of cowdung per digester. The digesters are used on a daily rotation basis. Everyday, one digester is filled with a trolley of cowdung that is mixed well with water in a mixer-well. The cowdung then passes from the mixer-well to the digester. The temperature inside a sealed digester is maintained at 35c to 55c. Microorganisms in the cowdung get metabolised at this temperature. The end products of the process are biogas and digested substrate.



Methan, with its high cattle population, is never short of cowdung. One trolley of cowdung weighs two and a half tonnes, and costs Rs 125. Dry waste, digested substrate, from the biogas plant is used in the fields as rich manure. This manure is sold at Rs 300 per trolley, and is much in demand in the village. The community manages the system; the plant uses local supply of cowdung; villagers use waste from the plant in their fields; the village saves huge quantities of fuelwood; and kitchens have cleaner, smoke-free fuel. Clearly, the biogas plant has changed more than just the way Methan cooks its food.

For more details please read further this article titled"What's cooking in India's largest biogas plant" on www.indiaenvironmentportal.org.in

Happenings

State Level Energy Quiz at IISWBM

This programme was the first of its kind to be jointly organized by the State Designated Agency (SDA) West Bengal State Electricity Distribution Company (WBSEDCL) & the Energy Management Department Indian Institute of Social Welfare & Business Management (IISWBM), Kolkata, in association with the Indian Renewable Energy Development Agency (IREDA), Govt. of India, and the Association of Energy Engineers (AEE - USA) India Chapter. This was a part of the observance of National Energy Conservation Day. The focus of this year's observance is "Corporate Social Responsibility (CSR) towards Promotion of Energy Conservation & Renewable Energy Application".

Dignitaries on dais taking part in open session AEE meeting. From left to right Prof Arindam Dutta, Dr Binoy Krishna Chowdhury, Dr Rajat Mandal, Dr S. C. Bhattacharya and Prof S. K. Dutta. Mrs Piyali Sengupta and Ms Pallavi Pallav are also found looking at each other

30 Jan, 2013 was chosen to host the final round of State level Quiz competition conducted as a part of National Observance of energy conservation. 5 Zonal champions from West Bengal participated with fervour to covet the state level championship. The quiz competition was preceded with a welcome address from Prof D. K. Sanyal, Director of IISWBM and Dr Rajat Mandal, Cluster head India, OSRAM. The quiz provided an excellent platform not only to participants but also to the audience in getting acquainted with energy conservation in general and renewable energy technologies in specific. Mr Soumitra Gowswami and Anirban Mukerjee of NSHM Knowledge Campus Durgapur from Burdwan zone won the state level championship.

New Head of IISWBM

Eminent economist, administrator and academician Prof. Amitava Sarkar has taken over the position of Director of IISWBM on 1st November 2013 and would also serve as the ex-officio President of AEE India Chapter.

National Conference on Green Design

ADaRSH along with The Energy and Resources Institute (TERI) and Ministry of New and Renewable Energy (MNRE) organized its flagship event the National Conference on Green Design 4th edition in New Delhi on 14-15 February 2013. The conference aimed to bring together pioneers in the field of green buildings, including policy makers and researchers together on one platform to share their experiences and view-points on the way forward for green habitats.

Upcoming Events

Energy Courses at IISWBM

IISWBM - India's first management institute, is also unique for the world class energy services to the society with the following three courses:

Two-Year Full-time Master Degree in Public Systems Management with specialization in Energy Management affiliated to University of Calcutta. 21st batch is going to commence in July 2014

Two-week short term certificate course on energy management & audit (syllabus completely covers CEM/CEA exam of BEE). Tenth batch is upcoming

One-week IRCA accredited EnMS - ISO 50001 - lead auditor course of Bureau Veritas (permissible batch strength: either 10 or 20 participants). Third batch is upcoming For details: Please visit www.iiswbm.edu OR http://www.energymanagertraining.com/new_energy_course.php

Renewable Energy World Conference & Expo India 2014

The event will take place from **5-7 May 2014** at **Pragati Maidan, New Delhi,** the largest venue of its kind in New Delhi. This high-level conference and exhibition is excited to present for the first time DistribuTECH India as a new co-located event along with HydroVision India and POWER-GEN India and Central Asia ensuring complete coverage of the power sector from generation to transmission & distribution. To get more information about this, please visit http://www.renewableenergyworldindia.com/

New AEE Chapter in Western India

After the first AEE Chapter in India being established in 2003 at IISWBM and the second at the National Capital Region Delhi in 2012, the stage is all set for the third AEE Chapter in India to come up in Mumbai very soon. For further information, please contact Mr. Milind Chittawar at milind.chittawar@seetechsolutions.in or Dr. B K Choudhury at binoykchoudhury@gamil.com

H.E. Mr George N Sibley Handing Over the AEE India Chapter Charter in 2003 at IISWBM

WEEC 2014

The **World Energy Engineering Congress (WEEC)** is going to be held from October 1-3, 2014 at Washington Convention Center, Washington, DC. Now in its 37th year, the WEEC is well-recognized as the most important energy event of international scope for end users and energy professionals in all areas of the energy field. To get more information about this, please visit at www.energycongress.com

Achievements

Mr. Senthil Kumar (2011-2013 batch of Energy Management, IISWBM) won the Special Young Energy Researcher Award by the Bengal Chamber of Commerce and Industries in 2013 Energy Conclave

Mr. Dipayan Sarkar and Mr. Pratim Raha (2012-2014 batch of Energy Management, IISWBM) won First Prize at the University Level for the Science Model Competition at West Bengal State Student-Youth Science Fair 2013 organised by Youth Services Department, Govt. of West Bengal in collaboration with Birla Industrial and Technological Museum, Kolkata

This year Association of Energy Engineers (AEE) India Chapter has been awarded with two very prestigious awards by AEE-USA. One for the Best Community Service and another for the Most New Members of the Year 2013.

Mr. Arindam Dutta, Assistant Professor and Secretary, AEE India Chapter, IISWBM, is receiving, on behalf of the Chapter, the AEE International Awards at 2013 WEEC, Washington DC, USA.

Mr. Milind Chittawar, CEO, SEE-Tech Solutions Pvt. Ltd. have received AEE's "Energy Professional Award 2013" for South Asia Region at 2013 WEEC.

This year, The Foundation of the Association of Energy Engineers (FAEE) scholarship 2013 is awarded to three of the Energy Management students of Indian Institute of Social Welfare & Business Management (IISWBM) Kolkata. They are Payel Chakraborty of 2011-13 Batch, Dipayan Sarkar & Akash Samanta of 2012-14 Batch.